Federal Court Cour fédérale

Date: 20231204

Dockets: T-557-21
T-561-21
T-573-21
T-577-21

Citation: 2023 FC 1520

Ottawa, Ontario, December 4, 2023

PRESENT: The Honourable Madam Justice McVeigh

Docket: T-557-21

BETWEEN:

ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD

Plaintiffs

and

JAMP PHARMA CORPORATION

Defendant

Docket: T-561-21

AND BETWEEN:

ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD

Plaintiffs

and

JAMP PHARMA CORPORATION

Defendant

Docket: T-573-21

AND BETWEEN:

JAMP PHARMA CORPORATION

Plaintiff by Counterclaim

and

ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD

Defendants by Counterclaim

Docket: T-577-21

AND BETWEEN:

JAMP PHARMA CORPORATION

Plaintiff by Counterclaim

and

ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD

Defendants by Counterclaim

PUBLIC JUDGMENT AND REASONS
(Confidential version issued on November 16, 2023)

I. Overview

[1] This matter involves a dispute between JAMP Pharma Corporation ("JAMP") and AbbVie Corporation and AbbVie Biotechnology Ltd (collectively, "AbbVie"). This dispute relates to JAMP's SIMLANDI product – a biosimilar of AbbVie's HUMIRA.

[2] HUMIRA is a successful and well-known drug, which purports to have changed the lives of millions of patients. HUMIRA is the brand name for the monoclonal antibody ("mAb") adalimumab sold by AbbVie and is used to treat a range of autoimmune disorders, including rheumatoid arthritis, Crohn's disease, and hidradenitis suppurativa ("HS"), amongst many other diseases.

[3] There are three patents at issue in this matter, all of which pertain to AbbVie's HUMIRA: Canadian Patent No 2,504,868 (the "868 Patent"); Canadian Patent No 2,801,917 (the "917 Patent"); and Canadian Patent No 2,904,458 (the "458 Patent"). Adalimumab is the anti-inflammatory biologic that is contained in each of the claimed patent inventions in this matter.

[4] This proceeding involves two patent infringement actions and two impeachment actions pursuant to subsection 6(1) of the *Patented Medicines (Notice of Compliance) Regulations*, SOR/93-133 [the *Regulations*], subsections 60(1)-(2) and 55(1) of the *Patent Act*, RSC 1985, c P-4 [the *Patent Act*] [Appendix A].

[5] Ultimately, this matter largely comes down to legal conceptual differences, as opposed to vast disagreements with the evidence. I commend the parties for distilling the issues down with appropriate concessions.

[6] For the reasons that follow, I find that JAMP has established on a balance of probabilities that the asserted claims of the 868 and 917 Patents are invalid. In light of the prior art, I find the dosing regimens for the 868 and 917 Patents were obvious to try.

[7] However, I find that JAMP has failed to demonstrate that the asserted claims of the 458 Patent are invalid. Those claims are not anticipated by WO 2006/138181 (the "181 Application"), nor are they obvious to try in light of the prior art. I also do not find the asserted claims are invalid due to overbreadth or double patenting.

[8] JAMP has conceded infringement of the 458 Patent. However, I will not grant AbbVie the injunction they sought, which would have restrained JAMP from making, using, promoting, or selling SIMLANDI in Canada until the 458 Patent expires on November 28, 2028. I also will not grant AbbVie's request for delivery up or destruction of the infringing products.

II. Background

[9] Court File T-557-21 involves one of the two patent infringement actions pursuant to subsection 6(1) of the *Regulations* [Appendix A]. In that action, AbbVie alleges JAMP directly or indirectly infringes the 868 Patent and the 917 Patent. JAMP denies infringement of the

patents and counterclaims, pleading the patents and their claims are invalid pursuant to section 60 of the *Patent Act* and section 8.1 of the *Regulations* [Appendix A].

[10] Court File T-573-21 involves a patent impeachment action, where JAMP seeks declarations of invalidity with respect to each of the patents and the claims at issue pursuant to subsection 60(1) of the *Patent Act* [Appendix A]. For each of the patents, JAMP seeks declarations pursuant to subsection 60(2) of the *Patent Act* that the making, using, or selling of JAMP products by JAMP in Canada will not infringe any of the valid asserted claims of the three patents at issue. AbbVie counterclaims pursuant to the *Patent Act*, seeking declarations that the claims of the 868 Patent and the 917 Patent are valid.

[11] Court File T-561-21 pertains to the 458 Patent and is the second infringement action pursuant to the *Regulations*. In that action, AbbVie seeks a declaration pursuant to subsection 6(1) of the *Regulations* [Appendix A] that the making, constructing, using, or selling by JAMP of its SIMLANDI product would directly or indirectly infringe the asserted claims of the 458 Patent. JAMP counterclaims, requesting a declaration that the asserted 458 Patent claims are invalid pursuant to section 60 of the *Patent Act* and section 8.1 of the Regulations [Appendix A].

[12] Court File T-577-21 relates to the 458 Patent and is the second impeachment action pursuant to subsection 60 of the *Patent Act* [Appendix A]. There, JAMP seeks a declaration of invalidity pursuant to subsection 60(1) of the *Patent Act* [Appendix A]. JAMP also seeks a declaration pursuant to subsection 60(2) of the *Patent Act* that the making, using, or selling of JAMP products by JAMP in Canada will not infringe any of the valid asserted claims of the 458

Patent. AbbVie counterclaims, asking for a declaration that the 458 Patent and its claims are valid and will be infringed by JAMP's SIMLANDI product, pleading the *Patent Act*.

A. *The Parties*

[13] AbbVie Corporation is a corporation existing under the laws of the province of Québec, having a principal office or place of business at 8401 Trans-Canada Highway in Montreal. AbbVie Biotechnology Ltd is a corporation existing under the laws of Bermuda with a principal office or place of business in Hamilton, Bermuda.

[14] In 2013, Abbott Laboratories ("Abbott") created AbbVie, which is an independent research-based pharmaceutical company.

[15] JAMP is a pharmaceutical company headquartered in Québec, and has its principal corporate office located at 1310 Nobel Street in Boucherville. JAMP operates its business as a manufacturer and distributor of pharmaceutical products.

B. *Procedural History*

[16] In December 2020 or January 2021, JAMP sought regulatory approval in Canada for SIMLANDI in the 40mg/0.4 mL pre-filled syringe, 40 mg/0.4mL auto-injector pen, and 80mg/0.8mL pre-filled syringe (see Table below). On February 19, 2021, JAMP served a Notice of Allegation ("NOA") on AbbVie pursuant to subsection 5(3) of the *Regulations*.

JAMP Presentation	Reference Biologic Drug
SIMLANDI, adalimumab, 40 mg in 0.4 mL sterile solution (100 mg/mL), subcutaneous injection, pre-filled syringe	HUMIRA, adalimumab, DIN 02458349, 40 mg in 0.4 mL sterile solution (100 mg/mL), subcutaneous injection, pre-filled syringe
SIMLANDI, adalimumab, 40 mg in 0.4 mL sterile solution (100 mg/mL), subcutaneous injection, auto-injector	HUMIRA, adalimumab, DIN 02458357, 40 mg in 0.4 mL sterile solution (100 mg/mL), subcutaneous injection, pre-filled pen
SIMLANDI, adalimumab, 80 mg in 0.8 mL sterile solution (100 mg/mL), subcutaneous injection, pre-filled syringe	HUMIRA, adalimumab, DIN 02466872, 80 mg in 0.8 mL sterile solution (100 mg/mL), subcutaneous injection, pre-filled syringe

[17] On January 5, 2022, the Minister of Health issued a Notice of Compliance ("NOC") to JAMP for the three JAMP presentations.

[18] Accordingly, JAMP launched its products on April 13, 2022, under the brand name SIMLANDI.

[19] AbbVie judicially reviewed the Minister of Health's decision to issue the NOC to JAMP, alleging the Minister erred by finding that JAMP was not a "second person" for the purposes of subsection 5(1) of the *Regulations* [Appendix A]. In *AbbVie Corporation v Canada (Health)*, 2022 FC 1209 [*AbbVie* 2022], the Court found the Minister's decision reasonable and dismissed the judicial review. An appeal is underway of that decision. At the time of writing this decision, the Federal Court of Appeal has yet to hear the appeal. This issue was not raised during the trial.

[20] Accordingly, following the trial, I issued a direction to the parties asking whether they wanted this Court to wait to release its decision, until after the Federal Court of Appeal determines the appeal, or whether I can proceed without regard to that decision.

[21] The parties jointly explained that the impeachment actions are "entirely unaffected" by the Federal Court of Appeal's pending decision and that this decision can be released without regard to the appeal of *AbbVie* 2022. Therefore, at the time of the release of this decision, T-557-21 and T-561-21 are not at issue.

[22] A brief summary of the actions is provided below. The bolded box (first two lines) indicates those actions are not live in this decision.

Court File No.	**Patents at Issue**	**Type of Action**
T-557-21	868 and 917 Patents	PM(NOC) Action
T-561-21	458 Patent	PM(NOC) Action
T-573-21	868 and 917 Patents	Impeachment Action
T-577-21	458 Patent	Impeachment Action

[23] On March 1, 2022, the Case Management Judge bifurcated the liability determination from the quantification and specific damages assessment.

[24] At the outset of the trial, the parties advised the Court that they had agreed to withdraw all claims and counterclaims in respect of the remaining non-asserted claims of the 917 Patent

and the 458 Patent. The parties withdrew all claims from Patent 2,847,142 (the "142 Patent"), Patent 2,385,745 (the "745 Patent"), and Patent 2,898,009 (the "009 Patent"). Accordingly, four court files associated with the 745 Patent and the 009 Patent are also no longer at issue.

[25] Finally, there is a confidentiality order presently in place that protects both parties' confidential technical, scientific, regulatory, sales, marketing, financial, business strategy, and other commercially sensitive information (or proprietary information) not otherwise known or available to the public.

C. *Technical Background*

(1) HUMIRA and Adalimumab

[26] D2E7, adalimumab, was the first fully human mAb developed in the world (Dr. Hoffman Witness Statement at para 28). It is not disputed that adalimumab and HUMIRA were a breakthrough for the treatment of rheumatoid arthritis. HUMIRA stands for "human monoclonal antibody in rheumatoid arthritis".

[27] HUMIRA was initially approved for patients with rheumatoid arthritis. The original buffered adalimumab formulation of HUMIRA was approved by the Food and Drug Administration ("FDA") in 2002. In Canada, HUMIRA first received approval in 2004 as a 50 mg/mL concentration of adalimumab. Amongst many other indications, HUMIRA is widely used around the world to treat rheumatoid arthritis, adult and pediatric Crohn's disease, and

psoriasis: *AbbVie 2022* at para 15. AbbVie is the exclusive marketer and seller of HUMIRA in Canada.

[28] Currently, AbbVie Corporation is authorized to market and sell the drug HUMIRA in Canada in the following strengths:

HUMIRA Strength	Approval
40 mg/0.8 mL sterile solution (50 mg/mL)	NOC on September 24, 2004
10 mg/0.1 mL sterile solution (100 mg/mL)	NOC on March 26, 2018
20 mg/0.2 mL sterile solution (100 mg/mL)	NOC on March 26, 2018
40 mg/0.4 mL sterile solution (100 mg/mL)	NOC on October 13, 2016
80 mg/0.8 mL sterile solution (100 mg/mL)	NOC July 28, 2017 and March 26, 2018

[29] Inflammation is the body's immune response, which generally protects the body from disease and fights infection. Typically, the body will respond to threats by triggering an immune response to eliminate the threats. However, in some diseases, the immune system targets the body's own cells and tissues (Dr. Marshall October Report at para 29). Cytokines are proteins that communicate between cells and assist in triggering an immune response. Tumor necrosis factor alpha ("TNFα") identifies threats and triggers the immune response to clear threats from the body (Dr. Marshall October Report at para 30).

[30] Antibodies are another type of protein that is also involved in the body's immune response to threats. Antibodies respond to a specific antigen and bind to the antigen to neutralize it. Antibodies consist of two parts: 1) the antigen-binding region and 2) the constant region (Dr. Marshall October Report at para 33).

[31] Antibody therapies function by targeting specific proteins in the body and neutralizing undesired side effects of the proteins (Dr. Marshall October Report at para 54). Adalimumab, also known as D2E7, binds to soluble TNFα and neutralizes the biological function of tumor necrosis factor ("TNF") by blocking its interaction with cell surface TNF receptors. HUMIRA is a biologic therapy, meaning it is a protein-based drug that is derived from cells or living organisms (Dr. Marshall October Report at para 54).

[32] Throughout the trial, there were discussions about human anti-human antibodies ("HAHAs"), which are now better known as anti-drug antibodies ("ADAs"). HAHAs and ADAs are produced by the body in response to humanized monoclonal antibodies ("mAbs"), and are a form of immunogenicity. The production of ADAs has the potential to impact adalimumab effectiveness in patients. When developing use of a new mAb, there is frequently concern about minimizing the development of ADAs. In and around 2004, ADAs had previously been reported for TNFα inhibitors. For example, the REMICADE (infliximab) Package Insert warned of ADAs and the associated risk of infusion related reactions (Dr. Mould Responding Report at para 91).

(a) *Protein Stability*

[33] A key consideration in mAb formulation is the stability of the protein formulation. This involves numerous considerations, including the potential of hydrogen ("pH"), conductivity, buffering agents, excipients, and the structure of the protein itself.

[34] Immunoglobulin G (“IgG”) antibodies have a general Y structure, consisting of two light chains and two heavy chains. The amino acid sequence for IgG antibodies are similar (Dr. Falconer Report at paras 93-96 and Dr. Falconer’s PowerPoint at slide 6).

[35] Proteins can vary dramatically and unpredictably, even when they have similar structures (Dr. Trout’s PowerPoint at slide 12). There are two classes of instability that can negatively impact the efficacy, safety, or appearance of the protein formulation: chemical and physical instability. Chemical instability leads to modification of the protein through bond formation or cleavage, which is where the peptide bonds between the amino acids essentially break. Physical instability involves changes to the “higher order structure of the protein” (458 Patent at 1).

[36] Pharmaceutical formulation scientists attempt to overcome these instabilities through the formulation process. The formulation of the protein is important, as the protein concentration increases, so does aggregation, insolubility, and degradation of the protein (458 Patent at 3 and Dr. Trout July Report at para 52).

[37] Aggregation results when the mAb molecules self-associate, which also potentially leads to mAb precipitates.

[38] pH is an important consideration, as the solubility, physical, and chemical stability of mAbs is pH dependent (Dr. Falconer’s PowerPoint at slide 11). Any given mAb formulation will have a pH value. The isoelectric point (or “pI value”), is where the pH of a formulation will have a neutral charge (Dr. Falconer’s PowerPoint at slide 11). The further away the pH value is from

the mAb's pI value, the more charged the molecules are. This means that the molecules repel each other, which increases solubility and decreases viscosity (Dr. Falconer's PowerPoint at slide 11).

[39] Excipients are used to maintain the given pH of a formulation. Buffering systems are an example of an excipient that can be added to a protein formulation.

[40] Buffering systems can be used to stabilize aqueous protein formulations, as buffers help maintain the pH of the formulation. There is an array of buffers such as acetate, succinate, citrate, amino acids, and phosphate (Dr. Falconer's PowerPoint at slide 13). Buffers have their own buffering capacity, which increases proportionally with the increasing buffer concentration, and a certain buffer range (Dr. Falconer's PowerPoint at slide 13).

[41] Surfactants are used in protein formulation as they reduce surface tension and decrease the driving force for protein adsorption, as well as aggregation on hydrophobic surfaces (Dr. Falconer's PowerPoint at slide 18).

[42] All of these considerations are important when creating and manufacturing mAbs because aggregation, insolubility, and degradation have implications on drug safety and efficiency.

(b) *PK/PD Modelling*

[43] Pharmacokinetic ("PK") is a branch within pharmacology that attempts to understand the effects of the body on an administered drug (Dr. Noertersheuser Witness Statement at para 1). PK models determine the fate of substances administered to a living organism. In essence, PK modelling understands what the body does to the drug (Dr. Mould's PowerPoint at slide 4 and Dr. Mould Report at para 41). There are several different types of PK modelling, including individual PK modelling, population PK modelling, and meta-modelling. PK deals with absorption, distribution, metabolism, and excretion.

[44] Pharmacodynamics ("PD") is another branch within pharmacology which analyzes the impact of a drug on the body. PD models simulate the biological response of the drug over time, following administration of a drug, thereby allowing a modeller to understand the body's response to the drug.

[45] PK/PD modelling combines these two disciplines in one complex model. A PK/PD model translates biological data into a mathematical framework. The PK/PD model consists of a series of mathematical equations and functions which can be used to predict what the body may do to a drug upon administration and what the effects may be on the body (Dr. Noertersheuser Witness Statement at para 2). The model can be used to support the development of clinical trial protocols.

(2) Crohn's Disease and Ulcerative Colitis

[46] Crohn's disease and ulcerative colitis ("UC") are types of inflammatory bowel disease ("IBD"). Both are serious diseases that affect the gastrointestinal tract ("GI") of the body.

[47] UC is confined to the colon and is characterized by inflammation of the colon, which causes diarrhea and bleeding. Discrete ulcers may be seen in the colon with UC, and the inflammation seen in UC is contiguous (Dr. Howden August Report at para 109).

[48] Unlike UC, Crohn's disease can occur anywhere in the GI tract. Inflammation also occurs in Crohn's disease, although the inflammation is typically patchier than UC. There may be "skip lesions" in persons affected with Crohn's disease, meaning that while some areas of the GI tract can be actively affected, the inflamed areas can be separated by normal-appearing areas.

[49] A comparison of the location, inflammation, and symptoms of Crohn's disease and UC can be seen below (Dr. Howden's PowerPoint at slides 9 and 10):

	Crohn's Disease	**Ulcerative Colitis**
Location	Can occur anywhere in the GI tract	Confined to the colon (i.e. large intestine)
Inflammation	Inflammation …. more patchy than in UC "Skip lesions"	Inflammation …. is contiguous
Symptoms	Diarrhea and rectal bleeding Rectal bleeding not always present Obstruction or abscess formation	Diarrhea and rectal bleeding May or may not … discrete ulcers in the colon

	Infections with intestinal abscess formation, fistulas, episodes of intestinal obstruction and … colorectal cancer Life-threatening and may require surgery	Anemia Toxic dilatation of the colon … a medical/surgical emergency If [medical treatment] fails …. surgical removal of the entire colon is required Long-term risk of colorectal cancer

(3) HS

[50] HS is a skin disorder of the apocrine glands and hair follicles, which involves swollen, painful, chronically inflamed lesions or lumps that develop in the groin and sometimes under the breasts and armpits. HS has a horrible odor from "purulent, malodorurant fluid" (Dr. Okun Nov 17 page 660 line 21), and many witnesses testified this a very unpleasant symptom. This, along with other symptoms, causes a reduced quality of life for patients (Dr. Okun Nov 17 page 660 line 27). HS symptoms appear and disappear over time.

[51] HS frequently occurs in patients who have other medical conditions, such as acne, diabetes, IBD, and in patients who are overweight (Dr. Sauder Invalidity Report at para 65).

[52] HS exists with varying severity in patients, ranging from mild symptoms to severe. HS can range from the appearance of swollen pimple-like bumps on the skin to lesion or lumps infected by bacteria (such as abscesses or draining fistulas) that can lead to scarring (Dr. Sauder's PowerPoint at slide 18 and Dr. Sauder Invalidity Report at para 63).

[53] Treatment depends on the severity of HS. Mild forms can be treated using warm compresses, topical antibacterial agents or washes, oral antibiotics, as well as anti-inflammatory agents (Dr. Sauder Invalidity Report at para 67). Moderate forms can be treated similarly, with corticosteroids to reduce swelling and retinoids. As well, although the parties raised an issue about TNFα inhibitors on cross-examination, based on a present understanding of treatment, I recognize this is another treatment option (Dr. Sauder Invalidity Report at para 67). Finally, severe forms of HS may require surgical intervention (Dr. Sauder Invalidity Report at para 67).

D. *The Patents at Issue*

(1) The 868 Patent

[54] The 868 Patent discloses a multi-variable dose method for treating TNFα disorders, including Crohn's disease and psoriasis. The 868 Patent is listed on the Canadian Patent Registrar in respect of the drug HUMIRA.

[55] The 868 Patent is titled "Multiple-Variable Dose Regimen for Treating TNF-α Related Disorders". The 868 Patent was issued on November 29, 2016, and its earliest prior date is April 9, 2004. Its filing date is April 11, 2005 and its publication date is September 29, 2005.

[56] The named inventors of the 868 Patent are Rebecca S. Hoffman (US), Elliot Keith Chartash (US), Lori K. Taylor (US), George Richard Granneman (US), and Philip Yan (US).

[57] The 868 Patent contains five claims. Those five claims are as follows:

868 Patent	Claims
1.	Use of D2E7 in multiple doses for treating inflammatory bowel disease in a human subject, wherein the multiple doses comprise of: a first dose of 160 mg of D2E7 for subcutaneous administration; a second dose of 80 mg of D2E7 for subcutaneous administration two weeks following administration of the first dose; and a third dose of 40 mg of D2E7 for subcutaneous administration two weeks following administration of the second dose.
2.	The use according to claim 1, additionally comprising further doses of 40 mg of D2E7 for subcutaneous administration two weeks apart commencing two weeks following administration of the third dose.
3.	The use according to claims 1 or 2, wherein the first dose and the second dose are provided in four and two dosage unit forms of 40 mg of D2E7 each, respectively.
4.	The use according to any one of claims 1 to 3, wherein the inflammatory bowel disease is Crohn's disease.
5.	The use according to any one of claims 1 to 3, wherein the inflammatory bowel disease is ulcerative colitis.

(2) The 917 Patent

[58] The 917 Patent is directed to the treatment of HS. The 917 Patent is also listed on the Canadian Patent Registrar in respect of the drug HUMIRA.

[59] The 917 Patent is titled “Uses and Compositions for Treatment of Hidradenitis Suppurativa (HS)”. The earliest priority date of the 917 Patent is June 3, 2010 and its filing date

is June 3, 2011. The 917 Patent's publication date is December 8, 2011 and it was issued on April 25, 2017.

[60] The two named inventors of the 917 Patent are Martin M. Okun (US) and Thomas C. Harris (US).

[61] The 917 Patent consists of seven claims. Those seven claims are as follows:

917 Patent	Claims
1.	Use of adalimumab, in multiple doses for treating moderate to severe hidradenitis suppurativa (HS) in an adult, wherein the multiple doses comprise: a first loading dose of 160 mg of adalimumab for subcutaneous administration to the subject at week 0; a second loading dose of 80 mg of adalimumab for subcutaneous administration to the subject at week 2; and a weekly maintenance dose of 40 mg of adalimumab for subcutaneous administration to the adult starting at week 4, wherein said multiple doses are not subject to any discretionary adjustment by a physician or medical practitioner.
2.	The use of claim 1, further comprising use of a biweekly maintenance dose of 40 mg of adalimumab for subcutaneous administration to the adult starting at week 16, wherein said weekly administration of the maintenance dose stops after week 15.
3.	The use of any one of claims 1 to 2 wherein said treating decreases the number of inflammatory lesions in the adult.
4.	The use of any one of claims 1 to 3 wherein said treating prevents worsening of abscesses in the adult
5.	The use of any one of claims 1 to 4 wherein said treating prevents worsening of draining fistulas in the adult.

6.	The use of any one of claims 1 to 5, further comprising use of antibiotics in the adult.
7.	The use of any one of claims 1 to 6, wherein the adult had an inadequate response to oral antibiotics prior to said treating.

(3) The 458 Patent

[62] The 458 Patent is titled “Protein Formulations and Methods of Making Same”. The 458 Patent deals with protein formulation, protein stability, and the shelf-life of proteins. Specifically, it is directed towards the finding that proteins formulated in water maintain solubility, as well as stability, even at high concentrations, during long-term liquid storage or other processing steps (458 Patent at page 4). The 458 Patent reports that “the formulations of the invention do not rely on a buffering system and excipients, including surfactants, to keep proteins in the formulation soluble and from aggregating” (458 Patent at page 42).

[63] The 458 Patent consists of 280 claims. However, not all of the claims are at issue. Only the following claims are at issue in this matter [Appendix B]:

- Claim 28 as it depends on claim 10 as it depends on claim 1;
- Any one of claims 37, 38, 40-43, 45-49 and 215 that depend either directly or indirectly on claim 28;
- Claim 83 as it depends on claim 72 as it depends on claim 69;
- Any one of claims 75, 76, 78-80, 124, 125 and 215 that depend, either directly or indirectly, on claims 83, 72 or 69;

- Claim 217 as it depends on claim 193 as it depends on claim 192 as it depends on claim 191; and
- Any of claims 194-198, 204 and 205 that depend, either directly or indirectly, on claims 217, 193, 192 or 191.

E. *SIMLANDI*

[64] JAMP markets its product SIMLANDI in Canada, which is a "biosimilar" of AbbVie's HUMIRA. JAMP began selling SIMLANDI in Canada on April 13, 2022.

[65] SIMLANDI is available as a 40 mg/0.4 mL pre-filled syringe, 40 mg/0.4 mL pre-filled auto-injector, and 80 mg/0.8 mL pre-filled syringe. It is a high concentration, low volume, citrate-free formulation.

F. *Witnesses-General Comments*

[66] Before turning to the specific witnesses for the parties, I wish to comment on the quality and calibre of the expert witnesses in this matter for all the patents at issue. All of the witnesses were excellent and provided assistance to the Court, subject to some observations. These specific concerns will be addressed when dealing with their evidence.

[67] Generally, the fact witnesses were candid and helpful. Some of the invention stories occurred a long time ago; therefore, this may be how the stories are remembered now. In the

analysis, I will address any concerns that I need to by giving that testimony less weight or preferring another witness's testimony on that particular matter.

[68] Counsel for AbbVie made much out of the opposing expert witnesses and devoted significant portions of closing to impugning their credibility. However, as counsel for JAMP put it, "[n]o one was perfect. They all have their warts. I think we should deal with the merits" (December 14 Trial Transcript at 2510). That is exactly what I intend to do in these reasons for both parties witnesses.

G. *Witnesses for AbbVie*

(1) Fact Witnesses

(a) *Dr. Rebecca S. Hoffman*

[69] Dr. Hoffman worked for 18 years at Abbott (as it was called then) and is a named inventor of the 868 Patent. In May of 2001, she was an Associate Medical Director at Abbott. During her time at AbbVie, she was a Global Medical Director. By 2008, Dr. Hoffman was responsible for all the global clinical development programs for HUMIRA.

[70] [redacted]

[redacted] Dr. Hoffman was involved in the clinical studies that ultimately led to the creation of the 868 Patent and the 458 Patent.

[71] Dr. Hoffman stated that Abbott was considering using adalimumab to treat Crohn's disease as early as January 2002 [redacted]

[72] Dr. Hoffman testified to the invention process [redacted]

(b) *Dr. Peter Noertersheuser*

[73] Dr. Noertersheuser worked at AbbVie and its predecessor companies for almost three decades. In the late 1990s, he began to develop PK/PD modelling for adalimumab, which was used to support the development of clinical trial protocols. Dr. Noertersheuser spoke to the PK/PD modelling that Abbott conducted and developed. He explained that the field of PK and PD biologics was relatively new and modelling was important for designing protocols for clinical trials. His work was used in the design of many protocols and trials, including Crohn's disease and HS.

(c) *Dr. Martin Okun*

[74] Dr. Okun is a medical doctor and former employee of Abbott. He is a named inventor of the 917 Patent. He helped develop the clinical study that investigated the use of adalimumab for the treatment of HS. [redacted] He discussed the life altering impact of using HUMIRA on HS patients that responded well.

(d) *Dr. Wolfgang Fraunhofer*

[75] Dr. Fraunhofer was a fact witness who spoke to the invention story of the 458 Patent. He is a highly qualified doctor with expertise in pharmaceutical formulation. He holds a pharmaceutical degree from Regensburg University and obtained his PhD in Pharmaceutical Technology and Biopharmaceutics at Ludwig University in Munich.

[76] Dr. Fraunhofer was not qualified as an expert witness; however, he was able to speak extensively on the prior art and the scientific knowledge of adalimumab in the 2000s. This was especially so in light of his PhD thesis, which focused on pharmaceutical antibodies and the use of analytical techniques to investigate their stability.

[77] Dr. Fraunhofer's testimony was wide-ranging and JAMP sought to use it in many places alongside that of AbbVie's expert witnesses. I will not do so. As mentioned, Dr. Fraunhofer was a fact witness, not an expert witness. He was not instructed in the law of claim construction, nor was he given the definitions of a person of ordinary skill in the art ("POSITA") or the common general knowledge. Moreover, his position as a research scientist working on adalimumab for

AbbVie makes it questionable whether his opinions, absent instruction from counsel, would line up with those of a POSITA and reflect the common general knowledge at the relevant time.

(2) Expert Witnesses

(a) *Dr. John Marshall*

[78] Dr. Marshall is a Professor of Medicine, Director of the Division of Gastroenterology and a full member of the Farncombe Family Digestive Health Research Institute at McMaster University. Up until 2018, he was Head of Clinical Research for the Division of Gastroenterology and Chief of Service for Gastroenterology at Hamilton Health Sciences.

[79] Dr. Marshall holds a Bachelor of Science from Queen's University and he received his Doctor of Medicine ("MD") from Queen's University in 1992. He also obtained a Master of Science in Clinical Epidemiology and Biostatistics from McMaster University in 2000. He has extensive experience with IBD, including prior work with clinical trials, care, and research. He also has lengthy involvement with numerous journals relating to gastroenterology.

[80] Dr. Marshall provided expert evidence via his testimonial evidence and two expert reports in this matter. He was qualified to give his expertise in the evaluation, treatment, and research of Crohn's disease and UC, including the clinical use of TNFα inhibitors. His expertise also relates to the design and conduct of clinical trials, including biologic medicines related to Crohn's disease and UC.

[81] Dr. Marshall provided expert evidence for the 868 Patent. Specifically, he addressed the POSITA and interpreted the patent claims as of September 26, 2005. He also gave his opinion on whether JAMP was influencing physicians and patients to choose SIMLANDI for the treatment of Crohn's disease and UC.

(b) *Dr. Diane R. Mould*

[82] Dr. Mould is a pharmacologist with expertise in pharmacokinetics and pharmacodynamics. She has modelled and developed dosing regimens in clinical trials. She received her PhD in Pharmaceutics and Pharmaceutical Chemistry from the Ohio State University College of Pharmacy in 1989. She is an Adjunct Professor at the College of Pharmacy at the University of Rhode Island, the College of Pharmacy at Ohio State University, and in the Pharmaceutics Department at the University of Florida. Dr. Mould also taught at the National Institutes of Health.

[83] Dr. Mould spent a decade working for major pharmaceutical and biopharmaceutical companies, including Hoffman-La Roche, Amgen, and SmithKline-Beecham. From 1999 to 2001, she worked for a consulting company, PharSight, on their scientific advisory board. In 2001, Dr. Mould founded Projections Research, Inc., which advises the pharmaceutical industry on pharmacology issues, including individual and population PK and PD models. Her models can be used to simulate different dose regimens and treatment options, design clinical studies, and support proposed labeling and dose adjustments. She has published a number of papers on the PK and PD of many of the currently approved mAb therapeutics, as well as other immunomodulatory biological agents.

[84] In this matter, Dr. Mould provided an expert report, along with a responding report to Dr. Sauder's and Dr. Baughman's expert reports. Her opinions related to the validity of the 868 Patent and the 917 Patent. Dr. Mould's expertise also included dosing simulations for small molecule and biologic drugs.

[85] Her evidence described the POSITA for the 868 Patent, along with the common general knowledge as of April 9, 2004 (the priority date). She opined on the construction and validity of the 868 patent and responded to Dr. Baughman's report. In her opinion, nothing in the prior art would have supported a pharmacologist selecting the dosing regimen for treating IBD of 160/80/40, given it was four times the approved dose for RA (Dr. Mould Responding Expert Report at paras 33 and 35). Dr. Mould stated there was a significant gap between the prior art and the inventive concept, and a pharmacologist would not have arrived at the 868 Patent claims.

[86] In her report, she also addressed the 917 Patent, including the POSITA and the common general knowledge as of June 3, 2010 (the priority date). Dr. Mould constructed the patent, reviewed its validity, and responded to Dr. Sauder's report. In her opinion, there was a significant gap between the state of the art and the inventive concept of the 917 Patent claims, that the "use of adalimumab in the claimed 160/80/40 EW regimen is safe and effective to treat HS" (Dr. Mould Responding Expert Report at para 308). She opined that the skilled pharmacologist "would not have been led directly and without difficulty to the solution taught by the 917 Asserted Claims" (Dr. Mould Responding Expert Report at para 308).

(c) *Dr. Gary Solomon*

[87] Dr. Solomon is an Associate Professor of Clinical Medicine at New York University Grossman School of Medicine. He obtained his Bachelor of Arts from the University of Michigan, and his MD from Mount Sinai School of Medicine in 1977. He has extensive experience in treating and researching inflammatory diseases, with a specific focus on treating inflammatory skin conditions. This rheumatology experience overlaps with the field of dermatology.

[88] Dr. Solomon provided two reports for the 917 Patent, including a response to Dr. Sauder's Report. He provided opinions on the POSITA, the common general knowledge, and the construction of claims 1 and 3-5. His second expert report addressed whether the 917 claims would have been obvious, and whether the asserted claims constrained the ability of physicians to utilize their skill and judgment.

(d) *Dr. Bernhardt Trout*

[89] Dr. Trout was AbbVie's expert for the 458 Patent. He is the Raymond F. Baddour Professor of Chemical Engineering at Massachusetts Institute of Technology ("MIT"). He has previously taught courses and supervised students in the area of protein stability.

[90] Dr. Trout received his BS and MS degrees from MIT in 1990. He obtained a PhD in Chemical Engineering from the University of California at Berkley in 1996. He completed post-doctoral research at the Max Planck Institute for Solid State Physics in Stuttgart, Germany.

Afterwards, Dr. Trout began his career as an Assistant Professor of Chemical Engineering at MIT. He became a full-time professor in 2008.

[91] Since 1998, Dr. Trout has conducted research at MIT in collaboration with the pharmaceutical industry. He has also worked with regulatory agencies, including the FDA. His research focuses on pharmaceutical development and manufacturing, including the stabilization and formulation of therapeutic proteins.

[92] From 2006 to 2014, Dr. Trout acted as the Co-Chair of the Chemical and Pharmaceutical Engineering Singapore-MIT Alliance Program. Additionally, from 2007 to 2019, Dr. Trout cofounded and served as the Director of the Novartis-MIT Centre for Continuous Manufacturing Research, which was aimed at transforming the way pharmaceuticals are manufactured.

[93] Dr. Trout has over 20 years of experience working on protein formulations and has focused his research on antibody formulation since 2004. Since joining MIT, Dr. Trout has worked on approximately 50 biologic therapeutics, most of them being mAbs.

[94] Dr. Trout was qualified as an expert in the field of protein formulation, including formulations for mAbs, as well as protein stability and techniques used to assess their pharmaceutical formulations. Dr. Trout provided an expert report on claim construction and infringement for the 458 Patent. He also prepared a responding expert report on validity.

[95] Dr. Trout provided evidence on the POSITA. He opined the skilled person would be a team of persons with an educational background in the pharmaceutical sciences, chemical engineering, chemistry or related fields, having knowledge or experience with protein-based formulations. He also stated the educational degrees would be a PhD with one to two years of relevant experience in formulating protein-based compositions, or it could be a lesser degree, like a bachelors or masters but with proportional experience.

[96] In his initial report, Dr. Trout provided his analysis of the claims at issue, detailing his interpretation of claims 1 and 69, along with claim 191 (and those claims at issue dependent thereon). He also examined the issue of infringement, finding the making, importation, use, offer for sale, and sale of the product fell within the scope of the following claims of the 458 Patent:

> (a) Claim 1 and the following claims which depend either directly or indirectly on Claim 1: Claim 10, Claim 28, Claim 37, Claim 38, Claims 40-43, Claims 45-49, and Claim 215.
>
> (b) Claim 69 and the following claims which depend either directly or indirectly on Claim 69: Claim 72, Claim 75, Claim 76, Claims 78-80, Claim 83, Claim 124, Claim 125, and Claim 215.
>
> (c) Claim 191 and the following claims which depend either directly or indirectly on Claim 191: Claims 192-198, Claim 204, Claim 205, and Claim 217.

[97] Additionally, Dr. Trout provided his opinion on the two key validity issues: anticipation and obviousness. He stated the 181 Application neither disclosed nor enabled the subject matter of the 458 Patent. Dr. Trout found the 458 Patent was not obvious given the challenges associated with antibody formulation. In his responding report, Dr. Trout noted antibody formulation is more difficult at high concentrations, since the formulation becomes more prone to stability issues as the concentration of antibodies increases. As of November 30, 2007, he stated it well known that a buffer was needed in a monoclonal antibody formulation to help stabilize the antibody formulation. Further, at that time, every commercially available monoclonal antibody formulation contained a buffer, including HUMIRA.

(e) *Dr. Eduardo Mysler*

[98] Dr. Mysler is a physician and rheumatologist with experience in the clinical use of biologic medicines and biosimilars, including adalimumab biosimilars marketed in Argentina. His clinical practice focuses on treating rheumatologic diseases. He is also a research scientist and has published extensively on biosimilars, including on the safety and effectiveness of biosimilars and switching patients to or between biosimilars.

[99] Dr. Mysler obtained a medical degree in 1987 from the University of Buenos Aires and completed a fellowship in rheumatic disease at Cornell University from 1992 to 1995. He worked as a resident and an attending physician at the hospital for joint disease in New York City from 1996 to 1998.

[100] Dr. Mysler explained how Health Canada has found each adalimumab biosimilar in the Canadian market is safe and effective, as all of them have similar quality, safety and efficacy. Dr. Mysler opined there would be no harm to patients if SIMLANDI was removed from the market and patients were prescribed one of the other approved adalimumab biosimilars. Dr. Mysler explained how biosimilars in the European market are interchangeable and there have been no safety issues.

(f) *Mr. Neil Palmer*

[101] Mr. Palmer did not provide testimonial evidence and his expert report was taken as read. Mr. Palmer gave evidence on drug approvals, specifically adalimumab biosimilars, and SIMLANDI's market share in Canada. He was tendered as a pharmaceutical industry consultant with expertise in the Canadian marketplace; in particular, product pricing, market access, reimbursement policies, and interchangeability with the listing of drug products.

H. *Witnesses for JAMP*

(1) Expert Witnesses

(a) *Dr. Colin Howden*

[102] Dr. Howden is a doctor who specializes in gastroenterology. He presently treats patients with IBD, including Crohn's disease and UC. He received his medical degree from the University of Glasgow in Scotland in 1978.

[103] Dr. Howden was qualified as a gastroenterologist with expertise in the evaluation and treatment of Crohn's disease and UC, including the clinical use of TNFα inhibitors like adalimumab. His expertise also includes the design, conduct and evaluation of clinical trials.

[104] Dr. Howden prepared two reports for this matter, including his initial expert report on the 868 Patent and a responding expert report to Dr. Marshall.

[105] In his first report, he opined the skilled person would be a physician with experience and expertise in the management of patients with IBD. Additionally, given the 868 Patent involved a dosing regimen, Dr. Howden stated the skilled person (or team of persons) would include individuals with experience in deciding the doses to use in clinical trials, such as a clinician and pharmacologist.

[106] For the 868 Patent, Dr. Howden determined the prior art included extensive information on TNFα inhibitors as of April 9, 2004 (including adalimumab, infliximab and etanercept), the use of TNFα inhibitors to treat IBD, and the doses of adalimumab disclosed to be therapeutically effective. At trial, he stated a skilled person in 2004 would appreciate an association between TNFα inhibitors and Crohn's disease. In particular, Dr. Howden referred to Professor van Deventer's paper, titled "*Tumour necrosis factor and Crohn's disease*" (1997) 40:4 Gut 443-448, which recognized that TNFα was an important pro-inflammatory mediator in Crohn's disease.

[107] Although the prior art did not specify the dosing regimen claimed by the 868 Patent, Dr. Howden found the loading and induction doses of 160 mg and 80 mg fell within the range of

doses of adalimumab previously described as being efficacious for treating IBD. Additionally, he noted the biweekly (or every other week) maintenance dose of at least 40 mg was the main, regulatory-approved dosing regimen of adalimumab for the treatment of RA.

[108] Dr. Howden opined that a clinician would know that, when treating IBD, a maintenance dosing regimen would be insufficient on its own to treat moderate to severe Crohn's disease, given an induction phase is crucial to bringing the disease under control. Therefore, he indicated a clinician would understand that a loading or induction dose should be incorporated with a maintenance dose (and the amount of adalimumab in the loading phase should be larger than the maintenance phase).

[109] Dr. Howden noted a clinician would understand the routine way for selecting a drug's dosing is to engage in a dose-ranging study. In his report, Dr. Howden stated AbbVie's internal documents supported his opinion that: (i) there was a strong expectation that adalimumab would treat Crohn's disease (and ulcerative colitis); (ii) there was a strong expectation that a dosing regimen for adalimumab for the treatment of Crohn's disease (and ulcerative colitis) would be selected and tested and demonstrated to be effective; and (iii) the efforts to arrive at the invention of the 868 Patent were routine.

[110] In his responding report, Dr. Howden disagreed with Dr. Marshall on several main points. First, Dr. Howden did not concur that the results of the 868 Patent in study M02-403 were surprising, as REMICADE had already been regulatory-approved and marketed for the treatment of Crohn's disease since the late 1990s. Further, REMICADE and adalimumab shared many

similarities. Second, Dr. Howden also did not agree that a skilled person would interpret the term "treating," as stated in the 868 Patent for Crohn's disease and UC, to mean something more than "simply administering a drug to a patient."

(b) *Dr. Sharon Baughman*

[111] Dr. Baughman is a pharmaceutical scientist with expertise in pre-clinical and clinical pharmacokinetics and pharmacodynamics of protein and small molecule entities. She has extensive experience working at pharmaceutical companies developing novel therapies. She holds a Bachelor of Science in Chemistry from the University of New Orleans and a PhD in Physical Organic Chemistry from Rice University.

[112] Dr. Baughman provided her opinion in relation to the 868 and 917 Patents, specifically focusing on the skilled pharmacologist perspective and the selection of dosing regimens. She supposedly provided a blind opinion. However, on cross-examination it became apparent that Dr. Baughman had been involved with litigation related to the 868 Patent previously.

[113] During the cross-examination of Dr. Baughman, AbbVie relied on and used Dr. Baughman's expert report from the Samsung Bioepis ("Bioepis") litigation, sworn on February 9, 2018 [2018 Affidavit], to show she did not provide a blind opinion.

[114] In the previous litigation, Bioepis served a NOA on AbbVie in relation to its proposed adalimumab product, HADLIMA, and the 868 Patent (amongst other patents). In its NOA, Biopeis alleged that HADLIMA would not infringe any of the AbbVie patents, leading AbbVie

to apply to this Court pursuant to section 6 of the *Regulations*. That matter was subject to a Protective Order, as agreed to by the parties and created by this Court: see *AbbVie Corporation v Samsung Biopeis Co, Ltd*, 2017 FC 675 at para 4. The terms of the applicable Protective Order can be found at Appendix A of that decision. The parties settled the matter in 2018; therefore, there was no trial. As a result, the information and documents contained in that matter still remain subject to the Protective Order.

[115] Within the report, Dr. Baughman referred to the dosing regimen of 160 mg, 80 mg and 40 mg every other week for Crohn's disease. During cross-examination, Dr. Baughman agreed that it appeared she had been aware of the dosing regimen prior to giving her opinion given the Biopeis litigation. When pressed further, Dr. Baughman stated she did not recall completing this earlier work.

(c) *Dr. Daniel Sauder*

[116] Dr. Sauder specializes in dermatology. He currently practices at the Dermatology Centre in Toronto, Ontario. He obtained his MD from McMaster University in 1975 and completed his Dermatology Residency at the Cleveland Clinic in Ohio in 1979. Like the other experts in this matter, he has extensive experience in his field and many publications. He also has clinical trial experience, as he has acted as a Principal Investigator or Co-investigator on approximately 50 clinical trials (Phases I to IV).

[117] The Court qualified Dr. Sauder to give his opinion on the use of biologic medicines, such as TNFα inhibitors, for the treatment of inflammatory skin diseases, including adalimumab for

treating HS. His expertise also includes the design and conduct of clinical trials for the treatment of inflammatory skin diseases.

[118] Dr. Sauder provided his opinion on the 917 Patent. He addressed whether the claim terms were described, along with anticipation, inventiveness, and the method of medical treatment. He provided two reports in this matter, including a response to Dr. Solomon's expert report.

(d) *Dr. Robert Falconer*

[119] Dr. Falconer is a professor in Bioprocess Engineering in the Department of Chemical Engineering & Advanced Materials at the University of Adelaide in South Australia. Since joining the university in 2019, Dr. Falconer has continued to focus his research on the interactions between proteins, excipients and water for the development of stable protein pharmaceutical formulations.

[120] Dr. Falconer received his BSc degree in Biotechnology from the University of New South Wales in 1984. Dr. Falconer obtained his PhD in the field of recombinant protein manufacturing process development from the University of Adelaide in 1998. Dr. Falconer has over 30 years of industry and academic research experience in protein chemistry and biotechnology. He has authored and co-authored over 60 papers in scientific journals, with several of his publications involving the stability of proteins and protein pharmaceutical formulations. He has also supervised doctoral students working in the area of protein stability.

[121] Dr. Falconer was qualified to provide expertise in the field of protein formulation, including formulations for mAbs, as well as protein stability and the techniques used to assess their pharmaceutical formulations.

[122] Dr. Falconer provided two expert reports in this matter for the 458 Patent.

[123] In his initial report, Dr. Falconer stated there was a large amount of knowledge on proteins, including mAbs and pharmaceutical formulations, as of November 2007. He indicated adalimumab was a well-known anti-tumour necrosis factor alpha (“anti-TNFα”) antibody, and an aqueous pharmaceutical formulation of adalimumab had been extensively studied and approved for medical use in the treatment of RA in 2002 in the US.

[124] At trial, Dr. Falconer stated a skilled person working on a formulation would have a science background. In his report, he indicated this person would have a sound knowledge of mAb chemistry and stability and a PhD in biology, chemistry, biochemistry or chemical engineering, with at least two years of practical experience in developing mAb pharmaceutical formulations for therapeutic use. Alternatively, Dr. Falconer suggested this person could have lesser qualifications, such as a master's or bachelor's degree, with more practical hands-on formulation experience.

[125] Dr. Falconer noted the overarching inventive concept of the 458 claims is an aqueous pharmaceutical formulation comprising an antibody or fragment of an antibody (including

adalimumab) at a concentration of at least 50 mg/mL with essentially no buffering system and little or no ionic excipients.

[126] Dr. Falconer opined the 181 Application disclosed and enabled each of the essential elements of the 458 claims. Further, in discussing pain associated with injection, Dr. Falconer noted there was an increasing interest during this time to reduce pain on injection.

[127] During questioning, Dr. Falconer testified that there were no significant differences between the 458 Patent and the 181 Application and that, if there were substantial differences, somebody familiar with the literature and skilled in the art would have been able to bridge those gaps. Dr. Falconer opined a skilled person would understand that a high concentration of adalimumab formulation would provide the buffering capacity that is required to maintain the preferred pH. As well, a skilled person would learn that having a low ionic content was advantageous.

[128] Dr. Falconer opined it was self-evident to try the invention. Additionally, he stated a skilled person would have been motivated to increase the adalimumab concentration, as a lower volume meant less pain.

[129] Dr. Falconer referred to literature which described significant gains in protein stability when increasing the protein concentration.

[130] Dr. Falconer also stated it was more or less self-evident that what was being tried should work. Based on the literature, he indicated there was a high probability that a stable high concentration adalimumab formulation could be made. He also indicated there were a finite number of identified predictable solutions.

(e) *Dr. Laurence Rubin*

[131] Dr. Rubin is a doctor with a specialization in rheumatology. He is presently a staff physician in the Rheumatology Division and the Metabolic Bone Clinic at Saint Michael's Hospital in Toronto. He obtained his MD from the University of Ottawa and has significant expertise in rheumatology.

[132] Dr. Rubin was qualified as a medical doctor, clinical rheumatologist, researcher and professor of medicine, with expertise in rheumatology, including the past and present treatment of chronic inflammatory rheumatic diseases in Canada using biologic medicines and biosimilars. He also responded to Dr. Mysler's Report.

[133] His evidence pertained to biosimilars in Canada and injection site pain. His evidence was that, if SIMLANDI and Yuflyma were not available in Canada, then some patients forced to switch to another adalimumab formulation might have increased injection pain or poor tolerance, resulting in less adherence to the treatment.

(f) *Dr. Rosemary A. Bacovsky*

[134] Dr. Bacovsky is an experienced pharmacist, including prior work experience in government policy positions. She has acted as a consultant in many roles, including for private companies, the government, and various health authorities.

[135] With respect to SIMLANDI's place in the Canadian marketplace, the Court took Dr. Bacovksy's evidence as read.

(g) *Ms. Ashley Beacom*

[136] Ms. Beacom provided a report regarding the translation of some of the laboratory materials. She attested to the accuracy of the translation from German to English.

III. Issues

[137] The Parties filed the following Joint Statement of Issues:

A. *The 868 Patent*

1. Are claims 1-5 contrary to section 28.3 of the *Patent Act* (i.e. obvious)?
2. Are claims 1-5 contrary to section 2 of the *Patent Act* (i.e. patentable subject matter) for claiming a method of medical treatment?

B. *The 917 Patent*

1. Are claims 1 and 3-5 contrary to section 28.2 of the *Patent Act* (i.e. anticipated) in view of the 868 Application?
2. Are claims 1 and 3-5 contrary to section 28.3 of the *Patent Act* (i.e. obvious)?
3. Are claims 1 and 3-5 contrary to section 2 of the *Patent Act* (i.e. patentable subject matter) for claiming a method of medical treatment?
4. Are claims 1 and 3-5 contrary to subsection 38.2(2) of the *Patent Act* for containing a claim term that cannot reasonably be inferred from the 917 Patent's specification or drawings contained in the application on its filing date and/or for claiming subject matter that was neither made nor disclosed by the named inventors?

C. *The 458 Patent*

1. Are the 458 claims contrary to section 28.2 of the Patent Act (i.e. anticipated) in view of WO 2006/138181?
2. Are the 458 claims contrary to section 28.3 of the *Patent Act* (i.e. obvious)?
3. Are the 458 claims invalid for overbreadth?
4. Are the 458 claims invalid for same-invention and/or obviousness-type double patenting in view of CA 2,815,689?

D. *Infringement*

1. Does JAMP infringe the asserted claims, as alleged by AbbVie?

E. *Entitlement to Relief*

1. Is AbbVie entitled to a permanent injunction (if infringement is found) and, if it is entitled to a permanent injunction, what ought to be the proper scope of said injunction?
2. Is JAMP required to deliver up or destroy its infringing products (if infringement is found)?

[138] Prior to the commencement of the trial, a disagreement arose as to whether JAMP was able to argue previously pleaded invalidity allegations for which it had provided no expert evidence. AbbVie took the position that AbbVie bears the burden on invalidity and that, having delivered no expert evidence on some invalidity allegations, JAMP was not entitled to advance them at trial.

[139] On November 7, 2022, I directed that JAMP was not precluded from advancing the pled invalidity issues.

[140] JAMP preserved the right to advance lack of utility (i.e. not demonstrated and/or not soundly predicted) in respect of the 868 Patent. Ultimately, JAMP did not advance this invalidity ground in its written closing submissions nor in its oral closing arguments. As JAMP bears the burden of establishing this invalidity ground, it has not proven it and this issue is dismissed without further reasons.

[141] On December 6, 2022, the parties provided an updated Joint Statement of Issues. In that update, JAMP stipulated to infringement of the 458 Patent claims, subject only to their validity. Accordingly, to the extent that any of the 458 Patent claims are valid, then JAMP agrees that its SIMLANDI products infringed the Asserted claims.

IV. Applicable Legal Framework

[142] AbbVie has the burden of proving infringement on a balance of probabilities. Where validity is at issue, the starting point is that the patent is presumed to be valid: subsection 43(2) of the *Patent Act*. [Appendix A]The burden is on JAMP to prove each ground of invalidity on a balance of probabilities: *Teva Canada Innovation v Pharmascience Inc*, 2020 FC 1158 at para 156 [*Pharmascience*].

A. *General Principles of Claim Construction*

[143] The principles of claim construction are well-established. The Federal Court of Appeal summarized these principles at paragraphs 30-34 of *Tearlab Corporation v I-Med Pharma Inc*, 2019 FCA 179.

[144] At paragraphs 33 to 35 of *Corlac Inc v Weatherford Canada Inc*, 2011 FCA 228 [*Weatherford*], the Federal Court of Appeal explained that, where the validity of a dependent claim depends on the inventiveness of the independent claim, the first instance court is not required to construct elements of the dependent claim which were not in dispute. The Federal Court of Appeal upheld this principle in *Swist v MEG Energy Corp*, 2022 FCA 118, again re-

stating that, “where the first instance court correctly determines the validity of the dependent claims rests on the inventiveness of the independent claim, it is not required to construe elements of the dependent claims that were not actually in dispute” (at para 22).

B. *Prior Art*

[145] Prior art is “the collection of learning in the field of the patent at issue” and “comprises any publicly available teaching, however obscure or not generally accepted”: *Eli Lilly Canada Inc v Mylan Pharmaceuticals ULC*, 2016 FCA 119 at para 23 [*Mylan Pharmaceuticals ULC*].

[146] For patent cases, prior art can be used “to found an allegation that prior art anticipated the invention or rendered it obvious”: *Mylan Pharmaceuticals ULC* at para 25.

[147] Common general knowledge is a subset of the state of the art: *Hospira Healthcare Corporation v Kennedy Trust for Rheumatology Research*, 2020 FCA 30 at para 84 [*Hospira*].

[148] The state of the art is no longer limited by what the skilled person could locate in a reasonably diligent search. At paragraphs 83 to 86 of *Hospira*, the Federal Court of Appeal held that it is an error to exclude from consideration prior art that was available to the public at the relevant date because it would not have been located through a reasonably diligent search.

[149] In *Gemak Trust v Jempak Corporation*, 2022 FCA 141 [*Gemak*], the Federal Court of Appeal held:

> [100] Thus, it is no longer required that prior art be available to the POSITA through a reasonably diligent search for it to be potentially relevant for the purpose of the obviousness or anticipation analyses. That said, knowledge that is only discoverable through a reasonably diligent search is not, and has never been, considered to be part of the common general knowledge.
>
> [Emphasis added.]

C. *Common General Knowledge*

[150] Common general knowledge is the knowledge that was generally known at the relevant time by the person skilled in the art or science to which the patent relates: *Janssen Inc v Pharmascience Inc,* 2022 FC 1218 at para 114 [*Janssen* 2022], citing *Apotex Inc v Sanofi-Synthelabo Canada Inc*, 2008 SCC 61 at para 37 [*Sanofi* or *Plavix* 1]; Bell Helicopter Textron Canada Limitée v Eurocopter, société par actions simplifiée, 2013 FCA 219 at paras 63-65 [Eurocopter]. Common general knowledge informs the way claims and specifications are read by the POSITA: *Gemak* at para 98; *Mylan Pharmaceuticals* at para 25.

[151] The relevant date for the purposes of construction is the date of publication, while the relevant date for the purposes of invalidity is the claim date, which is the priority date if there is one, or the filing date if there is not: *Guest Tek Interactive Entertainment Ltd v Nomadix, Inc*, 2021 FC 276 at para 51.

[152] The Federal Court of Appeal recently underscored that common general knowledge does not include all of the information in the public domain: *Gemak* at para 95. Not all information available to the skilled person is necessarily common general knowledge. A piece of particular

knowledge only becomes general knowledge when it is generally known and accepted without question by the bulk of those who are engaged in the particular art; in other words, when it becomes part of the common stock of knowledge relating to the art: *Gemak* at paras 95-96.

D. *Anticipation*

[153] Anticipation law is central to this dispute. The parties agree in broad strokes on the legal principles of anticipation. However, the parties disagree as to whether prior art which leaves open choices for the skilled person, or which broadly encompasses the claimed invention, is sufficient to invalidate the patents based on anticipation.

[154] The relevant statutory provisions are found in section 28.2 of the *Patent Act*. [Appendix A]

[155] Both parties rely on *Sanofi*, albeit through a different lens and understanding. JAMP heralds *Sanofi* to represent a "sea change" in anticipation law. AbbVie, instead, relies on *Sanofi* as a clarification and refining of the test from *Beloit Canada Ltd v Valmet OY* (1986), 8 CPR (3d) 289 (FCA) [*Beloit*], saying that *Sanofi* does not represent a significant change in the law.

[156] It is not in dispute that the law of "anticipation requires proof of both disclosure and enablement" (*Sanofi* at para 42). Lord Hoffman also explained in *Synthon BV v SmithKline Beecham plc*, [2006] 1 All ER 685, [2005] UKHL 59 [*Synthon*] that these two requirements must be kept distinctly separate (at para 30). *Sanofi* and *Synthon* clearly direct that experimentation or trial and error is permitted at the enablement stage, not the disclosure stage.

[157] I understand that the parties disagree as to whether prior art that discloses a range can anticipate a point within a range or embodiment. For example, has disclosure occurred if the range is 0.2-400 mg in the prior art, and the subsequent patent claims about 10 mg or a narrower range such as 0.10-100 mg.

[158] JAMP relies on several recent cases where the Federal Court held a range or a broad disclosure can anticipate a point within a range or an embodiment: *Hoffman-La Roche Limited v Apotex Inc*, 2013 FC 718 [*Hoffman-La Roche*]; *Alcon Canada Inc v Apotex Inc*, 2014 FC 699 [*Alcon Canada*]; *Eli Lilly Canada Inc v Mylan Pharmaceuticals ULC*, 2020 FC 816 [*Eli Lilly* 2020]; *Swist v MEG Energy Corp*, 2021 FC 10.

[159] In contrast, AbbVie argues that, where the disclosure broadly includes or encompasses the claimed invention, without necessarily planting the flag at the precise destination, then this will be insufficient to meet the requirements of anticipation. AbbVie points to the Federal Court of Appeal's decision in *Apotex Inc v Shire LLC*, 2021 FCA 52 [*Shire*] at paragraph 45, and says that the cases relied on by JAMP must be read in light of this decision.

[160] To add to this discussion, Professor Norman Siebrasse's [Siebrasse] commentaries have strongly stated that the Federal Court had it wrong in both *Alcon Canada* and in *Hoffman-LaRoche*: Norman Siebrasse, "Construction of the Inventive Concept is Determinative of Obviousness" (27 August 2014), Sufficient Description (blog), online: <http://www.sufficientdescription.com/2014/08/>; Norman Siebrasse, "Time to Abandon the

Doctrine of Selection Patents?" (26 July 2013), Sufficient Description (blog), online: <http://www.sufficientdescription.com/2013/07/time-to-abandon-doctrine-of-selection.html>.

[161] Professor Siebrasse also states that the Federal Court was "clearly wrong" in *Eli Lilly* 2020: Norman Siebrasse, "Does a Range Anticipate a Point Within the Range?" (23 September 2020), Sufficient Description (blog), online: <http://www.sufficientdescription.com/2020/09/does-range-anticipate-point-within-range.html>.

[162] In those cases, the trial judge found that a range anticipated a point within the range. Siebrasse said that, while it might be obvious to determine the optimum dosage by routine experiments, this does not mean the dosage is anticipated by the disclosure of a range. In *Eli Lilly* 2020, Siebrasse determined the Federal Court conflated the disclosure and enablement steps by finding a range plants the flag. In his opinion, the two requirements must be kept distinct; it is not enough to say, given the prior art, that a POSITA would be able to come to the invention, since trial and error is permitted only at the enablement stage.

[163] Siebrasse's final criticism of the Federal Court is *Merck & Co, Inc v Pharmascience Inc*, 2010 FC 510, which is a decision that some of these other cases have relied on: Norman Siebrasse, "Teaching Away Irrelevant to Anticipation" (23 May 2019), Sufficient Description (blog), online: <http://www.sufficientdescription.com/2019/05/teaching-away-irrelevant-to-anticipation.html>. In that decision, Siebrasse says his position is based on the rule that, "A signpost, however clear, upon the road to the patentee's invention will not suffice. The prior inventor must be clearly shown to have planted his flag at the precise destination before the

patentee" (*General Tire & Rubber Co v Firestone Tyre & Rubber Co*, [1972] RPC 457 at 486; *Sanofi* at para 21).

[164] In *Apotex Inc v Shire LLC*, 2018 FC 637 [*Shire* 2018], Justice Fothergill recognized Siebrasse's criticism of *Hoffman-La Roche*: Norman Siebrasse, "Time to Abandon the Doctrine of Selection Patents?" (26 July 2013), Sufficient Description (blog), online: <http://www.sufficientdescription.com/2013/07/time-to-abandon-doctrine-of-selection.html>. Justice Fothergill acknowledged Siebrasse's conclusion that *Hoffman-La Roche* was very similar factually to *Sanofi* and the two decisions could not be reconciled (*Shire* 2018 at para 95).

[165] Wrapped around this discussion is whether it matters if the patent is a selection patent. That issue was settled in *Shire,* as the FCA said the validity analysis does not change depending on whether the patent is a selection patent or not. The FCA noted a selection patent is not even contained in the *Patent Act*: *Shire* at paras 31-34.

[166] I find that, as is often the case, the application of the law depends on the facts. In this case, the issue is whether the prior art, that disclosed a range, planted the flag at a precise enough point to move to the second stage, which is whether it was enabled after some experimentation.

[167] Support for this somewhat middle ground is based on Justice Rennie's writing in *Shire.* In the decision, Justice Rennie stated that ranges do not necessarily anticipate points. **But they may**. He noted, "A genus may, depending on its size, the language of the claims, context and included examples, anticipate the individual species": *Shire* at para 46.

[168] In my opinion, if the range is sufficiently small, based on the factual situation (e.g. in a pharmaceutical context 0.10-0.12 mg/ml), it can be said that inventor planted their flag with sufficient specificity to anticipate a point in a claim.

[169] To unpack this a bit further, we can look at what lead Justice Rennie to this finding. As well, we can examine what examples are seen as having too broad a range, and what might fall into the anticipatory range.

[170] Justice Rennie at paragraphs 45-46 of *Shire* said:

> [45] It would also be inconsistent with the principle articulated, and noted earlier, in *General Tire*, that "[t]he prior inventor must be clearly shown to have planted his flag at the precise destination before the patentee" (at page 486). The point was also made succinctly in *Ranbaxy Laboratories Limited v. AstraZeneca AB*, [2013] FCA 368 (Aus.) at paragraph 170:
>
> > …. it is not sufficient for a prior publication to merely "include" or "encompass" the claimed invention—a broad disclosure will not necessarily anticipate a later, more specific claim: see eg *Eli Lilly* [2013] FCA 214 at [272] to [293] and the authorities cited therein.
>
> [46] This is not to say that anticipation has no role in the context of genus disclosures—to the contrary, it is very much alive. A genus may, depending on its size, the language of the claims, context and included examples, anticipate the individual species (see, e.g., *Aux Sable Liquid Products LP v. JL Energy Transportation Inc.*, 2019 FC 581, [2020] 1 F.C.R. 547 at paragraphs 90 and 98; *Valence* T*echnology Inc. v. Phostech Lithium Inc*., 2011 FC 174, 92 C.P.R. (4th) 123, at paragraphs 228-230, affd 2011 FCA 237, 96 C.P.R. (4th) 207).
>
> [47] Therefore, the ultimate answer to the question of whether the inventor "planted a flag" at the compound is <u>driven by the specific evidence in each case.</u> Here, the Judge identified differences that relate to the specific asserted claims within CA ′646. In doing so, he found that those specific claims were not anticipated. The Judge undertook the exercise required of him by *Sanofi*. The Judge

> identified the correct test for anticipation (Decision, at paragraphs 99–100) and his conclusion that CA ′646 was not anticipated by AU ′168 was amply supported by the evidence.
>
> [Emphasis added.]

[171] Looking at what Justice Southcott in *Aux Sable* held:

> [90] …Aux Sable also submits, and I agree, that Federal Court jurisprudence demonstrates that the prior disclosure of a point within a range prescribed by a patent is anticipatory (see, e.g. *Baker Petrolite Corp. v. Canwell Enviro-Industries Ltd.*, 2002 FCA 158, [2003] 1 F.C. 49 (*Baker Petrolite*), at paragraph ; *Calgon Carbon Corporation v. North Bay (City)*, 2006 FC 1373, 56 C.P.R. (4th) 281 (*Calgon Carbon*), at paragraphs , 153 and 163).

[172] Justice Rothstein, who authored the *Sanofi* decision in 2008, wrote in 2002 for the FCA in *Baker Petrolite* (at para 42) that, "The Board therefore does not accept the patent proprietor's submission to the effect that a **complete** analysis of a prior used product must be possible, so as to enable an **exact** reproduction of such product, in order to destroy the novelty of the claimed product" [Emphasis in bold in original; other emphasis added].

[173] I find that the law has developed that, where the evidence presented at trial shows that the range is narrow enough, such that a flag can be planted based on the context and examples given, then it is anticipated. If the evidence shows a very broad range that the Judge, with the experts' assistance (if needed), does not see it as a precise enough to plant the flag before proceeding to the enablement stage, then it fails at the disclosure stage.

E. *Obviousness*

[174] The starting point for an analysis of obviousness is section 28.3 of the *Patent Act*. [Appendix A]

[175] Obviousness is assessed against the four-part test established in *Sanofi*:

> 1. (a) Identify the notional "person skilled in the art";
>
> (b) Identify the relevant common general knowledge of that person;
>
> 2. Identify the inventive concept of the claim or if that cannot readily be done, construe it;
>
> 3. Identify what, if any, differences exist between the matter cited as forming part of the "state of the art" and the inventive concept of the claim or the claim as construed; and
>
> 4. Viewed without any knowledge of the alleged invention as claimed, do those differences constitute steps which would have been obvious to the person skilled in the art or do they require any degree of invention?

[176] The threshold for inventiveness is low – a "mere scintilla of invention" will suffice to support the validity of a patent: *Valeant Canada LP/Valeant Canada SEC v Generic Partners Canada Inc*, 2019 FC 253 at para 105 [*Valeant Canada*], citing *Diversified Products Corp v Tye-Sil Corp* (1991), 35 CPR (3d) 350 (FCA) at 365.

[177] As AbbVie emphasized, the Court must be cautious not to employ hindsight bias in its obviousness analysis: *Valeant Canada* at para 104; *Meda AB v Canada (Health)*, 2016 FC 1362 at para 138; *Bridgeview Manufacturing Inc v 931409 Alberta Ltd (Central Alberta Hay Centre)*, 2010 FCA 188 at para 50.

[178] When assessing obviousness, the trier of fact can look to the cumulative effect of the prior art that can be considered by a skilled person: Donald Cameron, *Canadian Patent Law Benchbook*, 4th ed (Toronto: Thomson Reuters, 2022) at 241. In addition, the Court should undertake the inquiry on a claim-by-claim basis: *Zero Spill Systems (Int'l) Inc v Heide*, 2015 FCA 115 at para 85 [*Zero Spill Systems*].

(1) Obvious to Try

[179] In *Pharmascience Inc v Teva Canada Innovation*, 2022 FCA 2 [*Pharmascience* 2022], the Court clarified that the fourth step in the *Sanofi* obviousness test is the "obvious to try" test. Under the fourth part of the *Windsurfing/Pozzoli* test, in some cases a secondary analysis will be required to determine whether the "obvious to try" test applies. In *Sanofi*, the Supreme Court of Canada outlined where the obvious to try test will arise. The Court explained at paragraph 68:

> In areas of endeavour where advances are often won by experimentation, an "obvious to try" test might be appropriate. In such areas, there may be numerous interrelated variables with which to experiment. For example, some inventions in the pharmaceutical industry might warrant an "obvious to try" test since there may be many chemically similar structures that can elicit different biological responses and offer the potential for significant therapeutic advances.

[180] This Court and the Federal Court of Appeal have frequently held that the "obvious to try test" applies in pharmaceutical matters that require experimentation: *Janssen Inc v Teva Canada* Ltd, 2020 FC 593 at para 198 [*Janssen* 2020]; *Teva Canada Limited v Novartis Pharmaceuticals Canada Inc*, 2013 FCA 244 at para 7.

[181] At paragraph 43 of *Bristol-Myers Squibb Canada Co v Teva Canada Limited*, 2017 FCA 76 [*Bristol-Myers Squibb*], the Federal Court of Appeal outlined the non-exhaustive list of relevant factors to consider (citing *Sanofi* at paragraph 69):

> 1. Is it more or less self-evident that what is being tried ought to work? Are there a finite number of identified predictable solutions known to persons skilled in the art?
>
> 2. What is the extent, nature and amount of effort required to achieve the invention? Are routine trials carried out or is the experimentation prolonged and arduous, such that the trials would not be considered routine?
>
> 3. Is there a motive provided in the prior art to find the solution the patent addresses?

[182] Again, the Court must be wary of hindsight bias from expert witnesses, as Justice Manson explained in *Janssen* 2020 at paragraph 169.

[183] I emphasize that the obvious to try test is not a "fair expectation of success" test and obvious to try means "very plain": *Eli Lilly Canada Inc v Mylan Pharmaceuticals ULC*, 2015 FCA 286 at para 4. The Federal Court of Appeal has also emphasized that the obvious to try test must be approached with caution as it remains one factor amongst many that may assist in the obviousness inquiry: *Bristol-Myers Squibb* at para 38; *Teva Canada Limited v Pfizer Canada Inc*, 2019 FCA 15 at para 27.

(2) Commercial Success and Meritorious Awards

[184] Commercial success and meritorious awards may be a relevant consideration under the obviousness analysis: *Novopharm Limited v Janssen-Ortho Inc*, 2007 FCA 217 at para 25.

F. *Patentable Subject Matter*

[185] The Federal Court of Appeal has previously held patentable subject matter is a shorthand expression for the conclusion that a patent application discloses no invention, as defined in section 2 of the *Patent Act* (*Amazon.com, Inc v Canada (Attorney General)*, 2011 FCA 328 at para 12). [Appendix A]

[186] Methods of medical treatment are not patentable subject matter: *Hospira* at para 52. Where a patent and its claim constrain a medical professional in exercising their skill and judgment, a patent will be invalid for un-patentable subject matter. Justice Manson summarized this principle in *Janssen* 2022 as follows:

> [164] For use claims, the analysis is on the essential claim elements to determine whether professional skill and judgment is required to practice the invention as claimed. A claim for "use" of a medicine to treat a patient is not an unpatentable method of medical treatment if it includes a specific dosage amount and/or specific administration interval. With respect to dosing elements, the law has evolved such that claims restricted to particular dosages and specific administration schedules have been found to be patentable subject matter, where the amounts and timing are fixed… whereas claims to dosages or schedules with ranges within which the physician must exercise skill and judgment have been found to not be a vendible product and thus not patentable.
>
> [Emphasis added and citations omitted.]

[187] The prohibition against methods of medical treatment is originally found in *Tennessee Eastmen Co et al v Commissioner of Patents*, [1974] SCR 111, 1972 CanLII 167. There, the Supreme Court of Canada found that claims relating to a surgical method of closing incisions in

animal tissues was not a process and could not be an invention, as was required by section 2 of the *Patent Act* (at page 119).

[188] In *AbbVie Biotechnology Ltd v Canada (Attorney General)*, 2014 FC 1251 [*AbbVie* 2014], this Court considered whether the fixed dosage amount of HUMIRA on a fixed, bi-weekly schedule required the exercise of a physician's skill and judgment (at para 10). The Court concluded that the claim provided a fixed dosage at a fixed interval, and no skill or judgment needed to be exercised. Therefore, the patent did not restrict methods of medical treatment or the skill and judgment of a physician. (See: *Janssen Inc v Pharmascience Inc*, 2022 FC 1218 paras 169-170)

G. *Overbreadth*

[189] Overbreadth is a doctrine that has suffered from much uncertainty and has been the subject of much debate. However, the jurisprudence is clear that it is an independent ground of invalidity, rooted in subsections 27(3) and 27(4) of the *Patent Act*. [Appendix A] Subsection 27(3) requires that a patent "correctly and fully describe the invention", and subsection 27(4) requires that a patent include "claims defining distinctly and in explicit terms the subject-matter of the invention for which an exclusive privilege or property is claimed" (*Western Oilfield Equipment Rentals Ltd. v M-I LLC*, 2021 FCA 24 at para 129 [*Western Oilfield*]).

[190] At the most basic level, a patent will be overbroad where the scope of its claims exceeds that of its disclosure (*Seedlings Life Science Ventures, LLC v Pfizer Canada ULC*, 2021 FCA 154 at para 51 [*Seedlings*]). More specifically, this can occur when the claims are broader than

the invention disclosed in the specification or when they are broader than the invention made by the inventor (*Pfizer Canada Inc v Canada (Health)*, 2007 FCA 209 at para 115, cited approvingly in *Western Oilfield* at para 128 and *Seedlings* at para 50).

[191] In an overbreadth analysis "a claim is overbroad if it omits one or more elements that, based on the description, are essential to the art, process, machine, manufacture or composition of matter that the inventor has made" (*Seedlings* at para 60). Therefore, the identification of the essential elements of the invention is crucial.

H. *Claim Term Not Described*

[192] There is no authority in Canadian law that indicates where a patent fails to comply with subsection 38.2(2) of the *Patent Act* it is necessarily invalid. [Appendix A]

[193] *Western Oilfield Equipment Rentals Ltd v M-I LLC*, 2019 FC 1606 dealt with an argument where the defendants (by counterclaim) raised a similar argument to JAMP in this action. The defendants argued that, since the 173 Patent was amended after the original patent application and the new subject matter could not be reasonably inferred from the original specification and drawings filed, the patent violated subsection 38.2(2) of the *Patent Act*. [Appendix A] Justice O'Reilly found the concepts included in the amendment were already present or could be reasonably inferred from the original patent application (at para 256).

[194] The defendants appealed this issue to the Federal Court of Appeal: *Western Oilfield*. On appeal, the defendants suggested the test for reasonable inferability was a strict one, relying on

United Kingdom jurisprudence: *Bonzel v Intervention Ltd* (No 3), [1991] RPC 553; *Gedeon Richter plc v Bayer Pharma AG*, [2012] EWCA Civ 235, [2012] All ER (D) 87 (Mar) at para 13. However, the Federal Court of Appeal did not adopt this test. While it did not outright reject the UK approach, it outlined reasons as to why Canadian courts should be wary of it (at paras 141-144).

[195] The Federal Court of Appeal explained that a party's motivation for amending a claim is not relevant to whether the new matter therein can reasonably be inferred from the original application (at para 144).

[196] Ultimately, the Federal Court of Appeal agreed with Justice O'Reilly, finding that the added feature was "at least" reasonably inferable from the original patent application (para 147). As such, the Federal Court of Appeal did not definitively address whether an unsupported claim term is a proper ground of invalidity.

[197] Thus, as the law currently stands, it is unclear whether a patent is invalid when a party adds a claim term that cannot be reasonably inferred from the specification or drawings.

I. *Double Patenting*

[198] An inventor is only entitled to a single patent for each invention: *Whirlpool Corp v Camco Inc*, 2000 SCC 67 [*Whirlpool*] at para 63. Refer to Appendix A for subsection 36(1) of the *Patent Act*.

[199] If there is a subsequent patent with identical claims to the first, there will be an improper extension of the monopoly: *Whirlpool* at para 63. As stated by the Supreme Court of Canada, the patent claims must be compared to determine whether there is double patenting, rather than comparing the disclosure, as the claims define the monopoly: *Whirlpool* at para 63. The question is how "identical" the claims are to justify invalidation.

[200] Double patenting does not require identical wording in the claims; however, the wording in the claims must claim the same invention: *Sanofi* at para 109.

[201] There are two types of double patenting: same invention-type double patenting and obviousness type double patenting: *Eli Lilly Canada Inc v Apotex Inc*, 2015 FC 875 at para 62 [*Eli Lilly* 2015].

[202] In same invention-type double patenting, the subsequent patent is identical or coterminous with the claims in the first patent: *Eli Lilly* 2015 at para 63.

[203] In obviousness-type double patenting, the question is whether the claims in the subsequent patent are patentability distinct from those in the earlier patent; that is, there is a non-obvious invention "over and above that claimed in the first patent": *Eli Lilly* 2015 at para 64.

J. *Infringement*

[204] Pursuant to section 42 of the *Patent Act*, [Appendix A] a patent holder has the right to full enjoyment of the monopoly granted by the patent. Any act which interferes with the right of the

patentee will constitute infringement: *Monsanto Canada Inc v Schmeiser*, 2004 SCC 34 at para 34 [*Monsanto*].

[205] Under section 55(1) of the *Patent Act* [Appendix A] a person who infringes a patent is liable for all damages sustained by the patentee, after the grant of the patent, by reason of the infringement.

[206] The party alleging infringement has the burden of proving it on a balance of probabilities: *Angelcare Canada Inc v Munchkin, Inc*, 2022 FC 507 at para 155 [*Angelcare*]. The evidence to establish infringement must be "sufficiently clear, convincing, and cogent to satisfy the balance of probabilities test": *Angelcare* at para 155.

[207] When analyzing infringement, the alleged infringing product is compared with the claims as construed: *Angelcare* at para 154. For infringement to exist, all the essential elements of the asserted claim must be found in the alleged infringing product: *Angelcare* at para 154, citing *Free World Trust v Électro Santé Inc*, 2000 SCC 66 at paras 31(f) and 68.

V. The 868 Patent

A. *The Invention Story*

[208] [redacted] In or around 2002, Abbott hoped to develop adalimumab

for application in Crohn's disease patients. [redacted]

[209] Dr. Noertersheuser and Dr. Hoffman explained the development of the clinical trial protocol for the 868 Patent.

[210] Dr. Noertersheuser suffered significant credibility issues. It became apparent during his cross-examination that much of his statement was nearly identical, or word-for-word the same, as a witness statement made by Dr. George Richard Granneman on December 18, 2017 in US litigation. While this is not, in and of itself, hugely problematic, his responses on cross-examination reduced his credibility. He attempted to explain that perhaps he and Dr. Granneman had written identical statements because of how closely they had worked together in the past. He said they worked side by side and discussed things back then, and that must have been the reason they wrote identical statements. He was asked several times and confirmed that he independently came up with the exact same words but that he never copied. This is clearly inaccurate, and he would have better served the Court by admitting the statements were copied, instead of trying to claim that it was sheer coincidence.

[211] The Federal Court dealt with a similar issue in *Rovi Guides, Inc v Bell Canada*, 2022 FC 1388 [*Rovi*]. In that case, Justice Lafrenière found the witness was unaware that plagiarism had occurred but remained troubled that the witness kept insisting that he wrote all of the words. The

Court found that the "lack of candour" went to the issue of credibility and reliability of the witness's evidence.

[212] Unlike in *Rovi*, Dr. Noertersheuser was not an expert witness. Nonetheless, the word-for-word copying of Dr. Granneman's report raised significant concerns about Dr. Noertersheuser's impartiality. His inability to accept or acknowledge the paragraphs were word-for-word the same greatly impugned his credibility and reliability.

[213] In closing, AbbVie attempted to suggest that Dr. Noertersheuser's credibility issues were due to a language barrier. It was very clear from Dr. Noertersheuser's direct examination and cross-examination that there was no language barrier—his English was impeccable and to suggest otherwise would do him a disservice. Therefore, I have not and will not consider this suggestion any further.

[214] I note the Federal Court of Appeal's comments on the role of expert evidence in *dTechs EPM Ltd v British Columbia Hydro and Power Authority*, 2023 FCA 115. In that decision, the Court commented on the role of counsel with expert reports, specifically for patent cases. While the Federal Court of Appeal acknowledged counsel are actively involved, and that this did not inevitably detract from the substance of the opinion expressed by the expert, it stated:

> [34] I agree with the appellant that there are, however, limits to the involvement of counsel. The Court must ultimately be presented with the substantive and objective opinion of the expert. This is why experts are very clearly put on notice of their duty towards the Federal Court when they agree to abide by the Code of Conduct for Expert Witnesses. I know of no cases where an expert report was excluded in a patent case on the sole ground that the first draft of said report was penned by counsel after meetings with the expert to

> discuss their opinions in detail. While counsel may make mistakes and overstep the bounds of what is permissible involvement, this will normally be revealed on cross-examination at trial, and will be considered by trial courts in assessing the evidence (*Medimmune Ltd. v. Novartis Pharmaceuticals UK Ltd*., [2011] EWHC 1668 (Pat.) (Medimmune).

[215] The similarity between Dr. Noertersheuser (fact witness) and Dr. Granneman's expert report went well beyond the appropriate limits. I will assess Dr. Noertersheuser's evidence with some caution when it is in disagreement with other witnesses.

[216] Dr. Hoffman, also a fact witness, explained that the development of adalimumab in treating Crohn's disease patients was new and required inventiveness, as it was unknown whether adalimumab would be safe and effective. [redacted]

[217] [redacted]

[218] [redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]

[219] [redacted]

[220] [redacted]

  - [redacted]
  - [redacted]
  - [redacted]
  - [redacted]

[221] [redacted]

[222] [redacted]

[223] [redacted]

[redacted]		
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted] 1. [redacted] 2. [redacted]
[redacted]	[redacted]	[redacted] • [redacted] • [redacted] • [redacted]

[224] [redacted]

[225] Dr. Hoffman spoke to the clinical studies and the phases. However, she too suffered credibility issues.

[226] First, Dr. Hoffman confused some dates in her witness statement. She stated that infliximab received approval in 2002 for Crohn's disease, and that Celltech abandoned their clinical trials in 2002. Both dates were incorrect: infliximab received approval in 1998 and Celltech abandoned its clinical trials in 2003. These are important dates, which are extremely relevant to the invention story of the 868 Patent.

[227] Dr. Hoffman was also inconsistent between her February 2022 examination and her cross-examination before this Court. Dr. Hoffman had a significant improvement in her memory between February 2022 and this trial, approximately ten months later, which she explained was due to reading over documents and communications.

[228] During the course of this trial, it arose that Dr. Hoffman was previously involved in litigation regarding the 868 Patent in 2017 and 2018. Although Dr. Hoffman's evidence from that matter was not provided to the Court, it raised questions about her memory and recall. This is especially so in light of the fact that she repeatedly said it had been almost 20 years since she had last considered the 868 Patent. Neither the documents she reviewed to reinvigorate her

memory nor her witness statement from the previous litigation were provided to the Court. She was, however, steadfast in her explanations.

[229] I accept Dr. Hoffman and Dr. Noertersheuser's factual assertions that Abbott completed PK/PD modelling and clinical trials. However, I do not accept both witnesses' assertions that the dosing regimen, PK/PD modelling, and safety concerns were as challenging and significant as they purport them to be.

B. *Claims Construction*

(a) *Dr. John Marshall – AbbVie*

[230] Dr. Marshall was a bright and intelligent expert, who was knowledgeable about the field of gastroenterology. However, he refused to concede any point – even where he was obviously incorrect or mistaken. For example, he was a referee on a journal, yet he said that journal was mid-tier and the article was wrong. He qualified almost every statement and this ended up doing a disservice to his evidence. I found that he often, to his detriment, overstated findings. Nonetheless, on the whole, he was a sincere witness who was knowledgeable. I assign his evidence a moderate weight.

[231] Dr. Marshall opined that the POSITA of the 868 Patent is a team comprised of the following people:

1) A gastroenterologist with clinical experience in treating Crohn's disease and ulcerative colitis; and

2) A pharmacologist with experience in the pharmacokinetics and pharmacodynamics of monoclonal antibodies and other biological immunomodulatory agents.

[232] His expert reports and his testimony provided the perspective of the skilled gastroenterologist on the team.

[233] Dr. Marshall's evidence was that there were no studies in the prior art that indicated adalimumab would achieve any response at all in Crohn's disease or UC. He said there was a significant gap between the state of the art and the 868 Patent claims. He also asserted that, as of April 2004, a skilled gastroenterologist would have been uncertain about the efficacy and safety of adalimumab for treating IBD.

[234] Dr. Marshall, in his construction and infringement report, when addressing the common general knowledge, focused on the clinical assessment of Crohn's disease and provided prior art in support of this. Specifically, he relied on five scientific, peer-reviewed papers. Those scientific papers were referenced in support of clinical assessment, such as CDAI assessment and the use of the MAYO score: see for example Harriman G, Harper L, Schaible T, "Summary of Clinical Trial in Rheumatoid Arthritis Using Infliximab, an Anti-TNFa Treatment", *Ann Rheum Dis* 1999 58:(Suppl I) 161-164 [Harriman 1999]; Targan S, Hanauer S, et al, "A Short-Term Study of Chimeric Monoclonal Antibody cA2 to Tumor Necrosis Factor a for Crohn's Disease", *New England Journal of Medicine* 1997 337:15 [Targan 1997]. In cross-examination, Dr. Marshall acknowledged that there were various other outcome measure scores for UC.

[235] Dr. Marshall's second responding validity report dealt with the common general knowledge in more detail. On the whole, Dr. Marshall's evidence regarding the common general knowledge suffered slightly from tunnel-vision and focused on the negative aspects of the prior art. Although he explained that, as of April 9, 2004, TNFα inhibitors were an "emerging class" for some inflammatory diseases, he said that TNFα therapies had "more question marks than successes" (Dr. Marshall October Report at para 85).

[236] Dr. Marshall believes that, as of April 2004, anti-TNFα biologics were afflicted with side effects and there were concerns regarding patients developing ADAs. In support of that, he relied on the following two papers:

- Hanauer et al, *Maintenance infliximab for Crohn's disease; the ACCENT 1 randomised trial*. Lancet (2002); 359(9317):1541-9 [Hanauer 2002]
- Sandborn et al, *Infliximab in the treatment of Crohn's disease: a user's guide for clinicians*. AM J Gastroenterol (2002); 97(12): 2962-72 at 2969 [Sandborn 2002]

[237] Dr. Marshall explained that the Sandborn 2002 paper highlighted the need to find the right dose to balance ADA formulation against a complete loss of response to the anti-TNFα therapy. In addition, he relied on Sandborn et al, "Etanercept for active Crohn's disease: a randomized, double-blind, placebo controlled trial" Gastroenterology (2001); 121: 1088-1094 at 1093 [Sandborn 2001] for the finding that there was no clear reason for the differences that would cause a lack of efficacy for etanercept. Despite the failure of etanercept in Sandborn 2001,

Dr. Marshall admitted that this had not dissuaded people from exploring the TNFα biologics in treating Crohn's disease.

[238] In fact, as Dr. Marshall acknowledged on cross-examination, Dr. Sandborn and other scientists continued to investigate TNFα inhibitors: see for example Sandborn 2002; Van Deventer, "Transmembrane TNF-α, Induction of Apoptosis, and the Efficacy of TNF-Targeting Therapies in Crohn's Disease": Gastroenterology, 2001; 121(5): 1242-6 at 1242.

[239] Sandborn, W J et al, "An engineered human antibody to TNF (CDP571) for active Crohn's disease: a randomized double-blind placebo-controlled trial" (2001) 120:6 Gastroenterology 1330–1338 [Sandborn May 2001] was an important paper on Dr. Marshall's cross-examination. Dr. Marshall relied on Sandborn May 2001, which was included as Exhibit F in his responding validity report, to explain why Celltech proceeded with the 10 mg/kg constant dose in the Phase III trial involving 396 patients, which did not show long-term efficacy in the treatment of Crohn's disease. However, on cross-examination, Dr. Marshall initially agreed that the article showed 10 mg/kg did not achieve a better response rate than the 20 mg/kg at the two-week mark. In response, counsel for JAMP pointed out that Dr. Marshall's statement in his expert report, which previously claimed the 10 mg/kg achieved a "better response" rate at the two-week mark, was wrong. Instead of conceding this point, particularly in light of his earlier answer, Dr. Marshall attempted to backtrack and stated "Only the 10 mg/kg dose was significantly better than placebo at the two-week mark" (November 16 Trial Transcript at 428).

(b) *Dr. Mould—AbbVie*

[240] Dr. Mould also suffered some credibility issues and tunnel vision in her approach to the 868 Patent, although she was more willing to concede points and accept errors when counsel for JAMP pointed them out.

[241] Most concerning to her credibility was a failure to disclose her prior involvement with the 868 Patent Application. Dr. Mould previously provided expert evidence on behalf of AbbVie regarding a US patent application with similar subject matter to the 868 Patent. She admitted that she had not disclosed the content of her prior opinion. Although counsel for AbbVie suggested a declaration that Dr. Mould had previously worked for AbbVie in patent matters was sufficient, I disagree (AbbVie Closing at para 121). Direct involvement with the patents that are before this Court require a declaration. Dr. Mould's direct testimony to me after this revelation showed she was no longer engaged with the Court and was clearly shaken. Much like I treat Dr. Baughman's evidence who suffered similar issues (see below) I will give her evidence moderate weight.

[242] Despite this, Dr. Mould provided some useful insight into the 868 Patent. Dr. Mould believes that the POSITA of the 868 Patent is also a team of people with two main skillsets:

1) A gastroenterologist with clinical expertise in treating IBD; and
2) A pharmacologist with at least a graduate degree in pharmacology, and experience working in the PK and PD of mAbs and other biological immunomodulatory agents.

[243] During her cross-examination, Dr. Mould explained that it was very likely that the skilled pharmacologist would have a few years of experience, although it was plausible in her mind that someone with a year of experience could be the skilled pharmacologist.

[244] Her report and testimony provided the perspective of the skilled pharmacologist within the aforementioned team.

[245] Dr. Mould explained that the common general knowledge of the skilled pharmacologist as of April 9, 2004 would have included the general principles of PK and PD, along with basic knowledge on the design of dosing regimens and pharmacokinetic modelling. A skilled pharmacologist would also have information on available TNFα inhibitors, including that they have different pharmacological profiles and risks compared to small molecule drugs.

[246] Dr. Mould further clarified what a skilled pharmacologist would understand about the design of a dosing regimen, including the factors to consider, such as the route of administration, the dose approach, the dosing interval and the dose amount. Additionally, Dr. Mould stated a skilled pharmacologist would have been aware of diseases like IBD, although they would have deferred to a gastroenterologist for clinical evaluation. Finally, Dr. Mould indicated the common general knowledge for a skilled pharmacologist would not have been materially different as of September 26, 2005 (which was the publication date).

(c) *Dr. Baughman – JAMP*

[247] Dr. Baughman's evidence suffered a complication, when it was revealed during her cross-examination that she had previously provided expert evidence in another matter involving the 868 Patent. By way of background, Dr. Baughman became involved in this proceeding through a different dispute. Around July 2021, she was contacted by American counsel for a proceeding in the US involving Alvotech Hf and AbbVie, where she provided her opinion on how, as of April 9, 2004, an ordinary skilled pharmacologist would have approached dosing, and what doses or regimens they would have selected to develop a drug containing adalimumab for the treatment of IBD. Around 2022, she was informed that the US proceeding had ended. The opinion Dr. Baughman provided to US counsel was contained within her expert report in this matter.

[248] During cross-examination, Dr. Baughman stated she had not reviewed the claims of the 868 Patent or the dosing regimen before providing her opinion. However, during cross-examination, counsel for AbbVie presented Dr. Baughman with the 2018 Affidavit, which revealed Dr. Baughman previously provided an expert opinion for Samsung Bioepsis in a Canadian dispute involving the 868 Patent. The 2018 Affidavit showed Dr. Baughman was aware of the dosing regimen for the 868 Patent before providing her opinion to US counsel and before giving her opinion in this matter. Dr. Baughman stated she did not recall completing this earlier work. AbbVie has argued that this is a massive failing and essentially destroys the value in her evidence, as the premise was for her to blind create the dosing regimens in her simple PK models.

[249] AbbVie says that Dr. Baughman's evidence should be completely disregarded for providing false testimony. In addition, AbbVie also faults Dr. Baughman for having similar paragraphs and excerpts as Dr. Howden.

[250] I rely on Dr. Baughman's evidence, not for the fact that it was blinded but for the reasoning it provides. In *Seedlings Life Science Ventures, LLC v Pfizer Canada ULC,* 2020 FC 1 [*Seedlings FC*], the Federal Court explained that "[w]hatever the merits of blinding in other respects, I must say that it is not particularly helpful with respect to the skilled person, common general knowledge, and claims construction" (at para 43). In *Seedlings FC*, Justice Grammond echoed a similar skepticism as Justice Locke in *Shire Canada Inc v Apotex Inc*, 2016 FC 382 and Justice Phelan in *Janssen Inc v Apotex Inc*, 2019 FC 1355 [*Janssen* 2019]. In *Janssen* 2019, Justice Phelan commented:

> [58] There is some authority in this Court that favours blinded witnesses. However, I am of the view that blinding can be overrated. It may be a factor in giving weight but the Court is more interested in the substance of the opinion and the reasoning behind the conclusions. In that respect my conclusion is similar to that in *Shire Canada Inc v Apotex Inc*, 2016 FC 382, 265 ACWS (3d) 456.

[251] Similarly here, I am more interested in the substance of Dr. Baughman's opinion and how it applies to PK/PD modelling for the 868 Patent.

[252] I realize that AbbVie is not critiquing the concept of blinding but, instead, the failure of Dr. Baughman to remember that she gave evidence on the same patent. While it does cause some pause for concern, I agree with JAMP that the past three years have been immensely stressful and have been trying times for much of the world. In addition I understand that this matter did

not go to trial so she did not testify in that trial which would make it more memorable. I accept that Dr. Baughman sincerely failed to recall her previous evidence. As noted, she was apologetic and appeared shocked that she had provided an expert opinion on the 868 Patent earlier. Therefore, I am willing to accept her evidence as credible and reliable, although I only assign a moderate weight to it. This is similar to how I treated Dr. Mould's evidence.

[253] Finally, Dr. Baughman's evidence is remarkably similar between the 2018 Affidavit and this proceeding. Contrary to AbbVie's submission that she is tainted by hindsight bias, her evidence in both proceedings shows her views and opinions are consistent. This provides further reason to accept her evidence as credible and reliable.

(d) *Dr. Howden – JAMP*

[254] In comparison to Dr. Marshall's overview, Dr. Howden provided a much more detailed perspective of the prior art. I found Dr. Howden's evidence to be measured without tunnel vison or embellishment. He withstood an excellent cross-examination with his credibility still intact. It was brought to my attention that often parts of his report were almost identical to Dr. Baughman's. He said he did not copy it, but it may have been adapted as counsel did some of the drafting. However, he reviewed it and it was his opinion. See my discussion regarding this above at paragraphs 207-210. His evidence was very helpful and I will rely on it unless otherwise noted.

[255] Dr. Howden noted that, between April 2004 and September 2005, there would not have been a significant evolution in the prior art or the common knowledge. He did point out,

however, that physicians would have used infliximab more frequently and would have become more familiar with the use and safety of infliximab (Dr. Howden August Report at para 133).

(2) The POSITA for the 868 Patent

[256] Where there exists some discrepancy or minor disagreement between the expert witnesses who appeared for the same party, I have used the lesser requirement from the experts' evidence.

[257] Both Dr. Mould's and Dr. Marshall's position was that the POSITA for the 868 Patent would consist of at least a team. Based on Dr. Mould's and Dr. Marshall's evidence, AbbVie's position is that the POSITA would consist of:

1. A gastroenterologist with clinical experience in treating IBD;
2. A pharmacologist with at least a graduate degree in pharmacology, and experience (at least a year) working in the PK and PD of mAbs and other biological immunomodulatory agents; and
3. A clinician because the treatment of TNF disorder is conducted under the supervision of a clinician.

[258] Both Dr. Howden and Dr. Baughman were consistent in their description of the POSITA. In their view, the skilled person consists of a team that includes:

1. A medical doctor who has experience treating IBD;
2. A person involved in the development of dosing regimens, more specifically, a clinician who has previous experience in selecting doses for clinical trials; and

3. A pharmacologist.

[259] I find that the POSITA would be a team of individuals with the following skills: a gastroenterologist with clinical experience with IBD, a pharmacologist with a graduate degree and experience working in pharmacokinetics and pharmacodynamics of mAbs, and developing dosing regimens for clinical trials with a biologic drug.

(3) Prior Art

[260] The parties disagreed on whether the prior art pointed away from adalimumab being effective in treating Crohn's disease and UC patients.

[261] I have summarized the key art below.

(a) *Effectiveness of Adalimumab*

[262] As of 1999, it was known that "TNFα seems to play a central part in the inflammatory response in patients with active Crohn's disease": G, Harriman, L K Harper & T F Schaible, "Summary of clinical trials in rheumatoid arthritis using infliximab, an anti-TNFα treatment" (1999) 58 Suppl 1: Ann Rheum Dis I61-64; see also Van Deventer, S J, "Tumour necrosis factor and Crohn's disease" (1997) 40:4 Gut 443–448 [Van Deventer 1997]. In the late 1990s, various authors showed that infliximab could be used to treat Crohn's disease, further showing TNFα was of importance.

[263] In a 1999 review article, Dr. Rutgeerts stated that "an anti-cytokine therapy directed toward TNFα that down-regulates and controls activation of the effector cells may have an essential role in treating Crohn's disease" (Rutgeerts, "Review article: efficacy of infliximab in Crohn's disease – induction and maintenance of remission", Aliment Pharmacology and Therapeutics 1999:13 (Suppl. 4), 9-15 [Rutgeerts 1999 Review]). Dr. Rutgeerts also concluded that patients with Crohn's disease therapy goals required both induction and maintenance (Rutgeerts 1999 Review at 10).

[264] Thus, the POSITA would have known that TNFα was an important development in the treatment of Crohn's disease and that an induction and maintenance dose may be required.

[265] Prior to 2004, the following was known about several TNFα inhibitors:

TNFα Biologic	**Approval**	**Clinical Trial + Application for Crohn's Disease**
Infliximab (Janssen)	Approved for the treatment of RA and Crohn's disease	• Shown to be safe and effective for Crohn's disease. • Used the following dosing: o Induction + maintenance therapy, using a "three dose induction" of: o Induction dose of 5 mg/kg at weeks 0, 2 and 6 o Maintenance dose of 5 mg/kg every 8 weeks thereafter (see 2002 REMICADE (infliximab) package insert)
Etanercept (Immunex/Amgen/also known as ENBREL)	Approved for use in RA	• Etanercept was determined to be safe but not effective for Crohn's disease patients • Used the same maintenance dosing regimen as in RA patients

		(see ENBREL 1998 Package Insert; Sandborn 2001 at 1088)
CDP571 Celltech	No approval	• Investigated for treating Crohn's disease • It was reported that "CDP571 is effective for the induction of clinical improvement and for steroid sparing in patients with active and steroid-dependent Crohn's disease" • In August 2003**,** it was announced that Celltech abandoned its Crohn's disease treatment (see Sandborn, "Strategies for targeting tumour necrosis factor in IBD". Best Practice & Research Clinical Gastroenterology (2003); 17(1): 1105-117 at 115 [Sandborn 2003 February]; Simon Bowers, "Celltech hit by failure of Crohn's disease drug" (20 August 2003), online: <theguardian.com>)
CDP870	No approval	• A phase II study in active Crohn's disease showed significant short-term benefits at 2 weeks for CDP870 subcutaneous doses of 100, 200, and 400 mg compared with placebo • No significant differences between CDP870 at any of the three doses or in placebo were noted at 12 weeks in patients undergoing maintenance therapy every 4 weeks (see Sandborn, "Optimizing anti-tumour necrosis factor strategies in inflammatory bowel disease." Curr Gastroenterol Rep (2003); 5(6): 501-505 at 504 [Sandborn 2003])
Onercept (p55 tumour necrosis factor receptor)	No approval	• Concluded, "neutralizing the activity of tumour necrosis factor-α… may be valuable in the treatment of patients with Crohn's" • Recommended larger placebo-controlled trials (see Rutgeerts et al, "Treatment of active Crohn's disease with onercept (recombinant human soluble p55 tumour necrosis factor receptor): results of a randomized, open label, pilot study." Aliment Pharmacol Ther (2003); 17:2: 185-192 at 185)

[266] Dr. Howden explained that although etanercept had failed, those studies had been conducted using the dosing for rheumatoid arthritis. He noted that Professor van Deventer suggested a higher dosing, or more frequent dosing, may be required for Crohn's disease.

[267] AbbVie's own documents also demonstrate that [redacted]

[268] Dr. Marshall posited that the prior art pointed away from the success of adalimumab with Crohn's disease, especially in light of Dr. Sandborn's studies. Specifically, he believed that people in the art had lower expectations of success in light of Sandborn 2001. JAMP, however, said there was a continued interest and hope for the development of adalimumab. Specifically, Dr. Sandborn did not rule-out the possibility that etanercept would be effective in the treatment of Crohn's disease.

[269] I accept that Dr. Sandborn's studies did not point away from adalimumab, and that people skilled in the art had a continued interest in pursuing adalimumab in treatment for Crohn's disease. This is supported by [redacted], an investigator led study by Dr. Sandborn. Dr[redacted]

[redacted]

(b) *Mechanism of Action*

[270] Dr. Marshall says that while there was a hypothesis that TNFα was important, the mechanism of action was unknown: Dullemen, Hendrik M van et al, "Treatment of Crohn's disease with anti-tumor necrosis factor chimeric monoclonal antibody (cA2)" (1995) 109:1 Gastroenterology 129–135 [Van Dullemen 1995].

[271] I accept that in 1995 Van Dullemen explained the mechanism of action of infliximab was unknown in Crohn's disease. However, by 2004, it was known that both infliximab and adalimumab were TNFα inhibitors that were IgG1 antibodies. Targan, S R et al, "A short-term study of chimeric monoclonal antibody cA2 to tumor necrosis factor alpha for Crohn's disease. Crohn's Disease cA2 Study Group" (1997) 337:15 N Engl J Med 1029–1035 [Targan 1997] stated that the "cA2 monoclonal antibody is a chimeric mouse-human IgG1" (at 1030). Infliximab is a chimeric monoclonal antibody. Sandborn 2003 also explains that both infliximab and adalimumab are IgG1 monoclonal antibodies.

[272] Papadakis and Targan explained that, as of 2000, the pathogenic role of TNF had been implicated in both RA and Crohn's disease: Papadakis, K A & S R Targan, "Tumor necrosis factor: biology and therapeutic inhibitors" (2000) 119:4 Gastroenterology 1148–1157 [Papadakis and Targan 2000]. Papadakis and Targan 2000 also stated that several lines of evidence suggested that TNF played a "central role" in the pathogenesis of mucosal inflammation in Crohn's disease (at 1151).

[273] The parties disagreed about the importance and relevance of T-cell apoptosis. By 2003, infliximab was known to induce T-cell apoptosis, whereas, whether adalimumab induced T-cell apoptosis was unknown. AbbVie says that while JAMP purports that infliximab and adalimumab were similar, Dr. Marshall says that because it was unknown whether adalimumab induced T-cell apoptosis, the similarities in the mechanism of action were not known at that time. AbbVie submits that understanding T-cell apoptosis was an important consideration for the key aspects of adalimumab's mechanism of action.

[274] From the prior art, it appears that T-cell apoptosis was an important consideration: Van Deventer, S J H, "Transmembrane TNF-α, induction of apoptosis, and the efficacy of TNF-targeting therapies in Crohn's disease" (2001) 121:5 Gastroenterology 1242–1246 [Van Deventer Editorial 2001]. The Van Deventer Editorial 2001 paper also discussed the mechanism of action and the implications for further development of TNF-targeting strategies in Crohn's disease. Van Deventer concluded that "…the therapeutic efficacy of TNF-α-neutralizing antibodies in Crohn's disease is related to apoptosis of TNF-α-expressing target cells rather than

to neutralization of soluble TNF-α" (at 1244). However, Van Deventer does acknowledge that binding to membrane associated TNFα is an important mechanism (at 1245).

[275] Disagreement arose between Dr. Marshall and Dr. Howden over Sandborn 2003 and the implications for the common general knowledge in 2004. I have produced a table that summarizes Dr. Sandborn's comments on the mechanisms of action for different anti-tumour necrosis factor biologic agents below. After reviewing the information known at that time, Dr. Sandborn concluded that the "efficacy of anti-TNF therapy for unselected patients with Crohn's disease is linked to the ability of the molecule to induce T-cell apoptosis" (at 502).

Anti-Tumor Necrosis Factor Biologic Agent	Efficacy	Type of Antibody	Binds	Complement fixation	Induce T-Cell Apoptosis?
Infliximab	Effective in patients with Crohn's disease	IgG1 chimeric mAb	Soluble and membrane-bound TNF	Fixes Complement	Yes
Etanercept	Not effective in Crohn's disease	Fusion protein, comprised of human IgG1 Fc antibody fragment	Soluble and membrane-bound TNF	Does not fix complement	Does not induce T-cell apoptosis
CDP571	Modest short-term effect but not remission in Crohn's disease	Humanized IgG1 mAb	Soluble and membrane-bound TNF	Not expected to fix complement or mediate ADDC	Unknown
CDP870	Modest short term effective – but effect more pronounced in patients	Humanized Fab fragment linked to polyethylene glycol	Soluble and membrane bound TNF	Not expected to fix complement or to mediate ADDC	Unknown

	with elevated baseline CRP conc				
Adalimumab	No information re efficacy in Crohn's disease	Fully human IgG1 mAb	Soluble and membrane-bound TNF	Fixes complement and mediates ADDC	Unknown
Onercept	Small pilot study suggested higher-dose had greater effect	Fully human p55 TNF receptor	Soluble and membrane-bound TNF	Does not fix complement or mediate ADDC	Unknown

[276] Puzzlingly, T-cell apoptosis was not a central issue for Dr. Marshall and Dr. Howden, and debate only arose in closing arguments. As such, it is challenging for me to firmly determine whether knowing the inducement of T-cell apoptosis would have pointed a person skilled in the art away from pursuing adalimumab. Dr. Marshall suggested that it was relevant to understanding the mechanism of action, relying on Sandborn's 2001 statement that "binding to transmembrane TNF with subsequent apoptosis of T cells may be important for efficacy." Based on the Sandborn articles, I find T-cell apoptosis would have been a relevant consideration for a person skilled in the art.

[277] However, that said, whether adalimumab induced T-cell apoptosis was unknown. Therefore, I find that a person skilled in the art would not have been discouraged from pursuing adalimumab due to the failure of etanercept, since the mechanism of action was unknown for adalimumab at the time.

(c) *Safety of Adalimumab*

[278] In terms of safety, the prior art is clear that TNFα inhibitors, such as etanercept, were safe in studies. For example, Sandborn 2001 found there was similar safety between etanercept and placebo, and there were no significant differences comparing etanercept to the placebo.

[279] Dr. Hoffman and the expert witnesses agreed that by April 2004, a clinician would have been aware that TNFα had been studied and previously approved for the treatment of Crohn's disease. However, the disagreement between AbbVie and JAMP is whether it was known that adalimumab would be safe and effective for Crohn's disease.

[280] The prior art indicates that, as of 2004, it was known that adalimumab was safe and effective. Multiple reviewed studies and clinical studies which used adalimumab concluded that it was safe and effective: Kempeni, J, "Update on D2E7: a fully human anti-tumour necrosis factor α monoclonal antibody" (2000) 59:Suppl 1 Ann Rheum Dis i44–i45; Schattenkirchner et al., "Long-Term Use of the Fully Human Anti-TNF Antibody D2E7 in Combination with Methotrexate in Active Rheumatoid Arthritis", Arthritis and Rheumatism 2000; 43(9 Suppl):S228, Abstract 968; Weisman et al., "A dose escalation study designed to demonstrate the safety, tolerability and efficacy of the fully human anti-TNF antibody, D2E7, given in combination with methotrexate (MTX) in patients with active RA", Arthritis & Rheum. (2000);43 (9 Suppl. 1):S391, Abstract 1948; van de Putte et al., "One Year Efficacy Results of the Fully Human Anti-TNF Antibody D2E7 in Rheumatoid Arthritis", Arthritis & Rheum 2000; 43(Supp.):S269, Abstract 1218; Weisman, Michael H et al, "Efficacy, pharmacokinetic, and safety assessment of adalimumab, a fully human anti-tumor necrosis factor-alpha monoclonal

antibody, in adults with rheumatoid arthritis receiving concomitant methotrexate: a pilot study" (2003) 25:6 Clin Ther 1700–1721.

[281] Abbott's HUMIRA development plan illustrates that [redacted]

[282] Yet, Dr. Mould asserted that the skilled pharmacologist would have been aware that a loading dose or induction dose came with safety risks (Dr. Mould Report at para 176). The safety concerns were found in the label for HUMIRA in the black box. The warning was for a risk of tuberculosis infections. Goodman & Gilman's explained that the use of a loading dose can have significant disadvantages.

[283] In contrast, Dr. Howden said that adalimumab would have been understood to be a safe drug in April 2004 (Dr. Howden Report at para 194). In his opinion, the dosing regimen loading doses of 160 mg and 80 mg fell within the previous range of doses of adalimumab for treating IBD. He relied on the 459 Patent and van de Putte et al and
A Single Dose Placebo Controlled Phase I Study of the Fully Human Anti-TNF
Antibody D2E7 in Patients with Rheumatoid Arthritis. Arthritis &Rheumatology (1998); 41:(Su pp S57) (cite found at page 54 of Dr. Howden's Report).

(d) *Dosing of Adalimumab*

[284] Dr. Mould asserted that the existing field of TNFα inhibitors would have pointed the skilled pharmacologist away from the use of a loading or induction dose.

[285] Dr. Mould raises five points in support of this. First, Dr. Mould explained that both etanercept and CDP571 did not use induction or loading doses. Second, Dr. Mould explained that the skilled pharmacologist would have known that the dose and regimen for a given mAb must be tested empirically and cannot be extrapolated from another mAb. Third, despite the fact that REMICADE used an induction dose for Crohn's disease, etanercept had not tested a loading or induction regimen. Fourth, Dr. Mould says that while a skilled pharmacologist relied on infliximab's regimens to inform the dosing of adalimumab for IBD, the skilled pharmacologist would have tried a higher dose than the approved 40 mg dose in RA without an induction phase. Fifth, Dr. Mould asserts that increasing the dose did not necessarily result in the induction of remission in IBD or any particular disease.

(e) *Subcutaneous Administration*

[286] Dr. Mould provided prior art describing the absorption process following subcutaneous administration: Malcolm Rowland and Thomas Tozer, Clinical Pharmacokinetics: Concepts and Applications, 3d ed (Philadelphia: Lippincott Williams & Wilkins, 1995), Chapters 1, 4, and 7. For instance, Porter, C J & S A Charman, "Lymphatic transport of proteins after subcutaneous administration" (2000) 89:3 J Pharm Sci 297–310 states the bioavailability of a subcutaneously

administered drug is usually lower than for the same drug administered intravenously because some amount of drug is lost at the injection site and during the process of absorption.

[287] Dr. Baughman also provided prior art demonstrating that subcutaneous administration of adalimumab was known to be safe and effective prior to 2004: Schattenkirchner et al, "Efficacy and Tolerability of Weekly Subcutaneous Injections of the Fully Human Anti-TNF-Antibody D2E7 in Patients with Rheumatoid Arthritis-Results of a Phase I Study" (1998) Arthritis & Rheumatism, online: <https://www.semanticscholar.org/paper/EFFICACY-AND-TOLERABILITY-OF-WEEKLY-SUBCUTANEOUS-OF-Schattenkirchner-Kr%C3%bcger/2b7d77f1a970f27c9a771a3f98dba2f7c4816eab>; Schattenkirchner et al, "Long-Term Use of the Fully Human Anti-TNF Antibody D2E7 in Combination with Methotrexate in Active Rheumatoid Arthritis", Arthritis and Rheumatism 2000; 43(9 Suppl):S228, Abstract 968.

(4) Common General Knowledge for the 868 Patent

[288] Both parties agree that, as of 2004, and even now, there is no cure for Crohn's disease or UC. Therefore, the treatment goal prior to 2004 was to induce and maintain remission. Remission, in effect, means that a patient will experience no significant symptoms. That treatment goal remains the same today.

[289] I find that the common general knowledge of April 2004 reflected the following:

Common General Knowledge as of April 2004
• Adalimumab was understood to be a safe drug

• The literature described some clinical studies that had been done with adalimumab in relation to RA, including Phase I safety studies and Phase II dose-ranging studies
• A person familiar with the prior art would have known that other biologic TNFα inhibitors existed
• As of 2002, infliximab was approved for the treatment of RA and Crohn's disease
• Etanercept was safe but not effective for the treatment of Crohn's disease
• Although it was unknown whether adalimumab induced T-cell apoptosis, a POSITA would not have been discouraged from pursuing adalimumab, given infliximab had similar features to adalimumab and both are IgG antibodies
• Canadian Patent 2,243,459 (the "459 Patent"), which was issued on September 17, 2002, references "… human antibodies, and antibody portions, of the invention, also can be used to treat intestinal disorders, such as idiopathic inflammatory bowel disease, which includes two syndromes, Crohn's disease and ulcerative colitis"
• It had publicly been reported that adalimumab was being used in Phase II/Phase III trials for the treatment of Crohn's disease • The Sandborn Classic II and III papers would have been a part of the common general knowledge
• A clinician would have known that when treating IBD, a maintenance dose is insufficient and that an induction dose would be necessary to swiftly bring the disease under control

(5) Claim Construction

[290] The relevant time for construing the patent's claims is the publication date of the 868 Patent. The 868 Patent was published on September 26, 2005.

[291] Each of the claim terms of the 868 Patent are an essential element of their respective numbered claims. Each of the claims can also be construed by their plain and ordinary meaning.

[292] Claim 1 is an independent claim and the remainder of the claims are dependent.

[293] The only real dispute between the parties is the definition of “treating” in Claim 1.

[294] AbbVie says treating means a safe and meaningful clinical response, including remission. To determine if in clinical remission, AbbVie (Dr. Marshall) stated the test scores of the CDAI for Crohn’s and the Mayo score for UC would be used. Dr. Howden and Dr. Baughman constructed treating to “means achieving some therapeutic effect or benefit, with no particular level or duration of efficacy being required” (JAMP Closing at para 57).

[295] AbbVie submitted that Dr. Baughman agreed on cross-examination with Dr. Marshall. JAMP submitted that on cross-examination Dr. Marshall agreed with Dr. Howden and Dr. Baughman.

[296] I agree and adopt JAMP’s experts’ construction, as, even given its ordinary meaning, treating does not always achieve a meaningful result. Treating means attaining some therapeutic results but does not demand a particular duration or result.

[297] Treating does not mean achieving a meaningful clinical response and I do not accept Dr. Marshall’s definition that there must be a “certain therapeutic effect” (Dr. Marshall Report at

para 91). “Treating” means a physician administering or prescribing adalimumab to an IBD patient according to the dosing regimen of the patent.

[298] The essential elements of the claims are conjunctive. The first claim requires the combination of multiple prefilled syringes of varying dosage amounts that are used for administration in accordance with the claim dosing schedule using subcutaneous injections. The claimed invention is a dosing regimen for the treatment of Crohn’s disease and UC.

C. *Invalidity*

(1) Obviousness

[299] The relevant date for assessing obviousness is the claim date, as defined by section 28.3 of the *Patent Act*. The applicable claim date is the priority date of the 868 Patent: April 9, 2004.

[300] AbbVie argues that the asserted claims of the 868 Patent are not obvious because the state of the art neither set out safety, efficacy, the PK or PD of adalimumab in IBD, nor suggest any dosing for treatment. AbbVie submits that JAMP has fallen prey to hindsight bias and ignores the significant climate of uncertainty facing TNFα inhibitors. AbbVie also contends that the dosing regimen was not obvious to try in the circumstances.

[301] JAMP argues that it was “more or less self-evident to try to obtain the invention” and the public knowledge that Abbott was in Phase II/III clinical trials for adalimumab in the treatment of Crohn’s disease indicated Abbott’s confidence. JAMP also indicates that by April 9, 2004,

other TNFα inhibitors had been tested in patients with Crohn's disease using a loading dose regimen.

[302] The issue is whether it would have been obvious to the POSITA to develop the 868 Patent's dosing regimen for Crohn's disease and UC. Would the unimaginative but skilled POSITA have come to the solution taught by the 868 Patent directly and without difficulty?

[303] I find that, on a balance of probabilities, the 868 Patent dosing regimen would have been obvious to try in the circumstances.

(a) *Self-Evident That Adalimumab Would Be Safe and Effective in IBD*

[304] AbbVie raises two points in support of its position that it was not self-evident that adalimumab would be safe for IBD. First, AbbVie explains that in the field of gastroenterology, 70% of clinical trials fail. Relying on this fact, the failure of CDP571, and Dr. Marshall's summary of the uncertainty of TNFα inhibitors, AbbVie submits that there was uncertainty around the effectiveness of adalimumab. Second, AbbVie posits that while adalimumab was effective for the treatment of RA, it was unknown whether adalimumab would be successful for a completely different disease.

[305] JAMP argues that, as of 2004, there were published clinical studies reporting on the efficacy and safety of adalimumab in the treatment of patients with RA using a range of doses and different routes of administration. In support of this, JAMP relies on the DE005, DE007, and DE009 studies. JAMP also points to Abbott's patents and applications which disclosed that

adalimumab was effective for the treatment of IBD, along with the dosing ranges at which it would be effective.

[306] As of 2002, the POSITA would have known that there was "much enthusiasm behind the development of further strategies aimed at blocking TNFα with new and innovative drugs" directed toward chronic inflammatory diseases: Lorenz, Hanns M, "Technology evaluation: adalimumab, Abbott laboratories" (2002) 4:2 Curr Opin Mol Ther 185–190 at 185 [Lorenz 2002].

[307] As of 2002, it was publicly known that Abbott was pursuing Phase II studies for Crohn's disease and Phase III for RA: Lorenz 2002.

[308] Significantly, Canadian Patent No. 2,243,459 (the "459 Patent") also describes recombinant antibodies that bind to TNFα. The patent specifies that the "most preferred recombinant antibody of the invention" is D2E7 (adalimumab) (459 Patent at 000246). The description sets the uses of the antibodies of the invention and states that "[t]umor necrosis factor has been implicated in the pathophysiology of inflammatory bowel disorders" (459 Patent at 000282).

[309] The 459 Patent description further explains that "the human antibodies, and antibody portions of the invention, can be used to treat intestinal disorders, such as idiopathic inflammatory bowel disease, which includes two syndromes. Crohn's disease and ulcerative colitis" (459 Patent at 000282). Claim 71 states "the use of claim 61, wherein the disorder is an

intestinal disorder" (459 Patent at 000328). Claim 61 consists of "the use of the antibody, or antigen-binding portion thereof, of any claims of 1-24 in the manufacture of a medicament for the treatment of a disorder in which TNFα activity is detrimental" (459 Patent at 000327).

[310] AbbVie argued that gastroenterologists do not consult patents to determine the efficacy so this would not be something a POSITA would know.

[311] When the prior art is considered in its entirety, AbbVie's position is incorrect. The prior art points the POSITA in the direction of using adalimumab for IBD. Despite the failure of CDP571, there was much optimism in the field about using adalimumab for treatment. Many articles involving clinical studies indicated that adalimumab was safe. Dr. Marshall's evidence was that by April 9, 2004, a POSITA would have known that TNFa inhibitors were well tolerated in IBD patients. In particular, Phase III trials using adalimumab for Crohn's disease patients proceeded without Phase II given the safety information garnished from the RA studies, which would have been transferable to subjects with Crohn's disease.

[312] Although Dr. Hoffman's report stated [redacted]

[redacted] I find there is evidence to support that the POSITA would not have been concerned about safety.

(b) *Self-Evident that Loading then Maintenance Doses Were Required*

[313] As of 2001, loading doses that used twice the treatment dose were in existence and being used in Crohn's disease dose finding trials.

[314] In light of the availability of 40 mg pre-filled syringes, the approximately 2-week half-life, and the 40 mg every other week and weekly dosing for RA, Dr. Baughman explained that the ordinary skilled pharmacologist would envision loading doses of both 80 mg and 160 mg.

[315] Dr. Baughman also explained that serum drug concentrations are affected by the drug's absorption rate, the volume in which it distributes, and its clearance. Therefore, as of April 9, 2004, Dr. Baughman noted that a drug serum's concentration can be routinely simulated with knowledge of the drug's absorption rate, bioavailability, volume of distribution, and clearance (Baughman Invalidity Report at para 269).

[316] Using this information, Dr. Baughman simulated the pharmacokinetic profile of adalimumab over time, as a function of dosing regimen. For the parameters used in the model, see Appendix C. Dr. Baughman used a software titled Phoenix WinNonLin, which would have been available as of 2004 with the same functionality (Dr. Baughman Validity Report at para 273).

[317] Dr. Baughman modelled the following regimens based on the 2003 HUMIRA package insert:

	Week 0	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Regimen A	80		40		40		40
Regimen B	160		80		80		80
Regimen C	160		80		40		40
Regimen D	80	40		40		40	
Regimen E	120		40		40		40
Regimen F	160		40		40		40
Regimen G	80	80	40		40		40
Regimen H	80	80		40		40	
Regimen I	120		80		40		40
Regimen J	40	40	40		40		40
Regimen K	40	40		40		40	

[318] I accept Dr. Baughman's evidence that the ordinary skilled pharmacologist would have been motivated to select dosing regimens with every other week dosing, as less frequent injections promoted patient adherence to treatment.

[319] Accordingly, Dr. Baughman indicated that the ordinary skilled pharmacologist most likely would have conducted a dose ranging trial using Regimens A, B, and C [Appendix D].

[320] On cross-examination, AbbVie raised the point that Regimen C gives a patient a total amount of 320 mg, compared to Regimen A, which administers 200 mg in total (November 29 Trial Transcript at 1795). AbbVie indicated that Dr. Baughman's Regimen C selection is counterintuitive to the "central principle" of drug development – which is to administer the lowest effect drug dose possible. However, Dr. Baughman explained, and I accept, that when inducing remission (i.e. using an induction dose), this central principle does not apply.

[321] In his 2001 paper, Dr. Sandborn described a previous placebo-controlled dose finding trial of subcutaneous etanercept in 49 patients with active Crohn's disease. In that study, six patients received the highest dose, which consisted of a 32 mg/m^2 intravenous load, followed by 16 mg/m^2 subcutaneous injections twice weekly. On cross-examination, Dr. Mould acknowledged that this study described by Dr. Sandborn consisted of a loading dose that was twice the treatment dose of etanercept.

[322] This same logic can be applied to the ARMADA Phase II dose-ranging trial for adalimumab in RA. The treatment arms in DE009 were 80 mg administered subcutaneously every other week, 40 mg subcutaneously every other week, and 20 mg subcutaneously every other week. Using the same methods as above, whereby the experimenter doubles the loading dose, the ARMADA trial would lead to a dose-ranging clinical trial of 160 mg at week 0, 80 mg at week 2, 40 mg at week 0, and 20 mg at week 2.

[323] Based on the prior art, I accept that a loading dose then maintenance dose was self-evident for the treatment of IBD. Further, as explained by Dr. Baughman, given the regimens for

RA, an ordinary skilled pharmacologist would envision loading doses of both 80 mg and 160 mg. I have accepted Dr. Baughman's evidence on the simulation of the pharmacokinetic profile of adalimumab over time, as a function of dosing regimen.

(c) *Self-Evident What Would be a Safe and Effective Dosing Regimen*

[324] The prior art is clear that high doses of adalimumab were well-tolerated, even for multiple doses. For example, den Broeder 2002 demonstrated that a Cmax value for a 10 mg/kg IV dose would be 294 µg/mL, which is higher than the above dosing regimens modelled by Dr. Baughman. (Cmax: the numerical value that describes the maximum concentration of the drug in the body)

[325] As of 2004, many papers had reported that adalimumab was safe and efficacious. This proposition was also supported by the HUMIRA package insert, as it showed that multiple doses of up to 10 mg/kg had been administered to patients without dose-limiting toxicities. It also revealed that the maximum tolerated dose of HUMIRA had not yet been established in humans.

[326] In their closing submissions, JAMP argued that Abbott [redacted] Further, JAMP highlighted the fact that [redacted]

[327] Based on the above, I agree that a safe and effective dosing regimen was self-evident. As of April 9, 2004, a skilled person would have known that TNFα inhibitors were well-tolerated. Further, the HUMIRA package insert at the time demonstrated that adalimumab was safe. I accept that Abbott [redacted]

(d) *Commercial Success and Motivation to Try*

[328] AbbVie argued that there was no motivation to try, given the failures of the other two TNFα inhibitors, and despite the success of infliximab. AbbVie highlighted the numerous accolades that AbbVie's scientists and researchers had won over the years. For example, in 2007 Abbott received the Prix Galien award in relation to its work for HUMIRA, which AbbVie says is the pharmaceutical industry's equivalent to the Nobel Peace Prize.

[329] As JAMP rightly points out, "[a] patent, as has been said many times, is not intended as an accolade or civic award for ingenuity" (*Apotex Inc v Wellcome Foundation Ltd*, 2002 SCC 77 at para 37). Although commercial success and meritorious awards may be secondary factors that the Court can consider as relevant to the obviousness analysis, commercial success cannot save an invention that is obvious: *Teva Canada Limited v Janssen Inc*, 2018 FC 754 at para 91 [*Velcade*].

[330] As Justice Locke explained in *Velcade*, there must be a causal relationship between the alleged invention and any commercial success: DH MacOdrum, *Fox on the Canadian Law of Patents*, 5th ed (Toronto, Ont: Thomson Reuters Canada, 2013), ch 4:18 at 4-158.1; *Corning*

Glass Works v Canada Wire & Cable Ltd (1984), 81 CPR (2d) 39, [1984] FCJ No 353 (QL) (FCA); *Pollard Banknote Limited v BABN Technologies Corp*, 2016 FC 883 at para 224.

[331] There was little evidence presented of these awards. While I accept that AbbVie and its researchers have won numerous awards, beyond this, I am unable to assess the causal relationship between HUMIRA and its commercial success.

(2) Patentable Subject Matter

[332] JAMP alleges that several of the patent claims at issue in this matter involve un-patentable subject matter. Specifically, JAMP contends that each of the claims of the 868 Patent and the 917 Patent are directed to a method of medical treatment that requires the exercise of professional skill or judgment.

[333] JAMP asserts that where there is evidence that the dose would be changed over time in response to a patient's needs, then that regimen is vulnerable to an attack on the basis that is an unpatentable method of medical treatment. In JAMP's view, the dosing regimen must be appropriate for all.

[334] JAMP relies on the statements from Dr. Howden and Dr. Marshall that the 868 Patent's dosing regimen is adjusted over time in some patients using their skill and judgement.

[335] In support of this proposition, JAMP cites *AbbVie* 2014. There, Justice Kane held that, simply because claims involve a fixed dosage and schedule, this does not mean they are

"automatically patentable" (*AbbVie* 2014 at para 113). Justice Kane further held that where the evidence indicates that the claimed dosage and schedule "is not exactly as it is claimed" then it enters the domain of skill and judgment (*AbbVie* 2014 at para 113).

[336] In *Hoffman-La Roche Limited v Sandoz Canada Inc*, 2021 FC 384, Justice Manson relied on *AbbVie* 2014 to similarly conclude that fixed dosage regimens do not interfere with or engage professional skill and judgment, unless there is evidence to contradict the claimed dosage (at para 197).

[337] AbbVie rejects the notion that the 868 Patent is a method of medical treatment. AbbVie explains that the relevant question is whether the "invention as claimed" requires professional skill and judgment to practice: *Janssen* 2022 at para 164.

[338] I agree with AbbVie that Justice Manson's comments in *Janssen* 2022 are directly on point:

> [171] The claims are a guide for the treatment of schizophrenia, providing specific dosing regimens expected to produce a plasma concentration of paliperidone within the therapeutic range necessary for safe and effective treatment of patients. A physician can choose to implement a claimed specific dosing regimen or not; however, skill and judgment are not required to implement the claimed dosing regimens. To the extent a physician chooses a maintenance dose other than 75 mg-eq. (as is contained in the product monograph and which much cross-examination and testimony were focused), or decides to stop treatment with paliperidone palmitate and switch therapies, <u>they would no longer be practicing the claimed invention.</u> Thus, the claimed subject matter does not require the exercise of skill and judgment and is not a method of medical treatment.
>
> [Emphasis added.]

[339] The experts in this matter indicated that patients commence treatment within the scope of the claimed regimen. The dosing regimen is the only option available to physicians implementing adalimumab under the 868 Patent. I agree with AbbVie that, to the extent a minority of physicians wish to deviate from the claimed regimens at some point, this does not render the claims unpatentable; rather, it takes their conduct outside the scope of the patents like in *Janssen* 2022.

VI. The 917 Patent

A. *The Invention Story*

[340] Dr. Okun spoke to the 917 Patent invention and is a named inventor of the patent. He came across as a sincere individual who was honest and genuine in his responses. Dr. Okun was visibly moved by how this treatment had changed some HS patients' lives.

[341] He explained that when he joined Abbott he was an Associate Medical Director in Medical Affairs. Dr. Okun clarified that [redacted]

[342] Dr. Okun assisted the team at Abbott in conducting the first ever clinical study to assess the safety and effectiveness of adalimumab for treating HS. [redacted]

[343] [redacted]

[344] [redacted]

[345] [redacted]

[346] Upon close inspection, elements of the invention story have some flaws.

[347] Nonetheless, the record suggests that the 917 Patent dosing regimen was relatively straightforward to arrive at. Emails between Dr. Okun and Dr. Susan Paulson, the Director of Clinical Pharmacology & Pharmacometrics at Abbott, show that [redacted]

[348] [redacted]

1. [redacted]
2. [redacted]
3. [redacted]

[349] [redacted]

[350] M10-467 is the Phase 2 clinical study that Abbott conducted to determine the clinical efficacy and safety of adalimumab in subjects with moderate to severe HS after 16 weeks of treatment. The following arms were tested:

- Arm A: 160 mg at week 0, 80 mg at week 2, 40 mg weekly starting at week 4 through week 15
- Arm B: 80 mg at week 0, 40 mg every other week at week 1 through week 15
- Arm C: Placebo, administered weekly, weeks 0 through 15

[351] [redacted]

[352] Therefore, it appears there was no complex invention required Dr. Okun acknowledged that he was aware of the dosing schedule for Crohn's disease, as well as case reports that described the use of adalimumab for the treatment of patients who had unlabeled diseases (who also had HS).

[353]

[354]

[355] [redacted]

[356] [redacted]

[357] To be clear, this is not to say I, in any way, distrust Dr. Okun's evidence; rather, I believe his evidence has been subject to the frailties of time and distance from these events. He has made significant contributions to his field and to the understanding of HS. My findings here do not mean to detract from his work or imply any misgivings about his testimony.

B. *Claims Construction*

(1) The POSITA for the 917 Patent

[358] The experts partially disagreed on the POSITA for the 917 Patent.

[359] Dr. Solomon stated the POSITA is a team comprised of a physician (i.e. a rheumatologist or dermatologist) with experience treating complex inflammatory skin diseases, and a pharmacologist with experience working in the PK/PD of biologic drugs. He opined that a

pharmacologist's expertise was necessary because the 917 Patent relates to a specific dosing regimen. Dr. Mould substantially agreed with Dr. Solomon's definition of the POSITA, adding that a pharmacologist would have at least a graduate degree in pharmacology.

[360] Dr. Sauder opined that the POSITA is a physician (most likely a dermatologist), who is experienced with treatments for HS patients, including the prescription of TNFα inhibitors. According to him, the POSITA does not include a pharmacologist.

[361] The critical difference between the parties' positions is whether the POSITA includes a pharmacologist. In my view, the POSITA does not include a pharmacologist. The 917 Patent relates to the use of adalimumab, a TNFα inhibitor, to treat HS. While pharmacologists may assist in the design of clinical trials, physicians do not generally consult with pharmacologists when making treatment decisions for patients with HS. Even Dr. Solomon admitted during his examination that, "The team might also include a pharmacologist to assist with dosing logistics but, in general, I think the main target of the patent is physicians who regularly see and treat complex inflammatory skin conditions." (November 18 Trial Transcript at 769, ln 17-25)

[362] The team might include a pharmacologist to assist with dosing logistics, but, in general, I think the main target of the patent is a physician who regularly sees and treats complex inflammatory skin conditions.

[363] Further, neither of the two named inventors of the 917 Patent appear to be pharmacologists: Dr. Okun is a dermatologist and Mr. Harris is a project director. Since Dr.

Okun spearheaded the clinical study investigating the use of adalimumab to treat HS, I accept that a physician experienced in the treatment of HS would have sufficient expertise to understand a clinical trial involving a specific dosing regimen for HS. I do not think it is necessary to limit the skilled physician to dermatologists, they can also be a rheumatologist (like Dr. Solomon), as long as they have experience treating HS.

[364] Based on the evidence and submissions of the parties, I would define the POSITA of the 917 Patent as a physician experienced in the treatment of HS. The physician would be familiar with drugs and therapies available to treat HS, including TNFα inhibitors, and would keep up to date with research conducted in the field. The physician would also have at least a working knowledge of the design and conduct of clinical trials for the treatment of inflammatory skin diseases.

(2) The Common General Knowledge

[365] Given I have found the POSITA for the 917 Patent does not include a skilled pharmacologist, I afford less weight to Dr. Mould's evidence in relation to the 917 Patent.

(a) *The Relevant Date*

[366] The relevant date for construing the claims is December 8, 2011. This is the publication date of the 917 Patent. However, the experts opined on the POSITA's common general knowledge as of June 3, 2010, the relevant date for assessing validity. There were no changes to the POSITA's common general knowledge between June 3, 2010 and December 8, 2011, so for

the purposes of claim construction, the common general knowledge will be taken to be the same as of both of these dates.

(b) *HS*

[367] Dr. Solomon and Dr. Sauder agreed that, as of June 3, 2010, the POSITA would have known the following about HS:

- HS is a chronic inflammatory skin disease involving the hair follicles and sweat glands;
- Symptoms vary from patient to patient. The disease and its symptoms can be mild, moderate, or severe;
- Symptoms will appear and disappear over time;
- HS often occurs in patients who also have other medical conditions, such as acne, diabetes, IBD, or being overweight;
- The cause of HS is unknown and there is no known cure for the disease;
- Many treatments are available and a combinations of treatments are frequently tried;
- Mild forms of HS may be treated with warm compresses, topical antibacterial agents or washes, oral antibiotics, and/or anti-inflammatory agents;
- Moderate forms of HS may be treated with topical anti-bacterial agents or washes, oral antibiotics, corticosteroids to reduce swelling, anti-inflammatory agents, and retinoids;
- Severe forms of HS may be treated with the same agents as moderate HS but could also include surgical intervention; and
- An HS's patient's response to therapeutic treatment is characterized by a decrease in the number of inflammatory lesions, prevention of worsening of abscesses, and/or prevention of worsening of draining fistulas.

(c) *TNFα inhibitors*

[368] On both sides, the experts agree that the POSITA would have generally been aware that TNFα inhibitors are immunosuppressants, meaning they suppress the immune system by binding and inhibiting TNFα at the site of inflammation. By June 2010, Health Canada had approved three TNFα inhibitors – HUMIRA® (adalimumab), REMICADE® (infliximab), and ENBREL® (etanercept) – for treating the following disorders:

HUMIRA® (adalimumab)	REMICADE® (infliximab)	ENBREL® (etanercept)
• Rheumatoid Arthritis • Juvenile Idiopathic Arthritis • Psoriatic Arthritis • Ankylosing Spondylitis • Crohn's Disease • Plaque Psoriasis	• Rheumatoid Arthritis • Crohn's Disease • Ulcerative Colitis • Ankylosing Spondylitis • Psoriatic Arthritis • Plaque Psoriasis	• Rheumatoid Arthritis • Juvenile Idiopathic Arthritis • Psoriatic Arthritis • Ankylosing Spondylitis • Plaque Psoriasis

[369] Since TNFα inhibitors were approved for the treatment of other disorders, but not HS, prescribing them to treat HS was considered "off-label". The term off-label refers to the use of an approved drug outside of its authorized use. For instance, to treat a disorder for which the drug has not been approved.

[370] The principal area of dispute is whether the POSITA's common general knowledge included the use of TNFα inhibitors as an off-label treatment for HS.

[371] Dr. Sauder submits that, by June 2010, physicians were prescribing TNFα inhibitors for off-label treatment of skin disorders, such as HS. He claims physicians would have been aware of evidence in the literature suggesting that TNFα inhibitors like adalimumab, infliximab, and etanercept were effective for the treatment of HS.

[372] Dr. Solomon disagreed with Dr. Sauder, claiming TNFα inhibitors were not a part of the standard of care for HS and were not being prescribed as an off-label treatment. In June 2010, TNFα inhibitors were merely viewed as a possible new approach for treating HS. While there were some encouraging reports of off-label use of TNFα inhibitors for HS, they were anecdotal and of limited value.

[373] The POSITA would have understood that more data and randomized clinical trials were needed to investigate TNFα inhibitors, especially since they presented an increased risk of serious infections and tuberculosis to patients. In fact, the product labels for HUMIRA®, REMICADE®, and ENBREL® each contained a "black box" warning against their risk of serious infection. Dr. Solomon used US labels, but the analysis is the same for the Canadian labels. To illustrate, the "black box" warning for HUMIRA® US label (June 2008) stated:

> WARNING: RISK OF SERIOUS INFECTIONS
>
> Tuberculosis (frequently disseminated or extrapulmonary at clinical presentation), invasive fungal infections, and other opportunistic infections, have been observed in patients receiving HUMIRA. Some of these infections have been fatal. Anti-tuberculosis treatment of patients with latent tuberculosis infection reduces the risk of reactivation in patients receiving treatment with HUMIRA. However, active tuberculosis has developed in patients receiving HUMIRA whose screening for latent tuberculosis infection was negative.
>
> Patients should be evaluated for tuberculosis risk factors and be tested for latent tuberculosis infection prior to initiating HUMIRA and during therapy. Treatment of latent tuberculosis infection should be initiated prior to therapy with HUMIRA. Physicians should monitor

> patients receiving HUMIRA for signs and symptoms of active tuberculosis, including patients who tested negative for latent tuberculosis infection. [*See Warnings and Precautions (5.1) and Adverse Reactions (6.1)*]

[374] In light of the "black box" warnings, Dr. Solomon stated physicians were only prescribing TNFα inhibitors on-label for approved disorders – whose benefits (i.e. effectiveness) and risks (i.e. safety) had already been assessed and balanced. Conversely, the balance of benefits and risks of TNFα inhibitors had not been evaluated for off-label disorders. Additionally, Dr. Solomon explained that the POSITA would have been particularly averse to the risk of prescribing TNFα inhibitors to HS patients, as they suffer from open lesions that make them more susceptible to infection. Therefore, he submits it would not have been common practice for the POSITA to prescribe TNFα inhibitors off-label to HS patients.

[375] I prefer Dr. Sauder's articulation of the common general knowledge regarding TNFα inhibitors, as, in my view, it is better supported by the literature. When there is no well-established therapy or clinical trial for a particular condition, physicians must make treatment decisions using any available data from sources, such as case reports, and their own clinical experience. In June 2010, there were no Health Canada approved systemic therapies for HS, but there were a number of promising reports on the use of TNFα inhibitors. Accordingly, these reports demonstrated that physicians were aware of the potential infection risks posed by TNFα inhibitors; therefore, they simply screened (eg: tested for TB) HS patients to mitigate these risks before prescribing TNFα inhibitors. I conclude that the POSITA would have typically had some experience and knowledge of treating HS off-label with TNFα inhibitors.

(3) Claim Construction

[376] The 917 Patent has 7 claims. AbbVie asserts infringement of claims 1 and 3-5.

[377] Similar to the 868 Patent, the 917 Patent claims can generally be construed by their plain and ordinary meaning. Each of the claim terms of the 917 Patent constitute an essential element of their respective numbered claims. The only dispute between the parties pertains to the interpretation of certain terms in the claims, rather than essentiality. Although I note Dr. Solomon does not appear to reference essential elements, there is no doubt that the claim terms are essential.

[378] Claim 1 is the only independent claim alleged to be infringed. It provides the following:

> 1. Use of adalimumab, in multiple doses for treating moderate to severe hidradenitis suppurativa (HS) in an adult, wherein the multiple doses comprise:
>
> a first loading dose of 160 mg of adalimumab for subcutaneous administration to the subject at week 0;
>
> a second loading dose of 80 mg of adalimumab for subcutaneous administration to the subject at week 2; and
>
> a weekly maintenance dose of 40 mg of adalimumab for subcutaneous administration to the adult starting at week 4, wherein said multiple doses are not subject to any discretionary adjustment by a physician or medical practitioner.

[379] Again, the parties disagree on the meaning of the term “treating”. Dr. Solomon argues that treating “means to decrease or prevent the worsening of the symptoms of HS in an adult”. Dr. Sauder defines treating as encompassing both therapeutic and prophylactic (or suppressive) types of treatment. I prefer Dr. Sauder’s construction, as Dr. Solomon’s construction imputes more than the plain and ordinary definition of “treating”. Therefore, “treating” encompasses the

administration of adalimumab following the onset of the signs and symptoms of moderate to severe HS.

[380] AbbVie and JAMP also disagree on the following term: “wherein said multiple doses are not subject to any discretionary adjustment by a physician or medical practitioner”. Dr. Solomon says that this term simply confirms the fixed nature of the claimed dosing regimen. Dr. Sauder takes a narrower approach, suggesting that it means a physician would not have a choice to adjust the dosing regimen. Dr. Sauder states it does not allow any flexibility – such as administering the first 160 mg loading dose over two days instead of one.

[381] A plain and ordinary meaning of the “wherein” term confirms that the dosing regimen is fixed. I do not accept Dr. Sauder’s narrower approach; claim 1 allows for some flexibility in the administration of the fixed doses. For example, the POSITA would appreciate the pragmatic benefit that the first loading dose (of 160 mg) could be administered as a single dose of 160 mg, two doses of 80 mg, or four doses of 40 mg each. I accept Dr. Solomon’s construction.

[382] Claims 3 to 5 specify the treatment outcomes of decreasing the number of inflammatory lesions, preventing the worsening of abscesses, or preventing the worsening of draining fistulas, respectively. They raise no contentious issues of construction that are relevant to the parties’ arguments on infringement or validity.

C. *Invalidity*

(1) Anticipation

[383] JAMP claims that the asserted claims of the 917 Patent are anticipated by the 868 Application.

[384] Anticipation is a difficult test to meet. While an anticipatory reference need not be an "exact" description, the disclosure must be sufficient such that a skilled person willing to understand it can do so without trial and error: *Abbott Laboratories v Canada (Minister of Health)*, 2008 FC 1359 at para 75.

[385] To anticipate the 917 Patent, the 868 Application must provide the skilled person who follows the disclosure with a clear direction that leads them to necessarily infringe. It does not do so. As discussed above, a narrow range may anticipate a point. However, based on the facts in this instance, I find the range is sufficiently broad, such that it cannot be said the flag has been "planted" with sufficient specificity.

[386] The 868 Application does disclose the use of TNFα inhibitors as a means of treating 16 broad categories of disorders where TNFα may be implicated, preferably administered subcutaneously. HS is listed among the numerous disorders contemplated in the 868 Application, however no clinical data is provided for HS. The 868 Application also identifies adalimumab as a member of the class of TNFα inhibitors that could be used for the listed disorders.

[387] The 868 Application also presents a large class of dosing elements with numerous choices for the:

- TNFα inhibitor used (e.g., infliximab, etanercept, or adalimumab);

- number of loading doses (a single dose or a set of doses);
- amount for each loading dose (between 20-200 mg, but preferably between 80-160 mg);
- interval between loading doses, if more than one (one hour, one day, one week, two weeks);
- interval between loading and maintenance dose (one hour, one day, one week, two weeks); and
- amount of maintenance dose (between 20-120 mg, but preferably between 40-80 mg).

[388] Therefore, a skilled person reading the 868 Application would have a range of dose amounts, dosing intervals, and durations of treatment to choose from when creating a multiple variable dosing regimen to treat an inflammatory-related disorder.

[389] The 917 Patent claims a dosing regime consisting of: a first loading dose of 160 mg at week 0, a second loading dose of 80 mg at week 2, and a weekly maintenance dose of 40 mg starting at week 4. The 868 Application does not disclose the individual components of this dosing regime. Further, no teaching is provided which would direct the POSITA to arrive at this specific regimen.

[390] Given the number of dosing elements disclosed in the 868 Application, it is not clear that a POSITA would know to select adalimumab and to administer it using the specific dosing regimen claimed in the 917 Patent. If the POSITA reading the prior art reference must adopt a

specific way forward in order to infringe, yet there are numerous other ways to perform the prior art without necessarily infringing, then there is no disclosure: *Shire* at para 50.

[391] This gap is not supplemented by the common general knowledge. Therefore, in my view, the POSITA would not understand the dosing regimen that underlies all asserted claims of the 917 Patent when reading the 868 Application.

[392] On the facts before me, JAMP has not established prior disclosure of the subject matter of the 917 Patent. Given this finding, I do not need to consider enablement.

(2) Obviousness

[393] AbbVie asserts the claims of the 917 Patent are not obvious, as there was a significant gap between the state of the art and the inventive concept. AbbVie claims it was not obvious to try, raising several safety issues. JAMP contends there is no difference between the state of the art and the inventive concept, alleging each of etanercept, infliximab and adalimumab were reported to effectively (and safely) treat HS.

[394] I find that, on a balance of probabilities, the 917 Patent dosing regimen would have been obvious to try in the circumstances.

(a) *The POSITA and Common General Knowledge*

[395] The POSITA and common general knowledge are discussed under the heading *Claim Construction*, above.

(b) *Inventive Concept*

[396] The parties agree that the inventive concept of the asserted claims of the 917 Patent is the use of adalimumab in a multiple dose regimen comprising a first loading dose of 160 mg at week 0, followed by a second loading dose of 80 mg at week 2, and a weekly maintenance dose of 40 mg starting at week 4 to treat HS.

(c) *Differences between the State of the Art and the Invention*

[397] AbbVie argues that there was a significant gap between the state of the art and the inventive concept as of June 3, 2010:

- There were no clinically proven systemic therapies for treating HS—in fact, no approved therapies of any kind – and available options were largely ineffective;
- TNFα inhibitors were known to carry increased infection risk, and were not a part of the standard of care for HS;
- The state of the art did not include the use of adalimumab in the claimed dosing regimen;
- Although HUMIRA was approved for several other indications, none had the novel claimed dosing regimen;
- No literature or prior art taught that the claimed dosing regimen was effective;
- The prior art case reports did not demonstrate safety and efficacy for HS;

- There was no placebo-controlled study showing effectiveness of any TNFα inhibitor to treat HS; and
- No PK data was available on adalimumab in HS.

[398] JAMP asserts there is no gap between the state of the art and the inventive concept due to the 868 Application, either alone or when combined with the additional prior art.

[399] I find that AbbVie overstates the inventive gap that exists between the 917 Patent's claims and the state of the art. By June 2010, adalimumab was regarded as a relatively safe drug. The skilled person would not have any material concerns about its safety profile when used to treat HS in comparison to its use to treat other disorders.

[400] The skilled person would have understood that case reports disclosed that Crohn's disease patients, also suffering from HS, were experiencing treatment benefits for both disorders with biologics, such as infliximab and adalimumab. Thus, the adalimumab dosing regimen (160 mg, 80 mg, and 40 mg thereafter biweekly) used to treat Crohn's disease was known to treat HS. That dosing regimen is also very similar to the dosing regimens encompassed by claim 1 of the 917 Patent, the only difference being that the third maintenance dose of 40 mg is weekly instead of biweekly.

[401] In my view, the inventive gap was putting together the already tested dosing regimens and using PK modelling to select the most effective dosing regimens for HS. The inventive gap is, essentially, the creation of the dosing regimen claimed in the 917 Patent.

(d) *Whether the Differences Were Obvious or Required Invention*

[402] Based on the evidence, I conclude the differences between the state of the art and the invention would have been obvious to the POSITA.

[403] It was known adalimumab could treat HS. During the trial, Dr. Okun acknowledged [redacted] Further, at this point, dermatologists had been using adalimumab off-label to treat HS.

[404] Additionally, before beginning the HS clinical study, Dr. Okun was aware HS could coexist with Crohn's disease. In determining the dosing regimen, Dr. Okun knew about the loading regimen for Crohn's disease, which, as discussed above, was known to be safe and effective. Based on the case reports, Dr. Okun was also aware that HS likely required a higher dose of TNFα inhibitors than psoriasis. [redacted]

[405] Therefore, I find that in determining the dosing regimen, it would have been obvious to the POSITA that, given the known safety and effectiveness of the loading regimen for Crohn's disease, which was also known to treat HS, a clinical trial for HS should include a 160 mg, 80 mg and 40 mg regimen.

(e) *Whether the Invention was Obvious to Try*

(i) Self-Evident Adalimumab Was Safe and Effective for HS

[406] AbbVie argues that, at the time, there was no effective treatment for HS. Further, AbbVie states there were no TNFα inhibitors approved for HS, and the standard of care for HS did not include the off-label use of TNFα inhibitors. While there were case reports with TNFα inhibitors, AbbVie asserts that the POSITA would have viewed them skeptically.

[407] Although I accept that the case reports and unrolled studies would have been approached with some caution by the skilled person, the prior art is clear that there was interest and success in using adalimumab to treat HS. Additionally, I note Dr. Solomon acknowledged that he had "identified these reports as being important, a stimulating thought providing the intellectual basis for a controlled study."

(ii) Safety Would Not Have Pointed Away From 160/80/40ew

[408] AbbVie asserts that TNFα inhibitors, like adalimumab, had "black box" warnings. As such, the POSITA would not have used a high loading dose of 160/80 with a frequent maintenance dose of 40 mg weekly for HS patients susceptible to infection. AbbVie argues the POSITA would have been cautious, especially given HS patients are prone to infection, and would not have given an adalimumab dose higher and more frequent than any other doses used. AbbVie also notes that the HUMIRA label explicitly warned against use in patients with infections.

[409] In contrast, JAMP argues AbbVie's position on safety is implausible in light of the fact that the loading and maintenance regimens received regulatory approval. JAMP also asserts the Classic I/II studies tested a 160/80/40 weekly regimen in Crohn's disease patients that was very similar to that claimed in the 917 Patent, and it was reported to be effective and safe.

[410] Based on the evidence, I agree that safety did not point away from the 160/80/40 dosing regimen. It was shown that this regimen was safe and effective for Crohn's disease patients. As raised by JAMP, this dosing also received regulatory approval. Further, this dosing regimen was already known to assist in the treatment of HS. Accordingly, AbbVie's submissions that safety would have pointed away from a 160/80/40 regimen for HS are not founded.

(iii) Self-Evident What Would Be a Safe and Effective Dose

[411] AbbVie argues that the state of the art did not set out safety, efficacy, PK or PD of adalimumab in HS. Since there was no PK information, AbbVie states a skilled pharmacologist would have had no basis to predict a safe and effective regimen for the treatment of HS.

[412] I do not agree. I also do not accept Dr. Solomon's position that there was no justification to start with the HUMIRA dosing regimen for Crohn's disease. The prior art demonstrates that HS and IBD may occur together: see e.g.Maria Roussomoustakaki et al., "Hidradenitis suppurativa associated with Crohn's disease and spondyloarthropathy: response to anti-TNF therapy". J Gastroenterol (2003); 38(10):1000-4.

(3) Patentable Subject Matter

[413] JAMP makes similar arguments regarding the 917 Patent and the methods of medical treatment, as in the case of the 868 Patent.

[414] JAMP says that, where there is evidence that the dosing regimen is not appropriate for all those to whom it is administered, then the claims are unpatentable methods of medical treatment.

[415] As discussed above, to the extent a minority of physicians wish to deviate from the claimed regimens at some point that does not render the claims unpatentable; rather, it takes their conduct outside the scope of the patents like in *Janssen* 2022.

(4) Claim Term Not Described

[416] JAMP alleges that the 917 Patent asserted claim terms include an unsupported claim term and, as such, the 917 Patent fails to comply with subsection 38.2(2) of the *Patent Act* and is necessarily invalid.

[417] AbbVie argues that "claim term not described" is not a proper basis of invalidity. AbbVie explains that subsection 38.2(2) of the *Patent Act* is a procedural requirement for applications, and it has no bearing upon the demarcation point of patent issuance. AbbVie also points out that the Court has never recognized subsection 38.2(2) of the *Patent Act* as a ground of invalidity.

[418] Given my findings on anticipation and obviousness, this analysis is made in the alternative and is not determinative in this matter.

(a) *The Current Law on Subsection 38.2(2) of the Patent Act*

[419] Subsection 38.2(2) of the *Patent Act* [Appendix A] was introduced by the *Patent Act Amendment Act*, 1992 (Bill C-91) (34th Parl, 3rd Sess). The parties did not provide any relevant Hansard nor any detailed analysis of subsection 38.2(2). I note that there was a Legislative Committee on Bill C-91, however, there does not appear to be any in depth discussion of the creation of subsection 38.2(2).

[420] As outlined above, the only case that has dealt with subsection 38.2(2) in detail is *Western Oilfield*. However, the Federal Court of Appeal did not need to determine whether a violation of subsection 38.2(2) of the *Patent Act* rendered the patent invalid.

[421] Justice Locke raised three reasons why Canadian courts should be wary of following the stricter UK approach. First, the approach advocated for in *Western Oilfield* presumes that the matter has been improperly added and places the burden on the respondent to establish otherwise (*Western Oilfield* at para 141). Second, the UK provision does not mention the concept of reasonable inferability (*Western Oilfield* at para 142). Third, the UK provision explicitly provides for patent revocation, unlike subsection 38.2(2) (*Western Oilfield* at para 143).

[422] Pursuant to *Western Oilfield* this court cannot adopt the UK approach.

[423] However, the UK's approach sheds light on *why* it may be appropriate to allow subsection 38.2(2) to act as a ground of invalidity, despite the *Patent Act* not containing

independent statutory ground of revocation. I therefore review the applicable legislation and the context of the UK decision to provide further understanding of Justice Locke's comments in *Western Oilfield*.

[424] Subsection 76(3) of the UK's *Patents Act 1977* (UK), 1977, c 37 provides:

> No amendment of an application for a patent shall be allowed under, 18(3) or 19(1) if it results in the application disclosing matter extending beyond that disclosed in the application as filed.

[425] In *Vector Corporation v Glatt Air Techniques Inc*, [2007] EWCA Civ 805, Lord Justice Jacob explained the underlying rational for subsection 76(3) as follows:

> Section 76 must be given a purposive construction. Its purpose is to stop patentees inserting information after filing which enables them to support their claims. The addition of information irrelevant to claims as sought to be amended is a mere explanation which harms no one and assists the public. There is apparently no direct authority in the United Kingdom relating to amendments of a patent specification by way of an additional acknowledgement of prior art.
>
> [Emphasis added.]

[426] In my view, subsection 38.2(2) operates similarly: it stops patentees from inserting information after filing which enlarges or changes the scope of the claims from when originally filed. Subsection 38.2(2) indicates that specifications and drawings must be objectively assessed for patentability from the file date. Otherwise, it would be unfair to allow applicants to later add subject matter that was not suggested by the specifications.

[427] While the rationale for these prohibitions may be similar, I echo Justice Locke's wariness of adopting the strict UK approach (*Western Oilfield* at para 141).

[428] AbbVie alleges that subsection 38.2(2) is a procedural requirement for applications that has no bearing upon the "demarcation point" of patent issuance. However, this argument overlooks the Federal Court of Appeal's previous approach to other procedural requirements.

[429] This Court and the Federal Court of Appeal have previously relied on procedural requirements in the *Patent Act* and *Patent Rules,* SOR/96-423 [*Patent Rules*] to invalidate patents. In *Dutch Industries Ltd v Canada (Commissioner of Patents),* 2003 FCA 121 [*Dutch*], the Federal Court of Appeal upheld the Federal Court's decision that the Commissioner of Patent is precluded from extending payment deadlines. Under the *Patent Act* and *Patent Rules,* patent applicants and patentees pay prescribed amounts, called "maintenance fees" at specified times to keep an application or patentee in good standing. While the *Patent Rules* are silent on what should happen when a "large entity" pays the "small entity," the Commissioner of Patents allows these errors to be cured by "top-up" payments.

[430] Mr. Barton filed the 904 Application and paid the "small entity" status fee. However, the Federal Court of Appeal held that all 904 application maintenance fees should be paid on the "large entity" scale. As such, the Federal Court of Appeal invalidated the 904 application.

[431] *Dutch* demonstrates that the *Patent Act* procedural requirements can be used as a basis to invalidate a patent.

[432] *Dutch* also emphasizes the importance of the legislative scheme under the *Patent Act* and the *Patent Rules*. As Justice Locke recognized, the *Patent Act* does not provide explicit revocation for patents that are granted in violation of subsection 38.2(2).

[433] Nonetheless, it is fundamentally unfair to allow an applicant to successfully broaden or enlarge the patent through amendments to specifications or drawings. For example, the applicant could be given a broader monopoly than what was originally filed.

[434] Therefore, I agree with JAMP that amended language which is added, that cannot be reasonably inferred from the specification or drawings, is a violation of subsection 38.2(2) of the *Patent Act*, thereby rendering the patent invalid.

[435] Based on the Federal Court of Appeal's rejection of a strict test in *Western Oilfield*, I adopt a broad approach to reasonable inferability.

(b) *Claim Term Analysis*

[436] JAMP alleges that the claim term "wherein said multiple doses are not subject to any discretionary adjustment by a physician or medical practitioner" in claim 1 is inconsistent with the disclosure of the 917 Patent.

[437] Dr. Sauder alleged that the skilled person reading the 917 Patent would not understand that the subject matter is reasonably inferred from the disclosure. Rather, he says that the skilled person reading the 917 Patent would understand that its inventors had stated the patent's dosing

regimens are subject to discretionary adjustments. Dr. Sauder points to the following in the 917 Patent:

> Dosage regimens described herein may be adjusted (e.g., in individual patients) to provide the optimum desired response, e.g., maintaining remission of hidradenitis suppurativa, in consideration of the teachings herein.
>
> It is to be noted that dosage values can vary with the type and severity of hidradenitis suppurativa. It is to be further understood that for any particular subject, specific dosage regimens may be adjusted over time according to the teachings of the specification and the individual need and the professional judgement of the person administering or supervising the administration of the composition, and that dosage amounts and ranges set forth herein are exemplary only and are not intended to limit the scope or practice of the claimed invention.
>
> [Emphasis added.]

[438] JAMP points out that the claim term was added during the patent prosecution process and is inconsistent with the 917 Patent specifications, which is in violation of subsection 38.2(2) of the *Patent Act*. Accordingly, JAMP argues that since the patent fails to comply with the provision, the 917 Patent is necessarily invalid.

[439] AbbVie submits that JAMP's argument is meritless. AbbVie explains that the claim term confirms the fixed nature of the claimed regimen. In addition, AbbVie relies on the fact that the examiner allowed the claims, thereby indicating no concerns under subsection 38.2(2). In AbbVie's view, JAMP's argument rests entirely on Dr. Sauder's "nonsensical construction" of the claim term.

[440] The 917 Patent file history outlines the objection and response in respect of Claim 1.

[441] On June 25, 2015, the Examiner explained that claims 1 and 2 encompassed subject matter that lies outside the definition of invention. The Examiner asserted that claim 1 contained an essential element that is a dosage regimen which limits the professional skill or judgment of a physician, and is therefore a method of medical treatment.

[442] On December 14, 2015, AbbVie responded, arguing that the claims were not a method of medical treatment. AbbVie also explained that "in an effort to expedite allowance, the Applicant has inserted "wherein said multiple doses are not subject to any discretionary adjustment by a physician or medical practitioner"." (917 Patent File History at 006658).

[443] In my view, AbbVie's addition did not change claim 1, nor does it broaden the claim. Claim 1 would have had the same effect, with or without the additional statement.

[444] However, that is not the issue. The issue is whether the added claim term was reasonably inferable from the 917 Patent disclosure. I find that though it does conflict with the disclosure, AbbVie has not gained anything more than it originally had.

VII. The 458 Patent

A. *The Invention Story*

[445] AbbVie alleges it discovered the invention of the 458 Patent largely through a serendipitous occurrence, [redacted]

[446] [redacted]

[447] [redacted]

[448] [redacted]

[449] It is puzzling, however, that at Dr. Fraunhofer's examination for discovery in February 2022, that he did not recall [redacted] There are also some confusing elements to this invention story. For example, [redacted]

[redacted]

[450] I am persuaded by JAMP's criticisms. There are significant flaws in Dr. Fraunhofer's narrative that raise substantial doubts about the truth and accuracy of the claimed invention story. I accept that it is likely that AbbVie was searching for [redacted] I am reticent to accept that this was a serendipitous discovery that resulted from [redacted] The absence of documents to support this request, [redacted] also further supports JAMP's theory.

B. *Claims Construction*

(1) The POSITA for the 458 Patent

[451] Drs. Trout and Falconer largely agree on the qualifications of the POSITA. Where they have expressed some of the qualifications differently, I have chosen a formulation that in my view reconciles both of their opinions.

[452] The POSITA is a team of scientists having knowledge in the pharmaceutical sciences, chemical engineering, chemistry, and other fields in the biological sciences involving knowledge of protein based formulations. The POSITA has education at the PhD level, or MSc or BSc

education with practical work experience filling the gap. The POSITA has roughly two years of experience in protein formulation, preferably of mAbs.

[453] Dr. Trout suggests that the POSITA may include a clinician and/or immunologist because the 458 Patent is directed, in part, toward the therapeutic use of the claimed formulations. Dr. Trout excludes such a person from his definition of the Skilled Formulator. Since he offers his expert opinion from the perspective of the Skilled Formulator, I do not find that the clinician and/or immunologist is an essential member of the POSITA team.

(2) The Common General Knowledge

(a) *The Relevant Date*

[454] Both Drs. Trout and Falconer focussed their exposition of the common general knowledge to before November 30, 2007—the publication date of the 458 patent.

(b) *The Basics*

[455] The experts for both sides agree that the common general knowledge included knowledge of proteins: that they are composed of two or more amino acids; that they have a three-dimensional shape due to the folding, bending, and interacting of their constituent amino acid chains; that they can combine to form large structures; that they are dynamic structures; and that different types of proteins can serve different purposes depending on their amino acid composition and structure.

[456] They agree that the common general knowledge includes knowledge of antibodies. Antibodies are a class of protein used by the body's immune system. They are Y-shaped and are made up of four polypeptide chains. The top portion, the v-shape, of the Y, contains the light chains and the bottom portion, the l-shape, contains the heavy chain. The tops of the v-shaped portion are variable regions. There are five different classes of human antibodies: IgG, IgM, IgA, IgE, and IgD. The most abundant is IgG, which is itself broken up into four sub-categories.

[457] The experts further agree that the common general knowledge includes familiarity with mAbs. A particular type of antibody, mAbs, are typically produced *ex vivo* (i.e., in a lab). Each mAb contains constant and variable regions, and the amino acid sequences in the variable region begin different from one antibody to the next.

[458] Adalimumab is a monoclonal antibody. It was first approved for medical use by the FDA in 2002, and was sold under the brand name HUMIRA as of November 30, 2007. HUMIRA was approved for the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease.

[459] In order to be useful in medical contexts, mAbs must be stable. The two main types of instability are chemical and physical. There are several possible causes of chemical instability. The main concern for physical stability is protein aggregation, which occurs when the protein structure changes, causing proteins to aggregate together.

[460] The experts agree that successful administration of a mAb requires that the proteins be formulated either as stable liquids (aqueous) or as freeze-dried (lyophilized) dosages reconstituted with a diluent prior to injection. The 458 Patent describes an aqueous formulation.

[461] The experts further agree that the common general knowledge outlined several aspects to consider when formulating stable aqueous mAb pharmaceutical formulations. Broadly, these are: the mAb concentration, the pH of the solution, the effects of excipients, the effects of manufacturing processing and equipment, and the route of administration.

[462] An excipient is a compound in a formulation other than the active ingredient. Excipients are added to pharmaceutical formulations and can impact the stability of a formulation, as well as effect administration.

(c) *Protein Concentration*

[463] Drs. Trout and Falconer both agree that high concentration mAb formulations are desirable. Higher concentrations lower the required dose volume, meaning less liquid is injected into the patient. Dr. Trout states that, as of November 2007, very few high concentration liquid mAbs were approved. Dr. Falconer cites two examples: adalimumab at 50 mg/mL and bevacizumab at 25 mg/mL. Higher concentrations were available in lyophilized formulations.

(d) *Solution pH*

[464] The experts agree that the physical and chemical stability of a mAb formulation was known to be pH dependent as of November 30, 2007. Each mAb had an associated pI, a formulation pH at which the mAb had a neutral charge and tended to self-associate, causing aggregation (i.e., physical degradation). It was known that keeping a formulation's pH away from the pI avoided this problem. It was also known that the use of buffers, a kind of excipient, could help a formation maintain the stability of its pH.

(e) *Buffers*

[465] As mentioned above, an important class of excipients known on November 30, 2007, was buffers. Buffers can help maintain the pH stability of a formulation during manufacturing and storage. They do this by resisting changes in pH, and their capacity to do so is referred to as buffer capacity. Different buffers were available in 2007. In fact, as of November 30, 2007, all commercially available mAb formulations contained a buffer.

(f) *Other Excipients*

[466] Other excipients were available as of November 30, 2007, and were used for a variety of purposes. They could be used to protect against different kinds of chemical degradation, to control physical stability, or to prevent other unwanted effects after injection. At the time, it was known that the addition of an excipient could have effects on a formulation beyond solving the problem which prompted the excipient's use. Known and implanted excipients at the time included polyols and sugars, surfactants, and salts.

(g) *Effects of Manufacturing Processing and Equipment*

[467] On November 30, 2007, it was known that during manufacturing, there are a number of stresses placed on mAbs that can destabilize them if they are not well formulated. For example, freezing and thawing. As well, during storage the choice of containment could impact stability.

(h) *Route of Administration*

[468] At the relevant date, it was known that different methods of injection have different benefits and drawbacks. Some examples include: more or less pain on injection, volume of injection, speed of absorption in the patient's body, and the requirement that administration be done by a medical professional.

(i) *Ionic Strength*

[469] The common general knowledge as of November 30, 2007, included the importance of the ionic strength of an aqueous formulation. Ionic strength is the measure of a solution's ion concentration, and is impacted by the use of ionic excipients. It was known that the ionic strength of a formulation can impact the physical and chemical stability of the antibody in the solution.

(j) *HUMIRA*

[470] On November 30, 2007, it was known that HUMIRA was the commercially available formulation of adalimumab, approved by the FDA on December 31, 2002. It contained adalimumab in a concentration of 50 mg/mL and used a phosphate/citrate buffering system, a well known buffer with a large buffering capacity. It contained other excipients as well, namely: salt to deal with tonicity, a concern for chemical stability; mannitol, a polyol and tonicity agent;

polysorbate 80, a surfactant; and water, the solvent. HUMIRA had a pH of 5.2, which was away from the isoelectric points of adalimumab—between pH 8 and 9.

[471] HUMIRA was administered subcutaneously via pre-filled syringes, meaning that patients could inject themselves. It was approved for two dosing regimens. The first regimen was for the treatment of rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, and Crohn's disease, and consisted of a 40 mg injection every other week. The second regimen was approved for Crohn's disease and consisted of an initial dose of 160 mg, then an 80 mg dose two weeks later, followed by a maintenance dose of 40 mg every other week from the fourth week onward. For this second regiment, the syringes only contained 40 mg of adalimumab, meaning that the initial dose required four syringes, and the patient only made it to one syringe per dose on the fourth week.

[472] It was known on November 30, 2007, that injection-site reactions were a common side-effect. The HUMIRA package insert stated that pain was one of these side-effects. It also further stated that most injection-site reactions were "mild" and generally did not necessitate drug discontinuance.

(k) *The Difficulty of Therapeutic mAb Formulation*

[473] Drs. Trout and Falconer disagreed on the difficulties the POSITA would have with the formulation of stable therapeutic proteins, specifically mAbs, as of November 30, 2007.

(l) *Specific Documents in the State of the Art*

[474] Drs. Trout and Falconer provided, between them, numerous documents that they claimed form part of the common general knowledge of which a POSITA would be aware. I will lay out the relevant documents to which they both referred.

[475] US Patent No 6,090,382 (the "382 Patent") concerns anti-TNFα antibodies and mentions adalimumab as the most preferred of those antibodies. As Dr. Trout points out, the 382 Patent mainly sets out dosage forms. However, it does mention that pharmaceutical compositions may be made, and it lays out various examples of the kinds of excipients that may be included in those compositions.

[476] WO 2004/016286 (the "286 Application") disclosed a buffered antibody solution having a pH of between 4-8 and a shelf-life of 18 months. It taught protein concentrations from 1-150 mg/mL and preferred the higher concentrations within this range, but only provided examples up to a concentration of 63 mg/mL. Adalimumab was one of the antibodies disclosed. In one embodiment of the 286 Application, there was an aqueous formulation containing adalimumab, a polyol, a surfactant, and a buffer system comprising citrate and/or phosphate at a pH of roughly 5.2. The 286 Application further stated the need for formulations suitable for single use subcutaneous injection and in forms not injurious to the patient.

[477] European Patent Application 0,893,450 states that low pH and low salt "would, in theory, benefit any IgG product".

[478] Dr. Falconer submitted a number of documents pertaining to polyclonal antibodies, as well as protein formulations in lyophilized form. In his response, Dr. Trout claimed there are important differences between monoclonal and polyclonal antibodies which make lessons learned in formulating one difficult to translate to the other. For example, polyclonal antibodies are typically stable over wider pH ranges than mAbs. For lyophilized formulations, Dr. Trout pointed out that they tend to be more stable than aqueous ones, which is supported by their greater presence in the marketplace as of November 30, 2007.

[479] SYNAGIS was a mAb available as of the relevant date, in both liquid and lyophilized form. The liquid solution had a protein concentration of 100 mg/mL, and was administered via intramuscular injection. The formulation was salt-free, but it did contain other ionic excipients such as histidine, which is a buffer.

[480] The book titled “Rational Design of Stable protein Formulations” by Carpenter and Manning (“Carpenter 2002”) teaches that there is a roughly 1 mL maximum possible volume for subcutaneous injection beyond which patients typically experience discomfort. Dr. Falconer submits that a POSITA would have understood that this would place constraints on the concentration of protein in a formulation given a certain dose range.

[481] Carpenter 2002 does state that, in the context of one protein, “significant gains in protein stability can be realized by increasing protein concentration”. However, as Dr. Trout points out, in the context of another protein, the book shows instability at higher protein concentrations.

[482] On the topic of excipients, Carpenter 2002 claims that the choice of which to use may impact pain on injection. Carpenter 2002 counselled against the use of sodium phosphate buffers. Further, Carpenter 2002 taught that protein solubility can be improved with low salt concentrations—less than 0.15M. Finally, Carpenter 2002 taught that sugars are the first-line choice among non-specific stabilizers.

[483] Dr. Falconer presented the article "Self-buffering antibody formulations" written by Gokarn et al. and first published on November 19, 2007, in the Journal of Pharmaceutical Science (the "Gokarn Article"). This article, he states, teaches "a self-buffered [i.e., bufferless] mAb1 formulation" with a concentration of 60 mg/mL, a pH of 5.2 with no salt. As Dr. Trout points out, the sequence and structure of the mAbs discussed in the Gokarn Article is unknown. Furthermore, the article notes that differences in buffer capacity, if any, are expected based on the structural differences between proteins. Therefore, I accept that a POSITA would not recognize in the Gokarn Article a template or plug-and-play method to create bufferless (also known as unbuffered) formulations using mAbs other than the four it discusses. Adalimumab is not one of those four.

[484] US Patent Application No. 2004/0170623 (the "623 Application") expresses the market's desire for stable, liquid, injectable, antibody formulations, particularly at high protein concentrations. The motivation for liquid over lyophilized formulations was to obviate the need to reconstitute the powder, which is a hassle on administration. Further, subcutaneous administration was preferred. The 623 Application discloses concentrated aqueous solutions, with preferred concentrations of 100 mg/mL and more, and most preferred pH values of between

5 and 6. Regarding the higher concentrations, the embodiments focussed on in the 623 Application used buffers to keep their viscosities low.

[485] The 623 Application also teaches that fewer excipients are better from a manufacturing standpoint. Yet, I take Dr. Trout's point that the POSITA would not have immediately jumped to the conclusion that excipients present in existing formulations at the relevant time were superfluous, and that their removal would not hamper the therapeutic effectiveness or stability of the formulations which contained them.

[486] The 623 Application further teaches that it can be circumstantially advantageous to remove buffers. In the context of the 623 Application though, this does not apply to all buffers, since not all buffers are contemplated by the Application. Rather, it is relevant for certain buffers under certain pH conditions, and not every buffer mentioned in the 623 Application created the same problems that were solved by removal. As Dr. Trout points out, much in line with the point immediately above, where buffers had proven themselves to be capable of integration into stable therapeutic formulations, a POSITA would not have interpreted the 623 Application to wholesale recommend their removal.

[487] Only one mAb is the subject of focus in the 623 Application's examples, and it is omalizumab, not adalimumab. Example 1 of the 623 Application teaches a 98 mg/mL aqueous solution with a pH of 7.04, as well as a 98 mg/mL solution in 0.01% acetic acid with a pH of 5.4. The acetic acid was useful in reducing viscosity, suggesting that the acetic acid helped stability. Example 2 discusses a solution in 0.1% acetic acid with a concentration of 161 mg/mL, which a

POSITA may have reasonably read as suggesting that higher acetic acid, and consequently less water, helps stability at higher concentrations with omalizumab. Example 7 discloses a means of preparing solutions with high protein concentrations but includes a buffer for stability. Example 9 further includes a buffer.

[488] PCT Patent Application WO 2002/096457 (the "457 Application") teaches bufferless formulations of omalizumab, a mAb, in concentrations near 100 mg/mL and over 200 mg/m. The 457 Application includes the addition of acetic acid to reduce viscosity. However, as Dr. Trout points out, the 457 Application also discloses that an aqueous formulation experienced problems with viscosity which were negatively impacted by the removal of the buffer. In determining whether to select between a liquid and a lyophilized formulation, the 457 Application notes the disadvantages of lyophilisation, while at the same time recognizing that lyophilisation does help overcome some of the stability problems typical of liquid formulations.

[489] The paper "Proteins as Buffers" by Christensen, published in the Annals New York Academy of Sciences in 1966, discusses the self-buffering properties of proteins and introduces titration curves. As Dr. Trout points out, formulations come in many forms and the Christensen article does not teach that a protein can or will be stable in a liquid formulation with a buffering system. On the subject of titration curves, the author points out that experimental and predicted curves do not always match. This is in agreement between the two experts that absolute certainty of a protein's titration curve requires experimentation.

[490] Dr. Falconer mentions a 1993 article titled “The development of stable protein formulations: a close look at protein aggregation, deamidation, and oxidation” written by Cleland et al. The article teaches that salts will neutralize protein charges. But it also stresses that each protein must be studied in a given solvent environment. Further, it counsels the use of buffers and excipients including salts.

[491] A 2003 article by Chi et al. titled “Physical stability of proteins in aqueous solution: mechanism and driving forces in non-native protein aggregation” (“Chi 2003”) teaches that salt reduces the repulsion between like-charged particles. This kind of repulsion force can reduce aggregation and viscosity. This is Dr. Falconer’s takeaway from the article. Dr. Trout, though, cautions against this reading, stating that salts can also have other, different effects on the stability of formulations, some in the positive direction.

[492] Dr. Falconer referenced a 2005 article by Valente et al. titled “Colloidal Behavior of Proteins: Effects of the Second Virial Coefficient on Solubility, Crystallization and Aggregation of Proteins in Aqueous Solution” (“Valente 2005”). It provides information on the benefits of low-salt formulations in achieving higher solubility and stability. Valente 2005 does, however, caution that its findings may not apply to all proteins. It also admits that some of the areas in which its findings were made were still “relatively unexplored” at the time of the article’s publication.

[493] Dr. Falconer submitted a 2006 article by Zhang and Cramer which he claimed further explained why low salt and low buffer solutions were favourable to proteins staying in solution.

Dr. Trout was circumspect on the broad applicability of these findings, due to the failure of Valente 2005 and Chi 2003 to teach a broadly transferrable preference for low salt solutions. Moreover, Dr. Trout pointed out that Zhang and Cramer themselves did not claim that low salt and low buffer solutions would work for all proteins.

[494] A 2004 review article by Shire, referred to in the 458 Patent and submitted by Dr. Falconer, has, as its focus, challenges in the development of high protein concentration formulations. Viscosity is mentioned as one of the challenges, impacting stability, administration to patients, and manufacturability. Self-association of proteins in solution is also mentioned as a problem. Dr. Falconer claims the work referenced in the article is potentially misleading because the pH of the formulations tested was close to the pI of the mAb in the solution. However, Dr. Trout counters that the article does not actually reference the pI of the mAb tested, nor does it state it is only applicable to proteins in formulations with pHs close to the proteins' isoelectric points.

[495] In his report, Dr. Falconer discussed a number of papers dealing with the pain associated with injection. An article by Kivitz from 2006 compares the administration of adalimumab in a pre-filled pen versus in a syringe. Patients tended to prefer administration via the pen over the pre-filled syringe, but several other factors were also discussed as having an impact on injection pain, such as the speed of injection and the angle of needle insertion. Notably, the adalimumab in both the pre-filled pen and the syringe was in a buffered form. Kivitz does not teach modifications to protein formulation or establish a link between protein formulation and injection pain. Dr. Trout suggests that Kivitz "teaches away" from removing the buffer. I do not think it

goes so far; rather, it is simply silent on this issue. Kivitz, along with a 1996 article from Jorgensen, teach that compliance is often a problem in medical therapies and that compliance may be improved where therapies are more convenient for patients. Jorgensen teaches that low injection volumes are preferable.

[496] A 2006 article by Laursen proposes moving away from using citrate and citrate buffers in parenteral formulations for reasons of pain upon injection. Laursen recommends using a different buffer: histidine.

[497] Dr. Falconer cites a 1996 article by Fransson which teaches that the amount of buffers in parenteral formulations should be minimized, so that the pH of the injected formulation adjusts quickly to the physiological pH, thereby causing less injection pain. Fransson does not contemplate buffer removal. Also, Fransson 1996 does not consider adalimumab and lists many other factors impacting injection-site pain, including injection volume, injection speed, osmolality, pH, injection site, needle size, needle quality, presence of irritating substances, and temperature.

[498] US Patent Application No. 2004/0038878 (the "878 Application") teaches that the use of sugar in the formulation generally acts as a soothing agent, especially when the sugar replaces a salt. It further specifies selecting sugars from the group of mannitol, sorbitol, trehalose, and sucrose. Furthermore, the 878 Application teaches that sugars help the long-term stability of the formulation. It includes a protein concentration range of 10-150 mg/mL, specifies that the formulations do not include a buffer, though one could be included, and counts mAbs among the

proteins it considers. However the 878 Application does not include test data from all of the proteins it references—it evaluates injection pain for five formulations. All of these formulations use buffers. I do not find, based this data, that a POSITA would have considered the 878 Application as preferring bufferless formulations.

[499] Dr. Trout submitted a 1998 article by Brazeau et al. (the "Brazeau Article") on the subject of injection-site pain. Dr. Falconer did not address this article in his report, but did discuss it on his cross-examination. The Brazeau Article teaches numerous ways to address injection-site pain, one of which is modification to the buffer. Brazeau does not suggest removing the buffer.

(3) The Construction of the Claims See: Appendix B)

(a) *Claims 1 and 69*

[500] Claim 1 provides:

> 1. An aqueous pharmaceutical formulation comprising an anti-tumor necrosis factor alpha (TNFα) antibody, or antigen-binding fragment of the antibody, at a concentration of at least 50 mg/mL and water, wherein the formulation has a conductivity of less than 2.5 mS/cm and the antibody, or antigen-binding fragment of the antibody, has a light chain variable region (LCVR) comprising a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ Ip NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) comprising a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8.

[501] The 458 Patent defines “aqueous formulation” as a solution which is solvent in water. It further defines “pharmaceutical formulation” as referring to “preparations which are in such a form as to permit the biological activity of the active ingredients to be effective, and, therefore may be administered to a subject for therapeutic use”.

[502] The parties disagree over whether “pharmaceutical formulation” implies stability of the solution in the context of the 458 Patent. This disagreement stems from claims 41-43, which depend from claim 1 and introduce stability claims over time, specifically 3 months, 12 months, and 22.5 months respectively. I agree with JAMP that claims 41-43 must be used to interpret Claim 1.

[503] The interpretive key, I find, is in contrasting two items. First, Dr. Trout’s reference to these claims as “the long-term stability claims”, which is wholly consonant with the construction of those claims, and will be discussed below. Second, the definition of “pharmaceutical formulation”, which states that the form of the preparations are such “as to permit the biological activity of the active ingredients to be effective…for therapeutic use”. I find that this definition does require stability, as an unstable preparation could not be administered in a form that permits the biological activity of its active ingredients to be effective for therapeutic use. However, the stability that it requires is the amount of stability sufficient to permit the effective therapeutic use of its biological ingredients, and no more. It is the stability required to manufacture and administer the aqueous formulation, with no long-term storage implication.

[504] Therefore, the POSITA would have understood an "aqueous pharmaceutical formulation" in the context of the 458 Patent to mean the solution of a drug in water with sufficient stability to permit the drug to be administered to facilitate its intended use in the treatment of a disease or disorder.

[505] Claim 1 then states that the pharmaceutical formulation comprises "an anti-tumor necrosis factor alpha (TNFα) antibody, or antigen-binding fragment of the antibody, at a concentration of at least 50 mg/mL and water". The use of "comprising" in prefacing these two alternatives, the antibody or the antigen-binding fragment thereof, means that the formulation contains, but is not necessarily limited to, one or the other of these active ingredients. A POSITA would have understood by this language that claim 1 does not exclude the use of excipients.

[506] The antibody or fragment thereof must, according to claim 1, be present in a concentration of at least 50 mg/mL in the aqueous solution. That solution may or may not contain excipients.

[507] Claim 1 also includes a requirement for conductivity, specifically, that the formulation have a conductivity of "less than 2.5 mS/cm". Per the definition given in the 458 Patent, "conductivity…refers to the ability of an aqueous solution to conduct an electric current between two electrodes." The 458 Patent then goes on to specify that conductivity increases in proportion to the amount of ions present in the aqueous solution, and that conductivity may be altered through the use of ionic excipients. As Dr. Falconer points out, the POSITA would have

understood that a conductivity of less than 2.5 mS/cm would imply a low amount of ions in the formulation.

[508] Finally, claim 1 places restriction on the amino acid makeup and structure of the antibody or antigen-binding fragment thereof which it contemplates.

[509] Claim 69 reads:

> An aqueous pharmaceutical formulation comprising water and an antibody, or antigen-binding fragment of the antibody, at a concentration of at least 50 mg/mL, wherein the formulation has a conductivity of less than 2.5 mS/cm, and wherein the antibody, or antigen-binding fragment of the antibody, has a light chain variable region (LCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8.

[510] Claim 69 would be understood by the POSTIA in the same way as would claim 1, with one important difference: claim 69 does not specify that the antibody must be an anti-TNFα antibody. This would be understood by the POSITA to broaden the scope of antibodies contemplated by this claim.

(b) *Claim 191*

[511] Claim 191 reads:

> An aqueous pharmaceutical formulation comprising:

> 1) an anti-tumor necrosis factor alpha antibody comprising a light chain variable region (LCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8, wherein the concentration of the antibody is 50 to 200 mg/ml; and
>
> 2) water; wherein the formulation does not comprise a buffering system.

[512] The term “aqueous pharmaceutical formulation” would be understood by the POSITA in the same manner as it was for claims 1 and 69. Unlike claims 1 and 69, however, claim 191 does not contemplate an antigen-binding fragment of the antibody that it mentions. Further, it specifies that the antibody concentration in the solution is between 50 to 200 mg/mL and includes no conductivity requirement.

[513] Another important aspect of claim 191 is the fact that the antibody-containing aqueous solution does not contain a buffering system. As mentioned above, buffers were known at the relevant date to be excipients used to keep the formulation’s pH to within the desired range, promoting stability. Therefore, the POSITA would have understood claim 191 to teach an anti-TNFα antibody in aqueous solution with water, at a concentration between 50 to 200 mg/mL, without the addition of excipients serving to maintain the desired pH.

[514] The POSITA would, however, have known of non-buffering excipients. Claim 191 would not be understood to rule out the use of these kinds of excipients in the formulation contemplated.

(c) *Claims 10, 72, and 217*

[515] Claim 10 depends from claim 1 and adds the further restriction that the antibody or antigen-binding fragment thereof be present at a concentration of 100 mg/mL. As Dr. Falconer points out, claim 10 plants a flag at 100 mg/mL. This distinguishes it from other claims, such as claim 5 which discloses at least 100 mg/mL, and claim 1 which discloses at least 50 mg/mL.

[516] Claim 72 depends from claim 69 and also serves to specify a concentration of 100 mg/mL for the antibody or antigen-binding fragment thereof.

[517] Claim 217 depends from any one of claims 177-215. It specifies that the concentration of the antibody or antigen-binding fragment thereof is 100 mg/mL for the formulations contemplated by those claims. I note that claim 191 does not have an antigen-binding fragment.

(d) *Claims 28 and 83, 192 and 193*

[518] Claim 28 depends from claims 1-26 and introduces the further restriction that the pharmaceutical formulation "comprises adalimumab and water". The POSITA would have been familiar with adalimumab and known that it is an anti-TNFα antibody.

[519] Claim 83 is like claim 28. It refers to "[t]he formulation of any one of claims 69-80, which comprises adalimumab in water". The same understanding by the POSITA would apply.

[520] Claim 192 depends from claim 191 and narrows the anti-TNFα antibody, placing restrictions on its amino acid makeup and structure.

[521] Claim 193 depends from claim 192 and further specifies that the anti-TNFα is adalimumab.

(e) *Claims 37, 38, 40, 75, 76, 78-80, 194-198*

[522] Claim 37 depends from claims 1-36 and specifies the said pharmaceutical formulations further compromise a non-ionizable excipient. As mentioned above, the POSITA would have understood the "non-ionizable" feature of the excipient to refer to the fact that its use in the formulation would not have impacted the conductivity thereof.

[523] Claim 38 further specifies that the non-ionizable excipient of claim 37 is a polyol, a non-ionic surfactant, sucrose, trehalose, raffinose, or maltose.

[524] Claim 40 again adds further specification, limiting the non-ionic surfactant of claim 38 to polysorbate 20, polysorbate 40, polysorbate 60, or polysorbate 80.

[525] Claim 75 mirrors claim 37 in that it refers to "[t]he formulation of any one of claims 69-74, further comprising a non-ionizable excipient." Claim 76 depends from claim 75 and specifies that the non-ionizable excipient is a polyol. Claim 78 also depends from claim 75 and specifies that the non-ionizable excipient is a non-ionic surfactant. Claim 79 depends from claim 78 and

names the non-ionic surfactant as polysorbate 80. Finally, Claim 80 depends from claim 75 and specifies that the non-ionizable excipient is sucrose.

[526] Claim 194 depends from any one of claims 191-193 and introduces a non-ionizable excipient to the formulations of these claims.

[527] Claim 195 depends from any one of claims 191-193 and specifies that the formulations of these claims comprise a polyol. Claim 196 depends from claim 195 and further specifies that the polyol therein contemplated is mannitol, sorbitol, or sucrose.

[528] Claim 197 depends from any one of claims 191-193 and introduces a surfactant to the formulations of these claims. Claim 198 depends from claim 197 and further specifies that the surfactant therein contemplated is polysorbate 80 or polysorbate 20.

(f) *Claims 204, 205, 215*

[529] Claims 204 and 205 both depend from claim 193 and specify pH values for the formulation referred to in claim 193. For Claim 204, the formulation of claim 193 has a pH from 5 to 6. For claim 205, the formulation of claim 193 has a pH of 5.2. The POSITA would have understood all of these to be acidic formulations, given that anything less than a neutral pH of 7 is acidic.

[530] Claim 215 depends from any one of claims 1-180. It specifies that the formulations contemplated in those claims have a pH of 5.2.

(g) *Claims 41-43*

[531] Claims 41-43 introduce long-term stability limitations to claims 1-40. Specifically, they require stability in liquid form for at least 3 months, 12 months, and 22.5 months respectively. The 458 Patent defines a "stable" formulation as one in which the protein "essentially retains its physical stability and/or chemical stability and/or biological activity upon storage." These claims do not cover stability either during manufacturing or at the moment of administration, when there has been no storage of the formulation, since this is the stability required by claim 1. However, since claims 41-43 ultimately depend from claim 1, this stability is implied.

[532] The POSITA would have understood the reference to "in liquid form" to exclude any changes in state, such as freezing or freeze-drying involved in lyophilization.

(h) *Claim 45*

[533] Claim 45 specifies that the formulation of any one of claims 1-44 be suitable for *in vitro* or *in vivo* use. The POSITA would have understood that use *in vitro* referred to use outside a living organism, for example as a reagent in a test tube or petri dish. Use *in vivo*, by contrast, would have referred to use in a living organism.

(i) *Claims 49 and 125*

[534] Claim 49 refers to "[a]n article of manufacture comprising the formulation of any one of claims 1-47." Per the text of the 459 Patent, the "article of manufacture…contains the aqueous

formulation…and provides instructions for its use." The 459 Patent gives examples of possible containers, including bottles, vials, syringes, auto injector pens containing syringes, and test tubes. The POSITA would have known that these kinds of containers are common in the industry.

[535] Claim 125 refers to "[a]n article of manufacture comprising the formulation of any one of claims 69-123." It would be understood by the POSITA in the same way as claim 49.

(j) *The Asserted Claims*

[536] The asserted claims in dispute between the parties are claims 28, 41-43, 83, 205, 215 and 217. Based on claim construction, these claims reduce to two variants, with further specifications added through the dependent claims.

[537] The first is an aqueous solution comprising adalimumab and water, the adalimumab having a concentration of 100 mg/mL, a pH of 5.2, and a conductivity of less than 2.5 mS/cm.

[538] The second is an aqueous solution comprising adalimumab and water, the adalimumab having a concentration of 100 mg/mL, a pH of 5.2, and the absence of a buffer. I will refer to this as the bufferless formulation.

C. *Invalidity*

(1) Anticipation

[539] JAMP argues that the asserted claims of the 458 Patent are anticipated by the 181 Application, titled "Self-Buffering Protein Formulations". By reference, the 181 Application incorporates US Provisional Application No. 60/690,582 (the "Gokarn Provisional"), which the parties agree forms a part of the 181 Application.

(a) *Anticipation Claim in the US Counterpart to the 458 Patent*

[540] AbbVie has asked this Court to note that, in a prior proceeding before the Patent Trial and Appeal Board ("PTAB") of the United States Patent and Trademark Office ("USPTO"), the PTAB refused to institute an *inter partes* review of the corresponding bufferless formulations of the US 619 Patent based on alleged anticipation by the 181 Application.

[541] AbbVie provided the relevant decision from the USPTO. JAMP opposes AbbVie's reliance on the PTAB decision and has asked this court to determine the validity of AbbVie's patents based on Canadian jurisprudence and the evidence before this Court alone.

[542] JAMP rightly notes that this Court is not bound by decisions of foreign courts which deal with corresponding patents: *Mylan Pharmaceuticals ULC*. As the Federal Court of Appeal commented in *Pharmascience* 2022 at para 40, "there are a myriad reasons that this Court is not bound by any of them. As regards the foreign decisions, the law is different, the patents are likely different, and the evidence is surely different."

[543] AbbVie has simply placed the PTAB portion before this Court without leading evidence. I therefore will not consider the PTAB decision.

(b) *Prior Disclosure in the 181 Application*

[544] The 181 Application does specify that the most preferred formulations implement liquid carriers, preferably water. Therefore, they are aqueous solutions. Importantly, adalimumab is listed among the proteins contemplated in the 181 Application.

[545] The most preferred protein concentration range in the 181 Application is 20-150 mg/mL. This is a very large range. For the four proteins tested whose test results appeared in the 181 Application, there were concentrations of 90 mg/mL and 110 mg/mL which proved to be self-buffering within pH ranges which included 5.2. But there were other ranges tested too, and none of these proteins were adalimumab. Moreover, in the claims section of the 181 Application, these proteins are not introduced in the same claim as adalimumab and there is no indication of dependency between the claims that introduce these proteins and the claim which refers to adalimumab.

[546] As mentioned above, a range does not always anticipate a point, but it could if dependant on the facts of the particular patent. This is even truer where the range is very large or broad. Accordingly, I do not see how a range of protein concentration from 20-150 mg/mL can plant a flag at the specific concentration of 100 mg/mL, especially where specific examples of formulations given do not include the relevant protein.

[547] The preferred pH range of the 181 Application's formulations is roughly 4-5.5. In their reports and their testimony, Drs. Trout and Falconer did not specifically address whether the

POSITA would consider this to be wide range. After a review of the prior art, I find this to be a broad range on these facts.

[548] The 181 Application contemplates both buffered and bufferless formulations. The bufferless formulations are preferred and represent the focus of the actual proteins tested.

[549] Despite claiming bufferless formulations though, it is not clear from the 181 Application that the so-called bufferless adalimumab formulation would not actually need a buffer. The bufferless formulations most preferred are those in which the protein provides "at least approximately 99%" of the buffer capacity of the solution. However, the word 'approximately' in the context of the 181 Application means plus or minus 20%. Therefore, 99% may be as low as 79.2% and as high as 100%—a broad range. There is no indication how this margin is to be understood in the context of the myriad proteins put forward in the 181 Application, except for those tested. Adalimumab, as has been mentioned, was not among the proteins tested. The 181 Application therefore does not make clear whether in its purported bufferless adalimumab formulation the adalimumab is really only contributing about 80% of the buffering capacity.

[550] The 181 Application mentions a variety of salt concentrations, which the experts agree corresponds to the conductivity of the solution. One of the concentrations specified, 25 mM, (millimolar) fits with the 458 Patent's conductivity of less than 2.5 mS/cm (MilliSiemens per centimetre).

(c) *Enablement*

[551] For its enablement argument, JAMP relies heavily on the fact that the tests a POSITA would use to arrive at the self-buffering capacity of adalimumab are fairly straightforward and not time-consuming. Undoubtedly, an amount of trial and error is permitted in performing something already disclosed. The 181 Application, though, goes too far.

[552] There are over 60 preferred proteins listed and no indication that adalimumab is to be selected over and above the others. Furthermore, the 181 Application only includes empirical information from tests of a handful of proteins—adalimumab is not among them.

[553] On the subject of proteins, I note that the 181 Application lists monoclonal and polyclonal antibodies, as well as various other types of antibodies which it distinguishes from these two, as among the "highly preferred proteins". Dr. Trout's testimony and report highlight the fact that formulation concerns are different for monoclonal and polyclonal antibodies. On cross-examination, Dr. Falconer stated that adalimumab may not be the preferred protein in the 181 Application.

[554] Given the sheer number of proteins disclosed, it is not clear that a POSITA would know to select adalimumab. It is further not clear that, having selected adalimumab, the POSITA would know adalimumab to have self-buffering capacity at a concentration of 100 mg/mL and a pH of 5.2.

[555] Turning to conductivity, I note that there are salt concentrations specified other than 25 mM, and many of them are very different. The 181 Application refers to:

> "preferably 150 mM, particularly preferably 125 mM, especially preferably 100 mM, very particularly preferably 75 mM, particularly preferably 50 mM, preferably 25 mM".

[556] From this it can be seen that 150 mM is given the same degree of preference as 25 mM, yet it would correspond to a much higher conductivity, beyond the range of less than 2.5 mS/cm. Further, from this it can be seen that a higher degree of preference is given to 125 mM, 100 mM, 75 mM, and 50 mM. On cross-examination, Dr. Falconer admitted that he would expect a POSITA to pay more attention to the values with a higher degree of preference.

[557] In view of these considerations, I fail to see how a POSITA would know to select 25 mM when the 181 Application explicitly offers more preferable alternatives. I further fail to see how the POSITA would know to pick 25 mM over 150 mM, given that they are both expressed with the same degree of preference.

[558] This Court is clear that the law of anticipation is strict and requires the planting of a flag, and "If a prior document leaves a choice open for the skilled person and if the result only falls within the patent claim if the skilled person adopts one way forward and not the other, then there is no lack of novelty" (*Takeda Canada Inc v Canada (Minister of Health),* 2015 FC 751 at para 36; *Bristol-Myers Squibb Canada Co v Teva Canada Limited*, 2016 FC 580 at para 232).

[559] If the POSITA has a choice, that is a question of obviousness, to which I will now turn. I do not find that the 458 Patent was anticipated.

(2) Obviousness

[560] The first two stages of the *Sanofi* test for obviousness involve identifying the notional POSITA and their common general knowledge. I have done that above, and shall proceed to the remaining stages of the inquiry.

(a) *The Parties' Approaches to Identifying the Inventive Concept*

[561] Both Dr. Falconer and JAMP offer an inventive concept for the 458 Patent as a whole. Their submission is:

> an aqueous pharmaceutical formulation comprising an antibody or fragment of an antibody (including adalimumab) at a concentration of at least 50 mg/mL with essentially no buffering system and little or no ionic excipients.

[562] Dr. Trout and AbbVie identify inventive concepts for the two kinds of formulations focussed on by the 458 Patent: the low conductivity formulation and the bufferless formulation. The inventive concept of the low conductivity formation, they propose, is "stable aqueous pharmaceutical formulations comprising 100 mg/mL adalimumab and water that have a low ionic strength (conductivity less than 2.5 mS/cm)". The inventive concept of the bufferless formulation they claim to be "stable buffer-free aqueous pharmaceutical formulations comprising 100 mg/mL adalimumab in water". AbbVie then identifies inventive concepts of various further dependent claims.

[563] The differences between these two propositions reflect different approaches to the identification of the inventive concept. JAMP's approach evinces the desire to limit the whole of

the inventive concept to claim 1. However, this misses the fact that the claims in dispute are not primarily limited by claim 1. Claim 1 is only included in the disputed claims by reason of its independence. JAMP's approach is also inconsistent with how it has characterized the disputed claims of the 458 Patent for the purpose of anticipation—for example, focussing on specifics from the dependent claims such as the 5.2 pH, the 100 mg/mL, and adalimumab.

[564] Additionally, JAMP's reduction of the inventive concept of the disputed claims to only the subject-matter of claim 1 runs afoul of section 58 of the *Patent Act*, which permits a patent to remain valid only if some of its claims are declared invalid (*Shire* at para 27). Therefore, should independent claim 1 be invalid, the 458 Patent may maintain its validity through one or more of its dependent claims.

[565] I prefer AbbVie's approach to identifying the inventive concept of the disputed claims. It is more in line with section 28.3 of the *Patent Act* which requires that obviousness be assessed with respect to "[t]he subject-matter defined by a claim" (*Safe Gaming System v Atlantic Lottery Corporation*, 2018 FC 542 at para 161 [*Safe Gaming System*]). Jurisprudence from the Federal Court of Appeal confirms this, for example: *Zero Spill Systems* at paras 85-94. Furthermore, obviousness must be assessed for all of the claims in issue, since an invention may not be found obvious by reason of what is disclosed in its narrow dependent claims (*Safe Gaming System* at para. 161).

[566] Therefore, proper identification of the inventive concept requires a claim-by-claim analysis that is not identical to claim construction (*Shire* at paras 26 and 68).

[567] I agree with AbbVie's differentiation between the claims of the 458 Patent directed to the low-conductivity formulation and those directed to the bufferless formulation. Broadly, I adopt this distinction.

(b) *The Inventive Concept of Low Conductivity Claims 28 and 83*

[568] The first of the disputed claims is 28, depending from claims 1 and 10. I accept AbbVie's submission that the inventive concept of this claim is a stable aqueous pharmaceutical formulation comprising 100 mg/mL adalimumab and water, and having a low ionic strength (conductivity of less than 2.5 mS/cm), with the caveat that I understand the word 'stable' as I have set out in claim construction. The inventive concept of claim 83 as it depends from claims 69 and 72 is the same.

(c) *The Inventive Concept of Bufferless Claim 217*

[569] Claim 217 depends from claims 191 through claims 192 and 193. As with the low conductivity claims, I do not agree with Dr. Trout and AbbVie's submissions regarding the word stable. I therefore find that the inventive concept of claim 217 is, to use the language of Dr. Trout in his report, keeping in mind that I do not adopt his definition of stability, "a stable buffer-free aqueous pharmaceutical formulation comprising 100 mg/mL adalimumab in water".

(d) *The Difference Between the State of the Art and the Inventive Concept*

[570] As of November 30, 2007, I identify the following elements as constituting the difference between the 458 Patent and the existing aqueous adalimumab formulations. For the low conductivity claims:

- A protein concentration of 100 mg/mL, with the protein being adalimumab; and
- A conductivity of less than 2.5 mS/cm.

[571] For the bufferless claim:

- A protein concentration of 100 mg/mL, with the protein being adalimumab; and
- The absence of a buffer.

[572] I note that the 286 Application suggests a wide range of adalimumab concentrations: 1-150 mg/mL. However, in its examples, it only goes up to 63 mg/mL. Since the inventor must plant the flag when disclosing an invention, I am not convinced that 100 mg/mL is in the state of the art. I say more about the 286 Application below.

(e) *Would the 100 mg/mL Adalimumab in Water Have Been Obvious to a POSITA at the Relevant Time?*

[573] JAMP and Dr. Falconer use the 181 Application as the starting point for their obviousness argument. As discussed above in anticipation section, I do not think a POSITA would consider it obvious to select adalimumab from among the 60 plus proteins disclosed. Moreover, I do not think a POSITA would know that adalimumab, if selected from among the 60 plus proteins disclosed, could be formulated into a stable aqueous solution at 100 mg/mL.

[574] Dr. Falconer points to the 286 Application as proof that the POSITA at the relevant time would have known that high concentration adalimumab formulations could be successfully formulated. However, while the 286 Application claims a range of protein concentration from 1-150 mg/mL, as I have already mentioned, the examples it provides only go up to 63 mg/mL. As both experts admitted during the trial, a POSITA would place less importance on the wider ranges claimed in a patent than he or she would on the patent's specific examples or amounts claimed. Given that the 286 Application preferred formulations in the upper end of its range, but only included examples of up to 63 mg/mL, I do not find that the POSITA would see the 286 Application as teaching that a 100 mg/mL adalimumab formulation should work. In fact, 63 mg/mL is closer to the 50 mg/mL of the original HUMIRA product than it is to the 100 mg/mL of the 458 Patent.

[575] Dr. Falconer also points to Xolair, Raptive, and Synagis as examples of at least 100 mg/mL concentration mAb formulations. However, these three were all lyophilized formulations and none of them contained adalimumab. I am not convinced that a POSITA would interpret these as rendering obvious non-lyophilized 100 mg/mL adalimumab in water.

[576] I do not think that these documents, when taken together, would be interpreted by a POSITA as obviously teaching 100 mg/mL adalimumab in water. Specifically, given that the 286 Application prefers high concentrations but only contains actual formulations of up to 63 mg/mL, I do not see how it would push a POSITA to know that, from among the 60 plus compounds mentioned in the 181 Application, adalimumab could be made at 100 mg/mL in water. In fact, the 286 Application and the 181 Application, taken together, are more likely to

teach away from 100 mg/mL adalimumab in water, given that they both mention 100+ mg/mL concentration yet fail to include examples of adalimumab among them.

(f) *Is There a Motive in the Prior Art to Find 100 mg/mL?*

[577] I take Dr. Falconer's point that the success of HUMIRA would motivate people to want to improve upon it. There was a trend towards increasing the amount of mAb delivered in treatment, suggesting that high concentrations would be beneficial given that they require fewer injections.

[578] However, Dr. Falconer makes more of injection-site pain than the evidence supports. The common general knowledge shows that pain associated with injection was "mild" and did not tend to lead to discontinuance. It is not clear, therefore, that a POSITA would be tremendously motivated to improve adherence to the therapeutic protocol by reducing injection-site pain. Also, as Dr. Trout points out, certain documents in the prior art actually teach away from increasing concentration as a means of reducing injection-site pain. Further, the POSITA would have known that many liquid mAb formulations suffered aggregation and other problems with increasing concentration. Given that no created and tested high concentration adalimumab formulation was on the market, or included in the relevant prior art, the POSITA would not have known that high concentration adalimumab would not encounter this problem.

[579] Therefore, it is not evident that a POSITA would have been motivated to reduce injection-site pain in order to improve adherence; and were the POSITA to be so motivated, it is

not evident that he or she would pursue higher protein concentrations as a means to achieve that end.

[580] I note that Dr. Falconer did not explain why this particular solution would be obvious to try over and above the established methods of reducing injection-site pain taught at the relevant time. A review of the common general knowledge shows the POSITA had many avenues to try other than removal of the buffer. It is not obvious that a POSITA would have viewed removal of the buffer as more obvious than other means, given that there were no approved bufferless mAb formulations at the relevant time and other methods of reducing injection-site pain were widely used.

[581] There is also the motivation to reduce the number of injections needed for a course of treatment. I recognize that this would be a valid motivation to try adalimumab at a higher concentration. I am not persuaded, though, that this would make it obvious to try 100 mg/mL. Given that previous attempts in the prior art at making higher concentration adalimumab formulations only teach solutions of up to 63 mg/mL, it is a stretch, without evidence, to assume that the POSITA would view 100 mg/mL as having a reasonable chance of success.

(g) *Would the Low Conductivity at 100 mg/mL Concentration Be Obvious to a POSITA?*

[582] Since I have found that the high concentration, 100 mg/mL adalimumab in water, would not be obvious to a POSITA, this finding carries to that same formulation having a low conductivity: less than 2.5 mS/cm. For JAMP's argument concerning the obviousness of

conductivity, Dr. Falconer's report and testimony focus on the 181 Application and the fact that conductivity would be an inherent property of a formulation. Given my findings on anticipation, I do not think the 181 Application would make low conductivity of 100 mg/mL adalimumab in water obvious.

[583] On the subject of the inherent nature of conductivity, I agree with Dr. Falconer. Claims 28 and 83 depend from claims which include specific excipients and, if the formulations of these claims were made, it would be routine to discover their conductivities. However, this misses the fact that such a formulation would also be an aqueous solution of 100 mg/mL adalimumab in water, which I have found is not obvious.

(h) *Would Bufferless Adalimumab in Water Be Obvious to a POSITA?*

[584] This is the largest hurdle for JAMP. At the relevant date, there were no approved bufferless mAb formulations on the market, and the parties' submissions indicate there are still none to this day; however, I am aware that the 458 Patent may be the reason for this. The removal of the buffer constitutes a significant difference between prior HUMIRA products and the 458 Patent.

[585] For the reasons set out in the anticipation analysis, I find that the 181 Application did not make bufferless adalimumab obvious. Briefly, I do not find that the 181 Application teaches that adalimumab can obviously be self-buffering at high concentrations. Further, every mAb antibody on the market at the time contained a buffer. At the time, discussions in the relevant art which addressed problems with buffers taught changing buffers, not removing them. For example,

while the 623 Application does mention bufferless formulations, it clearly shows that the more stable formulations it tested contained buffers.

(i) *Is There a Motive in the Prior Art to Find a Bufferless Adalimumab Formulation?*

[586] The problems with injection-site pain, as I mentioned before, were overstated by Dr. Falconer in light of the evidence on the record. Even if a POSITA were motivated to improve injection-site pain, it is not obvious that removal of the buffer would be something to try. While some buffers were associated with injection-site pain, others were not, and those which were not associated with pain were often preferred for that reason.

[587] I acknowledge that there would have been a motivation to reduce the number of injections needed for treatment with adalimumab. However, this pertains more to the protein concentration than to the presence or absence of a buffer.

(j) *The Actual Course of Conduct*

[588] As I explained above, I am not persuaded that Dr. Fraunhofer has completely and accurately described the actual course of conduct taken to arrive at the 458 Patent. I do not doubt the accuracy of the tests performed and their results, but I am circumspect as to their motives.

[589] Nevertheless, I am not willing to leap to the conclusion made by JAMP, which is that the actual course of conduct was nothing but routine, and manifestly motivated by the state of the art. For reasons I have already given above, I do not find that the evidence establishes a clear

enough motivation at the relevant time for a POSITA to make the invention of the 458 Patent. I am skeptical of AbbVie's invention story, but that does not mean that I will ignore my other findings and read an actual course of events into a story with holes in it.

(k) *The Remaining Disputed Claims*

[590] Since I have found claims 28, 83, and 217 are not obvious, I refrain from extending my obviousness analysis to the other claims which depend from these three. By logical necessity, they too are not obvious.

(l) *Conclusion on Obviousness*

[591] In summary, I find that claims 28, 83, and 217 of the 458 Patent are not obvious. Their inventive concepts point to differences between the 458 Patent and the state of the art, the overcoming of which would not have been obvious to a POSITA at the relevant time. Furthermore, though there was motivation to improve upon the approved HUMIRA formulation on the market, that motivation did not translate clearly enough to making the improvements which lie at the heart of the inventiveness of the disputed claims.

(3) Overbreadth

[592] JAMP argues that the asserted claims of the 458 Patent are overbroad, since they do not limit themselves to the bufferless and low conductivity formulations of the asserted claims. More precisely, the conductivity claims do not exclude a buffer from the formulation, the bufferless claims do not limit the conductivity of the formulation, and none of the claims specify the

osmolality or hydrodynamic diameter, and these parameters are elsewhere described and claimed.

[593] AbbVie counters that the essential elements of the invention are not the combination of a bufferless formulation with low conductivity. Rather, the asserted claims are embodiments. The invention, as described in the "Summary of the Invention" section of the patent, "relates to methods and compositions for aqueous protein formulations which comprise water and a protein, where the protein is stable without the need for additional agents".

[594] To start with, Dr. Falconer's expert report does not reference any instructions from counsel on the law of overbreadth, nor does it contain his opinions concerning the essential elements of the invention of the 458 Patent. Therefore, JAMP has presented no expert evidence that directly addresses its overbreadth argument. It is also worth noting that JAMP's closing submissions on overbreadth do not reference a single piece of case law.

[595] I turn first to JAMP's contentions that the low conductivity claims are overbroad because they do not exclude a buffer from the formulation, and the bufferless claims are overbroad because they do not limit conductivity. To support this, JAMP has not offered any evidence, and only relies on statements made by Dr. Trout on cross-examination. As AbbVie points out, a similar state of affairs presented itself in *Pharmascience* 2022, in relation to a lack of utility argument. Justice Locke had the following to say:

> [27] A final reason that I would be hesitant to interfere with the Trial Judge's conclusion on utility is that Pharmascience adduced no evidence from its own experts on this issue, an issue on which it had the burden of proof. Pharmascience relies principally on the

> evidence of Teva's experts and their testimony during cross-examination. However, the reports submitted by these experts discussed the issue of obviousness, not utility. Teva's experts were not instructed on the law concerning utility and were never asked directly for their opinions on the issue.

[596] Here too, for its argument, JAMP relies entirely on statements made by Drs. Trout and Fraunhofer, expert and fact witnesses for AbbVie, respectively. Yet, Dr. Trout did not address the issue of overbreadth in his report, nor was he instructed on the relevant law.

[597] JAMP's use of the relevant answers given by Dr. Trout is misleading. Dr. Trout's answers were given in the context of his mandate, which was to aid the Court in its anticipation and obviousness analysis. To do this, he offered his opinions on a number of relevant issues. Importantly, he did not give his opinion on the essential elements of the invention and, for that matter, neither did Dr. Falconer.

[598] Moreover, Dr. Fraunhofer was a fact witness. His testimony was relevant to the invention story and not to the proper understanding of the patent he invented. Therefore, he was not an appropriate source for important conclusions on claim construction or the identification of essential elements of the invention. His statements cannot assist JAMP.

[599] A finding of overbreadth requires a comparison between the claims and the essential elements of the invention. I note that JAMP did not offer its own proposed formulation of the essential elements of the invention, nor did it suggest that the elements it claims are overbroad in the asserted claims are not within the scope of the specifications. JAMP's argument would have

this Court find overbreadth based on the claims alone, with no analysis of the essential elements of the invention. This the Court cannot do.

[600] In reference to JAMP's argument that the asserted claims do not specify the osmolality or hydrodynamic diameter, Dr. Falconer's report suggests that they do not need to. From the report:

> 182. The 458 Patent further states that, as a result of increasing concentration of the protein while decreasing additional components, such as ionic excipients, the [hydrodynamic diameter] of the protein in the aqueous pharmaceutical formulations is smaller (at least about 50 % smaller) relative to the protein in a standard buffering solution. In addition, also as a result of the low level of ionic excipients, the pharmaceutical formulations of the invention have low conductivity (e.g., less than 2 mS/cm) and low osmolality (e.g., no greater than 30 mOsmol/kg).
>
> [Emphasis added.]

[601] In another place in his report, Dr. Falconer says that "the skilled person would understand that osmolality is an inherent property of an aqueous formulation and is related to the concentration of chemical molecules in the formulation". He also says that "the skilled person would know that the [hydrodynamic diameter] is an inherent property of an antibody or fragment of an antibody, including adalimumab, and is a reflection of both its molecular weight and its structure".

[602] Therefore, Dr. Falconer's evidence supports that the osmolality and hydrodynamic diameter are the consequence of other properties which the claims do specify and to which JAMP does not object in its overbreadth argument—e.g. the protein choice and concentration, choice, and quantity of excipients. Accordingly, its argument on this point is not supported by its own expert and I am not persuaded by it.

[603] JAMP's overbreadth argument therefore fails on two fronts. First, it fails to identify the essential elements of the invention. Since an overbreadth analysis requires a comparison of the essential elements of the invention with the claims as construed, JAMP has not given this Court the information needed to assess overbreadth. Second, JAMP's own expert Dr. Falconer explains why hydrodynamic diameter and osmolality may not need to be explicitly specified in the claims, casting doubt on JAMP's claim that they are missing.

(4) Double patenting

[604] JAMP alleges that the asserted claims of the 458 Patent are invalid for double patenting. Specifically, JAMP says that claim 9 of Canadian Patent No 2,815,687 ("689 Patent") and its dependent claims share the same inventive concept and essential elements as the 458 Patent. Therefore, there are no differences and there is no inventive ingenuity.

[605] AbbVie argues the asserted claims of the 458 Patent are valid for two reasons. First, AbbVie explains that JAMP's argument fails because a later filed (and therefore later expiring) patent cannot be used to invalidate and earlier filed (and therefore earlier expiring) patent on the basis of double patenting. Second, AbbVie says that even if a later filed patent could invalidate an earlier patent it could not occur where the later-expiring patent has been dedicated to the public. AbbVie dedicated the 689 Patent to the public on September 9, 2022, which was approximately two months before the start of the trial.

(a) *Considerations for Selecting the Relevant Date*

[606] The parties disagree about the relevant date for a double patenting analysis. JAMP argues for the date of issuance, claiming that the 689 Patent allowed AbbVie to benefit from eight months of a monopoly on the 458 Patent before the 689 Patent was granted. AbbVie, by contrast, argues that the relevant date is the filing date.

[607] In canvassing double patenting decisions, I note that the courts have used both the issuance date and filing date as the relevant date—JAMP and AbbVie have each submitted cases going to one or the other. Often, the factual constraints and the stances taken by parties influence the relevant dates selected (*Apotex Inc v Eli Lilly Canada Inc*, 2016 FCA 267 at para 40).

[608] Double patenting is not a single ground of invalidity. Rather, there are two kinds of double patenting: same invention double patenting and obviousness double patenting (*Whirlpool* at paras 64-66). Generally, the confusion in the case law surrounding the appropriate date for assessing double patenting only applies to obviousness-type double patenting, since the time between filing dates, publication dates, issuance dates, and combinations thereof, may change the state of the art and common general knowledge (*Mylan Pharmaceuticals ULC* at para 44).

[609] All of this must, however, keep in mind the purpose of the double patenting doctrine. Double patenting is a means of preventing patentees from securing more advantage than they are entitled to from their inventions. The most often discussed advantage is time extension, and double patenting usually seeks “to prevent a patentee from effectively extending the life of the

previous patent" (*Hospira* at para 96). This has also been referred to as the "evergreen" problem (*Whirlpool* at para 63; *Les Laboratoires Servier v Apotex Inc*, 2019 FC 616 at para 305). One consequence of this is that a later expiring patent typically cannot be used to invalidate an earlier expiring patent, though a later expiring patent can be invalidated in light of an earlier expiring one. Per Justice Hughes in *Bayer Inc v Cobalt Pharmaceuticals Company*, 2013 FC 1061, aff'd 2015 FCA 116 [*Bayer*]:

> [144] Given the expiry date of each of the '426 patent (August 31, 2020) and the '728 patent (December 22, 2019), it is obvious that the '426 patent may be challenged for Double Patenting in light of the '728 patent, but not the other way around. Only the '728 patent has been challenged by Cobalt in light of the '426 patent. Thus, that challenge is not justified.
>
> [Emphasis added.]

[610] *Merck* explains that where the patentee attempts to secure an advantage through a dedication, the Court should not permit the declaration to secure the advantage (at para 31). Even where the party did not intend to secure more than what it was entitled to under the *Patent Act*, allowing the advantage is fundamentally unfair. However, "[i]n circumstances where there is no suggestion that the patentee had extended its monopoly, dedication of claims under one patent may protect another patent with overlapping claims from an allegation of double patenting" (at para 30).

[611] There are further considerations under the *Regulations*. Most relevant to the present circumstances, JAMP claims that the double patenting of drugs confers unfair advantages; specifically, that generic manufacturers will need to address the double patents when seeking NOCs.

[612] Justice Kelen of this Court addressed this problem in *Glaxosmithkline Inc. v Apotex Inc*, 2003 FCT 687 (CanLII), [2003] FCJ No 886 (QL) [*GSK* cited to CanLII]:

> 90. I cannot agree with GSK that "the sin of double patenting" has evaporated. GSK has overlooked the impact that a second patent can have under the *Regulations*. Under paragraph 7(1)(e) of the *Regulations*, the Minister is prohibited from issuing the requested NOC for 24 months once the owner of a patent has applied for an order under subsection 6(1). The effect of this provision is to put in place a mandatory injunction that remains in force until either the case is disposed of or the 24-month period expires. The existence of additional patents allows the patent-holder to bring additional applications, thereby obtaining multiple injunctive periods. There is no need to look further than the case at bar for an excellent example of this practice. Even though Apotex successfully invalidated the '637 patent in 2001, the filing of this application by GSK has prohibited Apotex from bringing its product to market for the past two years.
>
> [Emphasis added.]

[613] In *GSK*, the particular concern was that a patentee could obtain a two-year injunction for each patent listed under the relevant drug after the NOA was filed. Subsequent amendments to the *Regulations*, however, have remedied this, and under subsection 5(4) a second person now only need address in its NOA patents on the Register at the time of filing the NOA (see, for example, the decision of the Commissioner of Patents in CD 1328, 2012 CanLII 150834 at paras 27-29).

[614] However, I am not convinced that this amendment completely removes the potential for unfair advantage from double patenting under the *Regulations*. As JAMP points out, a first person with more patents under a given drug on the Register will make more work for a second person seeking a NOC for a biosimilar. This is ordinarily not a problem where several patents

correspond to the same drug on the Register, but it may constitute an unfair advantage for a first person where more work is created than a single invention warrants, i.e. where a generic manufacturer has to do a disproportionate amount of work due to a double patent.

(b) *Analysis*

[615] I am guided by *Merck* and *Bayer* in my conclusion on double patenting vis-à-vis patent term extension. Furthermore, I have kept in mind the evergreen problem which the double patenting doctrine has been formulated to address.

[616] The 689 Patent was filed after the 458 Patent and, per section 44 of the *Patent Act*, the filing date controls its term length. Were the 689 Patent not dedicated to the public by AbbVie, (very recently) it would therefore expire after the 458 Patent.

[617] For this reason, the 458 Patent would not extend AbbVie's monopoly on the subject matter disclosed in the 689 Patent—there would be no evergreen problem. That is not to say that, were the filing dates of the patents reversed, the dedication would save the 458 Patent from a double patenting analysis.

[618] However, an extension of a patent's term may not be the only concern under a double patenting analysis, though it is the most common. JAMP also argued that the presence of the 689 Patent on the Register was an attempt "to require biosimilars to address both patents under the PM (NOC) Regulations".

[619] I recognize that there is merit to this kind of argument, and it is in line with the holding in *GSK*. Yet, I notice that JAMP has not advanced its argument beyond this vague formulation. I am open to the possibility that double patenting may lead to unfair advantages under the *PM (NOC) Regulations*—an extension of the monopoly other than in time—but a clearer description of the actual unfair advantage conferred by the double patenting would be needed to ground such a finding.

[620] To conclude, AbbVie's dedication has not extended its monopoly in time, and JAMP has not clearly articulated what other advantage AbbVie has received via its dedication under the *PM (NOC) Regulations*. A double-patent on the register, even when it does not confer an advantage on the patentee, should be removed. AbbVie's dedication has done that. Therefore, I find that the 458 Patent is not an invalid double-patent.

VIII. Infringement

A. *Patents 868 and 917*

[621] In the event the patents are valid, AbbVie claims JAMP is inducing physicians and patients to infringe the 868 and 917 Patents. JAMP argues induced infringement is a difficult test to meet. As set out by the Federal Court of Appeal in *Weatherford*, in order to establish inducement, the patentee must show (at para 162):

> 1) The act of infringement must have been completed by the direct infringer;
>
> 2) The completion of the acts of infringement must be influenced by the acts of the alleged inducer to the point that, without the influence, direct infringement would not take place; and

> 3) The influence must knowingly be exercised by the inducer, that is, the inducer knows that this influence will result in the completion of the act of infringement.

[622] I agree that this is a difficult test to meet. However, for the purposes of this analysis, I do not need to determine whether JAMP induced infringement of Patents 868 and 917. As discussed above, I have already found both patents are invalid. As such, there can be no infringement where there is no patent.

B. *Patent 458*

[623] In the updated Joint Statement of Issues, JAMP agreed to infringement of the 458 Patent claims in the event they were found valid. As I have found the 458 Patent claims are valid, the only question remaining is entitlement to relief.

C. *Other Actions*

[624] I wish to comment on AbbVie's two actions (T-557-21 and T-561-21), which are not presently at issue. The parties agree that the infringement issues in the impeachment actions do not depend on JAMP being a "second person" under the *Regulations*. However, I disagree in part.

[625] Despite finding AbbVie's patents invalid under the impeachment actions, it is relevant for the purposes of any appeal to note that AbbVie cannot argue future infringement of these patents, unless it can meet the strict requirements of a *quia timet* patent infringement action (see e.g. *Connaught Laboratories Ltd v Smithkline Beecham Pharma Inc* (1998), 158 FTR 194, 1998

CanLII 8917 (FC); *Gilead Sciences, Inc v Teva Canada Limited*, 2016 FC 336). As was raised by counsel for JAMP during the trial, the only statutory basis to bring a *quia timet* patent infringement action is under subsection 6(1) of the *Regulations*.

[626] In *Teva Canada Innovation v Pharmascience Inc*, 2019 FC 595, Associate Judge Tabib explained the difference between section 55 of the *Patent Act* and subsection 6(1) of the *Regulations*. [Appendix A]. She indicated that infringement actions are statutory in nature and Section 55 of the *Patent Act* provides for that, but "Absent an actionable act of infringement, a patentee would have no means under the Patent Act to pre-emptively sue or seek an injunction to prevent a generic from coming to market with an infringing product, unless it can plead facts showing that the generic is using the invention for purposes other than seeking regulatory approval or unless it can meet the very stringent test for bringing a quia timet action" (para 9). Further she opined that to balance the rights of the innovators and the generics that "the Government has used the regulatory powers conferred by section 55.2(4) of the Patent Act to create the rights of action found in section 6(1) of the Regulations" (para 10).

[627] Accordingly, in the event of an appeal from this decision, and T-557-21 and T-561-21 become live actions again, AbbVie will have a statutory basis to argue future infringement.

IX. Relief

[628] Having found that the 458 Patent is valid, I next turn to AbbVie's request for an injunction: (a) restraining JAMP from making, using (including in Phase IV clinical trials), promoting, or selling SIMLANDI in Canada until the 458 Patent expires on November 28, 2028;

(b) requiring existing SIMLANDI patients to transition to an appropriate alternative within a 6 month period according to the procedure set out by Mr. Palmer; and (c) the delivery up or destruction of all infringing products.

[629] Section 57 of the *Patent Act* [Appendix A] gives the Court the discretion to grant an injunction to prevent a party from further use, manufacture or sale of the subject matter of a patent. Accordingly, even where infringement is found, the Court may decline to grant an injunction: *Rovi* at para 645.

[630] As found by Justice Martineau in *Eurocopter* at para 397, this discretionary power is usually granted unless there is an equitable reason not to. He noted this type of injunction is not only for the benefit of the successful party, but it is also in the public interest to ensure the enforceability of the patent system. Equitable factors could include delay, a lack of clean hands, unconscionability and triviality.

[631] In this case, JAMP argues permanent injunctive relief is not warranted for public interest reasons. JAMP highlights that AbbVie received approval for its formulation in 2015 in the US. It did not market its formulation to Canadian adults. JAMP notes SIMLANDI entered the Canadian marketplace in 2022. It is one of two 100 mg/mL formulations available to adults, and the only 80 mg/0.8 mL formulation.

[632] JAMP contends an alternate remedy is available. Specifically, it proposes a reasonable, running royalty on future sales of SIMLANDI, noting AbbVie presumably already receives

royalties, as it has licensing agreements with seven other pharmaceutical companies in Canada that offer adalimumab biosimilars.

[633] Further, JAMP contends the sale of SIMLANDI does not impact the sale of HUMIRA, given the reimbursement policies of provincial drug plans. JAMP notes HUMIRA would not benefit from additional sales in the event SIMLANDI was removed, as SIMLANDI patients would be switched to another biosimilar, for which AbbVie is likely receiving a royalty.

[634] Finally, JAMP argues the public interest would be disserved by removing SIMLANDI. The removal of SIMLANDI would deprive patients of the only 80 mg/0.8 mL formulation available in Canada. JAMP notes that, if SIMLANDI and Yuflyma are removed, all SIMLANDI patients will have to switch to a biosimilar with a higher injection volume and possibly citrate. JAMP states this could increase injection site pain for these patients and cause them harm.

[635] Notably, Drs. Mysler and Rubin suggested citrate could cause injection site pain in certain patients, and that pain is subjective and may be greater for some patients. In terms of injection volume, the experts indicated, again, that this could cause increased injection site ("ISP") pain for some patients. Though the evidence is scant for those few patents, it could be very harmful.

[636] Additionally, the JAMP experts, along with Dr. Marshall, in 2021 discussed how non-medical switching could negatively impact patients, through the "nocebo effect". This could result in actual harm to patients given their perception of an increase in ISP. There was some

evidence that ISP can affect a patient's quality of life and their adherence to a prescription. According to the Canadian Rheumatology Association, this occurred when the 50 mg/mL formulation was introduced over the 100 mg/mL. Again, the evidence was relatively limited but there was evidence of public harm.

[637] SIMLANDI is the only biosimilar that is higher concentration, lower volume, and citrate-free at an 80 mg/0.8mL presentation. JAMP indicated there was no evidence about whether Yuflyma's entry into the market was conditional on SIMLANDI's, meaning the switching to a biosimilar with citrate or a higher injection volume could represent an issue for some patients. Dr. Mylser also testified that doctors have preferences depending on patient support programs, and there was little evidence presented regarding all the patient support programs.

[638] Including SIMLANDI, there are eight biosimilar adalimumab products in Canada, which are as follows:

Biosimilar	Info	Volume/Citrate
SIMLANDI	Marketed by JAMP Pharma Corporation Entered the marketplace in or around May 2022 Available as 40 mg/0.4 mL pre-filled syringe and pre-filled auto-injector, or 80 mg/0.8 mL pre-filled syringe	Higher concentration, lower volume, citrate-free
Yuflyma	Marketed by Celltrion Healthcare Canada Entered the marketplace in or around March 2022 Available as a 40 mg/0.4 mL pen	Higher concentration, lower volume, citrate-free
Hadlima	Marketed by Samsung Bioepis Co. Ltd. Entered the market in February 2021	Lower concentration, higher volume, citrate-containing

	Available as 40 mg/0.8 mL pre-filled syringe or 40 mg/0.8mL pre-filled auto-injector	
Hyrimoz	Marketed by Sandoz Canada Inc. Entered the market in February 2021 Available as a 20 mg/0.4 mL pre-filled syringe or 40 mg/0.8 mL pre-filled syringe or 40 mg/0.8 mL pre-filled auto-injector	Lower concentration, higher volume, citrate-containing
Idacio	Developed and marketed by Fresenius Kabi Canada Ltd. Entered the Canadian market in February 2021. Available as a 40 mg/0.8 mL pre-filled pen injector and a 40 mg/0.8 mL pre-filled syringe.	Lower concentration, higher volume, citrate-containing
Abrilada	Marketed by Pfizer Canada ULC Entered the market in February 2022 Available as a 40 mg/0.8 mL pre-filled pen injector and a 40 mg/0.8 mL pre-filled syringe	Lower concentration, higher volume, citrate-free
Amgevita	Marketed by Amgen Canada Inc. Entered the marketplace in February 2021 Available as a 40 mg/0.8 mL pre-filled auto-injector, a 40 mg/0.8mL pre-filled syringe and a 20 mg/0.4 mL pre-filled syringe	Lower concentration, higher volume, citrate-free
Hulio	Marketed by BGP Pharma ULC Entered the marketplace in February 2021 Available as a 40 mg/0.8 mL pre-filled pen injector, 40 mg/0.8 mL pre-filled syringe, and a 20 mg/0.4 mL pre-filled syringe	Lower concentration, higher volume, citrate-free

[639] In contrast, AbbVie argues there is no equitable reason to deny granting a permanent injunction. AbbVie states injunctions are the rule, not the exception in patent cases. AbbVie contends a running royalty would not be an adequate alternative remedy, as AbbVie cannot be made whole if JAMP continues to sell SIMLANDI without the former's consent. AbbVie states that, if the Court finds otherwise, it will undermine the patent system.

[640] AbbVie argues JAMP's characterization of it as a non-practicing entity is incorrect, given it sells adalimumab for the treatment of IBD and HS in Canada, and sells its 100 mg/mL concentration citrate-free formulation for pediatric patients. AbbVie contends JAMP's position, that it is filling a void, is wrong since there are other citrate free biosimilars on the market and Health Canada has found that approved biosimilars are all relatively similar to HUMIRA. Therefore, SIMLANDI is not better or preferable to other adalimumab biosimilars. AbbVie states JAMP's harm theory is not scientifically supported, as there is no evidence that patients will be harmed if they no longer have access to SIMLANDI.

[641] JAMP presented that AbbVie has chosen not to market the formulation of 100 mg/mL, citrate-free adalimumab in Canada after marketing this formulation worldwide and despite having Health Canada approval. SIMLANDI, like HUMIRA's formulation, has a high concentrate, reduced injection volume, no citrate with a 29 gauge needle (Rubin August Report, Exhibit 84). I note all of the biosimilars, including HUMIRA, use a 29 gauge needle. As well, SIMLANDI is one of two 100 mg/mL formulations but the only 80 mg/0.8 mL formulation.

[642] This is one of those rare cases where I will not grant a permanent injunction given the public interest factor. Forcing SIMLANDI patients to switch to another biosimilar, given it is the only 80 mg/0.8 mL formulation in Canada, is not in the public interest. AbbVie can be compensated. Even though the risk is low to those patients, it is preferable to compensate AbbVie rather than take SIMLANDI off the market. JAMP does not need to deliver up its infringing product.

[643] As suggested it is possible that AbbVie can be compensated by a reasonable, running royalty on future sales of SIMLANDI for any loss. This rate should easily be determined given the licensing agreements it has with seven other biosimilar pharmaceutical companies. But I will not make this determination as it is left to be determined at the bifurcated trial if the parties do not reach an agreement before.

X. Conclusion

[644] I find that the 868 and 917 Patents are invalid on the basis of obviousness. I find that the 458 Patent is valid. As JAMP has conceded to infringement of the 458 Patent, AbbVie is entitled to relief. However, I will not grant an injunction in this matter.

[645] The confidential decision will be provided to the parties for them to provide the Court with any confidential information that is to be redacted. An agreement by the parties to what is confidential is preferred and is to be provided to the Court within 7 days of this decision.

XI. Costs

[646] On March 15, 2023, the parties informed the Court by way of a joint letter that they agreed on the following cost terms for the 458, 868 and 917 Patents that proceeded to trial as well as the 142 Patent. The Parties have not agreed on costs for the 745 and 009 Patents which the parties have confirmed will be discontinued and will be dealt within a separate motion in writing.

Outcome	Position re Costs
If either JAMP or AbbVie succeed in respect of all three patents asserted at trial	The successful party will be awarded costs on the basis of: i. 37.5% of reasonable legal fees allocable to the Asserted Patents as well as the 142 Patent; ii. 100% of reasonable disbursements, including reasonable fees for testifying fact and expert witnesses, allocable to the Asserted Patents as well as the 142 Patent for the 142 Patent no expert fees allocated if an expert did not tender a report for the 142 Patent.
Divided success (i.e. neither AbbVie nor JAMP succeed in respect of all Asserted Patents)	Each party will bear their own costs and there will be no award of costs
	No costs awarded for steps that had been ordered or agreed that there would be no award such as protective order, bifurcation order etc.
	If the costs cannot be agreed on then the parties can seek further direction from the court.
Patents 745 and 009 Patents no agreement regarding costs	That the judgment on the merits can be released pending determination of any costs flowing from the discontinued actions. This determination would be a motion in writing and they seek a further direction regarding the timeline and who would determine the motion.

[647] Given I have found two of the patents are invalid, and one valid and infringed there has been divided success between the parties. As such, I direct each party to bear their own costs for this matter. The Court appreciates when the parties reach agreements regarding costs.

JUDGMENT IN T-557-21, T-561-21, T-573-21 AND T-577-21

THIS COURT'S JUDGMENT is that:

1. Claims 1 to 5 of the 868 Patent are invalid on the asserted ground of obviousness.

2. A declaration that none of JAMP's activities constitute an infringement of claims 1-5 of the 868 Patent;

3. Claims 1 and 3-5 of the 917 Patent are invalid on the asserted ground of obviousness;

4. A declaration that none of JAMP's activates constitute an infringement of claims 1 and 3-5 of the 917 Patent;

5. The claims of the 458 Patent are valid;

6. A declaration that the claims of the 458 claims were infringed by the Defendant;

7. As agreed by the parties, each party will bear their own costs and there will be no award of costs.

"Glennys L. McVeigh"
Judge

APPENDIX A

Relevant provisions of the *Patent Act:*

Definitions	**Définitions**
2 In this Act, except as otherwise provided,	**2** Sauf disposition contraire, les définitions qui suivent s'appliquent à la présente loi.
…	…
invention means any new and useful art, process, machine, manufacture or composition of matter, or any new and useful improvement in any art, process, machine, manufacture or composition of matter;	**invention** Toute réalisation, tout procédé, toute machine, fabrication ou composition de matières, ainsi que tout perfectionnement de l'un d'eux, présentant le caractère de la nouveauté et de l'utilité.
Commissioner may grant patents	**Délivrance de brevet**
27 (1) The Commissioner shall grant a patent for an invention to the inventor or the inventor's legal representative if an application for the patent in Canada is filed in accordance with this Act and all other requirements for the issuance of a patent under this Act are met.	**27 (1)** Le commissaire accorde un brevet d'invention à l'inventeur ou à son représentant légal si la demande de brevet est déposée conformément à la présente loi et si les autres conditions de celle-ci sont remplies.
Application requirements	**Note marginale: Dépôt de la demande**
(2) The prescribed application fee must be paid and the application must be filed in accordance with the regulations by the inventor or the inventor's legal representative and the application must contain a	**(2)** L'inventeur ou son représentant légal doit, conformément aux règlements, déposer une demande qui comprend une pétition et un mémoire descriptif de l'invention et payer la taxe réglementaire.

petition and a specification of the invention.

Specification

(3) The specification of an invention must

(a) correctly and fully describe the invention and its operation or use as contemplated by the inventor;

(b) set out clearly the various steps in a process, or the method of constructing, making, compounding or using a machine, manufacture or composition of matter, in such full, clear, concise and exact terms as to enable any person skilled in the art or science to which it pertains, or with which it is most closely connected, to make, construct, compound or use it;

(c) in the case of a machine, explain the principle of the machine and the best mode in which the inventor has contemplated the application of that principle; and

(d) in the case of a process, explain the necessary sequence, if any, of the various steps, so as to distinguish the invention from other inventions.

Note marginale: Mémoire descriptif

(3) Le mémoire descriptif doit:

a) décrire d'une façon exacte et complète l'invention et son application ou exploitation, telles que les a conçues son inventeur;

b) exposer clairement les diverses phases d'un procédé, ou le mode de construction, de confection, de composition ou d'utilisation d'une machine, d'un objet manufacturé ou d'un composé de matières, dans des termes complets, clairs, concis et exacts qui permettent à toute personne versée dans l'art ou la science dont relève l'invention, ou dans l'art ou la science qui s'en rapproche le plus, de confectionner, construire, composer ou utiliser l'invention;

c) s'il s'agit d'une machine, en expliquer clairement le principe et la meilleure manière dont son inventeur en a conçu l'application;

d) s'il s'agit d'un procédé, expliquer la suite nécessaire, le cas échéant, des diverses phases du procédé, de façon à distinguer l'invention en cause d'autres inventions.

Claims

(4) The specification must end with a claim or claims defining distinctly and in explicit terms the subject-matter of the invention for which an exclusive privilege or property is claimed.

Subject-matter of claim must not be previously disclosed

28.2 (1) The subject-matter defined by a claim in an application for a patent in Canada (the "pending application") must not have been disclosed

(a) before the one-year period immediately preceding the filing date or, if the claim date is before that period, before the claim date by the applicant, or by a person who obtained knowledge, directly or indirectly, from the applicant, in such a manner that the subject-matter became available to the public in Canada or elsewhere;

(b) before the claim date by a person not mentioned in paragraph (a) in such a manner that the subject-matter became available to the public in Canada or elsewhere;

(c) in an application for a patent that is filed in Canada by a person other than the applicant, and has a filing date

Note marginale: Revendications

(4) Le mémoire descriptif se termine par une ou plusieurs revendications définissant distinctement et en des termes explicites l'objet de l'invention dont le demandeur revendique la propriété ou le privilège exclusif.

Objet non divulgué

28.2 (1) L'objet que définit la revendication d'une demande de brevet ne doit pas:

a) soit plus d'un an avant la date de dépôt de celle-ci, soit, si la date de la revendication est antérieure au début de cet an, avant la date de la revendication, avoir fait, de la part du demandeur ou d'un tiers ayant obtenu de lui l'information à cet égard de façon directe ou autrement, l'objet d'une communication qui l'a rendu accessible au public au Canada ou ailleurs;

b) avant la date de la revendication, avoir fait, de la part d'une autre personne, l'objet d'une communication qui l'a rendu accessible au public au Canada ou ailleurs;

c) avoir été divulgué dans une demande de brevet qui a été déposée au Canada par une personne autre que le demandeur et dont la date de

that is before the claim date; or

(d) in an application (the "co-pending application") for a patent that is filed in Canada by a person other than the applicant and has a filing date that is on or after the claim date if

(i) the co-pending application is filed by

(A) a person who has, or whose agent, legal representative or predecessor in title has, previously regularly filed in or for Canada an application for a patent disclosing the subject-matter defined by the claim, or

(B) a person who is entitled to protection under the terms of any treaty or convention relating to patents to which Canada is a party and who has, or whose agent, legal representative or predecessor in title has, previously regularly filed in or for any other country that by treaty, convention or law affords similar protection to citizens of Canada an application for a patent disclosing the subject-matter defined by the claim,

(ii) the filing date of the previously regularly filed application is before the claim date of the pending application,

dépôt est antérieure à la date de la revendication de la demande visée à l'alinéa (1) a);

d) avoir été divulgué dans une demande de brevet qui a été déposée au Canada par une personne autre que le demandeur et dont la date de dépôt correspond ou est postérieure à la date de la revendication de la demande visée à l'alinéa (1) a) si :

(i) cette personne, son agent, son représentant légal ou son prédécesseur en droit, selon le cas:

(A) a antérieurement déposé de façon régulière, au Canada ou pour le Canada, une demande de brevet divulguant l'objet que définit la revendication de la demande visée à l'alinéa (1) a),

(B) a antérieurement déposé de façon régulière, dans un autre pays ou pour un autre pays, une demande de brevet divulguant l'objet que définit la revendication de la demande visée à l'alinéa (1) a), dans le cas où ce pays protège les droits de cette personne par traité ou convention, relatif aux brevets, auquel le Canada est partie, et accorde par traité, convention ou loi une protection similaire aux citoyens du Canada,

(iii) the filing date of the co-pending application is within twelve months after the filing date of the previously regularly filed application, and

(iv) the applicant has, in respect of the co-pending application, made a request for priority on the basis of the previously regularly filed application

(ii) la date de dépôt de la demande déposée antérieurement est antérieure à la date de la revendication de la demande visée à l'alinéa a),

(iii) à la date de dépôt de la demande, il s'est écoulé, depuis la date de dépôt de la demande déposée antérieurement, au plus douze mois,

(iv) cette personne a présenté, à l'égard de sa demande, une demande de priorité fondée sur la demande déposée antérieurement.

Invention must not be obvious

28.3 The subject-matter defined by a claim in an application for a patent in Canada must be subject-matter that would not have been obvious on the claim date to a person skilled in the art or science to which it pertains, having regard to

(a) information disclosed before the one-year period immediately preceding the filing date or, if the claim date is before that period, before the claim date by the applicant, or by a person who obtained knowledge, directly or indirectly, from the applicant in such a manner that the information became available to the public in Canada or elsewhere; and

Objet non évident

28.3 L'objet que définit la revendication d'une demande de brevet ne doit pas, à la date de la revendication, être évident pour une personne versée dans l'art ou la science dont relève l'objet, eu égard à toute communication:

a) qui a été faite, soit plus d'un an avant la date de dépôt de la demande, soit, si la date de la revendication est antérieure au début de cet an, avant la date de la revendication, par le demandeur ou un tiers ayant obtenu de lui l'information à cet égard de façon directe ou autrement, de manière telle qu'elle est devenue accessible au public au Canada ou ailleurs;

(b) information disclosed before the claim date by a person not mentioned in paragraph (a) in such a manner that the information became available to the public in Canada or elsewhere.

b) qui a été faite par toute autre personne avant la date de la revendication de manière telle qu'elle est devenue accessible au public au Canada ou ailleurs.

Restriction

(2) The specification and drawings contained in an application, other than a divisional application, may not be amended to add matter that cannot reasonably be inferred from the specification or drawings contained in the application on its filing date.

Limite

(2) Les dessins et le mémoire descriptif qui sont compris dans une demande autre qu'une demande divisionnaire ne peuvent être modifiés pour y ajouter des éléments qui ne peuvent raisonnablement s'inférer des dessins ou du mémoire descriptif qui sont compris dans la demande à sa date de dépôt.

Patent for one invention only

36 (1) A patent shall be granted for one invention only but in an action or other proceeding a patent shall not be deemed to be invalid by reason only that it has been granted for more than one invention.

Brevet pour une seule invention

36 (1) Un brevet ne peut être accordé que pour une seule invention, mais dans une instance ou autre procédure, un brevet ne peut être tenu pour invalide du seul fait qu'il a été accordé pour plus d'une invention.

Amendments to specifications and drawings

38.2 (1) Subject to subsections (2) and (3) and the regulations, the specification and any drawings furnished as part of an application for a patent in Canada may be amended before the patent is issued.

Modification du mémoire descriptif et des dessins

38.2 (1) Sous réserve des paragraphes (2) et (3) et des règlements, le mémoire descriptif et les dessins faisant partie de la demande de brevet peuvent être modifiés avant la délivrance du brevet.

Restriction on amendments to specifications

(2) The specification may not be amended to describe matter not reasonably to be inferred from the specification or drawings as originally filed, except in so far as it is admitted in the specification that the matter is prior art with respect to the application.

Limite

(2) Le mémoire descriptif ne peut être modifié pour décrire des éléments qui ne peuvent raisonnablement s'inférer de celui-ci ou des dessins faisant partie de la demande, sauf dans la mesure où il est mentionné dans le mémoire qu'il s'agit d'une invention ou découverte antérieure.

Contents of patent

42 Every patent granted under this Act shall contain the title or name of the invention, with a reference to the specification, and shall, subject to this Act, grant to the patentee and the patentee's legal representatives for the term of the patent, from the granting of the patent, the exclusive right, privilege and liberty of making, constructing and using the invention and selling it to others to be used, subject to adjudication in respect thereof before any court of competent jurisdiction.

Contenu du brevet

42 Tout brevet accordé en vertu de la présente loi contient le titre ou le nom de l'invention avec renvoi au mémoire descriptif et accorde, sous réserve des autres dispositions de la présente loi, au breveté et à ses représentants légaux, pour la durée du brevet à compter de la date où il a été accordé, le droit, la faculté et le privilège exclusif de fabriquer, construire, exploiter et vendre à d'autres, pour qu'ils l'exploitent, l'objet de l'invention, sauf jugement en l'espèce par un tribunal compétent.

Term of patents based on applications filed on or after October 1, 1989

44 Subject to section 46, where an application for a patent is filed under this Act on or after October 1, 1989, the term limited for the duration of the patent is

Durée du brevet

44 Sous réserve de l'article 46, la durée du brevet délivré sur une demande déposée le 1er octobre 1989 ou par la suite est limitée à vingt ans à

twenty years from the filing date.

compter de la date de dépôt de cette demande.

Liability for patent infringement

55 (1) A person who infringes a patent is liable to the patentee and to all persons claiming under the patentee for all damage sustained by the patentee or by any such person, after the grant of the patent, by reason of the infringement.

Contrefaçon et recours

55 (1) Quiconque contrefait un brevet est responsable envers le breveté et toute personne se réclamant de celui-ci du dommage que cette contrefaçon leur a fait subir après l'octroi du brevet.

Liability damage before patent is granted

(2) A person is liable to pay reasonable compensation to a patentee and to all persons claiming under the patentee for any damage sustained by the patentee or by any of those persons by reason of any act on the part of that person, after the specification contained in the application for the patent became open to public inspection, in English or French, under section 10 and before the grant of the patent, that would have constituted an infringement of the patent if the patent had been granted on the day the specification became open to public inspection, in English or French, under that section.

Indemnité raisonnable

(2) Est responsable envers le breveté et toute personne se réclamant de celui-ci, à concurrence d'une indemnité raisonnable, quiconque accomplit un acte leur faisant subir un dommage après la date à laquelle le mémoire descriptif compris dans la demande de brevet est devenu accessible au public, en français ou en anglais, sous le régime de l'article 10 et avant la date de l'octroi du brevet, dans le cas où cet acte aurait constitué une contrefaçon si le brevet avait été octroyé à la date où ce mémoire descriptif est ainsi devenu accessible.

Injunction may issue

57 (1) In any action for infringement of a patent, the court, or any judge thereof, may, on the application of the

Interdiction

57 (1) Dans toute action en contrefaçon de brevet, le tribunal, ou l'un de ses juges, peut, sur requête du plaignant

plaintiff or defendant, make such order as the court or judge sees fit,

(a) restraining or enjoining the opposite party from further use, manufacture or sale of the subject-matter of the patent, and for his punishment in the event of disobedience of that order, or

(b) for and respecting inspection or account,

and generally, respecting the proceedings in the action.

ou du défendeur, rendre l'ordonnance qu'il juge à propos de rendre :

a) pour interdire ou défendre à la partie adverse de continuer à exploiter, fabriquer ou vendre l'article qui fait l'objet du brevet, et pour prescrire la peine à subir dans le cas de désobéissance à cette ordonnance;

b) pour les fins et à l'égard de l'inspection ou du règlement de comptes,

et d'une façon générale, quant aux procédures de l'action.

Invalid claims not to affect valid claims

58 When, in any action or proceeding respecting a patent that contains two or more claims, one or more of those claims is or are held to be valid but another or others is or are held to be invalid or void, effect shall be given to the patent as if it contained only the valid claim or claims.

Revendications invalids

58 Lorsque, dans une action ou procédure relative à un brevet qui renferme deux ou plusieurs revendications, une ou plusieurs de ces revendications sont tenues pour valides, mais qu'une autre ou d'autres sont tenues pour invalides ou nulles, il est donné effet au brevet tout comme s'il ne renfermait que la ou les revendications valides.

Impeachment of patents or claims

60 (1) A patent or any claim in a patent may be declared invalid or void by the Federal Court at the instance of the Attorney General of Canada or at the instance of any interested person.

Invalidation de brevets ou de revendications

60 (1) Un brevet ou une revendication se rapportant à un brevet peut être déclaré invalide ou nul par la Cour fédérale, à la diligence du procureur général du Canada

ou à la diligence d'un intéressé.

Declaration as to infringement

(2) Where any person has reasonable cause to believe that any process used or proposed to be used or any article made, used or sold or proposed to be made, used or sold by him might be alleged by any patentee to constitute an infringement of an exclusive property or privilege granted thereby, he may bring an action in the Federal Court against the patentee for a declaration that the process or article does not or would not constitute an infringement of the exclusive property or privilege.

Déclaration relative à la violation

(2) Si une personne a un motif raisonnable de croire qu'un procédé employé ou dont l'emploi est projeté, ou qu'un article fabriqué, employé ou vendu ou dont sont projetés la fabrication, l'emploi ou la vente par elle, pourrait, d'après l'allégation d'un breveté, constituer une violation d'un droit de propriété ou privilège exclusif accordé de ce chef, elle peut intenter une action devant la Cour fédérale contre le breveté afin d'obtenir une déclaration que ce procédé ou cet article ne constitue pas ou ne constituerait pas une violation de ce droit de propriété ou de ce privilège exclusif.

Relevant provisions of the *Regulations:*

Register and Patent List

5 (1) If a second person files a submission for a notice of compliance in respect of a drug and the submission directly or indirectly compares the drug with, or makes reference to, another drug marketed in Canada under a notice of compliance issued to a first person and in respect of which a patent list has been submitted, the second person shall include in

Registre et liste de brevets

5 (1) Dans le cas où la seconde personne dépose une présentation pour un avis de conformité à l'égard d'une drogue, laquelle présentation, directement ou indirectement, compare celle-ci à une autre drogue commercialisée sur le marché canadien aux termes d'un avis de conformité délivré à la première personne et à l'égard de laquelle une liste de brevets a été présentée

the submission the required statements or allegations set out in subsection (2.1).

(2) If a second person files a supplement to a submission referred to in subsection (1) seeking a notice of compliance for a change in formulation, a change in dosage form or a change in use of the medicinal ingredient and the supplement directly or indirectly compares the drug for which the supplement is filed with, or makes reference to, another drug that has been marketed in Canada under a notice of compliance issued to a first person and in respect of which a patent list has been submitted, the second person shall include in the supplement the required statements or allegations set out in subsection (2.1).

(2.1) The statements or allegations required for the submission or the supplement, as the case may be, are — with respect to each patent included on the register in respect of the other drug and with respect to each certificate of supplementary protection in which the patent is set out and that is included on the register in respect of the other drug — the following:

(a) a statement that the owner of that patent has consented to the making, constructing, using or selling in Canada of the drug for which the

— ou y fait renvoi —, cette seconde personne inclut dans sa présentation les déclarations ou allégations visées au paragraphe (2.1).

(2) Dans le cas où la seconde personne dépose un supplément à la présentation visée au paragraphe (1), en vue d'obtenir un avis de conformité à l'égard d'une modification de la formulation, d'une modification de la forme posologique ou d'une modification de l'utilisation de l'ingrédient médicinal, lequel supplément, directement ou indirectement, compare la drogue pour laquelle le supplément est déposé à une autre drogue commercialisée sur le marché canadien aux termes de l'avis de conformité délivré à la première personne et à l'égard duquel une liste de brevets a été présentée — ou y fait renvoi —, cette seconde personne inclut dans son supplément les déclarations ou allégations visées au paragraphe (2.1).

(2.1) Les déclarations ou allégations exigées pour la présentation ou le supplément, selon le cas, à l'égard de chaque brevet inscrit au registre pour l'autre drogue — et à l'égard de chaque certificat de protection supplémentaire qui mentionne le brevet et qui est inscrit au registre pour cette autre drogue — sont les suivantes:

submission or supplement is filed by the second person;

(b) a statement that the second person accepts that the notice of compliance will not issue until that patent or certificate of supplementary protection, as the case may be, expires; or

(c) an allegation that

(i) the statement made by the first person under paragraph 4(4)(d) is false,

(ii) that patent or certificate of supplementary protection is invalid or void,

(iii) that patent or certificate of supplementary protection is ineligible for inclusion on the register,

(iv) that patent or certificate of supplementary protection would not be infringed by the second person making, constructing, using or selling the drug for which the submission or the supplement is filed,

(v) that patent or certificate of supplementary protection has expired, or

(vi) in the case of a certificate of supplementary protection, that certificate of supplementary protection cannot take effect.

(3) A second person who makes an allegation referred to in paragraph (2.1)(c) shall

a) soit une déclaration portant que le propriétaire du brevet a consenti à la fabrication, à la construction, à l'exploitation ou à la vente au Canada de la drogue à l'égard de laquelle la présentation ou le supplément a été déposé par la seconde personne;

b) soit une déclaration portant que la seconde personne accepte que l'avis de conformité ne soit pas délivré avant l'expiration du brevet ou du certificat de protection supplémentaire, selon le cas;

c) soit toute allégation portant que :

(i) la déclaration faite par la première personne en application de l'alinéa 4(4)d) est fausse,

(ii) le brevet ou le certificat de protection supplémentaire est invalide ou nul,

(iii) le brevet ou le certificat de protection supplémentaire est inadmissible à l'inscription au registre,

(iv) en fabriquant, construisant, exploitant ou vendant la drogue pour laquelle la présentation ou le supplément est déposé, la seconde personne ne contreferait pas le brevet ou le certificat de protection supplémentaire,

(a) serve on the first person a notice of allegation relating to the submission or supplement filed under subsection (1) or (2) on or after its date of filing;

(b) include in the notice of allegation

(i) a description of the medicinal ingredient, dosage form, strength, route of administration and use of the drug in respect of which the submission or supplement has been filed, and

(ii) a statement of the legal and factual basis for the allegation, which statement must be detailed in the case of an allegation that the patent or certificate of supplementary protection is invalid or void;

(c) serve the following documents with the notice:

(i) a certification by the Minister of the date of filing of the submission or supplement,

(ii) a document setting out the second person's address for service for the purpose of any action that may be brought against them under subsection 6(1), along with the names of and contact information for their anticipated solicitors of record if that action is brought,

(iii) a searchable electronic copy of the portions of the

(v) le brevet ou le certificat de protection supplémentaire est expiré,

(vi) dans le cas d'un certificat de protection supplémentaire, celui-ci ne peut pas prendre effet.

(3) La seconde personne qui inclut une allégation visée à l'alinéa (2.1)c) est tenue de prendre les mesures suivantes:

a) signifier à la première personne un avis de l'allégation à l'égard de la présentation ou du supplément déposé en vertu des paragraphes (1) ou (2), à la date de son dépôt ou à toute date postérieure;

b) insérer dans l'avis de l'allégation:

(i) une description de l'ingrédient médicinal, de la forme posologique, de la concentration, de la voie d'administration et de l'utilisation de la drogue visée par la présentation ou le supplément,

(ii) un énoncé du fondement juridique et factuel de l'allégation, lequel énoncé est détaillé dans le cas d'une allégation portant que le brevet ou le certificat de protection supplémentaire est invalide ou nul.

c) signifier, avec l'avis, les documents suivants:

submission or supplement that are under the control of the second person and relevant to determine if any patent or certificate of supplementary protection referred to in the allegation would be infringed, and

(iv) if the second person is alleging that the patent or certificate of supplementary protection is invalid or void, an electronic copy of any document — along with an electronic copy of it in English or French if available — on which the person is relying in support of the allegation;

(d) provide, without delay, to the first person any portion of a submission or supplement referred to in subparagraph (c)(iii) that is changed on or before the later of the 45th day after the day on which the notice of allegation is served and the day of the disposition of any action that has been brought under subsection 6(1); and

(e) provide to the Minister proof of service of the documents referred to in paragraphs (a) and (b), along with a copy of the notice of allegation.

…

(4) A second person is not required to comply with

(i) une attestation par le ministre de la date du dépôt de la présentation ou du supplément,

(ii) un document indiquant l'adresse de la seconde personne aux fins de signification dans le cas où une action serait intentée contre elle en vertu du paragraphe 6(1), ainsi que les noms et les coordonnées des avocats qui seraient inscrits au dossier dans un tel cas,

(iii) une copie électronique — pouvant faire l'objet de recherches — de toute partie de la présentation ou du supplément qui est sous le contrôle de la seconde personne et qui est pertinente pour établir si un brevet ou un certificat de protection supplémentaire visé par l'allégation serait contrefait,

(iv) si la seconde personne allègue que le brevet ou le certificat de protection supplémentaire est invalide ou nul, une copie électronique — ainsi qu'une copie électronique en français ou en anglais si une telle copie est disponible — de tout document à l'appui de son allégation;

d) transmettre à la première personne, dans les plus brefs délais, toute partie de la présentation ou du supplément visée au sous-alinéa c)(iii) qui est modifiée au plus tard le quarante-cinquième jour

(a) subsection (1) in respect of a patent, or a certificate of supplementary protection that sets out the patent, that is added to the register in respect of the other drug on or after the date of filing of the submission referred to in that subsection, including one added under subsection 3(2.2) or (5); and

(b) subsection (2) in respect of a patent, or a certificate of supplementary protection that sets out the patent, that is added to the register in respect of the other drug on or after the date of filing of the supplement referred to in that subsection, including one added under subsection 3(2.2) or (5).

suivant la date de signification de l'avis d'allégation ou, si elle est postérieure à ce jour, à la date à laquelle toute action intentée en vertu du paragraphe 6(1) est réglée;

e) transmettre au ministre la preuve de la signification des documents visés aux alinéas a) et b), ainsi qu'une copie de l'avis d'allégation.

…

(4) La seconde personne n'est pas tenue de se conformer:

a) au paragraphe (1) en ce qui concerne tout brevet, ou tout certificat de protection supplémentaire qui mentionne le brevet, ajouté au registre à l'égard de l'autre drogue — y compris celui ajouté en application des paragraphes 3(2.2) ou (5) — à compter de la date de dépôt de la présentation visée au paragraphe (1);

b) au paragraphe (2) en ce qui concerne tout brevet, ou tout certificat de protection supplémentaire qui mentionne le brevet, ajouté au registre à l'égard de l'autre drogue — y compris celui ajouté en application des paragraphes 3(2.2) ou (5) — à compter de la date de dépôt du supplément visé au paragraphe (2).

Right of Action

6 (1) The first person or an owner of a patent who receives a notice of allegation referred to in paragraph 5(3)(a) may, within 45 days after the day on which the first person is served with the notice, bring an action against the second person in the Federal Court for a declaration that the making, constructing, using or selling of a drug in accordance with the submission or supplement referred to in subsection 5(1) or (2) would infringe any patent or certificate of supplementary protection that is the subject of an allegation set out in that notice.

(2) If the person who brings an action under subsection (1) is not the owner of each patent — or of a patent that is set out in each certificate of supplementary protection — that is the subject of the action, the owner of each of those patents shall be or be made a party to the action.

(3) The second person may bring a counterclaim for a declaration

(a) under subsection 60(1) or (2) of the Patent Act in respect of any patent claim asserted in the action brought under subsection (1); or

(b) under 125(1) or (2) of that Act in respect of any claim, asserted in the action brought

Droits d'action

6 (1) La première personne ou le propriétaire d'un brevet qui reçoit un avis d'allégation en application de l'alinéa 5(3)a) peut, au plus tard quarante-cinq jours après la date à laquelle la première personne a reçu signification de l'avis, intenter une action contre la seconde personne devant la Cour fédérale afin d'obtenir une déclaration portant que la fabrication, la construction, l'exploitation ou la vente d'une drogue, conformément à la présentation ou au supplément visé aux paragraphes 5(1) ou (2), contreferait tout brevet ou tout certificat de protection supplémentaire visé par une allégation faite dans cet avis.

(2) Lorsque la personne qui intente l'action en vertu du paragraphe (1) n'est pas le propriétaire de chaque brevet — ou du brevet mentionné dans chaque certificat de protection supplémentaire — visé par cette action, le propriétaire de chacun de ces brevets est, ou est constitué, partie à l'action.

(3) La seconde personne peut faire une demande reconventionnelle afin d'obtenir une déclaration:

a) soit au titre des paragraphes 60(1) ou (2) de la Loi sur les brevets à l'égard de toute revendication se rapportant à un brevet faite dans le cadre

under subsection (1), in the patent set out in the certificate of supplementary protection in question in that action.

(4) If the Federal Court makes a declaration referred to in subsection (1), it may order any other remedy that is available under the Patent Act, or at law or in equity, in respect of infringement of a patent or a certificate of supplementary protection.

de l'action intentée en vertu du paragraphe (1);

b) soit au titre des paragraphes 125(1) ou (2) de la même loi, à l'égard de toute revendication, faite dans le cadre de l'action intentée en vertu du paragraphe (1), se rapportant au brevet mentionné dans le certificat de protection supplémentaire en cause dans cette action.

(4) Si la Cour fédérale fait la déclaration visée au paragraphe (1), elle peut ordonner toute autre réparation sous le régime de la Loi sur les brevets, ou en vertu de toute autre règle de droit, relativement à la contrefaçon d'un brevet ou d'un certificat de protection supplémentaire.

Notice of Compliance

8.1 A person who files a submission for a notice of compliance or a supplement to a submission for a notice of compliance in respect of a drug and who has reasonable grounds to believe that the making, constructing, using or selling of the drug might be alleged to infringe a patent or a certificate of supplementary protection is, if the submission or supplement directly or indirectly compares the drug with, or makes reference to, another drug marketed in Canada, an interested person

Avis de conformité

8.1 La personne qui dépose une présentation ou un supplément à une présentation pour un avis de conformité à l'égard d'une drogue et qui a un motif raisonnable de croire que la fabrication, la construction, l'exploitation ou la vente de celle-ci pourrait faire l'objet d'une allégation de contrefaçon d'un brevet ou d'un certificat de protection supplémentaire est, si la présentation ou le supplément, directement ou indirectement, compare cette drogue à une autre drogue commercialisée sur le marché canadien — ou y fait renvoi —, un intéressé:

(a) for the purpose of subsection 60(1) of the Patent Act with respect to bringing an action for a declaration that the patent or any claim in the patent is invalid or void; or

(b) for the purpose of subsection 125(1) of that Act with respect to bringing an action for a declaration that the certificate of supplementary protection or any claim in the patent set out in it is invalid or void.

a) pour l'application du paragraphe 60(1) de la Loi sur les brevets, pour ce qui est d'intenter une action afin d'obtenir une déclaration portant que le brevet ou toute revendication se rapportant au brevet est invalide ou nul;

b) pour l'application du paragraphe 125(1) de la même loi, pour ce qui est d'intenter une action afin d'obtenir une déclaration portant que le certificat de protection supplémentaire ou toute revendication se rapportant au brevet qu'il mentionne est invalide ou nul.

APPENDIX B

458 Patent Claims

Claim 1

An aqueous pharmaceutical formulation comprising an anti-tumor necrosis factor alpha (TNFα) antibody, or antigen-binding fragment of the antibody, at a concentration of at least 50 mg/mL and water, wherein the formulation has a conductivity of less than 2.5 mS/cm and the antibody, or antigen-binding fragment of the antibody, has a light chain variable region (LCVR) comprising a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) comprising a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8.

Claim 10

The formulation of claim 1, wherein the concentration of the antibody, or antigen-binding fragment of the antibody, is 100 mg/mL.

Claim 28

The formulation of any one of claims 1 -26, which comprises adalimumab and water.

Claim 37

The formulation of any one of claims 1 -36, further comprising a non-ionizable excipient.

Claim 38

The formulation of claim 37, wherein the non-ionizable excipient is a polyol, a non-ionic surfactant, sucrose, trehalose, raffinose, or maltose.

Claim 40

The formulation of claim 38, wherein the non-ionic surfactant is polysorbate 20, polysorbate 40, polysorbate 60 or polysorbate 80.

Claim 41

The formulation of any one of claims 1-40, wherein the formulation is stable in a liquid form for at least 3 months.

Claim 42

The formulation of any one of claims 1-40, wherein the formulation is stable in a liquid form for at least 12 months.

Claim 43

The formulation of any one of claims 1-40, wherein the formulation is stable in a liquid form for at least 22.5 months.

Claim 45

The formulation of any one of claims 1-44, wherein the formulation is suitable for in vitro or in vivo use.

Claim 46

The formulation of claim 45, wherein the formulation is suitable for administration to a subject via a mode of administration that is subcutaneous, intravenous, inhalation, intradermal, transdermal, intraperitoneal, or intramuscular.

Claim 47

The formulation of claim 45, wherein the formulation is suitable for administration to a subject via subcutaneous administration.

Claim 48

A device comprising the formulation of any one claims 1-47.

Claim 49

An article of manufacture comprising the formulation of any one of claims 1-47.

Claim 69

An aqueous pharmaceutical formulation comprising water and an antibody, or antigen-binding fragment of the antibody, at a concentration of at least 50 mg/mL, wherein the formulation has a conductivity of less than 2.5 mS/cm, and wherein the antibody, or antigen-binding fragment of the antibody, has a light chain variable region (LCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8.

Claim 72

The formulation of claim 69, wherein the concentration of the antibody, or antigen-binding fragment of the antibody, is 100 mg/mL.

Claim 75

The formulation of any one of claims 69-74, further comprising a non-ionizable excipient.

Claim 76

The formulation of claim 75, wherein the non-ionizable excipient is a polyol.

Claim 78

The formulation of claim 75, wherein the non-ionizable excipient is a non-ionic surfactant.

Claim 79

The formulation of claim 78, wherein the non-ionic surfactant is polysorbate 80.

Claim 80

The formulation of claim 75, wherein the non-ionizable excipient is sucrose.

Claim 83

The formulation of any one of claims 69-80, which comprises adalimumab and water.

Claim 124

A device comprising the formulation of any one of claims 69-123.

Claim 125

An article of manufacture comprising the formulation of any one of claims 69-123.

Claim 191

An aqueous pharmaceutical formulation comprising:

> (a) an anti-tumor necrosis factor alpha antibody comprising a light chain variable region (LCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:3, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:5, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region (HCVR) having a CDR3 domain comprising the amino acid sequence of SEQ ID NO:4, a CDR2 domain comprising the amino acid sequence of SEQ ID NO:6, and a CDR1 domain comprising the amino acid sequence of SEQ ID NO:8, wherein the concentration of the antibody is 50 to 200 mg/ml; and
> (b) water; wherein the formulation does not comprise a buffering system.

Claim 192

The formulation of claim 191, wherein the antibody comprises a LCVR comprising the amino acid sequence set forth in SEQ ID NO:1, and a HCVR comprising the amino acid sequence set forth in SEQ ID NO:2.

Claim 193

The formulation of claim 1 92, wherein the antibody is adalimumab.

Claim 194

The formulation of any one of claims 191-193, wherein the formulation further comprises a non-ionizable excipient.

Claim 195

The formulation of any one of claims 191-193, wherein the formulation further comprises a polyol.

Claim 196

The formulation of claim 195, wherein the polyol is mannitol, sorbitol, or sucrose.

Claim 197

The formulation of any one of claims 191-193, wherein the formulation further comprises a surfactant.

Claim 198

The formulation of claim 197, wherein the surfactant is polysorbate 80 or polysorbate 20.

Claim 204

The formulation of claim 193, wherein the pH of the formulation is from 5 to 6.

Claim 205

The formulation of claim 193, wherein the pH of the formulation is 5.2.

Claim 215

The formulation of any one of claims 1-180, wherein the pH of the formulation is 5.2.

Claim 217

The formulation of any one of claims 177-215, wherein the concentration of the antibody, or antigen-binding fragment of the antibody, is 100 mg/mL.

APPENDIX C

Dr. Baughman's Pharmacokinetic Profile – Parameters

Parameter	Value	Adjusted for F (CL/F; V/F)
CL	12 mL/hr	18.75 mL/hr
V	5400 mL	8400mL
F	64%	
K_a	0.017/hr	
T_{max}	131 hr	
K_e	0.002/hr	

APPENDIX D

Regimens A, B, and C Simulations

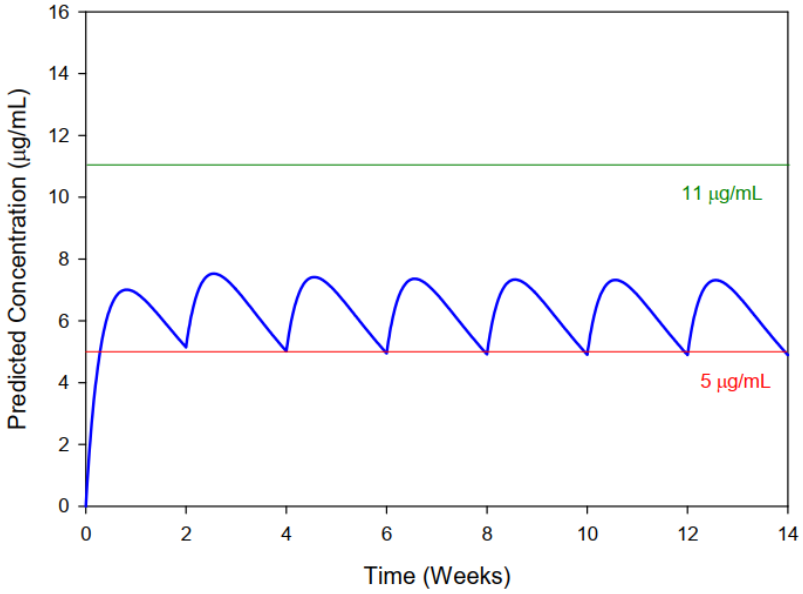

Figure 1. Simulation for Regimen A (80 mg week 0; 40 mg EOW)

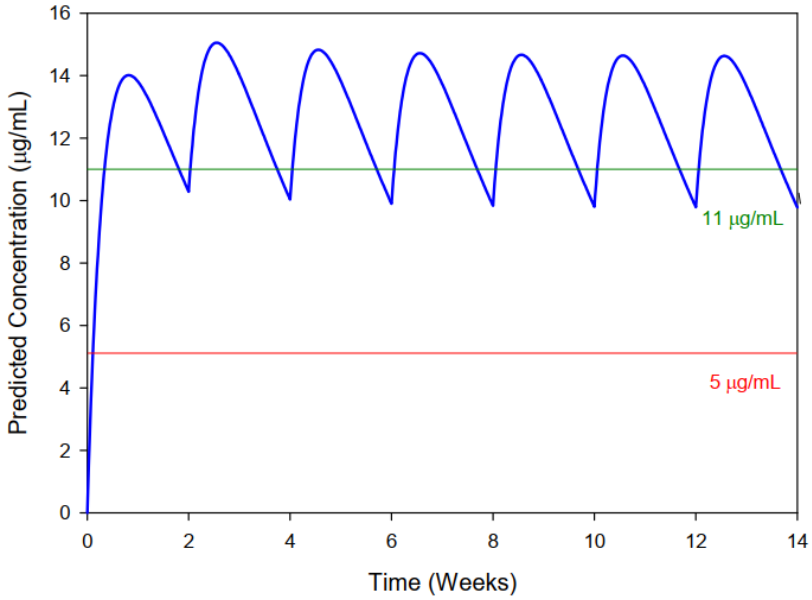

Figure 2. Simulation for Regimen B (160 mg week 0; 80 mg EOW)

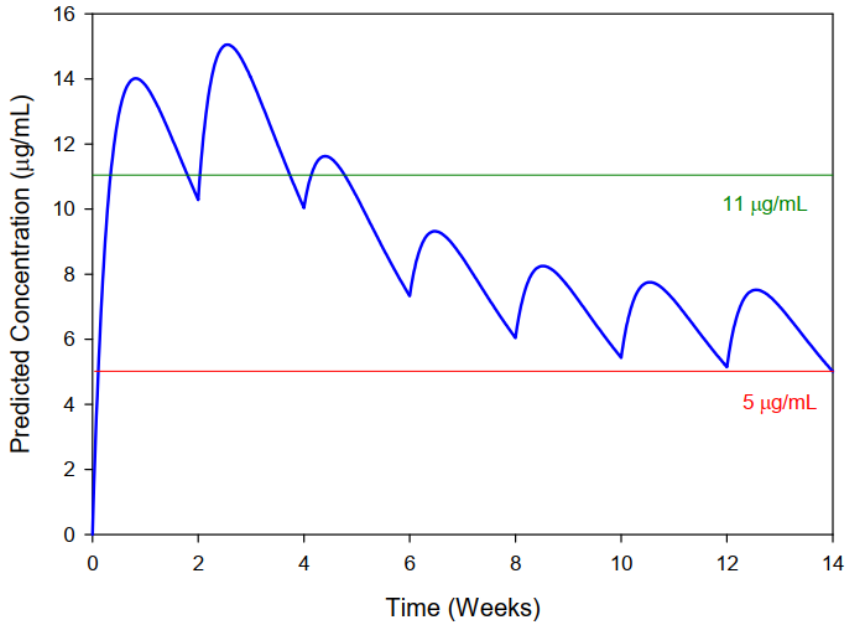

Figure 3. Simulation for Regimen C (160 mg week 0; 80 mg week 2; 4 0mg EOW)

FEDERAL COURT

SOLICITORS OF RECORD

DOCKETS:	T-557-21, T-561-21, T-573-21 AND T-557-21
DOCKET:	T-557-21
STYLE OF CAUSE:	ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD v JAMP PHARMA CORPORATION
AND DOCKET:	T-561-21
STYLE OF CAUSE:	JAMP PHARMA CORPORATION v ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD
AND DOCKET:	T-573-21
STYLE OF CAUSE:	JAMP PHARMA CORPORATION v ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD
AND DOCKET:	T-557-21
STYLE OF CAUSE:	ABBVIE CORPORATION AND ABBVIE BIOTECHNOLOGY LTD v JAMP PHARMA CORPORATION
PLACE OF HEARING:	TORONTO, ONTARIO
DATE OF HEARING:	NOVEMBER 14, 2022 TO DECEMBER 2, 2022 AND DECEMBER 13, 2022
CONFIDENTIAL JUDGMENT AND REASONS:	MCVEIGH J.
DATED:	DECEMBER 4, 2023 (CONFIDENTIAL JUDGMENT AND REASONS ISSUED NOVMEBER 16, 2023)

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