CRA Charles River Associates

Prepared for:

Innovative Medicines Canada

55 Metcalfe St, Suite 1220

Ottawa, ON K1P 6L5, Canada

The impact of IP and the promise doctrine on pharmaceutical R&D activity in Canada

Final report

Prepared By:

Tim Wilsdon and Adam Mitchell-Heggs

Charles River Associates

8 Finsbury Circus

London EC2M 7EA

Date: October 2016

CRA Project No. D21920-00

Table of contents

Table of figures

Executive summary

Charles River Associates (CRA) was asked by Innovative Medicines Canada (IMC) to survey Canadian industry with respect to the impact of the "promise of the patent doctrine" on pharmaceutical research and development (R&D) activity.

In recent years, Canadian federal courts have interpreted utility requirements of the *Patent Act* in a way that differs from the way it is interpreted in other countries and which predominantly impacts the pharmaceutical industry. If, in a given court case, the demonstration or evidence of the anticipated utility falls short of fulfilling the "promise" deemed to have been contained in the patent, the patent will be invalidated for lack of utility even if the invention is useful either to a different degree than promised or for some other purpose (the so-called "promise doctrine").

In effect, the promise doctrine presents three requirements:

1) A judge may construe the "promise of the patent" from the patent specification.
2) A heightened evidentiary standard for proof of utility is applied if a promise is construed, which requires that the promised utility either be "demonstrated" by the patentee or be based on a "sound prediction" of utility from the date of filing.
3) In relation to "sound prediction," a heightened disclosure requirement mandates that evidence establishing utility must have been disclosed in the original patent application.

As of September 2016, at least 28 pharmaceutical patents have been invalidated – either solely or partially – due to a lack of utility as a result of the judicial application of the promise doctrine, which arose out of the Federal Court in 2005. These decisions have allowed generic companies to manufacturer the drugs before their 20-year patent terms expired. The invalidation of this significant number of pharmaceutical patents as a result of heightened utility requirements has created an atmosphere of legal uncertainty among innovative pharmaceutical companies in Canada and beyond.[1]

The aim of this project was to explore evidence on the link between the intellectual property (IP) system (specifically the promise doctrine), and R&D investment in Canada. CRA initially undertook a literature review of existing assessments on the location of R&D in Canada and publicly available articles on the promise doctrine. This review was used as a framework for the development of both a structured interview guide and a survey, which were distributed among members of IMC's

[1] Vicki Needham, "Pharmaceutical companies express concerns about Canada revoking drug patents over their usefulness," 2014. Available at: http://thehill.com/policy/finance/199090-pharmaceutical-companies-express-concerns-about-canada-revoking

Legal and Compliance Network and Intellectual Property Core Team and to several Canadian business organizations. The resulting 18 completed surveys and 12 interviews form the basis for our findings and discussion. A total of 20 companies and organizations completed a survey and/or interview.

The majority of companies represented in the interviews and the survey shared similar views about factors that influence the location of R&D activity, such as the local IP climate and, more specifically, the promise doctrine. Our research yielded the following key conclusions:

- IP has been identified as an important factor in the determination of the location of R&D investment. While certain other independent factors (e.g. scientific strengths and costs of research) were cited by the majority of respondents as being more influential, the quality of an IP environment factors into the cumulative R&D perspective of a given location and carries particular weight when other factors are comparable.
- Uncertainty within the IP system was raised as a key factor in R&D decision-making. Where legal uncertainty is present, the local IP regime is weakened and becomes less attractive to investors.
- Given its implicit relationship with the local IP system and its perceived negative impact on legal certainty, the promise doctrine is a secondary factor in R&D investment appraisals.
- To date, the promise doctrine has not been identified as the sole cause of decreased investment levels in Canada. However, the promise doctrine was cited as having an important indirect effect on R&D investment decisions through the chilling effect it has had on Canada's innovation reputation.

In affirming a relationship between IP, the promise doctrine and investment decisions, the present study raises important concerns with regards to how Canada is being evaluated by pharmaceutical companies in a globalized market. Notably, it became clear that when Canada is assessed as a location for R&D investment, its local IP environment will be one of several key factors being compared to other nations – especially when all else is equal among comparator countries.

It is also clear from the interviews that an uncertain IP environment can have long-term reputational consequences that would take some time to restore. Although it may be difficult to directly attribute changing trends in the location of R&D investment to uncertainty in the IP environment, this study raises significant concerns with regards to the Canadian regime and how it compares to other nations.

Overall, in a world where IP global standards are gradually strengthening, Canada is perceived as falling behind other developed countries in rewarding innovation and ensuring certainty within its IP system for the innovative pharmaceutical

industry. Unlike many other factors that are beyond the control of the Canadian government (e.g. labour costs, market size, etc.), positively addressing IP issues such as the promise doctrine is one tangible way that Canada become a more attractive destination for international R&D investment. In the meanwhile and in light of the promise doctrine's significant potential to detract from the positive scientific and economic strengths of Canada's R&D perspective, how can Canada measure up to its global competitors?

1. Introduction

Charles River Associates (CRA) was asked by Innovative Medicines Canada (IMC) to survey Canadian industry with respect to the impact of the "promise of the patent doctrine" on pharmaceutical research and development (R&D) activity.

1.1. Background

Under the World Trade Organization's *Agreement on Trade-Related Aspects of Intellectual Property Rights* ("TRIPS"), in order to obtain a patent, an invention must be: (1) new; (2) non-obvious; and (3) useful (the utility requirement).[2] Although the Canadian *Patent Act*[3] embodies these norms, Canadian courts have interpreted the utility requirements of the legislation in a way that differs from the interpretation afforded by other countries and which impacts the pharmaceutical industry specifically.[4]

Under Canada's heightened utility requirements, new medicines are only considered to be useful if they do what they promised to do when the patent was applied for. This assessment of utility by the federal judiciary is called the "promise of the patent doctrine."[5] If, in a given court case, the demonstration or evidence of the anticipated utility falls short of fulfilling the "promise" deemed to have been contained in the patent, the patent will be invalidated for lack of utility even if the invention is useful either to a different degree than promised or for some other purpose.

In effect, the promise doctrine presents three requirements:

1. A judge may construe the "promise of the patent" from the patent specification.
2. A heightened evidentiary standard for proof of utility is applied if a promise is construed, which requires that the promised utility either be "demonstrated" by the patentee or be based on a "sound prediction" of utility from the date of filing.

---

2 *Agreement on Trade-Related Aspects of Intellectual Property Rights*, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex IC, 1869 U.N.T.S. 299, 33 ILM 1143 (1994) at art. 27.

3 *Patent Act*, RSC 1985, c P-4, at art. 2.

4 Note: The promise doctrine discriminates particularly against pharmaceutical or biotechnology related inventions as the patent application will have been filed before all clinical data has been established (i.e. before utility can demonstrated *in vivo*).

5 This requires that patent applications support the claimed inventive promise (made by the applicant to satisfy the utility requirement) by demonstrating use directly in working examples, or extrapolating from working examples via sound prediction, by the filing date of the application.

3. In relation to "sound prediction," a heightened disclosure requirement mandates that evidence establishing utility must have been disclosed in the original patent application.

The invalidation of a significant number of pharmaceutical patents as a result of heightened utility requirements has created an atmosphere of legal uncertainty among innovative pharmaceutical companies in Canada and beyond.[6]

Since 2005, when the doctrine began to emerge out of case law, 28 pharmaceutical patents have been invalidated – either solely or in part – for lack of utility as a result of the courts' application of the promise doctrine. These decisions have allowed generic companies to manufacturer the drugs prior to the natural expiry of the patent terms.[7]

The application of the utility requirement in Canada is different from the way utility is addressed in other international markets, as exemplified by several of Canada's major trading partners:[8]

- In the US, "to demonstrate that an invention is useful, an applicant must show that the invention has 'specific and substantial utility' or discloses sufficient information about the invention such that its utility is immediately apparent to those familiar with the technological field, so-called 'well-established utility.'"[9,10]
- In Europe, "patents shall be granted for any inventions … provided that they are new, involve an inventive step, and are susceptible of industrial application." Industrial applicability is established when an invention is "capable of being made or used in some kind of industry."[11]

1.2. Structure of the report

The remainder of the report is structured as follows:

---

6 Mark D. Penner and Richard Cheung, "Increased utility requirements in Canada? How the 'promise doctrine' has challenged patentees and what can be done to address these challenges," *Lawyer Issue, 2015.*

7 Vicki Needham, "Pharmaceutical companies express concerns about Canada revoking drug patents over their usefulness," 2014." Available at: http://thehill.com/policy/finance/199090-pharmaceutical-companies-express-concerns-about-canada-revoking

8 Jay A. Erstling, Amy M. Salmela and Justin N. Woo, "Usefulness Varies By Country: The Utility Requirement of Patent Law in the United States, Europe and Canada."

9 The United States Patent and Trademark Office (USPTO) "2107.01 General Principles Governing Utility Rejections [R-07.2015]" seen on USPTO.gov

10 This was described as "the basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility" by the US Supreme Court in *Brenner v. Manson*, 383 U.S. 519 (1966) at p. 383.

11 European Patent Office (EPO) "The European Patent Convention, Article 52 – Patentable inventions" seen on epo.org

- In Chapter 2, we describe the methodology used to survey Canadian industry with respect to the relationship between IP and the promise doctrine, and the location of R&D.
- In Chapter 3, we report on the interview and survey findings in terms of the relationship between the location of R&D investments and the local IP environment (and, by extension, the promise doctrine). Where appropriate, our findings are complemented with existing evidence from the secondary research.
- In Chapter 4, we discuss the main conclusions and lessons learned about the impact of IP and specifically of the promise doctrine on pharmaceutical R&D activity in Canada.

2. Methodology

In order to develop the contextual basis for this report, we undertook a background literature review of existing assessments of the location of R&D in Canada, including publicly available articles on the promise doctrine such as reports by Innovation, Science and Economic Development Canada, academics, consultants, and industry. However, the main focus of the project was to survey Canadian industry with respect to the potential relationship between R&D investment decisions and local IP environment.

Towards this aim, CRA invited members of IMC's Legal and Compliance Network and Intellectual Property Core Team as well as several industry stakeholders to participate in a structured interview and/or survey. On this basis, CRA was able to conduct primary research interviews with 12 key stakeholders and also yielded survey responses from 18 individuals, with a total of 20 companies and organizations participating in the survey and/or an interview. Survey participants were asked to volunteer to be contacted for a follow-up interview, after which time CRA included them in the pool of interviewees. Interviews and surveys were conducted among Canadian affiliates of the respective companies, where applicable, and all were carried out on the basis of anonymity. A list of participants, the discussion guide and the survey are provided in the appendix.[12]

For the structured interview process, CRA drafted a telephone interview guide around the following topics:

- Factors affecting the relationship between R&D investment and location
- Determining the relationship between R&D investment and IP
- Establishing a relationship between R&D investment and the promise doctrine

The survey was carried out using online survey software and completed over the period from May to July 2016. The survey asked fewer questions than the interview and focused on:

- Awareness of the promise doctrine
- Impact of the promise doctrine

In some instances, survey participants skipped questions, resulting in sample response rates smaller than the overall number of respondents (18) for certain questions.

12 Discussion guides were sent to interview participants ahead of time to allow them to review the discussion topics.

3. Results and discussion

In this chapter, we use the results gathered from the structured interview process and the survey to describe the relationships between the location of R&D and local IP environments (and, by extension, the promise doctrine). We look at two topics:

- Factors affecting the location of R&D investment
- The impact of the promise doctrine on the location of R&D activity

3.1. Intellectual property and related factors affecting the location of R&D investment

A particular location's IP environment was reported in both the survey and the in-depth interviews to be an important factor affecting the location of R&D investment. For example, one company reported that "*The policy environment is important to the global decision makers within our company. First and foremost they consider IP as this is the foundation of an innovative company and it is fundamental to have some certainty on exclusivity first. This is relevant to our investment decisions in Canada as our global decision makers take into consideration the policy environment of the countries they invest in.*" However, some other factors were ranked by respondents as being somewhat more important with respect to R&D investment decisions.

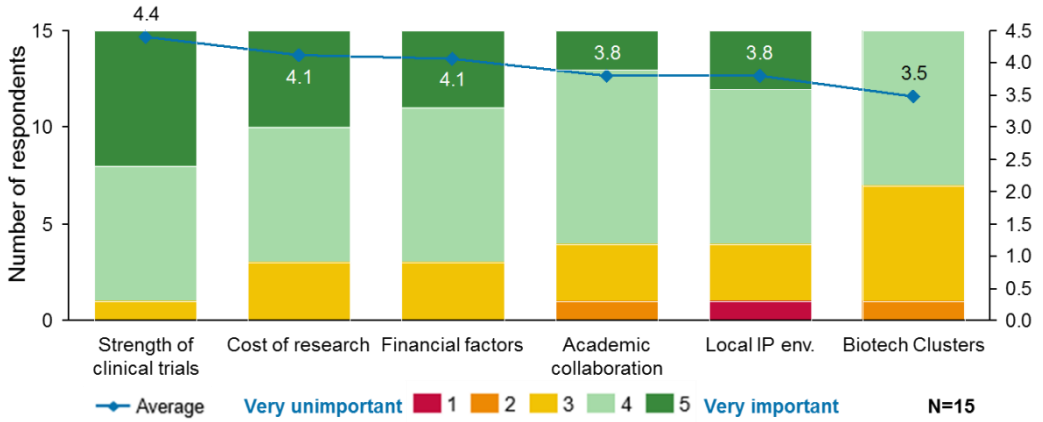
Almost all respondents interviewed highlighted that R&D location and investment decisions are determined on a global level; the distribution of funds for R&D is initially made on a global level with various country affiliates competing for funding. Local affiliates then make their case for R&D funding on the basis of scientific research strengths and local economic factors, but also on the basis of IP, academic collaboration, and biotech clusters:

- Clinical Trials: The scientific case for R&D investment was considered by respondents to be the most important reason for investing in a given location. This includes factors such as the clinical trial landscape, the quality of research, the workforce skillset and the science infrastructure.
- Economic/Legal and Regulatory case: There are various economic and legal/regulatory factors that stimulate R&D investment in a given location. These include financial factors (e.g. cost of research, financial incentives such as tax credits, currency rates) and legal/regulatory factors like IP regimes.

Respondents to the survey were asked to rate the relative importance of different factors in R&D investment decisions on a scale of 1-5 (with 1 indicating very unimportant and 5 indicating very important) (**Figure 1**). Respondents considered the strength of the clinical trials environment to be the most important factor. Despite being evaluated slightly behind the scientific and economic factors in terms of overall importance, the local IP environment was considered by most

respondents as being important (73% of respondents considered the local IP environment to be either an important or very important factor in investment decisions).

Figure 1: Relative importance of factors affecting R&D investment decisions



Source: CRA analysis of survey results.

Several interview respondents additionally highlighted that a country's IP environment is linked to that location's reputation as one that encourages and rewards innovation. Together, these findings are consistent with publicly available industry positions that state that a given location's scientific research strengths and supporting infrastructure are key factors influencing R&D investment decisions, but that additional factors include the strengths of commercial environments, supportive regulatory environments, industry/government relationships, fiscal and economic climates and supportive legal frameworks for intellectual property.[13] In addition, there are many existing academic papers that report a positive relationship between locations that have strong IP protection systems in place and

13 GSK, "GSK Public policy positions: Competitiveness and Investment Criteria,"" GSK Public policy positions, 2014.

local levels of innovative activity.[14,15,16,17] Consistent with our results above, these secondary sources demonstrate an interaction between national IP systems and other factors (i.e. scientific and economic factors, discussed above) in the creation of innovation- and investment-friendly environments.

For example, the Pugatch Consilium consultancy performed a study to identify the key factors that attract investment in clinical research (a necessary component in the approval and marketing of pharmaceuticals and a key indicator of R&D). It was a significant finding that key drivers were a combination of local research capacity and other supportive elements. The report states that around 30% of clinical trial intensity in a given location is attributable to health system capacity factors (e.g. number of hospital beds, number of physicians, and level of health spending) whereas over 40% can be explained by factors related to a pro-innovation culture, including the level of R&D spending and IP protection.[18] A more recent study by the same consultants has reiterated the importance of the IP environment – with an emphasis on the role of legal certainty.[19]

The topic of certainty within the IP system was a key factor affecting R&D investment decisions that emerged from the survey. Indeed, as illustrated in **Figure 2**, 86% of respondents stated that IP uncertainty is relevant with respect to R&D investment decisions. Given the length of the development process and the size of the investment required to bring a pharmaceutical product to market, certainty over the IP rules that will protect a product during its commercial life is crucial. Particularly important are the duration and quality of the IP protection, the conditions under which the patent can be challenged and the conditions governing rights of appeal.

14 For further evidence on the relationship between IP and innovation in developed markets, see E. Mansfield, "Patents and Innovation: An Empirical Study,", *Management Science* 32(2) (1986); or Wesley M. Cohen, Richard R. Nelson and John P. Walsh, "Protecting Their Intellectual Assets: Appropriability Conditions and Why US Manufacturing Firms Patent (or Not)"), National Bureau of Economic Research Working Paper 7552, 2000.

15 Iain M. Cockburn, "Intellectual Property Rights and Pharmaceuticals: Challenges and Opportunities for Economic Research," in The Economics of Intellectual Property: Suggestions for Further Research in Developing Countries and Countries with Economies in Transition, Chapter 5. World Intellectual Property Organization, 2009.

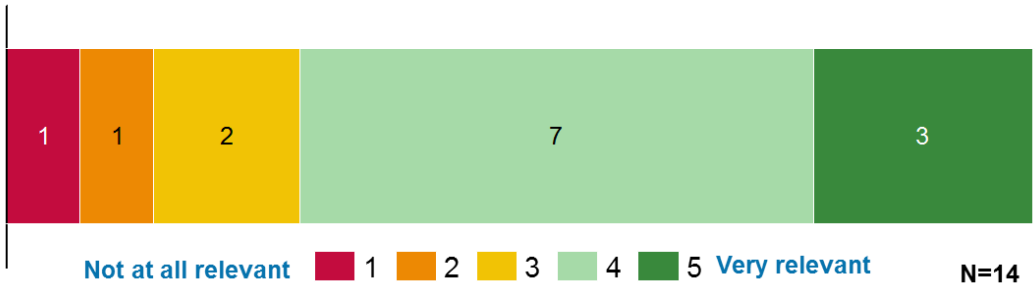
16 Yi Qian, "Do National Patent Laws Stimulate Domestic Innovation in a Global Patenting Environment?: A Cross-Country Analysis of Pharmaceutical Patent Protection, 1978-2002,"", The Review of Economics and Statistics, 89(3) (2007).

17 In addition to the evidence on developed countries, there is also some evidence that indication that an evolution and transformation of the pharmaceuticals industry is underway in emerging economies, such as India, since the introduction of the product patent Nobuo in certain locales. N. Kiriyama, "Trade and Innovation: Pharmaceuticals", OECD Trade Policy Working Papers, No. 113, OECD Publishing, 2011.

18 Pugatch Consilium "Scaling Up Global Clinical Trial Activity: Key Trends and Policy Lesson," 2014.

19 Pugatch Consilium "Building the Bioeconomy 2016 Examining National Biotechnology Industry Development Strategies Globally," 2016

Figure 2: Relevance of IP uncertainty in R&D investment decisions



Note: CRA analysis using survey results.

Our findings that IP and uncertainty in the IP environment are important factors in the determination of the location of R&D are consistent with existing research.

3.2. The impact of the promise doctrine on the location of R&D activity

Given the perceived importance of IP and legal certainty in R&D decision-making, we sought to examine the relationship between these issues and the promise doctrine. Unsurprisingly, all of the company respondents surveyed or interviewed were aware of the promise doctrine and its role in having invalidated the patents of important pharmaceutical products.

A clear connection was established between the promise doctrine and uncertainty in the Canadian IP system. Respondents – whether from companies directly impacted by the promise doctrine or not – reported that the subjective nature of the promise doctrine's interpretation by Canadian courts contributes a significant level of uncertainty to the national pharmaceutical IP system.

There was particular concern that decisions in which the promise doctrine has been applied represent a marked change in the judicial application of the rules around utility – a shift that occurred long after the patents for particular products had been granted by the Canadian Intellectual Property Office. Indeed, multiple companies have had a patent for at least one of their products challenged on the grounds of utility despite these patents having been filed prior to the introduction of the promise doctrine. The application of the promise doctrine in these cases meant that a different set of rules was being used to assess utility than those in effect at the time of patent filing. For example:[20]

- **AstraZeneca:** The Supreme Court of Canada ("SCC") has granted AstraZeneca leave to appeal a decision of the Federal Court of Appeal ("FCA"), which affirmed that the '653 Patent was invalid for lack of utility on the basis of the promise doctrine.[21] The matter is due to be heard before

20 Note: all company names refer to respective local Canadian affiliate.

21 *AstraZeneca Canada Inc. v Apotex Inc.*, 2014 FC 638, aff'd 2015 FCA 158.

the SCC in November 2016.[22] The Nexium patent under challenge was filed in Canada in 1998 and 1999 – years before the 2005 emergence of the promise doctrine.[23, 24]

- **GlaxoSmithKline ("GSK"):** GSK's Valtrex patent was invalidated in 2008 on the grounds of utility, which led to the subsequent market entry of multiple generic versions of the drug.[2526] GSK challenged this prior decision of invalidity through a series of infringement cases against all generic versions of Valtrex. It took GSK several years to regain patent exclusivity based on utility (in 2014), during which time the company suffered significantly from generic competition.[27]
- **Eli Lilly**: The promise doctrine has resulted in the invalidation of several Eli Lilly patents in Canada over the last decade.[28] In 2013, Eli Lilly began its challenge against the Government of Canada under the investor-state dispute resolution provisions of Chapter 11 of the *North American Free Trade Agreement* (NAFTA).[29,30] As noted in Lilly's filings, the promise doctrine was not the test for whether an invention was "capable of industrial application" when Lilly applied for the patents at issue or when the Canadian Intellectual Property Office thoroughly examined and issued these patents.[31]

In addition to the uncertainty around the grounds for claiming a lack of utility, further uncertainty reportedly stems from the inability to know how the courts will assess the utility of a company's patents on the basis of what was promised. Indeed, according to the interviewed companies, one of the most critical issues with the

22 Nikita Stepin, "Pharma in brief - Canada's patent utility standard and 'promise' doctrine to go before Supreme Court of Canada,"", Norton Rose Fulbright; CRA Survey, 2016.

23 *AstraZeneca Canada Inc. v Apotex Inc.*, 2016 SCC Case: 36654,

24 Nexium Patent Register – seen on http://pr-rdb.hc-sc.gc.ca/

25 *GlaxoSmithKline v. Pharmascience*, 2008 FC 593

26 Anna Wilkinson, "Improper Selection: A Separate Ground of Patent Invalidity in Canada?" Osgoode Hall Review of Law and Policy 3(1) (2010): 19–58.

27 Pharmapar "Valtrex regains its patent right," 2014

28 E.g. *Eli Lilly Canada Inc. v. Novopharm Limited*, 2010 FCA 197)

29 *Eli Lilly and Company vs Government of Canada* 2016 Case No. UNCT/14/2

30 Note: Eli Lilly filed a Notice of Arbitration against the Government of Canada under the dispute settlement provisions of NAFTA Chapter 11 in September, 2013. The hearing was heard in May - June, 2016 with a decision expected in late 2016 or early 2017.

31 See, e.g. *Eli Lilly v. Canada*, Notice of Arbitration under the North American Free Trade Agreement (1993) Chapter 11 (12 September 2013), available online: http://www.international.gc.ca/trade-agreements-accords-commerciaux/assets/pdfs/disp-diff/eli-03.pdf

promise doctrine is the uncertainty of the outcome of litigation due to the fact that court decisions on the grounds of utility are so subjective. For example, one company reported that "*You win some and you lose some – some companies are lucky and exhibit better outcomes due to subjectivity*".[32] Correspondingly, although not all companies interviewed and surveyed had previously had a product challenged on the grounds of utility, the vast majority of respondents (94 percent) said they were concerned that the promise doctrine might be used as a basis for invalidating their patents, with some participants highlighting, in the follow up interviews, that they felt unable to discern how utility standards would be assessed in the event of a utility-based challenge.

Another key issue that arose out of our primary research with respect to the promise doctrine was that of reputation. Various interview respondents were concerned that Canada was damaging its image as a country that rewards innovation, and that its reputation was falling behind similarly developed countries. "*The promise doctrine has had an effect on Canada's reputation. Canada is a player in the innovative world and needs to respect that this is a global game with global rules.*" [33]

These findings from the Canadian industry corroborate concerns that have been raised at a more global level. For example, in April 2016, the Special 301 Report of the Office of the United States Trade Representative expressed "…serious concerns about the lack of clarity and the impact of the heightened utility requirements for patents that have been imposed by Canadian courts."[34] Likewise, the World Trade Organization's 2015 Trade Policy Review (TPR) report on Canada made note that Canadian courts had continued to develop the promise doctrine during the review period. A number of individual countries also raised issues with Canada's utility standards in their submissions to the TPR.[35]

According to the survey, none of the participating companies have either decreased investment or moved activities outside of Canada thus far as a direct result of the promise doctrine. However, the doctrine has affected the strategic approaches of the surveyed companies, with about 30% having reported that the promise doctrine has had an impact on how they assess early stages of R&D and/or clinical trials. In particular, companies described the promise doctrine as a negative differentiator in investment decisions. In other words, if a company were

32 CRA interview with manufacturer

33 CRA interview with manufacturer

34 Executive Office of the President of the United States, "2016 Special 301 Report" (April 2016), p. 63, available at < https://ustr.gov/sites/default/files/USTR-2016-Special-301-Report.pdf>.

35 World Trade Organization, Trade Policy Review Body, 15 and 17 June 2015, Minutes of the Meeting - Addendum, "Trade Policy Review – Canada", WT/TPR/M/314/Add.1 (20 August 2015), pp. 57, 72-73, 131-132, 149 and 210.

to compare the investment potential of Canada with other countries on the basis of a variety of factors, the uncertainty now implicit to Canada's IP environment – as intensified by the promise doctrine – would score against the Canadian market. This devaluation was described by one company as follows: "*With regards to location of R&D (e.g. clinical trials), when Canada is on a short list of selected locations due to quality of research – IP can become a later decision driver when it comes to finalizing a decision, and the promise doctrine is an IP irritant."*[36]

Moving forward, Canada's volatile IP climate can be expected to become increasingly of concern for investors, with 70% of survey respondents reporting a perceived growth in patent litigation on the grounds of utility. Interviewees were therefore asked how the concerns raised in this paper might be addressed. The most common response was that the environment could be improved if the Supreme Court of Canada were to adopt a utility requirement in line with the rest of the world. Many stakeholders expect that the higher court proceeding between AstraZeneca and Apotex Inc. that is scheduled for November 2016 will definitively address what constitutes the appropriate Canadian patent utility standard.[37] The Supreme Court's decision, therefore, may have a significant impact on innovative pharmaceutical R&D investment and the perception of Canada by the international industry for years to come.

36 CRA interview with manufacturer

37 Robert Dewald "Supreme Court of Canada News - AstraZeneca Canada Inc. v Apotex Inc. (SCC Case: 36654, esomeprazole – NEXIUM®)," 2016. Seen on dww.com

4. Conclusions

The aim of this project was to explore the relationship between IP, specifically the promise doctrine, and innovative pharmaceutical R&D investment in Canada. Though it is not feasible to establish a direct causal link between the two given the multifaceted nature of investment decisions, the evidence gathered from the Canadian innovative pharmaceutical industry shows that the promise doctrine has had – and is likely to continue to have – a damaging impact on Canada's investment portfolio. The main lessons from this research can be summarized as follows:

- IP has been identified as an important factor in the determination of the location of R&D investment. While certain other independent factors (e.g. scientific strengths and costs of research) were cited by the majority of respondents as being more influential, the quality of an IP environment factors into the cumulative R&D perspective of a given location and carries particular weight when other factors are comparable.
- Uncertainty within the IP system was raised as a key factor in R&D decision-making. Where legal uncertainty is present, the local IP regime is weakened and becomes less attractive to investors.
- Given its implicit relationship with the local IP system and its perceived negative impact on legal certainty, the promise doctrine is a secondary factor in R&D investment appraisals.
- To date, the promise doctrine has not been identified as the sole cause of decreased investment levels in Canada. However, the promise doctrine was cited as having an important indirect effect on R&D investment decisions through the chilling effect it has had on Canada's innovation reputation.

In affirming some degree of relationship among IP, the promise doctrine and investment decisions, the present study raises important concerns with regards to how Canada is evaluated by pharmaceutical companies in a globalized environment. Notably, when Canada is assessed as a location for R&D investment, its local IP environment will be one of several key factors being compared to other nations – especially when all else is equal among comparator countries.

It is also clear from the interviews that an uncertain IP environment can have long-term reputational consequences that would take some time to restore. Although it may be difficult to directly attribute changing trends in the location of R&D investment to uncertainty in the IP environment, this study raises significant concerns with regards to the Canadian regime and how it compares to other nations.

Overall, in a world where IP global standards are gradually strengthening, Canada is perceived as falling behind other developed countries in rewarding innovation and ensuring certainty within its IP system for the innovative pharmaceutical industry. Unlike many other factors that are beyond the control of the Canadian government (e.g. labour costs, market size, etc.), positively addressing IP issues such as the promise doctrine is one tangible way that Canada become a more attractive destination for international R&D investment. In the meanwhile, and in light of the promise doctrine's significant potential to detract from the positive scientific and economic strengths of Canada's R&D perspective, how can Canada measure up to its global competitors?

Appendix

Organizations that participated in structured interview and/or responded to survey

Participating organizations	
Amgen	**Janssen**
Astellas	**Eli Lilly**
AstraZeneca	**Merck**
Bayer Inc.	**Novartis**
Bristol-Myers Squibb	**Novo Nordisk Canada**
EMD Serono	**Paladin Labs**
Ferring Pharmaceuticals	**Pfizer**
Gilead	**Sanofi**
GlaxoSmithKline	**BIOTECanada**
Hoffmann-La Roche	**The Canadian Chamber of Commerce**

Interview Discussion guide

The impact of the promise doctrine on the location of R&D activity

High-level interview guide

Background

Charles River Associates (CRA) has been asked by the Innovative Medicines Canada (IMC) to gather supplemental evidence on the impact that the promise of the patent doctrine has on the location of R&D activity.

The "Promise Doctrine" – Brief Overview

Canadian courts have interpreted utility requirements of the *Patent Act* in a way that differs from the way it is interpreted in other countries and which impacts the pharmaceutical industry specifically. If, in a given court case, the demonstration or evidence of anticipated utility falls short of fulfilling the 'promise' as it is deemed to have been contained in the patent, it will be invalidated for lack of utility even if the invention is useful, either to some other degree than promised or for some other purpose (the so-called promise doctrine).

In effect, the promise doctrine presents three requirements:

1) A judge subjectively construes the 'promise of the patent' from the patent specification;
2) A heightened evidentiary standard for proof of utility is applied, which requires that the promised utility either be 'demonstrated' by the patentee or be based on a 'sound prediction' of utility from the date of filing; and
3) In relation to 'sound prediction', a heightened disclosure requirement mandates that evidence establishing utility must have been disclosed in the original patent application.

The invalidation of an increasing number of pharmaceutical patents on the grounds of heightened utility requirements has created an atmosphere of uncertainty and distrust among pharmaceutical companies in Canada and beyond.

The Interview Structure

CRA is currently undertaking discussions with companies affected by the promise doctrine. The objective of the interview is to understand the extent to which your R&D activities are influenced by different factors, including the promise doctrine. The interview will be covering the following topics, broadly:

- High level review of investment decision-making and factors that influenced your investment decisions in Canada;
- The role the promise doctrine has had in investment decisions;

We envisage the discussion to last no more than one hour. The information from the interview will be presented as part of a report and **your company will not be quoted directly**.

Interview Questions

A. The factors affecting the relationship between R&D investment and location.

1. What are the key factors that your company takes into consideration when making R&D investment decisions in a particular country?
2. What are the motives for and against investing in R&D in Canada, in particular?
3. Is it your perception that Canada is more or less attractive for R&D investment as compared to other countries? Why?
4. What are the most important policy changes in Canada that have influenced investment in R&D?

B. Determining the relationship between R&D investment and intellectual property.

1. What is the importance and role of patenting in your company's R&D investments in relation to the other factors?
    a. Is your company's propensity to patent high or low?
    b. At what point in the R&D process do you typically file for patent?
    c. Does holding a patent bare more weight at different points in the R&D process? (i.e. preclinical, Phase I, Phase II, Phase III)
    d. To what extent does your company rely on patenting to fund research, secure venture capital, and recoup on investment? How does this compare to the other factors affecting R&D
2. Does uncertainty within a patent system play a role in R&D investment decisions? To what extent does the expectation of reliable patent protection justify R&D investment?

C. Establish a relationship between R&D investment and the promise doctrine.

1. To what extent has the promise doctrine affected your company's decisions regarding R&D investment?
    a. When, if ever, did it become apparent that the promise doctrine had impacted your patent portfolio?

   b. Was the real or potential impact of the promise doctrine discussed at the corporate level?

2. Has your company either decreased or increased its level of investment in Canada (either as a proportion of revenues or in absolute terms) as a result of the promise doctrine?
   a. Have there been significant new investments?
   b. Have you chosen to move activities outside of Canada?
3. Since the emergence of the promise doctrine, has your company perceived a growth in patent litigation on the grounds of utility?
   a. Have R&D investment strategies been revised so as to seek greater confidence that patent validity will be upheld, if challenged?
   b. Has this had an impact on strategic approaches to early stages of R&D or clinical trials?

D. The way forward

1. What are the implications for life sciences R&D in Canada going forward?
2. Is change warranted? How might the situation be improved?

Online Survey

Introduction and Background:

Charles River Associates (CRA) has been asked by the Innovative Medicines Canada (IMC) to gather supplemental evidence on the impact that the promise doctrine has on the location of R&D activity.

The objective of the survey is to understand the awareness of the promise doctrine, whether this is of concern, and extent this has had an impact on your business.

The "Promise Doctrine" – Brief Overview

Canadian courts have interpreted utility requirements of the *Patent Act* in a way that differs from the way it is interpreted in other countries and which impacts the pharmaceutical industry specifically. If, in a given court case, the demonstration or evidence of anticipated utility falls short of fulfilling the 'promise' as it is deemed to have been contained in the patent, it will be invalidated for lack of utility even if the invention is useful, either to some other degree than promised or for some other purpose (the so-called promise doctrine).

In effect, the promise doctrine presents three requirements:

1. A judge construes the 'promise of the patent' from the patent specification;
2. An evidentiary standard for proof of utility is applied, which requires that the promised utility either be 'demonstrated' by the patentee or be based on a 'sound prediction' of utility from the date of filing; and
3. In relation to 'sound prediction', a disclosure requirement mandates that evidence establishing utility must have been disclosed in the original patent application.

This has resulted in the invalidation of an increasing number of pharmaceutical patents on the grounds of these utility requirements.

1. Name
2. Organization
3. Title/Position

Awareness of the Promise Doctrine

4. Are you aware of the promise doctrine? *[Select Yes or No]*
5. Are there any products within your company that have been affected by the promise doctrine? *[Select Yes or No]*
6. If Yes, please briefly describe
7. Are you concerned that the promise doctrine could be applied to products in your portfolio in the future? *[Select Yes or No]*

Impact of the Promise Doctrine

8. Please rate your level of satisfaction with the current IP environment in the context of R&D investment in Canada? *[Please rate on a scale of 1-5, where 1 is very unsatisfied and 5 is very satisfied]*

9. Please rate the relative importance of the factors that your company takes into consideration when making R&D investment decisions in a particular country: [*Please rate on a scale of 1-5, where 1 is very unimportant and 5 is very important]*
10. Does uncertainty within the IP system play a role in R&D investment decisions? *[Please rate on a scale of 1-5, where 1 is not all relevant and 5 is extremely relevant]*
11. Has your company either decreased or increased its level of investment in Canada (either as a proportion of revenues or in absolute terms) as a result of the promise doctrine? *[Select Yes or No]*
12. If Yes, please briefly describe
13. Have you ever chosen to move activities outside of Canada because of the promise doctrine? *[Select Yes or No]*
14. Since the emergence of the promise doctrine, has your company perceived a growth in patent litigation on the grounds of utility? *[Select Yes or No]*
15. Has this had an impact on strategic approaches to early stages of R&D and/or clinical trials? *[Select Yes or No]*

Wrap-up

16. Would you be willing to follow-up with a telephone interview in the next few weeks? *[Select Yes or No]*