PATENT LAW FOR NEW MEDICAL USES OF KNOWN COMPOUNDS AND PFIZER'S VIAGRA PATENT

RICHARD A. CASTELLANO*

I. INTRODUCTION

"[I]nternational outcry" arose concerning China's commitment to the World Trade Organization (WTO) when the State Intellectual Property Office (SIPO) invalidated Pfizer Inc.'s VIAGRA patent in early July of 2004.[1] Amidst mounting criticism and in light of China's historically lacking IP enforcement,[2] the VIAGRA decision could be mistaken as demonstrative of why *not* to consider foreign direct investment in China.[3] While circumstantial evidence may tend to support State protectionist motives to selectively enforce IP laws, the

* Juris Doctor & Master of Intellectual Property, 2006, Franklin Pierce Law Center, Concord, NH; Bachelor of Science in Chemistry, concentration in Biochemistry, 2003, Frostburg State University, Frostburg, MD.

1 Roger Pilon, *China's Viagra Test*, Apple Daily (Hong Kong) 2 (Aug. 11, 2004) (available at www.cato.org/cgi-bin/scripts/printech.cgi/dailys/08-13-04.html) (stating "As this appeal is adjudicated, it is absolutely essential -- for China, and the world that deals with it -- that the proceedings be transparent, for all the world to see, if that huge nation is to become a full and trusted participant in the global economic community. The precondition for participation in that community is respect for property rights and contracts. Intellectual property is no less important than the real property the farmer tills. In fact, in the modern world, it is doubtless more important. The world will be watching.").

2 U.S. companies, when asked about the perceived progress China had made in implementation of WTO commitment areas, intellectual property rights and judicial enforcement of law being among the most important areas to these companies, observed some, but little extent in progress as of 2004 in those areas. United States General Accounting Office, World Trade Organization: *U.S. Companies' Views on China's Implementation of Its Commitments*, GAO 04-508 (Mar. 2004). *See also* Edwin Mansfield, *19 Discussion Paper: Intellectual Property Protection, Foreign Direct Investment, and Technology Transfer* (The World Bank 1994).

3 Pilon, *supra*. n.1 at 2; Duan Hongqing, Zhu Xiaochao & Fu Li'ao, *China Revokes Viagra Patent*, Caijing English Newsletter 2 (Nov. 25, 2004) (stating "Joseph M. Damond, associate vice president for Japan and Asia Pacific at the Pharmaceutical Research and Manufacturers Association, says the revocation sends a worrying message about China's commitment to protecting intellectual property rights.").

TRIPS signatory was far from alone in its decision to invalidate Pfizer's patent. Moreover, unlike actions in other developing countries, China's basis for invalidation was well-founded in patent law, albeit on a controversial principle. China did not expressly ignore their obligation to maintain minimum intellectual property standards as a Member of the WTO; they followed the jurisprudential lead of the United States with a harsh application of the written description doctrine on a second use patent, a technology that receives questionable protection elsewhere, including the U.S.[4]

Pfizer recycled their patented compound sildenafil citrate to yield $1.7 billion annually from a second patented medical use for the treatment of male erectile dysfunction (MED) under the VIAGRA mark. Despite sildenafil citrate's benefits to health[5] and considerable commercial success, many companies may be hesitant to pursue similar drug development tactics for fear that the fruits of their investment will be inadequately protected from sharp-eyed competitors.

Research-based pharmaceutical companies must invest, on average, eight hundred million dollars and 15 years to bring a new drug to market;[6] including four years of pre-clinical development, six years of clinical development, and several more years of regulatory review. During the lengthy preclinical phase, large pharmaceutical companies employ various search methods to identify possible drug candidates.[7] From serendipitous discovery to high through-put combinatorial library screening and rational drug design, unpredictable and expensive search methods significantly inflate pharmaceutical research and development costs.[8] The value of pharmaceutical companies' efforts exists not in the end product, which is amenable to reverse engineering, but in research and development. Thus, pharmaceutical companies rely substantially on patents to recoup research and development outlay.

---

4 Pfizer, Inc., 2004 Financial Report, 11 (available at http://pfizer.com/pfizer/annualreport/2004/financial/ financial2004.pdf).

5 Up to 50 percent of men over 40 suffer from MED, a condition now recognized to have a physical cause. Richard Teyman, *Viagra*, The Wellcome Trust 1 (Sept. 22, 2004) (available at http://www.wellcome. ac.uk/en/genome/tacklingdisease/hg12f007.html).

6 Pilon, *supra* n.1 at 1.

7 *See generally* http://www.wellcome.ac.uk (accessed May 15, 2005).

8 Combinatorial library screening involves reacting small numbers of starting compounds with large numbers of reagents to generate a library of organic compounds that react with a specific biological receptor. Rational drug design, an alternative method, enables researchers to design a compound for a specific target using structural information about a protein or its natural ligands, thereby yielding drugs with optimal binding affinity and minimal negative side effects without expensive large-scale screening. *Id.*; *see generally* Hardman and Limbird, *The Pharmacological Basis of Therapeutics* (10th ed., Goodman & Gilman 2001).

Second therapeutic indication[9] research is steadily rising[10] and it is probable that many known compounds could serve as potential drug candidates. Development of known compounds reduces search costs and affords greater success rates in clinical trials because the risk of unexpected side effects is lower, particularly for compounds that were already marketed as pharmaceuticals.[11] Compounds not previously marketed are also attractive candidates—only a small percentage of patented therapeutic compounds are fully developed.[12] Research and development costs are high and pharmaceutical companies are likely to avoid products that would receive weak patent protection or uncertain enforcement, which in turn would stifle development of new uses for patented compounds and foreclose a potentially vast well of pharmaceutics. About forty percent of the compounds in Pfizer's drug development pipeline have a prior-known use.[13]

The following discussion will explore second therapeutic use patent protection in the United States and the People's Republic of China while assessing recent and ongoing litigation over Pfizer's second medical use patent for VIAGRA. The discussion will illustrate that second use patent protection is available but enforcement is uncertain. It is the nature of the technology Pfizer seeks to protect that has led to the demise of market exclusivity in countries like the U.K., P.R.C., and Korea. Unlike Pfizer's untenable losses in Argentina and Egypt, invalidation of the VIAGRA patent by SIPO serves as a positive example of the role of law in twenty-first century China.

II. FROM LAB BENCH TO JUDGE'S BENCH

A. The VIAGRA Story

In mid-December of 1992, *Science* featured an article that touted the newly discovered and unexpectedly diverse roles occupied by the reactive

---

9 The terms second therapeutic indication, medical use, and therapeutic use denote the use of a compound for a different medical treatment or medical use than that of a prior art use; the terms are used interchangeably throughout.

10 Bengt Domeij, *Pharmaceutical Patents in Europe* 195 (Kluwer Law International 2000).

11 *See id.* at 195 (citing J.A. DiMasi & L. Lasagna, *Development of Supplemental Indications for Already-Approved Drugs by the United States Pharmaceutical Industry*, 5 J. Clinical Research and Pharmacoepidemiology 19 (1991)).

12 *Id.* at 196.

13 Kevin Kelleher, *The Wired 40: They are Masters of Innovation, Technology, and Strategic Vision – 40 Companies Driving the Global Economy*, Wired 4 (June 2004) (available at http://www.wired.com/_wired/archive/12.06/wired40.html?pg=4).

molecule nitric oxide (NO), the "smallest, lightest molecule—and the first gas—known to act as a biological messenger in mammals."[14] Functions with which nitric oxide was claimed to be associated include neurotransmission, muscle relaxation in peristalsis, and male tumescence.[15] The article was based in part on published research that, although significant to science, failed to support anything more than brief speculation about NO's relation to MED.

In January of 1992, a team of researchers, including Dr. Jacob Rajfer and Nobel laureate Professor Louis Ignarro, were credited for elucidating the non-adrenergic, non-cholinergic (NANC) pathway,[16] a NO dependent biochemical mechanism that affects smooth muscle relaxation.[17] In smooth muscle cells, NO[18] activates guanylyl cyclase, which facilitates conversion of intracellular guanosine triphosphate to cyclic guanosine monophosphate (cGMP). cGMP acts as an effector for enzymes that promote smooth muscle relaxation and vasodilation. Conversely, phosphodiesterases (PDEs) facilitate hydrolysis of cGMP to 5′GMP, thereby precluding muscle relaxation.

Muscle relaxation can be induced through increased production of NO or inhibition of the PDEs that catalyze cGMP cleavage. As of June 1993, five PDEs were known to regulate levels of cGMP and cyclic adenosine monophosphate (cAMP).[19] Using an L-arginine analog and the weak-acting ZAPRINAST, a selective cGMP PDE inhibitor, Rajfer and his colleagues tested both ends of the NANC pathway and concluded their report with the following conjecture:

> [The NANC pathway] may be involved physiologically in mediating penile erection….Smooth muscle relaxation is the mechanism by which papaverine and prostaglandin E sub1, [prior art medicaments], when injected intracaver-

---

14 Elizabeth Culotta and Daniel J. Koshland Jr., *NO News Is Good News*, 258 Science 1862 (Dec. 18, 1992).

15 *Id.* at 1863. In male erectile dysfunction too little nitric oxide is produced; not enough cyclic guanosine monophoshate is made.

16 The pathway is now referred to as the L-arginine-NO-cGMP pathway; the pathway was originally "named for what [they are not] . . . nobody knew what they were so they were called nonadrenergic and noncholinergic nerves," i.e. NANC. *Pfizer Ltd's Patent*, 2001 F.S.R. 16, 232 (Pat. Ct. 2000) (citing Day 3 Transcript p. 352).

17 J. Rajfer et al., *Nitric Oxide as a Mediator of Relaxation of the Corpus Cavernosum in Respect to Nonadrenergic, Noncholginergic Neurotransmission*, 362 New Eng. J. Med. 90 (Jan. 9, 1992).

18 NO is produced when the complex enzyme nitric oxide synthase removes five electrons from the amino acid L-arginine. NO is a short-lived gas that is produced physiologically from at least two sources. One source is the endothelial cells that line smooth muscle, which release what were once known as Endothelium Derived Relaxing Factors, now know to be NO. The second source is the non-adrenergic non-cholinergic nerves that service smooth muscle.

19 *Pfizer Ltd's Patent*, 2001 F.S.R. at 212.

> nosally,[20] cause tumescence in impotent men. . . . Interference with the L-arginine-nitric oxide pathway could be one cause of impotence that is treatable by the administration of *direct*-acting vasodilators.[21]

Notwithstanding Rajfer's speculation in 1992 over the import of the NANC pathway, Pfizer had already scheduled a vasodilator, sildenafil citrate, for evaluation in a model of erectile function by August of 1991.[22] Sildenafil citrate, one in a class of potent and selective cGMP PDE_V inhibitors called pyrazolopyrimidinones, was originally developed by Pfizer to treat circulatory problems and was accordingly patented as an antianginal agent.[23]

In 1992, shortly after Rajfer's article was published, Pfizer researchers injected anaesthetized monkeys with sildenafil citrate in an experimental model[24] that tested for *direct* inducers of erections. A week earlier, a Pfizer researcher distributed the Rajfer paper with an attached note reading: "[s]hould we not try out [sildenafil citrate] in impotence? Have we seen any beneficial effects?"[25] Unlike alpha blockers and prostaglandins, however, sildenafil citrate unexpectedly failed initial testing. According to VIAGRA inventor Dr. Peter Ellis, "we were disappointed…and did not have the conviction to continue exploring the utility of sildenafil citrate in MED in the absence of other supportive data. Indeed, I do not recall seeing any formal report of [the] study."[26] The anaesthetized monkeys used in the experimental model lacked adequate NO supply, such as that released during sexual arousal, and sildenafil citrate had no substantial amount of cGMP to potentiate. Pfizer later discovered that sildenafil citrate requires an adequate level of NO to be effective because the production

---

20 The *corpus cavernosum* is smooth muscle tissue in the penis; the same tissue was used for experimentation by Dr. Rajfer. *See generally* Rajfer *supra* n. 17. Sildenafil citrate is a PDE_V inhibitor; PDE_V is the dominant isoenzyme present in the *corpus cavernosum*.

21 *Pfizer Ltd's Patent*, 2001 F.S.R. at 229 (emphasis added).

22 *Id.* at 234.

23 *See e.g. Pyrazolopyrimidinone Antianginal Agents*, U.S. Patent 5,250,534 (Oct. 5, 1993) (claiming compounds inclusive of the active compound in VIAGRA, sildenafil citrate).

24 *Pfizer Ltd's Patent,* 2001 F.S.R. at 235 ("[T]he Urogenitals group were working on impotence and were investigating novel alpha blockers, injected intracavernosally, for the treatment of MED . . . . Gorm Wagner was a sex therapist who had developed a model in the monkey to assess compounds as potential treatments for MED. The model involved the use of an anaesthetized monkey. A ligature was placed around the penis and the compound under test injected intracavernosally. After a few minutes to allow adsorption of the compound the ligature was released and any erection were recorded").

25 *Id.* at 230.

26 *Id.* at 235.

of cGMP is not increased by application of the compound, instead breakdown of cGMP is countered—sildenafil citrate is not a *direct* inducer.[27]

By early 1993 oral forms of treatment for MED were in high demand over previous alpha blockers and direct inducers, none of which were oral medicaments.[28] Pfizer filed a patent application for an oral treatment of MED entitled "Pyrazolopyrimidinones for the Treatment of Impotence" in the United Kingdom on June 9, 1993.[29] Pfizer filed an international patent application on May 13, 1994 under the Patent Cooperation Treaty, claiming priority from the U.K. application, and patents were later granted in the U.S. and the P.R.C. among other countries. The patent includes claims to a method of using PDE inhibiting compounds for the purpose of treating MED,[30] and incorporates by reference compounds claimed in Pfizer's antianginal drug patent (Bell).[31] Pfizer marketed the invention under the VIAGRA mark and reaped enviable profits while introducing an unlikely drug to pop culture history.[32]

B. Patent Problems

China's decision to invalidate Pfizer's VIAGRA patent in July 2004, if anything, steeps the WTO Member in solidarity. Many countries have denied Pfizer exclusive rights to VIAGRA and their reasons vary. Under the guise of inadequate healthcare access[33] and through manipulation of TRIPS time extensions, VIAGRA exclusivity was denied by U.S. priority watch-list veterans like

---

27 *Id.* at 235-36.

28 *Id.* at 239.

29 App. No. 9311920.4 (available at http://v3.espacenet.coom/ textdoc?DB=EPODOC&IDX =RU2130776&F=0).

30 *Pyrazolopyrimidinones for the Treatment of Impotence*, U.S. 6,469,012 (Oct. 22, 2002).

31 *See* U.S. 5,250,534 (Oct. 5, 1993). This patent is a continuation of Serial No. 717,227, June 18, 1991 and claims sildenafil citrate among a class of pyrazolopyrimidinones.

32 *See Make Love, Not War*, 366 The Economist 8314, 60 (Mar. 6, 2003).

33 Paragraph 5 of the Declaration on the TRIPS Agreement and public health, adopted at Doha, Qatar on November 14, 2001, provides that TRIPS should be read in light of the objectives of the TRIPS Agreement. Accordingly, Members should not be restricted from taking measures to promote public health in the face of diseases like HIV/AIDS, tuberculosis, and malaria. Members may grant compulsory licenses, determine through independent means as to what constitutes a national emergency, and determine its own regime relating to exhaustion of patent rights. Adrian Zahl, *International Pharmaceutical Law and Practice* xvi-xvii (Matthew Bender 2005).

Egypt and Argentina in attempts to accommodate their domestic pharmaceutical industries through static competition, which promotes copying and imitation.[34]

Pfizer gained market approval for VIAGRA in Egypt during a period of maturation for intellectual property rights only to be thwarted by a campaign organized by local pharmaceutical companies to pressure Egypt's Ministry of Health. Pfizer-Egypt's 2002 market entry was soon followed by the Ministry of Health's decision to "grant market authorization for all Egyptian companies that applied to produce VIAGRA . . . in the interests of the poor people."[35] The president of the Ministry of Health, Dr. Mostafa Ibrahim, supported the decision with reference to the extended 2005 deadline granted to developing country Members to meet TRIPS standards.[36] Pfizer's director of health policy and external relations in the middle east, El Hakim, expressed concern over Egypt's protectionist policies, which initially led a hesitant Pfizer to "slam the brakes" on a state-of-the art production facility in Egypt in 2002.[37] According to Hakim, Egypt may be harming its own economy:

> A business environment that encourages new investments needs transparency in the regulatory system and strong intellectual property protection. There are many other countries in the region who are competing for these new high-tech investments. We should not lose out on the opportunity to attract them to Egypt . . . . [Allowing generic VIAGRA] will send a chill down foreign investor's spines.[38]

Similar concerns about insufficient intellectual property protection and foreign investment arose in Latin America during the 1990's. Argentina had cost the U.S. pharmaceutical industry an estimated $600 million annually—10% of global pharmaceutical losses—and was targeted by Pharmaceutical Research and Manufacturers of America.[39]

---

34 The extensions were granted to developing and least-developed countries to provide time to develop supporting infrastructure and laws that would advance TRIPS compliance.

35 Abeer Allam, *Seeking Investment, Egypt Tries Patent Laws*, The New York Times W1 (Oct. 4, 2002) (available at 2002 WLNR 4072698) (quoting Dr. Mostafa Ibrahim).

36 *A Tough Pill to Swallow*, Bus. Today (Egypt) 2 (Aug. 1, 2002) (available at 2002 WLNR 3395080).

37 *Id.* at 3.

38 *Id.* at 4.

39 Hernan L. Bentolilal, *Lessons from the United States Trade Policies to Convert a Pirate: The Case of Pharmaceutical Patents in Argentina*, 5 Yale J. L. & Tech. 3, n. 2 (citing Margalit Edelman, *The Argentine Trade Tango: Out of Step on Intellectual Property Protection*, AdTI Issue Brief No. 172 (July 1999) (available at http://www.adti.net/html_files/ip/Argentine_Trade_Tango.html)).

Under Argentine law, pharmaceutical patents were not granted until January 1, 2005—the expiration date of the initial TRIPS phase-in period.[40] TRIPS requires Members, pursuant to Article 70.9, to implement a "mailbox" system and corresponding exclusive marketing rights (EMRs) to allow pharmaceuticals to gain marketing approval prior to patent grants. Argentina granted only two such EMRs.[41] Although Article 5 of Argentine Law No. 24.766 provides for the protection of valuable information from dishonest commercial use during the marketing approval process, applicants could still gain market approval for similarly structured compounds. Thus, during the phase-in period, pharmaceutical companies, upon submitting relevant data while seeking market approval, could effectively give up their inventions without due compensation while local pharmaceutical companies developed and legally marketed similar compounds.

Indeed, after Pfizer gained market approval for VIAGRA, local Argentine companies filed market authorization requests for similarly structured compounds and prepared to produce generics. This prompted aggressive unilateral trade tactics from the United States. Special 301 of the Trade Act of 1974, Generalized System of Preferences (providing preferential tariff treatment), and the Dispute Settlement Understanding Mechanism of the WTO were used to pressure Argentina into compliance with U.S. standards on pharmaceutical intellectual property protection by October 24, 2000, well before the January 1, 2005 deadline. Pfizer's experience in Egypt and Argentina clearly demonstrates to foreign investors the pitfalls of bringing technologies that can be easily reverse engineered to investment environments that have little regard for the ownership of information as valuable property. Moreover, their propensity to take advantage of necessary regulatory disclosure requirements and the lack of protection for such disclosures emphasizes the importance of adequate patent protection laws *and* enforcement as a means of recouping R&D costs; whether a firm is bringing a drug to market or planning to invest in manufacturing or R&D facilities.

Investors may be hard pressed, however, to find solace in second use patent protection. Pharmaceutical industry giants Eli Lilly, Glaxo-SmithKline (GSK), and Bayer have waged substantially successful legal battles against Pfizer's VIAGRA. Eli Lilly and GSK/Bayer developed their own PDE inhibiting MED drugs, CIALIS and LEVITRA respectively. Already, Australia, Canada, Japan, and South Africa, among many others, have invalidated claims in

---

40 Art. 100, Argentine Law 24.481.

41 Bentolilal, *supra* n. 29, at 4.

Pfizer's second use patent.[42] In January of 2002, the UK invalidated the VIAGRA patent in a case brought by Eli Lilly, which prompted invalidation by the European Union. Similarly, Bayer in April 2003 sought to invalidate the VIAGRA patent[43] in South Africa,[44] citing obviousness and lack of novelty.

Administrative actions in the Pacific Rim have also yielded negative results for Pfizer. A final rejection from the Korean Intellectual Property Office, and unfavorable decision in a subsequent appeal to the Korean High Patent Court, were based on insufficient disclosure.[45] Less than a year later, in early July of 2004, the State Intellectual Property Office (SIPO) of the People's Republic of China (PRC) made international headlines when the combined efforts of domestic pharmaceutical companies resulted in a decision by SIPO to invalidate Pfizer's VIAGRA patent on similar grounds. Pending a final judgment on Pfizer's appeal of the Patent Reexamination Board's decision, speculation over China' ability to deliver an investment environment backed by TRIPS compliance continues. Meanwhile a dispute over the validity of the VIAGRA patent in the U.S. is stayed, pending Director ordered reexamination by the U.S. Patent and Trademark Office (USPTO).[46]

III. PATENT PROTECTION FOR SECOND MEDICAL USES OF KNOWN COMPOUNDS IN THE U.S. AND THE P.R.C.

Pharmaceutical companies that are preparing to venture into foreign markets, already cognizant of their peculiar reliance on patent protection, should explore the target country's relevant law and respective regulations to determine whether their technology can be protected. They then should assess interpretations of the law by the judiciary, relevant government agencies, or local patent agents to determine how the law will be interpreted and enforced. While patent law principles have a common thread throughout various WTO Member coun-

---

42 *E.g. Eli Lilly & Co. v. Pfizer Overseas Pharmaceuticals* [2005] FCA 67 (Feb. 10, 2005) (invalidating claim 10 of AU Pat. No. 676,571 for obviousness over the prior art and lack of support in the specification and stating that Eli Lilly's Cialis would have infringed said claim to the use of cGMP PDE_V inhibitors for the treatment of impotence).

43 ZA App. No. 94/4018.

44 Case No. 94/4018, *Bayer Ltd. v. Pfizer*, Court of Comm. of Patents For the Republic of South Africa (2003) (finding claims 1, 5, 6, 7 and 10 anticipated by and obvious in light of the prior art).

45 Commissioner of the Korean Intellectual Property Office Rebuttal Brief Case: 2001 Heo 2771-Final Rejection (Patent) (2003).

46 Theresa Agovino, *Viagra Maker Goes to Court*, http://www.cbsnews.com/stories/2002/10/23/health (accessed Oct. 23, 2002).

tries, TRIPS sets forth minimum standards for intellectual property protection; as such, there exists among Members variant interpretation and application of patent law principles although still within the bounds of the TRIPS agreement. This section will discuss patent protection for new uses of old compounds and highlight some areas of potential concern.

Unlike medical devices, methods of medical treatment have not always been patentable. Such methods include surgical techniques, medicament administration, and methods of treating disease. Pursuant to an incentive theory, patent law should not recognize medical methods like surgery or methods of diagnosis, which are substantially rival and excludable goods due to their reliance on the skill of a third party user. Pharmaceutical methods, however, are substantially non-excludable and non-rival—pharmaceuticals are easily reverse engineered—and without a legal rule to invoke against third-party users, such methods offer more uncertainty for researchers and investors who must realize benefits sufficient to justify their labors.[47] These desirable public goods will be under-produced absent adequate patent protection.[48] Legislatures in countries like the U.S. and the P.R.C. have recognized the need to carve out an exception for second uses of known compounds.

A. United States

1. The Business of Healing

Dr. Samuel Pallin sued Dr. Jack Singer in 1993 for infringing his patented method of making frown-shaped self-sealing incisions in the episcelral of the eye during corneal eye surgery.[49] Singer had videotaped the procedure and published it in the *Audiovisual Journal of Cataract and Implant Surgery*.[50] The United States District Court for the District of Vermont invalidated Pallin's patent and ordered that he "take no [further] action to enforce any feature of the patent against the parties, any physician, health care provider, hospital, clinic [or] teaching institution".[51]

---

47 *See generally* Roger E. Schechte & John R. Thomas, *Principles of Patent Law* § 1.3 (West 2004).

48 *Id.*

49 *Pallin v. Singer*, 1995 WL 608365 at *1 (D.Vt. May 1, 1995) (citing U.S. Pat. No. 5,080,111 (method disclosed utility of lower likelihood of post-suture astigamitism)).

50 *Id.* at *4.

51 *Pallin v. Singer*, 1996 WL 274407 at *1 (D. Vt. March 28, 1996).

Pallin inspired the American Medical Association (AMA) to launch an attack against the U.S. patent system for what it believed to be "dangers inherent in medical procedure patents."[52] The AMA argued that patented medical procedures compromised patient care by forcing physicians to perform inferior procedures for fear of infringement, increasing financial burdens through licensing fees and litigation costs, and threatening patient confidentiality.[53] According to the AMA, the medical profession had no need for the market intervention provided for by the patent regime; through their own incentive system, medical innovators could receive recognition for their advancements through publication in periodicals like *The New England Journal of Medicine*.[54]

In response, members of Congress proposed a bill to prevent the patenting of any technique, method, or process for performing a medical procedure or diagnosis except where a machine, manufacture, or composition of matter was a necessary component.[55] The proposed legislation would have denied patent protection to therapeutic methods, assays and vaccines; thereby threatening innovation of new pharmaceutical applications of known compounds, an expensive technology that is acutely subject to market failure.[56] The bill culminated in a new subsection (c) for 35 U.S.C. § 287 pursuant to The Omnibus Consolidated Appropriations Act.[57]

Currently, § 287 (c)(2) excludes from the definition of barred medical activity "the use of a patented machine, manufacture, or composition of matter or the practice of a patented use of a composition of matter or practice of a biotechnological process."[58] Accordingly, where novel therapeutic uses of known compounds or biotechnological processes are discovered, the inventor may receive exclusive rights to an invention derived from that discovery by claiming a method of use.

---

52 Eric M. Lee, *35 U.S.C. § 287(c)--The Physician Immunity Statute*, 79 J. Pat. & Trademark Off. Socy 701, 703 (Oct. 1997).

53 *Id.*

54 *Id.* at 703-04.

55 H.R. 1127, 104th Cong., § 2 (March 3, 1995).

56 Lee, *supra* n. 52, at 705.

57 Pub. L. No. 104-208, § 101, 110 Stat. 3009 (1996).

58 35 U.S.C. § 287 (2000) (providing in subsection (c)(2)(F) that "the term 'patented use of a composition of matter' does not include a claim for a method of performing a medical or surgical procedure on a body that recites the use of a composition of matter where the use of that composition of matter does not directly contribute to achievement of the objective of the claimed method").

2. Claiming New Medical Uses for Old Compounds

Pharmaceutical patents may include claims to methods of using compositions of matter.[59] For new compounds, pharmaceutical claims may be drafted to teach both pharmaceutical composition and method of use in the *Skuballa* format: "A method of treating a human to alleviate X, wherein said method comprises administering to said human compound Y"; provided that such claims are supported by their respective disclosure.[60] New uses for known compounds are also patentable; the compound itself, however, belongs to the prior art.[61] The new use must have utility, must be novel as to the use directed, unobvious in light of the prior art, and sufficiently disclosed so as to both enable and indicate possession of the invention at the time of filing.

Utility

A therapeutic use claim must set forth a coherent mode of operation that comports with known laws of physics and chemistry.[62] Utility must be specific, substantial, and credible enough for the skilled artisan to accept that the disclosed invention is in available form or could be expected to function in accordance with current scientific understanding.[63] For example, inventions alleged to have therapeutic utility against newly discovered or substantially untreatable diseases have been called into question in the absence of adequate clinical testing results.[64]

---

59 35 U.S.C. § 101; 35 U.S.C. § 100(b) (defining process claims); *see e.g.* U.S. Pat. 6,469,012 Oct. 22, 2002) (entitled "Pyrazolopyrimidinones for the Treatment of Impotence").

60 *Ex parte Skuballa*, 1989 WL 274384 at *1 (Bd. Pat. App. & Interf. June 2, 1989)

61 *In re Thuau*, 135 F.2d 344, 346 (C.C.P.A. 1943).

62 *See* 35 U.S.C. § 101; Jerome Rosenstock, *The Law of Chemical and Pharmaceutical Invention: Patent and Nonpatent Protection* § 3-2-3 p. 3-6 (1st ed., Little, Brown and Co. 1993).

63 *Brenner v. Manson*, 383 U.S. 519, 535-36 (1996); Jasmine C. Chambers, *Update on USPTO Practice for Biotech and Pharma Practitioners*, in *Biotechnology & Pharmaceutical Law: Patents & Business Strategies* 85 (S. Peter Ludwig ed., Practising Law Institute 2004) (providing by example that a claim to a receptor where neither receptor nor ligand has utility and receptor function cannot be predicted from DNA or protein sequence homology will cause utility issue).

64 *Ex Parte Kranz*, 1990 WL 357080 at *3-4 (PTOBA & I 1991). It has been suggested that a requirement for specific levels of clinical testing may serve to stifle research and development, especially considering the efficacy of modern *in vitro* models. Rosenstock § 3.2.3, p. 7-8 (2005) (*citing Ex parte Balzarini*, 21 U.S.P.Q.2d 1892, 1895 (PTOBA & I 1991)). From *In re Krimmel*, which stated that efficacy in animals is sufficient utility, to *Cross v. Iizuka*, which stated that mere *in vitro* inhibition of an enzyme by a compound was sufficient to establish patentable utility, it is evident that the Court has shown acute awareness of the need to

Novelty

Method claims for known compounds should employ the prior art compound only as a work-piece—no utility need be disclosed for a reference to anticipate a claim to an old compound.[65] In setting forth this principle, the Court of Appeals for the Federal Circuit (CAFC) relied in part on *In re Spada*, which provided that "discovery of an unobvious property and use does not overcome the statutory restraint of section 102 when the claimed composition is known."[66] Thus, where a novel property of a known compound or microorganism is discovered *a posteriori*, a monopoly for the known compound or microorganism cannot be granted again; the discovered property, however, may properly be claimed as a method of use.[67]

Although anticipation requires all of the claimed elements of a product or process to be present in a prior art reference, the discovery of an unknown but inherent property of a prior art invention may lead to anticipation pursuant to the doctrine of inherency.[68] Claims to a method of using a known compound, which are often based on newly acquired knowledge of biochemical pathways, must account for the possibility that the underlying mechanism for the new therapy is the same mechanism that allows for a prior art treatment using the same compound.

Amidst strong dissent, the CAFC recently addressed inherent anticipation in deciding *Eli Lilly & Co. v. Barr Laboratories, Inc.*, *Schering Corp. v.*

---

interpret 35 U.S.C. in light of developments in science leading to a parallel progression of utility case law and biotechnology—in this vein, it has even been suggested that the *in vivo* activity requirement for homologous or analogous compounds be abandoned and "mere receptor ligands [be deemed] patentably useful". Philippe Ducor, *New Drug Discovery Technologies and Patents*, 22 Rutgers Computer & Tech. L.J. 369, 433 (1996).

65 *In re Shoenwald*, 964 F.2d 1122, 1124 (Fed. Cir. 1992).

66 911 F.2d 705, 708-09 (Fed. Cir. 1990) (holding that "discovery of a new property or use of a previously known composition, even when that property and use are unobvious from the prior art, can not impart patentability to claims to the known composition."); see also *In re Thau*, 135 F.2d at 346 (holding that patents for old compositions of matter based upon new uses or properties are "contrary to the letter of the patent laws.").

67 Iver P. Cooper, *Biotechnology and the Law*, § 4:2 (West 2005).

68 *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1346-49 (Fed. Cir. 1999) (holding that anticipation may be found where the prior art necessarily functions in accordance with, or includes, the claimed limitations it anticipates regardless of prior knowledge thereof) (citing *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 780 (Fed. Cir. 1985) (using doctrine of inherent anticipation to enforce the principle that the "public remains free to make, use, or sell prior art compositions or processes, regardless of whether or not they understand their complete makeup or the underlying scientific principles which allow them to operate").

Geneva Pharmaceuticals Inc., and *Jansen v. Rexall Sundown, Inc*. The *Eli Lilly* Court found a claimed method of inhibiting serotonin uptake by applying fluoxetine hydrochloride to be an inherent result that naturally flowed from the application of fluoxetine hydrochloride for any purpose, including the prior art treatment of anxiety.[69] Judge Newman dissented: "To negate the patentability of a discovery of biological activity because it is the 'natural result' of the chemical compound can have powerful consequences for the patentability of biological inventions."[70] Shortly thereafter, in *Schering Corp.*, the Court found claims to using descarbethoxyloratidine, an isolated metabolite of loratidine discovered *in vivo*, to be anticipated by a patent that disclosed the same metabolite while silent on its utility.[71] Judge Lourie, dissenting, suggested that the nonenabling nature of the prior art disclosure, with respect to the metabolite, should preclude a finding of inherency and further stated that the Court's holding "mandate[s] that the mere issuance of the patent on the product—or any other publication of that product—inherently anticipates claims to the metabolite merely by disclosing that the product can be administered to a patient, in the theory that such administration would inevitably cause the human body to 'make' the metabolite".[72]

Jansen v. Rexall Sundown Inc. provides a safe harbor from the broadly construed anticipation doctrine for pharmaceutical and biotechnological inventions.[73] Judge Lourie, writing for the *Jansen* Court, held that "[t]he preamble is . . . a statement of the intentional purpose for which the method must be performed."[74] Relying on *Kropa v. Robie*, the Court found a claimed method of treating or preventing macrocytic-megaloblastic anemia by administering a combination of folic acid and vitamin B12 to a human in need thereof to have a preamble that set forth an objective and breathed life and meaning into the

---

69 *Eli Lilly & Co. v. Barr Laboratories, Inc.*, 251 F.3d 955, 971-72 (Fed. Cir. 2001).

70 *Id.* at 976 (Newman, J. dissenting).

71 348 F.3d 992, 993 (2003) (petition for rehearing en banc denied; Judge Lourie and Judge Newman dissenting in separate opinions).

72 *Id.* at 996 (citing U.S. Pat. No. 4,282,233, col. 4, II. 42-66; *but see Continental Can Co. USA v. Monsanto Co.*, F.2d 1246, 1268 (Fed. Cir. 1991) (holding that where reference is silent about inherent characteristic, extrinsic evidence may be used where such evidence makes clear that such characteristic would be recognized by one of ordinary skill in the art).

73 342 F.3d 1329, 1333 (Fed. Cir. 2003) (considering the effect of the preamble in a claim directed to a method of treating or preventing pernicious anemia in humans by administering a certain vitamin preparation to "a human in need thereof," the court held that "the claims' recitation of a patient or a human 'in need' gives life and meaning to the preambles' statement of purpose).

74 *Id.*

claims.[75] Under *Jansen*, the preamble is "not merely a statement of effect that may or may not be desired . . . but a statement of [] intentional purpose for which the method must be performed."[76]

Non-obviousness

Pharmaceutical methods of use must be non-obvious; several factual inquiries are relevant, and the balancing of these factors to determine whether an invention is obvious in light of the prior art is a matter of law.[77] Independent and *Skuballa*-type claims to compounds are subject to the *Hass-Henze* doctrine if prior art compounds are structurally similar.[78] Motivation to develop a com-

---

75 *Id.* at 1333-34.

76 *Id.* at 1333.

77 *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) (setting forth factors to be considered: scope and content of prior art, differences between prior art and the claims at issue, the level of ordinary skill in the pertinent art, and secondary indicia).

78 The *Hass-Henze* doctrine provides the first factor in determining obviousness of chemical compounds, which is to determine whether the claimed chemical is structurally similar to prior art compounds. *In re Hass* provided that a prior art homolog of the claimed compounds could be considered in an obviousness determination where the applicant asserted a non-obvious property. 141 F.2d 122 (C.C.P.A. 1944). *In re Henze* held that a presumption of obviousness arises in such occasions and to rebut this presumption the applicant had to show that the claimed compound possessed non-obvious or unexpected properties not possessed by the prior art. 181 F.2d 196, 200-01 (C.C.P.A. 1944). However, the unexpected properties portion of the test went largely neglected and applications were often rejected based solely on similar prior art compounds. Note, *Standards of Obviousness and the Patentability of Chemical Compounds*, 87 Harv. L. Rev. 607, 610-11 (1974). In finding that proof of non-obviousness or unexpectedly advantageous properties in the claimed compound not shared by the prior art compounds defeated a *prima facie* obviousness assertion, the *Papesch* court took advantage of an opportunity to reject the Patent Office Board of Appeals refusal to consider chemical properties in an obviousness rebuttal. *In re Papesch*, 315 F.2d 381, 391 (C.C.P.A. 1963). In *Papesch*, the Court reinforced the complete *Hass-Henze* doctrine; Judge Rich stating that the "compound and all of its properties are inseparable," noting that *nomenclature is merely symbolic* and "the patentability of [a] thing does not depend on the similarity of [the] *formula* to that of another compound but of the similarity of the former *compound* to the latter". *Id.* (emphasis added); *see also Commissioner of Patents v. Deutsche Gold-und-Silber-Scheideanstalt Vormals Roessler*, 397 F.2d 656, 662-63 (D.C. Cir. 1968) (following *Papesch* and observing that unique elemental configurations is increasingly rare in light of the body of known organic compounds in assessing obviousness of ring isomers). The CAFC has since followed this interpretation of *Hass-Henze* in stating that "generalization should be avoided insofar as specific chemical structures are alleged to be *prima facie* obvious from the other." *In re Grabiak*, 769 F.2d 729, 731 (Fed. Cir. 1985). The USPTO has established an array of *prima facie* obvious structures that must be overcome by showing non-obvious or unexpected properties, including adjacent homologues, tautomers, remote

pound or method of use, also probative of obviousness, may be found in the nature of the problem posed, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art.[79] Other factors include the level of skill in the art, secondary indicia like an existing nexus between commercial success and the merits of the claimed invention, and unexpected properties.[80]

A consistent criterion is whether the prior art would have suggested to one of ordinary skill that a process should be carried out and would have a reasonable expectation of success, where both the suggestion and the expectation of success are founded on the teachings of the prior art, not the applicant's disclosure.[81] The reasonable expectation of success principle was recently emphasized to clarify the distinction between non-obvious and obvious-to-try inventions.[82]

In re O'Farrell holds that obvious-to-try inventions are obvious and unpatentable if the inventor had a reasonable expectation of success in his endeavor.[83] O'Farrell claimed a method of using a fused gene to produce foreign protein in bacteria where a foreign gene was inserted following a portion of the native gene without a stop codon, thus allowing for translation of a chimeric protein.[84] The prior art taught fusion of a beta-galactosidase gene to a ribosomal RNA gene and subsequent transcription to yield an analog of the beta-galactosidase enzyme with a higher molecular weight.[85] Despite argument by O'Farrell that there existed no basis for predicting successful expression of ribosomal RNA, the Court found a reasonable expectation of success.[86]

---

homologues, compounds subject to ring enlargement or contraction, positional isomers, optical isomers, analogs, esters and their free acids, alcohols, oxygen/sulfur substitutions, ether linkages versus lack thereof, and compositional ranges where said ranges overlap even slightly. *See* Rosenstock § 8.02[A] 12-22 (2005) (listing structure utility comparisons and relevant cases).

79 *In re Dillon*, 919 F.2d 688, 692-93 (Fed. Cir. 1990) (en banc); *In re O'Farell*, 853 F.2d 894, 902 (Fed. Cir. 1988).

80 *In re Papesch*, 315 F.2d at 391.

81 *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988); *In re Longi*, 759 F.2d 887, 896 (Fed. Cir. 1985).

82 *In re O'Farrell*, 853 F.2d at 903-04.

83 *Id.*

84 *Id.* at 896. A chimeric protein results from readthrough transcription of chimeric DNA, which is produced by recombinant DNA technology consisting of a combination of unique genetic material, and subsequent translation of the resulting mRNA. *Dictionary of Scientific and Technical Terms* 339 4ed. (McGraw-Hill 1998).

85 *Id.*

86 *Id.*

Conversely, in an initial determination by the International Trade Commission, an administrative law judge (ALJ) found Amgen's patent on recombinant DNA capable of expressing erythropoietin to be non-obvious.[87] The ALJ reasoned that erythropoietin was a poorly expressed protein and that obstacles overcome, including construction of a genomic DNA library containing introns,[88] indicated no reasonable expectation of success in light of the prior art.[89] The expectation of success criterion will be increasingly important as new uses of compounds continue to find their basis in novel understandings of a seamless web of biochemical pathways.

The Written Description

The patent specification must describe the invention, enable one skilled in the art[90] to make and use the claimed invention without undue experimentation, and set forth a best mode.[91] Specifications for pioneering inventions that derive from unpredictable technology must disclose more than a mere starting point for further research.[92] Recent case law suggests includes possession, traditionally used to prevent unsupported new matter during prosecution, as a general disclosure requirement.[93]

The specification must clearly convey to those skilled in the art that the applicant was in possession of the claimed invention at the time of filing; a re-

---

87 *In re Certain Recombinant Erythropietin*, 337-TA-281 (Initial determination, Harris, A.L.J., Jan. 10, 1989).

88 Introns are nonencoding regions of a gene that are normally excised out during transcription.

89 *Recombinant Erythropoietin*, 337-TA-281.

90 The fictitious person of ordinary skill in the art is not held to the higher standard used in an obviousness determination. Donald S. Chisum, *Chisum on Patents* vol. 3 § 7.03(2) (c), 7-26 (Lexis 2002). Fulfillment of the utility condition does not render the disclosure *per se* enabling. *In re Cortright*, 165 F.3d 1353, 1356 (Fed. Cir. 1999) (claim to a using a compound for hair growth restoration was adequately supported by examples that disclosed the amount and length of time to apply the compound).

91 35 U.S.C. § 112 ¶ 1; *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1334 (Fed. Cir. 2003).

92 *Genentech Inc. v. Novo Nordisk A/S*, 108 F.3d 1361, 1366-68 (Fed. Cir. 1997).

93 *See generally* Eli A. Loots, *The 2001 USPTO Written Guidelines and Gene Claims*, 17 Berkeley Tech. L.J. 117, 134 (2002) (noting that conflicts between prosecution and litigation are inevitable but *Eli Lilly* decision symbolizes a "widening gulf between the norms of the scientific community and those of the legal system"); 119 F.3d 1559 (Fed. Cir. 1997); *Evans v. Eaton*, 20 U.S. 356 (1822); *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991).

quirement separate and distinct from enablement.[94] Moreover, possession is "ancillary to the statutory mandate" and that mandate may remain unmet despite a showing of possession if the specification does not teach the invention by describing it.[95] In *Regents of the University of California v. Eli Lilly & Co.*,[96] the Court found the University's disclosure inadequate to support claims to complementary DNA (cDNA) that would encode vertebrae, mammalian, and human insulin. At the time of filing, the University had cloned rat insulin genes, but had not yet isolated or even determined the respective human sequence.[97] Nonetheless, the specification purported to support claims to human insulin cDNA by referencing a method used to obtain rat cDNA and describing the human insulin protein. The Court held that "a cDNA is not defined or described by the mere name "cDNA", even if accompanied by the name of the protein that it encodes."[98] Recitation of nucleotide sequences or structural features common to members of a claimed genus may constitute an adequate description.[99]

The written description requirement applies not only to DNA, but also to antibodies and pharmaceutical method of use inventions.[100] Pharmaceutical method of use claims should be drafted with consideration of the foregoing case law, which collectively posits that a disclosure may describe without enabling, or conversely, enable without adequate description.[101] A claim to a method for treating disease 'Y' by administering a compound that is a receptor 'X' agonist may be adequately supported by disclosing physical and chemical characteristics of the administered compound and how to make and use the compound, unless within the skill of the ordinary artisan, so as to place the public in possession of the compounds by which the claimed treatment may be effectuated. In *University of Rochester v. G.D. Searle & Co., Inc.*, for example, the Court in-

---

94 *Mahurkar*, 935 F.2d at 1563 (written description requirement is separate and distinct from the enablement requirement).

95 *Enzo Biochem, Inc. v. Gen-Probe, Inc*., 323 F.3d 956, 969 (Fed. Cir. 2002).

96 119 F.3d 1559, 1569 (Fed. Cir. 1997).

97 *Id*.

98 *Id*. at 1568.

99 *Id*. at 1568-1569.

100 *See Noelle v. Lederman*, 355 F.3d 1343, 1349 (Fed. Cir. 2004) (finding that parent application for murine antibodies failed to provide structural elements of human antibody or antigen to support subsequent application's human and genus antibody claims); *U. of Rochester v. G.D. Searle & Co., Inc.* 358 F.3d 916, 927 (Fed. Cir. 2004) (stating "the statute applies to all types of inventions," including methods of using a compound).

101 Mark S. Cohen, *Compliance with the Written Description Requirement in Biotechnology and Pharmaceutical Patents*, in *Biotechnology & Pharmaceutical Law: Patents & Business Strategies*, 11, 14 (S. Peter Ludwig, Practising Law Institute 2004).

validated generic claims to methods for using non-steroidal compounds to selectively inhibit the activity of the prostaglandin H synthase-2 gene thereby reducing inflammation without the undesirable effects of inhibiting beneficial prostaglandins.[102] The patent included claims to a method of achieving a biological effect but did no disclose compounds that could accomplish the claimed effect.[103] Claims to compositions of matter or methods of using a compound must be supported by a description of the compound that allows for determination of the bounds of exclusivity, which must not overreach the inventor's contribution to the art.

Post-*Lilly* decisions and efforts by the U.S. Patent and Trademark Office to clarify the written description requirement indicate general acceptance of the doctrine.[104] With regard to possible global ramifications one commentator stated the following about U.S. influence on foreign intellectual property regimes:

> The Paris Convention has no room for a uniquely American doctrine of a "written description" as a possession requirement. . . . [T]hose patent regimes in countries that reluctantly strengthened the minimum protection for patents based upon pressures exerted under the Trade Related Aspects of Intellectual Property (TRIPS) will surely seize on any negative doctrine of this type as a way to dilute the patent rights of Americans in their country.[105]

The threat of TRIPS Member protectionist motives drawn toward manipulation of negative U.S. patent doctrine is not idle; Member nations have already enjoyed gross manipulation of TRIPS doctrine in efforts to sustain domestic business in a formidable global market.[106]

---

102 *U. of Rochester*, 358 F.3d 916, 926 (Fed. Cir. 2004) (finding invalid generic claims to COX-2 selective inhibitors that were supported merely by a description of an assay for screening and identifying compounds exhibiting the claimed effect).

103 *Id.*

104 EPO-JPO-USPTO, *Trilateral Project B3b, Mutual Understanding in Search and Examination: Report on Comparative Study in Biotechnology Patent Practices*, http://www.uspto.gov/web/tws/B3b_ reachthrough.pdf (accessed Oct. 20, 2005); *see generally* Dept. of Commerce, Patent and Trademark Office, *Request for Comments on Interim Guidelines for Patent Applications Under the 35 U.S.C. 112-1 "Written Description" Requirement*, 63 Fed. Reg. 32639 (June 15, 1998)..

105 Stephen B. Maebius, Sean A. Passino, Harold C. Wegner, *"Possession" Beyond Enablement: A New Written Description Requirement For All Technologies*, in *Biotechnology & Pharmaceutical Law: Patents & Business Strategies* 33, 63 (S. Peter Ludwig ed., Practising Law Institute 2004).

106 *See supra* Patent Problems.

B. The People's Republic of China

1. 1.2 Billion Consumers and More [107]

Accession to the WTO followed by phenomenal economic growth has made the country with the world's largest population an attractive market indeed. The People's Republic of China (P.R.C.) established a State Food and Drug Administration (SFDA) in 1998 to accommodate drug approval and importation.[108] In response to pressure from WTO Members, the P.R.C. adopted in 2001 new intellectual property and pharmaceutical legislation designed to centralize government oversight on the drug industry, encourage competition, and battle piracy and counterfeiting.[109] The P.R.C. acceded to the WTO on December 11, 2001[110] and now has one of the world's largest pharmaceutical industries with over 5,000 companies.[111]

China's burgeoning pharmaceutical industry is due in part to recent efforts to strengthen the patent regime to provide investors with incentive to venture into riskier technologies in a market notorious for reverse engineered and counterfeit goods. The P.R.C. National People's Congress Standing Committee adopted the Patent Laws of the People's Republic of China on March 12, 1984 (PLPRC 1984)[112], which included provisions barring patent protection for food, beverages, flavorings, pharmaceuticals, and other substances obtained from

---

[107] While "'1.2 billion consumers' was to become the commercial poetry of the 1990s . . . multinational business needed something more. It needed a further rationalization for a grand adventure and a reason why the market was going to be different this time." Joe Studwell, *The China Dream, The Quest for the Last Untapped Market on Earth*, p. 125 (Atlantic Monthly Press, N.Y.) (describing the investment atmosphere in China in late 20th Century).

[108] Zahl, *International Pharmaceutical Law and Practice,* at §5, 2.

[109] Like most countries, China has a civil law system; judgments are supported by statutes and regulations, not judicial precedent.

[110] The PRC is also a member of WIPO, Paris Convention and the Patent Cooperation Treaty (PCT), among others.

[111] Zahl, *International Pharmaceutical Law and Practice* at §5, 2. The Agreement establishing the World Trade Organization (WTO) concluded at Marrakesh on April 15, 1994, and entered into force on January 1, 1995. The Agreement culminated from the eight-year Uruguay Round negotiations under the auspices of the General Agreement on Tariffs and Trade. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) constitutes Annex 1C of the Marrakesh Agreement and binds all Members of the WTO pursuant to Article 11(2). The TRIPS Agreement requires Members to establish in their national law a minimum standard level of intellectual property protection.

[112] PLPRC 1984 allowed for a world record 3,455 applications to the Chinese Patent Office on its effective date, April 1, 1985. *See* Peter Feng, *Intellectual Property Law in China*, 142 (Sweet & Maxwell Asia 1997).

chemical processing.[113] Under PLPRC 1984, pharmaceutical patents were barred due to a then substantially imitation-based pharmaceutical industry.

Conflict between intellectual property administrative bodies, scholarly criticism concerning the undue complexity of PLPRC 1984, and the prospect of GATT membership prompted further change. The Sino-US Memorandum of Understanding of January 17, 1992 memorialized China's commitment to upgrade patent and copyright protection to meet international standards.[114] Accordingly, amendments to the Patent Law were adopted on September 4, 1992 and enacted January 1, 1993 in the Resolution on the Amendment of the PRC Patent Law (PLPRC 1992), which redacted the aforementioned exclusions. Thus, pharmaceuticals previously excluded under PLPRC 1984 were patentable under PLPRC 1992 and remain so under current PLPRC 2000.[115]

While China's patent law is strong in letter, enforcement is a chief concern among foreigners.[116] Foreign direct investors with concerns about misappropriation of valuable know-how can rely primarily on contract law and seek to resolve disputes through negotiation, mediation, or arbitration; but litigation is a more effective forum for enforcing patents on foreign complex technology and is of particular importance to companies selling products in the Chinese market even if they are not producing products in China. Lack of procedural rules for discovery and evidence, low damage awards, and lack of judicial independence are noted challenges facing foreign IP holders.[117] In light of recent discriminatory tax policies on semi-conductors and mandatory encryption standards for wireless networks, some worry that China may seek to pursue an industrial policy of limiting competition from imports while taking advantage of open compe-

---

113 Thomas Traian Moga, *Patent Practice & Policy In The Pacific Rim*, vol. 1, CHI 4.10 (Oceana Publications, Inc. 1999); Feng, *supra* n. 112, at 142 (following a policy of reform and open up, the State Science and Technology Commission was entrusted with the task of drafting a patent law; 24 drafts in all were produced).

114 Feng, *supra* n. 112, at 145.

115 *Id.* The Patent Laws were further amended to ensure TRIPS compliance. Additionally, the patent term was extended from 15 to 20 years for utility inventions and criminal sanctions for counterfeiting were added.

116 Keith E. Maskus, *Intellectual Property Rights in the WTO Accession Package: Assessing China's Reforms*, in *China and the WTO: Accession, Policy, Reform, and Poverty Reduction Strategies*, 49, 59 (2004); Stanley P. Kowalski, *Agricultural Biotechnology in China: An Unreachable Goal?* 6 Journal World Intellectual Property 655, 657-658 (July 2003) (discussing inadequacies of IP regime in China and potential consequences of weak IPR enforcement on agri-biotech development).

117 Catherine Sun, *IP Regime of the PRC* in Arthur Wineburg, *Intellectual Property Protection in Asia*, 2d §§ 3.01, 3-8-3-10 (2004).

tition in foreign markets.[118] A true perspective of the development of China's IP regime, however, cannot be without consideration of how IP rights limit economic development and sap resources in the short run, as is often the case in developing countries with weak domestic markets.[119]

China's biotech and pharmaceutical sector is far from weak. Beijing Genomics Institute represented China as the only developing country to participate in the Human Genome Project. Shenzhen-based SiBiono GeneTech Co., Ltd. developed in 2003 the word's first gene therapy medication. China's biopharmaceutical market is growing at an estimated thirteen percent annually.[120] Most of the nation's domestic pharmaceutical market is composed of competing generics and malleable patent principles that lend themselves to variable interpretation can pose large risks for innovative companies, domestic and foreign.

2. In China, Claim Swiss

The P.R.C. grants patents for new technical solutions that relate to a product, process, or improvement that is useful, novel, inventive, and sufficiently disclosed. [121] Patentable subject matter includes chemical or biological compounds having a pharmaceutical use, pharmaceutical uses for known compounds, and processes for preparing compounds having pharmaceutical uses. [122] Patents for medical treatment methods and methods of diagnosis are prohibited,[123] however, pursuant to the requirement that an invention must be that which can be made or used.[124] Medical treatment methods lack industrial applicability because their use depends not only on the invention, but also on the skill of a trained physician.[125] Whether the exclusion under Article 25.1(3) of PLPRC

---

118 Robert B. Zoellick, U.S. Trade Rep., Remarks at the Asia Society Annual Dinner, *China and America: Power and Responsibility* (Feb. 25, 2004).

119 Maskus, *supra* n. 116, at 56 (noting "[u]ndoubtedly, significant amounts of labor are employed in copying and retailing illegitimate products in China, and an important short-run cost of stronger IPRs will be labor displacement").

120 Matthew Chervenak, *An Emerging Biotech Giant?: Opportunities for well-informed foreign investors abound in China's growing pharmaceutical sector,* The China Business Review, 48, 49 (May-June 2005).

121 PLPRC Art. 22 (2000).

122 Zahl, *International Pharmaceutical Law and Practice at* §5, 4. Patentable subject matter includes living matter except plants and animals; naturally-occurring biological material isolated or purified from its natural state or synthetically manufactured; human cells or tissue; and selection patents.

123 PLPRC Art. 25.1(3).

124 *Id.* at Art. 22.

125 PLPRC Art. 22.4 (2000).

2000 applies to a pharmaceutical product depends on whether the claims are drawn to an industrial application or treatment of disease.[126]

To claim a new feature of a substance and application of such feature, the draftsperson must keep in mind that "[t]he essence of the use invention does not lie in the substance per se, but in the application of the feature of the substance."[127] Accordingly, an exemplary therapeutic method of use claim should read "a compound X applied for preparation of a pharmaceutical product Y". A claim drafted in this form defines a use invention capable of industrial applicability whose results do not rely on intervening skill from a variant third party. New pharmaceutical uses for known compounds do not belong to the prior art.[128]

Industrial Applicability

An invention has industrial applicability or utility if the invention can be made or used and can produce effective results.[129] A finding of utility may be supported with a specified medical use, pharmaceutical effectiveness, effective amounts and methods of administration, and qualitative or quantitative experimental data that supports a purported pharmaceutical effectiveness.[130] While many countries rely on a broader standard, Article 22 paragraph 4 provides a two part test to determine industrial applicability. The test considers whether the invention can be manufactured or used and the invention's ability to produce positive effects. Positive effects are those that the skilled technician can foresee on the date of filing in light of the totality of benefits conferred by the invention.[131]

Novelty

For an invention to be novel there must be no identical invention in a publication, no public use or other activity that educates the public as to the existence of the invention, nor a previous filing with the Patent Administration

---

126 *Id.*

127 The State Intellectual Property Office of the People's Republic of China, *The Guidelines for Patent* Examination, §2, 168 (2001) [Translated by Helen Han] [hereinafter Han].

128 Feng, *supra* n. 112, at 157.

129 PLPRC Art. 22.

130 A patent should include several working examples to support broad patent claims, especially for a new compound having a general formula and an invention concerning a broad range. It would be prudent for the draftsperson to provide three examples for a range, including upper, middle, and lower representatives. Han, *supra* n. 127, at §2, 173-175.

131 Feng, *supra* n. 112, at 191.

Department of the State Council that was later published.[132] Inventions are not anticipated if initially disclosed at an international exhibition recognized by the P.R.C., a prescribed academic or technological meeting, or if disclosed without consent of the applicant.[133]

Pharmaceutical inventions sometimes present unique problems in a novelty analysis. The existence of a natural material may anticipate an invention if the natural material is publicly known and possesses the same structure and state as the inventive substance.[134] A known substance cannot destroy novelty of a new use, however, if the new use is the invention.[135]

Inventiveness

Creativity or inventiveness may be found if the claimed subject matter has prominent substantive features that represent a notable advance in light of the prior art and based on the knowledge and ability of a person skilled in the art.[136] The P.R.C. focuses on technical effects of an invention using an analysis that first defines the inventive task or objective, then determines the nature of the invention (e.g. pioneering, improvement, combination, selection, and application inventions), and finally provides parameters for judging inventions according to their differing objectives and natures.[137] A pioneering invention must meet a higher inventive step threshold and more notable quality in technical effect but is not expected to achieve quantitatively extensive technical effects.[138]

Unexpected uses and results, although not required, may support inventiveness.[139] Exemplary unexpected results include a use different from that already associated with a known compound, a substantial improvement or increase of one known result of the known compound, or use of a result that cannot be deduced from general knowledge by one skilled in the art.[140] Use inventions of chemical substances are considered inventive where a new property has been found; the new use based on that property produces a positive result; and that property cannot be derived or expected from the structure, composition,

---

132 PLPRC Art. 22.1.

133 *Id*. at Art.24.

134 Han, *supra* n. 127, at §2, 171.

135 *Id*. at §2, 172; PLPRC Art. 22.2.

136 PLPRC Art. 22.

137 Feng, *supra* n. 112, at 187.

138 *Id*.

139 PLPRC Art. 22.3; Han, *supra* n. 127, at §2, 173.

140 Han, *supra* n. 127, at §2, 173.

molecular quantity or its physical-chemical property of the associated substance in an obvious way.[141] A new use that produces unexpected effects indicates prominent substantive features and notable progress in accord with Article 22.[142]

Written Description

Article 26 paragraph 3 of PLPRC 2000 requires the written description to contain a clear and complete disclosure that enables the notional skilled technician to comprehend and carry out the disclosed invention. The description must support the claims.[143] The scope of protection is based on the content of the claims and the description and drawings are used to interpret details in or outside the claims.[144] While the provision appears in the Chapter on Application for Patent in the Patent Law, it is also a statutory ground for requesting patent invalidation.

Pharmaceutical inventions must teach a method of preparing, conditions involved therein, and a description of the reactants.[145] Independent claims should contain all indispensable technical features for fulfilling the inventive tasks and should be expressed in more than one embodiment.[146] Article 22 of the Patent Law Implementation Regulations requires the preamble of the independent claims to identify closely related technical features of the prior art, partly to aid in novelty and inventive step analyses.[147] Generally, the number of embodiments required is that which would be sufficient to understand the invention and determine the feasibility and scope of the claims.[148]

For new pharmaceutical methods of use, the specific use, therapeutic effect, effective amount, and method of application must be disclosed.[149] Qualitative or quantitative data should be provided in a manner that enables a person skilled in the art to prove that the technical solution achieves the claimed effects on the technical problem to be resolved.[150] Methods used to produce performance data should be disclosed and should be the general or standard method

---

141 *Id.* at 175.

142 *Id.* at §4 (4.4).

143 PLPRC Art. 26.4.

144 PLPRC Art. 56.

145 Zahl, *supra* n. 33, § 5.01[4].

146 Feng, *supra* n. 112, at 208.

147 *Id.* at 209.

148 Han, *supra* n. 127, at § 2, 171.

149 *Id.* at § 2, 170.

150 *Id.* This may include animal experiment results or clinical testing results.

used in the relevant field.[151] The Guidelines suggest that method claims are a type of process claim; therefore, the disclosure should identify the raw material, the process steps and conditions it uses, and where necessary, the effect of the method on the property of the target substance in a manner that enables a person skilled in the art to resolve the problem intended to be resolved by the claimed method.[152]

IV. PFIZER AND THE TRUE SPORT OF KINGS

When China invalidated the VIAGRA patent in July, 2004, international criticism of China's intellectual property regime was omnipresent. Richard Mills, spokesman for the U.S. Trade Representative's office said: "It's hard not to view this case within a pattern of intellectual property infringement in China. . . . [The U.S.] remains deeply concerned about IP problems in China."[153] Despite criticism of China's IP regime by the U.S.,[154] Pfizer's second medical use patent is being contested on U.S. soil in the U.S. District Court of Delaware. On October 22, 2002 Pfizer filed patent infringement lawsuits against Eli Lilly ICOS and Bayer both of whom had taken steps to achieve market approval of their PDE inhibiting MED drugs, CIALIS and LEVITRA respectively. Pfizer, in an attempt to maintain their hold on the MED market, filed complaints seeking declaratory judgment and injunctive relief.[155] The case was stayed pending director ordered reexamination by the USPTO.[156]

Among four asserted substantial new questions of patentability regarding the '012 patent raised by the USPTO Commissioner on September 29, 2003, obviousness and anticipation were prominently supported. The Commissioner stated that U.S. Patent No. 5,250,534 (Bell) inherently anticipated '012 because a patient receiving treatment by a compound disclosed by Bell would be inherently treated for MED.[157] Pfizer responded with *Jansen v. Rexall, Inc.*, stressing the preamble's role in restricting the scope of '012 to administration of the dis-

---

151 *Id.*

152 *Id.*

153 Duan Hongqing, Zhu Xiaochao, Fu Li'ao, *China Revokes Viagra Patent*, Caijing English Newsltr., ¶ 7, http://caijing.com.cn/English/2004/040720/040720viagra.htm (accessed Nov. 25, 2004).

154 *See* Pilon, *supra* n. 1, at ¶ 7.

155 Compl. at ¶ 20, *Pfizer Inc. v. Lilly ICOS L.L.C.*, No. 02-1561 (D. Del. Oct. 22, 2002).

156 *See* U.S. Pat. No. 6,469,012 (Oct. 22, 2002).

157 *See* Response to Dir. Initiated Or. for Reexam. at 2, U.S. Pat. No. 6,469,012 (Oct. 22, 2002) [hereinafter "Response"] (filed with USPTO Dec. 5, 2003).

closed compounds for MED. Similar to issues raised in Eli Lilly's U.K. case against Pfizer, the Commissioner also asserted obviousness over Murray in combination with Bell.[158] Murray, like Rajfer, contemplated the use of PDE inhibitors, specifically PDE_V, for treating MED in light of Rajfer's results with ZAPRINAST. Pfizer replied stating that Murray provides no reasonable expectation that cGMP PDE inhibitors could be used orally in humans or that the inhibitors referenced by '012 could be used to treat ED in animals.[159]

Over a year earlier, Pfizer lost a suit in the U.K. against Eli Lilly. On January 23, 2002, the British High Court dismissed Pfizer's appeal from the Patents Court and affirmed the lower court's ruling that Pfizer's patent for a method of using PDE inhibitors to treat MED was invalid.[160] Justice Laddie of the Patents Court presided over the suit in which Eli Lilly ICOS LLC (Eli Lilly) sought to invalidate European Patent No. 702, 555 registered in the name of Pfizer, Limited.[161] Eli Lilly alleged anticipation, obviousness, and insufficient disclosure. The Court's holding, issued on November 8, 2000, cited obviousness over the prior art as the basis for invalidity.[162]

On claim construction, the Court found the following with regard to the principal claims at issue: Claim 1, "the use of a compound of formula (I)" covers compounds disclosed in the Bell patent; Claim 10, "the use of a cGMP PDE inhibitor, or a pharmaceutically acceptable sale thereof, or a pharmaceutical composition containing either entity, for the manufacture of a medicament for the curative or prophylactic oral treatment of erectile dysfunction in man" covers the use of any compound that inhibits cGMP PDE enzymes, whether selective or not, by oral administration; Claim 11, "the use . . . [of] a cGMP PDE subV inhibitor" was restricted to compounds that specifically inhibit cGMP PDEV.[163]

The Court applied a problem solution approach to determine inventive step for the broader claims 10 and 11.[164] The Court found that Dr. Rajfer, by teaching that *in vitro* ZAPRINAST enhances relaxation of smooth muscle, indicated to those unimaginatively skilled in the art that the same effect could possi-

---

158 K. J. Murray, *Phosphodiesterases V subA Inhibitors*, 6 Drug News & Perspectives 3, 150-56 (April 1993).

159 Response at 5, U.S. Pat. No. 6,469,012.

160 Michael Burdon & Kristie Sloper, *The Art of Using Secondary Patent to Improve Protection*, 3, 3 Intl. J. Med. Mktg. 226, 235 (June 2003).

161 *Pfizer Ltd.*, [2001] 16 F.S.R. 201, 206 (Pats. Ct. 2001).

162 *Id.* at 201, 244-45.

163 *Id.* at 217-18, 224-25.

164 *See Windsurfing Intl. v. Tabur Marine Ltd.*, [1985] R.P.C. 59, 73 (Ct. App. - Civ. Div. 1984).

bly be achieved *in vivo*. The Court further reasoned further that Murray, which addressed PDE_V inhibitors, would have led the skilled worker to the Bell disclosure to find cGMP PDE inhibitors similar to ZAPRINAST. The Court also found that oral administration would have been the most obvious to try because it is the most preferred route.[165]

The Court's findings indicate a moderate level of hindsight analysis. What Dr. Rajfer did was to elucidate a biochemical pathway and predict possible applications of his discovery. Pfizer's arguments, although dismissed by the Court, focused largely on the unpredictability involved in using Dr. Rajfer's disclosure for development of VIAGRA.[166] The most logical approach to manipulating the NANC pathway was to administer a treatment that would increase NO production. Indeed, Professor Ignarro, Dr. Rajfer's colleague, recalled during examination that the editor of the *New England Journal of Medicine* warned him "that impotent men would be asking where they get nitric oxide" and in Professor Ignarro's view "that popular response would have been mirrored by a skilled man in the field."[167] Furthermore, despite preference for an oral route of administration, such was not to be expected. cAMP, cGMP, and NO are ubiquitous *in vivo*; it would be obvious to one skilled in the art that systemic administration of a PDE would have drastically negative effects.[168] Although researchers may have been motivated to try and effectuate Dr. Rajfer's tenuous prediction, it is difficult to conclude that success in carrying out the endeavor was to be reasonably expected.

Unlike Pfizer's losses in Argentina and Egypt, patent invalidation and re-examination actions in the U.S. and the U.K. are grounded in substantive patent law and turn on principles thereof that have proven difficult to apply to inventions that manipulate biological functions.[169] This is precisely the case with China's decision over the VIAGRA patent. Although there are many valid concerns over Chinese IP enforcement issues, the VIAGRA case illustrates the P.R.C.'s willingness to adhere to the rule of law—instead of pirating, a dozen or so Chinese companies brought suit to enforce their right to sell what they claimed did not belong exclusively to a foreign pharmaceutical manufacturer.

Chinese pharmaceutical companies successfully petitioned SIPO to overturn Pfizer's second use patent by executing a two-pronged attack.[170] They

---

165 *Pfizer*, 16 F.S.R. at 241-45.

166 *Id.* at 231-36.

167 *Id.* at 231.

168 *Id.* at 238-39.

169 *See e.g. supra* at III A (2), Written Description.

170 Hongqing et al., *supra* n. 153, at ¶¶ 9, 14.

first cited the same prior art that the U.K. High Patent Court used to invalidate the patent, predominantly the Raijfer publication and the Murray publication, which addressed the role of NO in the NANC pathways and selective PDE_V inhibitors respectively.[171] According to counsel for the Chinese petitioners, the U.K. patent included the use of sildenafil citrate among other chemicals in the pyrazolopyrimidinone class, while the Chinese patent claimed only the use of sildenafil citrate; making it more difficult to use results of previous studies like Murray and Rajfer to attack the patent's validity.[172] The second prong of the attack was on the patent's clarity and sufficiency of disclosure.[173]

Crouching Pfizer, Hidden Rule

Though Chinese consumers welcomed VIAGRA, Chinese companies did not welcome Pfizer's respective patent. In early August 2004, Tonghua Hongtaomao Pharmaceutical Co. announced plans to set up a joint-stock company to make and sell generic VIAGRA.[174] SIPO granted Pfizer a patent on their method of using sildenafil citrate for treating MED on September 19, 2001.[175] Soon thereafter, a dozen Chinese pharmaceutical companies jointly filed for invalidation of Pfizer's patent. Three years later, July 5, 2004, a month before Tonghua Pharm's announcement, SIPO rendered Invalidity Claim Decision No. 6228 wherein the Patent Review Committee stated:

> In view of the technical descriptions in the specifications [sic] of the disputed patent and available technologies in the field concerned, it is impossible to confirm that the compound can cure or prevent erectile dysfunction of male animals without the creative labor of technical personnel in the field concerned. Therefore, the technical openness [sic] in the patent specifications [sic] is incompatible with the claims to rights, i.e. the disputed patent does not conform to the provisions in Clause 3 of Article 26 of China Patent Law. Therefore, the patent is declared invalid.[176]

The written description was considered insufficient to support the claimed technical solution.

---

171 *Id.* at ¶ 16.

172 *Id.* ¶¶ 18-19.

173 *Id.* at ¶ 20.

174 Pilon, *supra* n. 1, at ¶ 4.

175 CN Pat. No. 94,192,386 (Sept. 19, 2001).

176 Dongfang, *An In-Depth Look at Viagra's Abrupt Change of Fate in China*, 2 China Intell. Prop. 3, 3 (Sept. 2004) (citing SIPO Invalidity Claim Decision No. 6228 (July 5, 2004) (unpublished) (invalidating CN Pat. No. 94,192,386 (Sept. 19 2001)).

Article 22 requires creativity, substantive characteristics and remarkable progress, and Article 26 requires a clear, complete, and enabling description to support the technical solution without undue experimentation. During re-examination proceedings, these two issues were contested on grounds that Pfizer asserted the invention's beneficial results without clear and complete test data.[177] Although facially compliant with the 2001 Guidelines of Examination and PLPRC 2000, the disclosed enzyme activity data, testing methods, dispensing methods, and dosages for human use were insufficient to enable the skilled person in the art to carry out the technical solution as required under Article 26 paragraph 3. The only allowed claim in Pfizer's 2001 patent reads:

> 5-[2-allyloxy-5-(4-methyl-1-piperazinylsulphonyl)phenyl]-1-methyl-3-n-propyl-1,6-dihydro-7H-pyrazolo [4, 3-d] pyrimidin-7-one or a pharmaceutical acceptable salt thereof, or a pharmaceutical composition containing either entity, for the manufacture of a medicament for the curative or prophylactic treatment of erectile dysfunction in a male animal, including man.[178]

The formula is that of sildenafil citrate and is included among many others in the claims and specification in the international application and other national patents for VIAGRA including Pfizer's '012 in the U.S.[179] Pfizer provided general enzyme activity and non-toxicity data and the like for especially preferred compounds of the invention generally, *inclusive* of sildenafil citrate, but not for sildenafil citrate specifically. SIPO ruled for petitioners finding the disclosure inadequate to support the claimed technical solution, which was the treatment of MED using the compound, sildenafil citrate.

Pfizer sought to challenge SIPO's decision in the Beijing No. 1 People's Intermediate Court in March, 2005 and while the case is still pending, Pfizer tentatively retains market exclusivity. SIPO's Chinese Intellectual Property Newspaper reported the Review Committee's conclusion with a reminder that the European Patent Office also invalidated the same patent.[180] Investors already

---

177 *Id.* at 3-4. Article 22, which requires novelty, inventiveness, and practical applicability, was also raised as a basis for invalidity. *Id.*

178 CN Pat. No. 94,192,386 (Sep. 19 2001).

179 *See e.g.* WO Pat. No. 9,428,902 (Dec. 22, 1994), http://v3.espacenet.com/textclam?DB=EPODOC&IDX=WO9428902&F=0&QPN=WO9428902.

180 SIPO, *"Ten Thousand Mugworts May" The Patent Announce Invalid*, http:/216.239.37.104/translate_c?hl=en&sl=zh-CN&u=http:/www.sipo.gov.cn/sipo/zscqb/yaowen/t20040713_31275.htm.

appear shaken—GSK waived patent protection for its diabetic drug Avandia about one month after the VIAGRA invalidity decision.[181]

Insufficient support in the written description of the VIAGRA patent has served as a basis for invalidation elsewhere in Asia. The Korean Patent Court affirmed rejection of Pfizer's method of use application[182] for failure to provide adequate quantitative data. Pfizer argued in its dismissed appeal to the Korean Supreme Court that a strict quantitative data requirement is legally unfounded—a special requirement beyond that of enablement.[183] The same controversial written description doctrine that has dominated U.S. IP legal commentary serves as a pliable rule that works for domestic companies of developing nations that wish to strip mammoth foreign competitors of their profitable market exclusivity.

V. CONCLUSION

For developing countries, technology absorption and innovation is difficult to achieve if foreign biotech and pharmaceutical firms are deterred by risky investment environments. Some developing countries may not yet be capable of producing domestic technology worth protecting and may not perceive an immediate benefit from IP enforcement. A developing country may be tempted to perpetuate protectionism in efforts to limit foreign competition in domestic markets. The result: short-term economic satisfaction that could have devastating long-term effects on the local economies of developing Member countries.

Pfizer's forced charity in Argentina and Egypt exemplifies short-sighted economic policy. A common tactic in U.S. patent practice is to nest a preferred compound that a company uses for a drug within a larger 'preferred' class of compounds in the patent specification and to disclose quantitative data like enzyme activity or lab data as to the larger class. Data from clinical trials and the like for a specific compound within a claimed class is often considered valuable know-how and is not disclosed in the patent specification of a respective drug. Indeed, many countries, including the U.S. and the U.K., grant supplementary patent protection following lengthy regulatory review of required clinical data for a particular drug. In some cases, as with Pfizer in Argentina, valuable know-how is misappropriated and used to compete against the foreign patent holder

---

181 Kalley Chen, *Li Kui v. Li Gui, China's Path to Development: Enforcement and Challenges*, Corporate Counsel A4, A5 (Oct. 2004).

182 KO Pat. Application No. 10-1999-7001541 (Feb. 20, 1999).

183 Br. at 8, *Field of Use Case*, Supreme Court Appeal (Republic of Korea Mar. 10 2003) (Kim & Chang trans.).

who is waiting to enter the local market. Such actions may chill foreign direct investment in respective regions. Companies may be hesitant to start production in a country where they cannot protect valuable know-how; where a company's product may enter a foreign market that it was never intended to enter.[184]

The VIAGRA decision in the P.R.C., although criticized, was soundly based and should be viewed as having little impact on foreign direct investment. A legal environment with weak IP enforcement or one that fosters pirating, however, will pose a risk to foreign pharmaceutical companies that intend to introduce patented pharmaceuticals to the market.[185] It is expensive to research and design a drug, and markedly inexpensive for generic manufacturers and pirates to copy and produce the same. Pharmaceutical companies planning to sell in markets with unpredictable or weak patent enforcement may not be able to keep within desired or necessary profit margins. Perhaps this is why GlaxoSmithKline PLC "voluntarily abandoned [their] rosiglitazone formulation patent and withdrew from the [Patent Re-examination Board] hearing" a month after Pfizer's loss.[186] Pfizer, after having gained significant profits from VIAGRA prior to market entry in the P.R.C., may have calculated the risks of selling its product in China and decided to push for sale volume in China's vast market.[187] Regardless, while Pfizer's second use patent for VIAGRA has suf-

---

184 *See* Paul J. Heald, *Mowing the Playing Field: Addressing Information Distortion and Asymmetry in the TRIPS Game*, 88 Minn. L. Rev. 249, 263 (2003) (contesting the blanket rule that strong IP protection equals more foreign direct investment, "a close look at Mansfield's research supports the proposition that American firms with significant disclosure worries are influenced by the level of enforcement of trade secrecy and contract law in making foreign direct investment decisions. Its current status as dispositive evidence that maximum enforcement of all sorts of intellectual property law — and especially patent law — will stimulate investment should not remain unchallenged").

185 *Id.* at 265-66 (noting "[i]nadequate or ineffective protection of intellectual property works against introduction of the product into such country, whereby the business can never grow sufficiently to even reach questions of direct investment or licensing to subsidiaries. Thus, inadequate or ineffective protection of intellectual property in a country weighs heavily against . . . the natural progression of events which could lead to the question of foreign investment. This statement echoes the size-of-markets hypothesis that assumes 'foreign investment will take place as soon as the market is large enough to permit the capturing of economies of scale.' If Maskus is correct that strengthening intellectual property law will increase import volumes then a developing country with an adequate number of consumers may eventually see some direct investment following the successful exploitation of product markets").

186 Paul Mooney, *China Challenging Drug Patents*, The Scientist, ¶17 (Aug. 24, 2004), http://biomedcentral.com/news/20040820/02 (quoting Lilian Xiao, spokeswoman for Glaxo).

187 At the time Pfizer reached national phase filing for the P.R.C. on the VIAGRA patent, reexamination decisions were not subject to judicial review. Wineburg, *supra* n. 117, at § 3.02.

fered flawed losses in other developing countries, in China, SIPO's decision to invalidate was reasonably founded.

The U.S. and the P.R.C. have textually delineated between those medical methods that should receive patenting and those that should remain part of the public domain. Second use patents, including the VIAGRA patent, are often described by their biological function. Courts in both countries will invalidate generic claims that are not supported by the specification in a manner that indicates possession at the time of filing or in a manner that adequately describes the invention to the public, thereby satisfying the quid pro quo. Although anticipation and obviousness claims have proven mildly troublesome for the VIAGRA patent, resulting only in a questionable decision by the U.K., the written description requirement seems to be the most problematic for pharmaceutical method of use patents.

Pfizer's attempt to defend its VIAGRA patent in China seems to have resulted in a rare view of a migratory U.S. written description doctrine. The *Eli Lilly* decision has sparked a flurry of legal commentary in the U.S. forecasting the negative implications of heightened disclosure requirements. The P.R.C. applied a similar principle, albeit in a more stringent manner, and demanded of Pfizer quantitative data, without textual support in the patent law, to show possession of a clearly feasible invention. This, like the patent at issue in *University of Rochester*, is an instance where the patent is enabling without sufficiently describing. Without data specific to the function and effects of sildenafil citrate, the only compound referred to in the claims, the notional skilled person in the art, under Chinese law, is unable to carry out the claimed technical solution to the problem of treating MED with an oral medicament. Admittedly, the Chinese petitioners' approach to Pfizer's patent and the tactic's prior effectiveness in Korean courts illustrates the dangers of a "uniquely American doctrine of a 'written description' as a possession requirement."[188] Pliable rules make for unpredictable patent protection, but the quid pro quo must be met, the invention must be placed in the hands of the public, and the standard by which proper disclosure is defined may differ from country to country while still within the minimum standard of intellectual property protection required for WTO membership.

---

[188] *See* Maebius, *supra* n. 105, at 63.