Biologics, patents and drug prices

The global sales of the world's best-selling prescription drug, Humira, continue to grow even after the expiry of the patent over its main ingredient, adalimumab, a biologic used for the treatment of arthritis. By 2020, AbbVie Inc, makers of Humira, expects its sales to touch $21 billion — a figure that will surpass India's pharmaceutical exports for that year. But success has its price. In 2015, faced with the imminent expiry of the patent for Humira's main ingredient, AbbVie reassured investors that the "Broad U.S. Humira Patent Estate" — a list of 75 secondary patents in the U.S. for new indications, new methods of treatment, new formulations, and the like — would take care of the problem.

But what was the problem? Patents offer their owners market exclusivity for a limited period of time. For medicines, this exclusivity should last as long as the primary patent — which relates to the active pharmaceutical ingredient (API) of the medicine — is in effect, typically 20 years. The end of patent exclusivity is referred to as a patent cliff, because drug prices fall steeply afterwards — by as much as 80% — owing to generic competition.

But the threat of this precipitous fall in profits drives pharmaceutical companies to find new ways to postpone their exclusivity by filing secondary patents for derivatives and variants of the API, such as a physical variant of the API, a new formulation, a dosage regimen, or a new method of administering the medicine. The secondary patents prop up before the expiry of a primary patent thereby stretching the exclusivity beyond 20 years, a practice that is called "evergreening". This strategy is most lucrative when employed in the context of so-called blockbuster medicines, which reap annual revenues exceeding $1 billion.

The Humira patent estate now comprises secondary patents. While it is hard to comprehend how real estate can grow, the genius of patent law allows the intellectual property estate to expand by filing more secondary patents. Over the years, AbbVie has increased the price of Humira in the U.S. by 100%, while steadily filing a large number of secondary patents. While the complexity of biologics – drugs made from complex molecules manufactured using living cells — allows for filing more patents, the patent laws too play a role. The U.S. recognises and encourages secondary patents. India, however, does not, which means that while Humira costs $1,300 (85,000) in the U.S., the same treatment costs only $200 (13,500) in India, thanks to the rejection of secondary patents on Humira by the Indian Patent Office (IPO) and the consequent introduction of cheaper versions.

The rejection of a secondary patent for Novartis' Glivec, a crucial leukaemia cure, was famously upheld by the Supreme Court of India in 2013, while the same was granted in the U.S. Consequently, the cost of a monthly dose of the medicine in the U.S. was 1.6 lakh, while the cost of the generic was 11,100 in India. Likewise, Spiriva, a medicine for asthma, enjoys patent protection until 2021 in the U.S., largely due to secondary patents. All of these secondary patents were rejected in India. As a result, while the monthly cost of the medicine in the U.S. is over 19,100, it costs a mere 250 in India.

In our study of more than 1,700 rejections for pharmaceutical patents at the IPO spanning the last decade, we identified a subset of applications that sought protection in the form of secondary patents for blockbuster medicines. Our study sheds new light on how Indian patent law helps thwart evergreening practices by pharmaceutical companies. Secondary patents for several blockbuster medicines have been rejected by the IPO dramatically expanding access to medicines for important health problems such as cancer, AIDS, asthma and cardiovascular diseases.

None of this would have been possible without some remarkable innovations in Indian patent law.

To be deemed patentable, applications for secondary patents have to clear significant hurdles. As per Section 2(1)(ja) of the Patents Act, the product in question must feature a technical advance over what came before that's not obvious to a skilled person. Because secondary patents for pharmaceuticals are often sought for trivial variants, they typically fail to qualify as an invention. Further, when a medicine is merely a variant of a known substance, Section 3(d) necessitates a demonstration of improvement in its therapeutic efficacy. The provision also bars patents for new uses and new properties of known substances. This additional requirement is unique to Indian law, and along with Section 2(1)(ja), ensures that bad patents stay out of the system.

We found that secondary patents were rejected largely due to the stringent thresholds imposed by Sections 2(1)(ja) and 3(d). Section 3(d) is not our only defence against secondary patents. It is complemented by other exceptions to patentability: Section 3(e) ensures that patents for combinations of known substances are allowed only if there is synergistic effect, while Section 3(i) ensures that no exclusivity can be claimed over methods of treatment. Together, Sections 3(d), 3(e) and 3(i) have been instrumental in rejecting close to 1,000 secondary patents for pharmaceuticals we studied.

These provisions also extend to biologics, the new big players in the therapeutics marketplace. More lucrative than small molecule medicines, biologics are no stranger to the lure of secondary patenting for extending patent terms. For instance, a quarter of the secondary patents for Humira, a biologic, are directed towards new uses and methods of treatment. Thanks to the provisions in the patent law, Humira enjoys no patent protection in India, since AbbVie restricted their Indian filings to only cover their secondary patents.

Blockbuster medicines are crucial to the success of public health. But they have been gamed, and rendered inaccessible to the people and governments who need them. In order for these medicines to be accessible, there can be no surer way than to enact strong standards that put bad patents where they belong.

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Marriage is a civil contract — adultery or divorce should have only civil consequences

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