Intellectual Property

At the Interfaces of AI, Chemistry and Patents – Opportunities and Challenges

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The use of artificial intelligence (AI) has seen rapid acceleration in all areas of technology. In the chemical field, in particular, there has been a near exponential growth in the number of published papers and patents involving AI since 2015, (read more **HERE**).

There are numerous applications for AI in chemistry, including molecular property prediction, reaction optimization, synthetic route planning, and laboratory automation.

Drug discovery in particular has greatly benefited from AI technology. The drug discovery process is an expensive and often inefficient endeavor, frequently leading to failure. Of all the drug development programs established between 2000 and 2015, less than 15% were eventually approved. Already there are several AI-discovered small molecule drugs that are undergoing clinical trials for FDA approval (read more **HERE**), thus highlighting the potential for AI to facilitate the drug discovery process.

For the Canadian market, a large step forward for chemical AI research was taken in June of 2023 when Recursion Pharmaceuticals, a leading clinical stage TechBio company, opened a 28,000 square foot site in Toronto to serve as the headquarters for Recursion Canada. The opening of this site closely follows the company's acquisitions of two Canadian leaders in AI-enabled drug discovery: Cyclica, based in Toronto, and Valence, based in Montreal.

As with other innovative technologies, it is important for entrepreneurs in this space to consider developing a robust and thought-out intellectual property (IP) strategy. There are some key considerations to keep in mind when patenting inventions created with the assistance of AI. First, it is important to note that in most patent offices today, AI cannot be listed as an inventor (read more **HERE**). Therefore, the contributions made by *human* researchers at all stages of development must be considered. This encompasses decisions about research targets, selection of data and instructions for AI, and optimization of AI-generated predictions, since inventive contributions can occur at any point during this process.

Another challenge in securing patents for AI-based inventions is the issue of patentable subject matter. In the context of AI, inventions that involve algorithms, mathematical models or software may encounter resistance from patent offices in many jurisdictions, as these are often considered abstract ideas and, therefore, ineligible for patent protection. This necessitates a careful consideration of how AI inventions are framed in patent applications, and may involve emphasizing practical applications and tangible results achieved through AI technologies, rather than focusing solely on the underlying algorithms.

Further, when filing a patent application, in particular in the notoriously unpredictable field of chemical research, providing supporting experimental data is key. Computational data can be valuable for this purpose, but should not be solely relied on in the event it is not considered to demonstrate the necessary technical effect. In essence, patent applications must provide a clear and comprehensive description of the invention to enable a person skilled in the art to replicate and use the technology without undue experimentation.

For more information, or if you have questions about your IP strategy for AI-based innovation in chemistry, please feel free to contact a member of our newly formed Chemical AI practice group.

Practice Area News

FCA Rejects Test for Subject-matter Eligibility of Software-based Inventions. In ***Canada v Benjamin Moore & Co* (2023 FCA 168)**, the Federal Court of Appeal rejected the Benjamin Moore Test proposed by the Intellectual Property Institute of Canada for assessment of patentable subject matter. This allows the Canadian Intellectual Property Office to maintain its current approach to examining computer-implemented inventions, including considering the "actual invention" as potentially distinct from the claimed invention when construing the claims to determine subject matter eligibility.

Future of Privacy Law in Canada. The proposed Consumer Privacy Protection Act (CPPA) in Canada introduces definitions for "de-identified" and "anonymized" information, but the distinction hinges on the risk of re-identification. However, this risk varies depending on accessibility to additional information. On the other hand, a recent European Court decision (*SRB v EDPS* [T557/20]) emphasizes considering accessibility to additional data in determining whether information has been sufficiently anonymized to no longer be considered personal information.

CIPO's 2024 Patent Fee Increases: What you need to know. The Canadian Intellectual Property Office (CIPO) will implement substantial patent fee increases on January 1, 2024, as part of an effort to adjust for inflation. Most fees will rise by 25% above the inflation adjustment, except for recently introduced excess claims fees, which will increase by 10%. Small entity fees, while increasing, will not follow the standard 25% rise. Applicants may consider taking advantage of 2023 rates before the changes.

The More One Claims, the More One Must Enable. The U.S. Supreme Court, in ***Amgen Inc. v. Sanofi* (598 U.S. _ (2023))**, affirmed lower court decisions invalidating two Amgen patents related to its Repatha products. Around the same time, the Japanese IP High Court invalidated a corresponding Japanese patent, emphasizing stricter enablement standards for broad antibody claims. Applicants should provide comprehensive support, including functional and structural perspectives, and mechanistic details in their patent applications to protect against invalidation.

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