

My Intelligent Machines

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Augmented intelligence at the service of personalised medicine: how artificial intelligence is accelerating drug discovery and development

By harnessing patient and disease data, multi-omics and scientific literature, the fast-growing, AI company My Intelligent Machines (MIMs) is breaking new ground with software solutions that accelerate the identification of drug targets and biomarkers.

The traditional drug discovery and development process contends with a high failure rate of clinical trials at phase 2 and 3 as patients do not respond the same way to a given treatment. MIMs is challenging this deep-rooted a priori of time and financial losses with an augmented intelligence software that layers the drug manufacturer's own proprietary patient data on MIMs' knowledge-base from a vast library of structured and unstructured public data, to create a customized and turnkey solution. Its solutions are garnering interest thanks to their unique value proposition that equip life scientists with insights on patients' genetic and biological mapping for population stratification, target and biomarker discovery.

"While identifying biomarkers to select patients that will respond to drugs as moving closer to regulatory approval is a great avenue, at MIMs, we believe that embracing personalised medicine approaches early in preclinical stages will give better results and will redefine the discovery process," said Sarah Jenna, MIMs co-founder and CEO.

With access to solutions that rely on a knowledge base that magnifies their own data, drug manufacturers can then identify drug targets with increased efficacy for specific populations, and prioritize drug development. Used in the early stages of drug discovery, the solutions could allow those manufacturers to save up to \$500 million per development project, by reducing both the clinical trials failure rate, and the number and scale of trials, whilst enabling them to seek faster market approval (Fig. 1).

MIMs' solutions may also be used in later-stage drug development, for example, pharma companies specializing in oncology may have drug candidates with the potential to treat a wide range of cancers. Rather than carrying out several early-stage clinical trials, MIMs' augmented intelligence software can also help prioritize lead indications.

In addition to its focus on immune disorders and oncology, MIMs is contributing to the fight against COVID-19 via PandemIA, a collaboration between companies, biobanks, hospitals and universities that aggregates and analyses genomic, clinical and geodynamic data from COVID-19 infected patients, along with publications, in support of the personalization of COVID-19 vaccines and treatments. As part of PandemIA initiatives, MIMs is also developing COVsight in partnership with the Centre

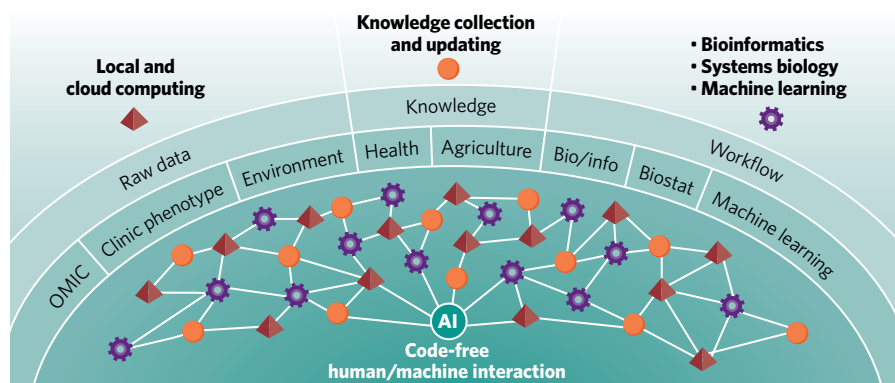


Fig. 1 | The My Intelligent Machines approach.

Hospitaller de l'Université de Montréal (CHUM). COVsight enables clinicians to keep abreast of scientific and medical insights, extracted from the literature on COVID-19 research and clinical advances.

Putting intelligence into software

MIMs' augmented intelligence software captures and aggregates clinical, experimental and omics data from structured and unstructured sources, to help its users understand patient heterogeneity. This allows life scientists using the MIMs software to stratify large populations of patients dispersed geographically, without moving the data, and without the need for computer scientists. In addition to its application to biopharma, the MIMs solutions are also dedicated to Agtech, with a focus on animal resilience. This has a potential to yield productivity gains while supporting animals' well-being.

"We define our platform as an augmented intelligence system rather than a software giving access to AI. Other AI companies only supply a list of targets generated from a 'black box' software; we provide dashboards helping life scientists to understand data analysis and integration methodologies for patient modelling and stratification. The goal is to empower life scientists by enabling them to move into the realm of systems biology and leverage their own expertise in biology, together with the modelling capabilities of our software," said Jenna.

MIMs' platform is code-free and intuitive. "We don't think biologists should have to learn how to code. The future of human-machine interaction is for computers to speak the human language and

not the other way around. The platform helps scientists to focus on science rather than on computing challenges," said Jenna.

MIMs uses a software-as-a-service (SaaS) business model, allowing the software to be adapted to the client's needs on a fee-for-service basis and a subscription fee granting access to the software on a secure web interface.

To protect data, a requirement of paramount importance for the company, MIMs' software is running on a General Data Protection Regulations (GDPR)-compliant cloud computing platform, engineered around a goal-oriented massive multi-agent system (GOMMAS).

Looking to the future

In 2021, MIMs raised \$5 million in funding for a total equity financing of \$8 million. Through the end of 2022, the company will further the automation of its infrastructure and continue deploying it in Canada, the USA and Europe. The expansion to other markets such as Asia is planned for 2023 and beyond.

CONTACT

Catherine Fiset, Director of Marketing & Communications
My Intelligent Machines
Montréal, QC, Canada
Tel: +1-438-492-1438
Email: catherine@mims.ai