DRUGBANK + MILNER
THERAPEUTICS INSTITUTE

Milner improves research results with DrugBank

Identification of SARS-CoV-2 induced pathways reveal drug repurposing strategies
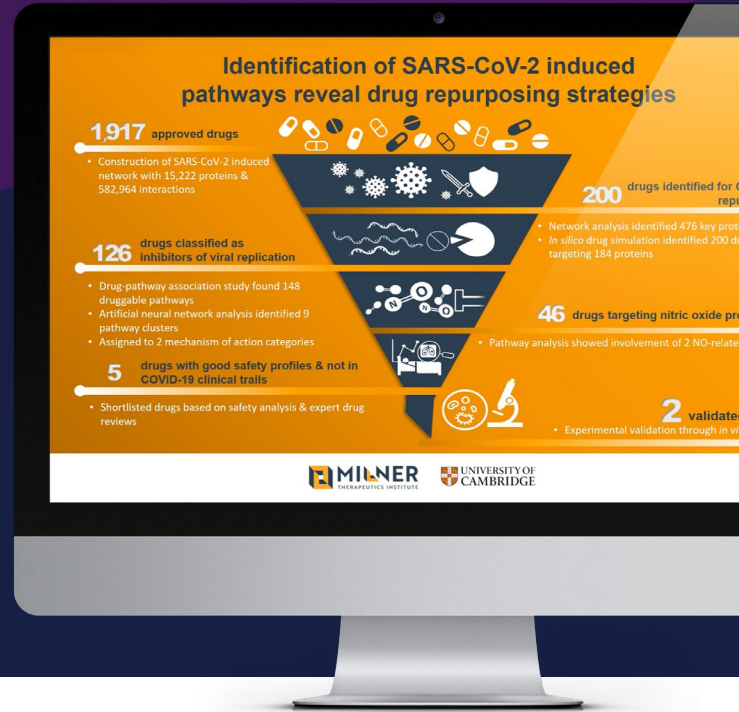
ABOUT MILNER THERAPEUTICS

The Milner Therapeutics Institute is a global therapeutic alliance encompassing a research institute and a global outreach program.

Based at the University of Cambridge, UK, they are dedicated to bringing discoveries to life by catalyzing innovative research collaborations between academia and industry.

WEBSITE
milner.cam.ac.uk

SOLUTION
DrugBank's
Academic+ Datasets

USE CASE
Drug repurposing
& discovery

THE CHALLENGE

The data scientists of the Han group at Milner Therapeutics Institute use bespoke machine learning methods to identify new signatures of disease and therapeutic targets, as well as network analysis to gain a deep understanding of the underlying causes of disease. Through research collaborations with academics and industry, their work included studies of cancer, Alzheimer's, as well as infectious diseases including COVID-19.

This work requires extremely detailed, high-quality data to train their machine learning algorithms.

Without this level of accuracy within their data, their results may not be valid or worth pursuing further. Throughout their research process, they consider where the study might lack data of sufficient depth and quality.

During their COVID-19 research, the team worked to identify drugs that could potentially be repurposed to prevent or treat the infection. The focus was on identifying key proteins and biological pathways that had the potential to be targeted by drugs.

From this research, they identified 200 drugs for repurposing, however, they needed a way to assess risk, implications, and efficacy for each of these drugs. 🔍
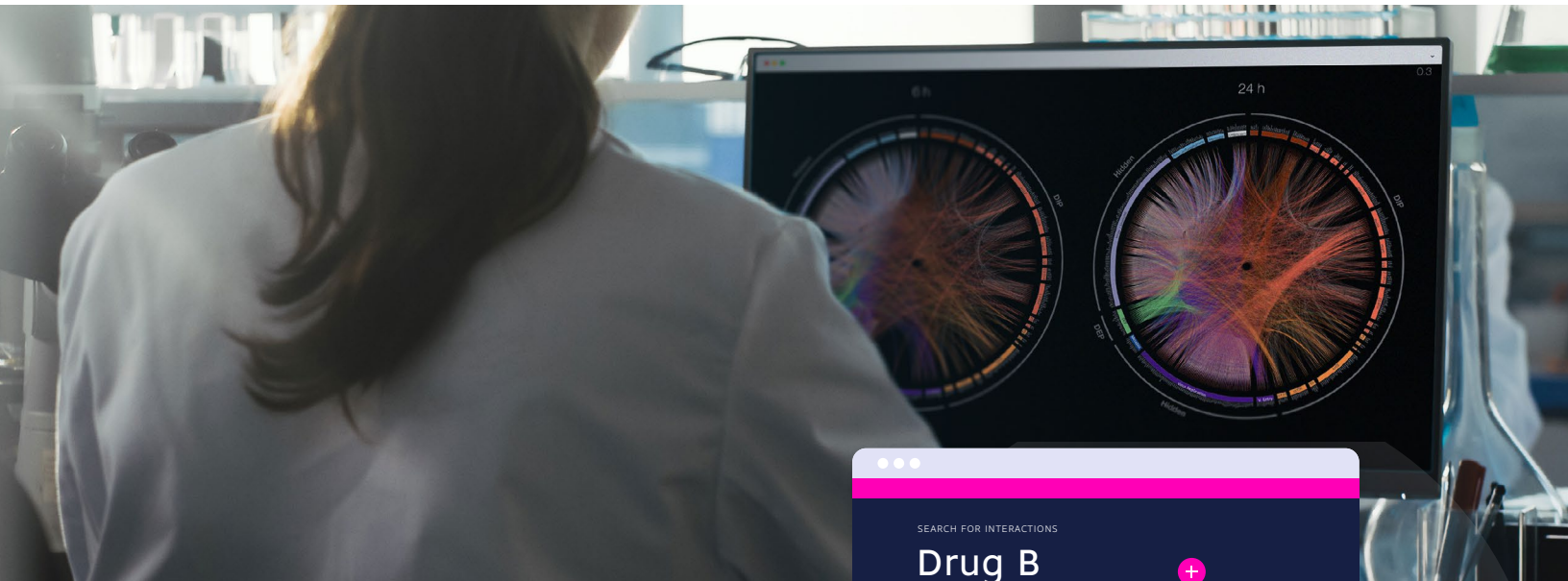
THE SOLUTION

In their search for reliable, in-depth drug data they turned to DrugBank. The Milner team found value in the strict data standards, guidelines for connecting drug targets, adherence to a clear organizational structure, and breadth of information.

The team lead Namshik Han was clear about what they were looking for.

"We are very careful about preparing our training datasets. We don't want to have large quantities of data that are of low quality. For reliable data science, we need the highest quality data."

Further, they also wanted to be able to look beyond the data to understand its origin, lineage, and updates.
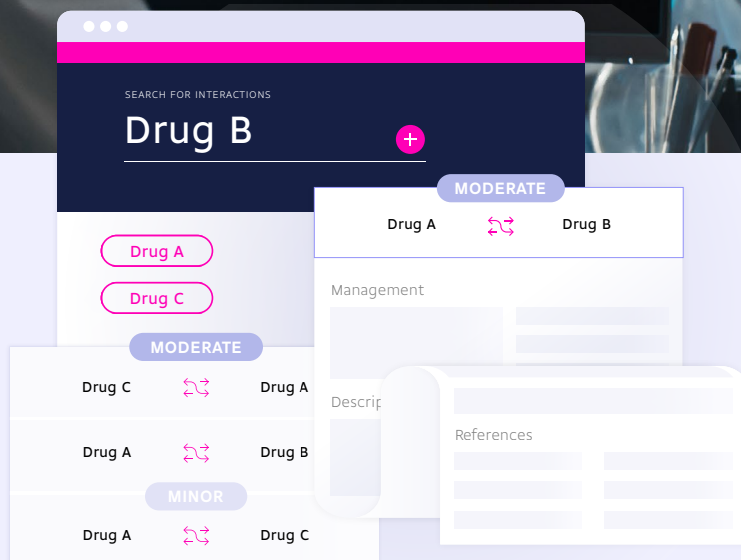
DrugBank was able to provide numerous drug datasets that proved to be powerful for Milner's research, including **targets, toxicity, drug-drug interactions, indications, mechanisms of action, and clinical trials data**.

Specifically looking at their work on COVID-19, Milner relied on our **drug-drug interaction dataset** to understand the implications of each potential drug. Additionally, they integrated the **clinical trials dataset** as a means of seeing where each of the potential 200 drugs were in the testing process and to make trial information easier to search. 🔍

THE RESULTS

Overall, the integration of DrugBank data into this research has increased the confidence of the Milner team in their research findings. This has resulted in their ability to more quickly and accurately test their hypotheses, validate experiments, and identify potential drugs for combinational therapy.

For their COVID-19 research, DrugBank datasets made it possible for Milner to identify 40 of the 200 drugs predicted to target SARS-CoV-2 as already in clinical trials.

Further, they were able to use artificial neural network analysis to classify these 200 drugs into nine distinct pathways, within two mechanisms of action.

From here, they were able to narrow their findings further to two drugs that have the potential for preventing infection or treating COVID-19. 🔍

"After benchmarking multiple different data sources, we ultimately chose DrugBank because of its high-quality, reliable datasets."

— Woochang Hwang, *Research Associate*

Discover more

Request a data sample today!

info@drugbank.com | drugbank.com