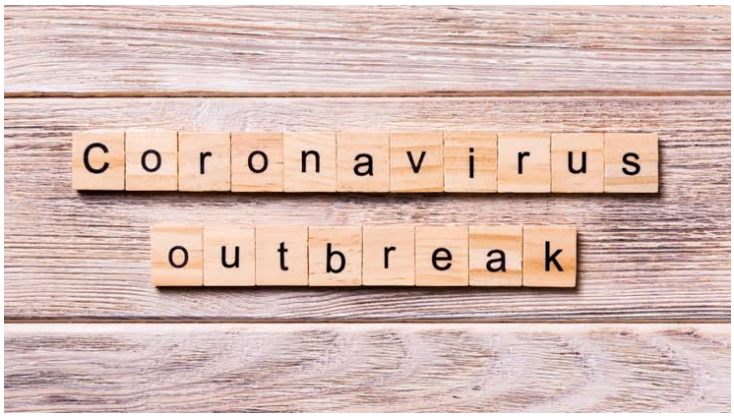
BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

China’s Institute of Materia Medica Partners With Cyclica for COVID-19

06 March 2020 | News

China’s Institute of Materia Medica Partners With Cyclica on Innovative Drug Repurposing for COVID-19



The epidemic of COVID-19 remains a prominent healthcare challenge, affecting more than 70 countries and regions over the world. This rapid widespread has made more countries realize the need for international collaboration to address this global concern.

Renowned Chinese medical research institution in Beijing, Institute of Materia Medica, Chinese Academy of Medical Sciences, enters a strategic collaboration with Canadian-based biotechnology company Cyclica to discover antiviral drug candidates for COVID-19 and explore opportunities to design multi-targeted antiviral compounds.

While current efforts to develop new medicines through generative approaches for the COVID-19 outbreak can result in possible therapies, new drug development efforts can be resource intensive and require a number of years of both pre-clinical and clinical testing. As such, drug repurposing offers a more effective strategy that suits the urgency of the need for treatments of COVID-19. Artificial intelligence (AI) approaches to drug repurposing can be deployed to further expedite the recommendation of potential therapeutic solutions.

Cyclica used its proprietary deep learning engine, MatchMaker^{TM}, to screen a collection of more than 6,700 FDA-approved drugs and drug candidates with at least Phase I clinical data against the structurally-characterized human proteome. MatchMaker is trained on millions of known human drug-target interactions (DTI) in addition to structural data. The resulting first-in-class database, named PolypharmDB, is a library of clinically assessed molecules and their polypharmacological profiles that can be used to identify repurposing opportunities for drug candidates.

Leveraging PolypharmDB and MatchMaker, Cyclica's scientists investigated both human targets as well as viral proteins with potential therapeutic relevance for COVID-19 in rapid fashion. The result is a set of molecules that are predicted to interact with the putative therapeutic targets for COVID-19. While the results are promising, modelling viral proteins pushes MatchMaker beyond established benchmarks, increasing the uncertainty around predictions for those targets. The prioritized set of molecules resulting from the interrogation of PolypharmDB represents an actionable collection of molecules primed for testing.

In this collaboration, China’s Institute of Materia Medica will conduct *in vitro* and *in vivo* antiviral assessment for molecules

proposed by Cyclica. In addition, the two parties will cooperate in a longer-term effort to design multi-target antiviral compounds with the goal of reducing drug resistance.

This international partnership is built on a historical relationship between Cyclica and China that stemmed from China-Canada Angel Alliance (CCAA), an angel investment group registered in Ontario, Canada. Naheed Kurji, President & CEO of Cyclica, says, "We have been closely following the progression of COVID-19 epidemic in China, and increasingly around the world. At the same time, we want to contribute our AI platform to searching for innovative therapies to overcome this viral outbreak in a way that is conducive to a rapid response. The opportunity to work with the leading scientists at the Institute of Materia Medica, Chinese Academy of Medical Sciences is one that we couldn’t pass up."