Team develops and gives away new drug-like molecule to help crowd-source cancer research

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Researchers from the Ontario Institute for Cancer Research (OICR) and the Structural Genomics Consortium (SGC) at the MaRS Discovery District in Toronto have developed a new drug prototype called OICR-9429 and made it freely available to the research community. Already research conducted by international groups using OICR-9429 has shown it to be effective in stopping cancer cell growth in breast cancer cell lines and a specific subtype of leukemia cells.

Significant time and resources are required to test new cancer treatments but unfortunately most ideas fail late in the development process and most of the activities are carried out in parallel, without sufficient collaboration. This leads to massive duplication of effort and ultimately increased cost of cancer drugs. By making early stage drug-like compounds such as OICR-9429 available, OICR and the SGC are allowing researchers to more rapidly test new treatment strategies and facilitate sharing of the results. Independent studies from Philadelphia and Vienna have now shown that the cellular target of OICR-9429 may be relevant for drug discovery.

"In the time that it would normally take to negotiate a legal agreement to provide OICR-9429 to other research teams we have received results back from our collaborators showing that it can kill two different types of cancer cells," says Dr. Cheryl Arrowsmith, Chief Scientist at SGC Toronto. "Opening our chemistry capabilities to the world's scientists

allowed us to crowdsource and accelerate the research." Dr. Arrowsmith is also a Professor in the Department of Medical Biophysics, Faculty of Medicine at the University of Toronto and a Senior Scientist, Princess Margaret Cancer Centre, University Health Network.

"It is remarkable how quickly our research results were translated into discoveries by the groups around the world. This demonstrates that Ontario is a new hub of a global drug discovery effort," says Dr. Rima Al-awar, Director and Senior Principal Investigator, Drug Discovery Program, OICR. "We are looking forward to seeing more research conducted with OICR-9429 and showing that this new approach to early-stage drug discovery has significant advantages."

OICR-9429 works to inhibit a protein called WDR5 and two recent studies evaluated its effect on breast cancer and leukemia cell lines and returned encouraging results.

A study led by Dr. Shelly Berger at the University of Pennsylvania used OICR-9429 to stop cancer cell growth in a panel of breast cancer cell lines driven by mutated forms of the gene p53. In its normal form p53 is a tumour-suppressor, however once it is mutated it leads to a 'gain of function' and causes cancers to grow though its stimulation of WDR5 function. This research is significant as p53 is mutated in at least half of all cancers and is dysregulated in others.

A team headed by Drs. Florian Grebien and Giulio Superti-Furga at the CeMM Research Center for Molecular Medicine in Vienna, Austria used OICR-9429 to demonstrate the potential of WDR5 as a therapeutic target for leukemia. Their research showed that OICR-9429 stopped the growth of leukemia cells with a very specific mutation found in about nine per cent of patients with acute myeloid leukemia.

These two studies culminated in joint publications, in *Nature* and *Nature*

Chemical Biology respectively, between the international researchers and the Ontario-based OICR and SGC teams.

"I applaud this innovative partnership between OICR and SGC and their collaborative efforts to catalyze cancer research worldwide," says Reza Moridi, Ontario Minister of Research and Innovation. "Collaboration, both at home in Ontario and abroad, is key to driving scientific discoveries and ultimately delivering better care to cancer patients."

OICR-9429 is just one in a series of drug-like compounds developed by the SGC that are enabling a new approach to early-stage drug discovery. The SGC and OICR teams are continuing their collaboration to identify additional drug-like molecules to advance cancer drug discovery.

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