MedicalXpress

International deal to screen potential cancer drugs using DNA 'barcodes'

January 22 2014

An innovative screening technology that tags compounds with unique strands of DNA – like barcodes – will be used to assess up to a billion prototype drug molecules for anti-cancer activity, under a collaboration announced today between The Institute of Cancer Research, London, Cancer Research Technology (CRT) and Denmark-based drug discovery company Nuevolution A/S.

Researchers will use Nuevolution's novel screening technology, Chemetics, to screen libraries of DNA-tagged compounds to identify those that act on a key protein in the stress response pathway, which has an important role in cancer cell survival and resistance to cancer treatments.

The collaboration will give scientists at The Institute of Cancer Research (ICR) access to data from screens of Nuevolution's proprietary library of small-molecule compounds, each of which is tagged with a unique strand of DNA – marking it like a barcode. Up to a billion compounds will be assessed, with the successful hit compounds identifiable through their DNA tag. This state-of the-art screening technology allows potent drug leads to be identified quickly, accurately and from very large and complex compound mixtures.

The three-way deal between the ICR, Nuevolution and CRT, the commercial arm of Cancer Research UK, builds on a previous collaboration between CRT and Nuevolution, which aimed to identify drug leads that block the activity of several challenging cancer targets of

therapeutic interest.

Under the new deal the Cancer Research UK Cancer Therapeutics Unit at the ICR and Nuevolution will collaborate to screen a key target within the stress response pathway using Nuevolution's Chemetics technology. Researchers from the Cancer Research UK Cancer Therapeutics Unit at the ICR will provide detailed insights and scientific expertise on the specific stress pathway target as well as their extensive experience in cancer drug discovery and development. In addition, they will use their cancer biology and molecular pharmacology expertise to validate prototype drug molecules identified by the Chemetics screening.

The parties have an option to co-develop promising compounds arising from this collaboration. The agreement is open-ended and allows for the screening of additional targets if the collaboration is successful.

Professor Paul Workman, Deputy Chief Executive of The Institute of Cancer Research, London, and Director of the Cancer Research UK Cancer Therapeutics Unit said: "The stress response pathway plays a key role in allowing cancer cells to survive and to develop drug resistance – so it is increasingly being seen as an exciting source of future drug targets. But for some of these targets it is technically very challenging to identify prototype small molecule drugs. The new collaboration between the ICR, Cancer Research Technology and Nuevolution will allow us to screen very rapidly and efficiently for compounds that are able to bind to a key component of the stress response pathway that we have identified as especially important, and could help us to identify new drug candidates far more quickly than would otherwise be the case. By working in partnership we can accelerate the potential for patient benefit."

Dr Phil L'Huillier, Cancer Research Technology's director of business management, said: "Our role is to build global industry-academic

partnerships to bring the best technologies and expertise together to develop new treatments for cancer patients – ultimately saving more lives from the disease. This exciting international collaboration combines global expertise and resources to exploit the untapped biology of the stress response pathway.

"This work will accelerate the identification of potential new cancer drugs though an innovative approach to scan for DNA 'barcode' tags on promising new molecules – extending the existing relationship between Nuevolution and CRT."

Thomas Franch, CSO, Nuevolution A/S said: "We are delighted to enter this project and to expand our present collaborations with ICR and CRT. The project will address a highly challenging target for which small molecule compounds is not easily identified using conventional screening methods. We hope to identify lead compounds using the Chemetics® technology and look forward to moving this exciting project forward together with the world-leading team at ICR".

Provided by Institute of Cancer Research