Study finds new way to combat resistant cancers

January 21 2015

A team of researchers at Massachusetts General Hospital has developed a new platform that can rapidly identify effective drug combinations for lung cancer patients whose tumors have stopped responding to targeted therapy. The research, which was supported in part by the National Foundation for Cancer Research (NFCR), is a critical milestone on the road to personalized medicine.

Drug resistance is a devastating problem for cancer patients. Although many genetically targeted drugs are effective at first, they almost always stop working as cancers can activate so-called "escape pathways." "If we understand what makes tumors resistant, then we can design better drug combinations - ones that not only attack the cancer but also cut off its escape routes. The current approach doesn't do the job effectively," said Alice Shaw, M.D., Ph.D., NFCR-supported scientist and one of the lead researchers on the project.

Now, thanks to recent work by Dr. Shaw and her colleagues, a new and better way to combat resistant cancers is emerging. In this research, cells taken directly from the patients' cancer were grown in the laboratory and treated with a host of different drug combinations to find the ones that work. The results were remarkable. "We identified several effective drug combinations that would not have been predicted to work using standard testing," said Dr. Shaw. "With further refinements, this strategy might be used to select the optimal treatment for each individual patient, and could also be applied to other types of cancer."

Dr. Shaw's research is supported through the Hillsberg Lung Cancer Translational Research Grant, a fund established in 2013 by two generous NFCR donors, Sanford and Penny Hillsberg. The Grant is aimed to develop approaches that effectively address the key issues of drug resistance to lung cancer treatment, in ways that can be quickly translated into clinical applications to bring direct clinical benefits to patients. Mr. and Mrs. Hillsberg hoped that their support could help accelerate translational research in this critical field. With this landmark paper, their trust has rapidly been repaid.

"We are so happy to be part of this important research effort," said Mr. Hillsberg. "We have worked with NFCR for years, and we know their excellent track record of supporting high-quality science. That's why we were excited to participate in their donor-initiated research model, which matched our interest in translational lung cancer research with some of the best scientists in the world. We know these efforts will benefit patients fighting cancer, and we are fully committed to continuing our support of Dr. Shaw and the other great projects at NFCR."

"We are very proud of the work that Dr. Shaw has done on behalf of not only lung cancer patients, but patients with all types of cancer," said Franklin Salisbury, Jr., president of NFCR. "Without our donors NFCR would not be able to fund very promising research and the scientists behind it. From donor-initiated research projects to grassroots support, NFCR is grateful for all those who join us in our mission - to advance the critical research that will bring a cure for cancer - all types of cancer."

This research is published in the December 19, 2014 issue of the journal *Science*.

Provided by The Science Coalition