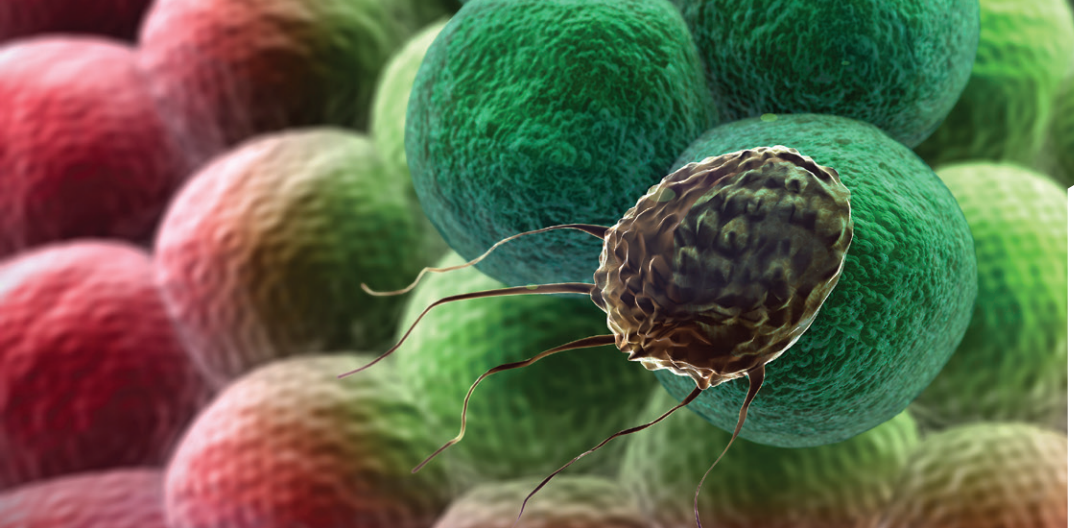

Targeted Therapies

Roychowdhury, team advise physicians on individualized treatment

"There is no routine cancer."

The powerful slogan of The Ohio State University Comprehensive Cancer Center – James Cancer Hospital and Solove Research Institute is a testament to the recent paradigm shift in the field of oncology. For years, a patient's cancer and treatment were characterized by location and stage. Now, researchers such as those in Dr. Sameek Roychowdhury's lab at OSUCCC – James are looking at tumors on a molecular level to understand the nuances in each individual's cancer. By processing genetic sequencing data through the Ohio Supercomputer Center, Roychowdhury and his team can advise physicians and patients on targeted, novel therapies for treatment.

When patients initially receive a cancer diagnosis, they are given the standard of care for their cancer type. If the standard of care fails and the tumor continues to grow or the cancer spreads, physicians often turn to clinical trials for more treatment options. Roychowdhury and his team are attempting to match patients with the most appropriate clinical trial, based on their genomics biomarkers.

"There are a lot of studies that require what we call molecular eligibility," said Julie Reeser, Ph.D., a clinical research coordinator with the Roychowdhury Lab. "So instead of being grouped by cancer, you're grouped by a genetic alteration that you have."

The lab performs a biopsy on tissue from referred patients either looking for the best clinical trial option or who have selected a trial and want to compare with results after treatment. Researchers use next generation sequencing, looking at 300 different genes and the changes that occur to these genes during treatment. They run this data through the supercomputer to be analyzed. Researchers then compare the cell line before it became resistant to a certain therapy and after to inform decisions on the next course of treatment for a patient. Though the pharmacological purpose of this study is ongoing, researchers are hoping to better understand why tumors develop resistance to certain drugs and to identify the driving mutations that provide molecular eligibility for targeted therapies.

"All the information helps other patients in some way," Reeser said. "The more we learn about it, the more discoveries we can make."

While clinical trials enroll patients for whom the standard of care was not successful, physicians can use the genetic information of patients with certain types of cancer to inform standard-of-care procedures. For these cancer types, there are certain genes that are known to have mutations that cause tumor growth, and so they can be treated with targeted therapies. These "smart drugs," as Reeser called them, are becoming more prevalent, but more research is needed on many different tumor types before they become the dominant therapy. The data collected in the Roychowdhury Lab will help inform this research. •

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