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Learn how NIBR uses next generation sequencing to transform clinical trials and diagnostics in oncology.

By [PJ Kaszas & Ryan McBride](#) | Oct 01, 2015

Novartis cancer researchers in Cambridge, MA, were elated to learn recently that a DNA sequencing test they helped to develop uncovered details about a patient's tumor to inform treatment decisions.

Genoptix, a Novartis molecular diagnostics company in Carlsbad, CA, introduced the next-generation sequencing-based test with the help of the Cambridge researchers for diagnosing non-small cell lung cancer. Marking more progress toward precision medicine in cancer, the test uses information from an individual's sequenced tumor genes to pinpoint mutations that tip off experts that a patient might benefit from specific targeted drugs.

"If you get into the DNA, every cancer patient has different genetic changes," says Wendy Winckler, Executive Director, Next Generation Diagnostics at the Novartis Institutes for BioMedical Research (NIBR), "and those genetic changes are going to mean that they respond differently to different drugs."

Precision medicine takes into account many types of data, especially information unique to each patient, to prevent disease or tailor care to achieve the best treatment outcomes. Many have hailed the field as a major frontier in improving care. Oncology is a pioneer in this space because of the recent availability of both diagnostics and therapies targeting specific cancer genes.

Next-generation sequencing provides an indispensable tool for Winckler's group. The technology reads millions of DNA bases in parallel, providing complete profiles of genes much faster and less expensively than older systems. It no longer takes millions of dollars and months or years to sequence a patient's DNA. Her team can sequence an entire genome in about a day for several thousand dollars.

The team includes experts in genome technologies, genetics, bioinformatics, and software engineering to tackle research on precision medicine in oncology. They sequence tumor genes from patients in Novartis clinical trials to help identify the genetics underlying why a therapy worked or didn't work. Their diagnostics work focuses on development of tools to better characterize tumor genomes and to advance the use of this data in patient care.

"My hope for personalized medicine is that every cancer patient will have access to comprehensive genetic tests that will let them better understand the types of genetic changes that have happened in their tumor," Winckler says, "and that will then help them and their physicians to decide on the best course of therapy that's unique for their disease."

Learn more about NIBR's oncology research.

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