

How oncologists sort through masses of genetic data

Whether they are concerned with a mutation of a single gene, or mutations in a combination of two or more genes, today's oncologists look forward to using genomic information to more precisely target and treat cancer. But as more and more researchers delve into the work of discovering which genetic mutations are associated with specific subtypes of cancer, or which drugs are most effective in fighting the cancers identified by their signatures, they begin to test the limits of their informational tools—computing platforms, informatics packages, and analytic algorithms. These digital factors are driving (and sometimes hindering) advances in developing more precise and targeted therapies for individual cancer patients.

Many of today's challenges to increasing the precision of cancer treatment are directly related to both the complexity of data generated by genetic sequencing and the sheer volume of biomedical information contained in the published literature detailing new discoveries in the root causes of cancer and the drugs and therapies that most effectively treat it.

From biopsy (or blood draw) and sequencing and tissue analysis to the eventual determination of a diagnosis and the development of a treatment regimen, clinicians devoted to precision oncology are as effective as their computational infrastructure is robust. According to David Jackson, Ph.D., chief innovation officer of diagnostic company Molecular Health, the ability to capture, store, and analyze vast datasets generated by molecular technologies is shifting the skills needed to treat cancer.

"Some people have described medicine as more of an art than a science," Dr. Jackson said. "I think what you are seeing with the evolution of these technologies is [a shift in the other direction. These technologies] are driving medicine away from an art form and making it much more an information science."

The challenge today is not found in generating the sequencing information, it is in handling the data—integrating it within a broader medical informatics and patient-centric setting to provide clear decision support to the oncologists who rely on it.

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