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Reporter Backgrounder: Genomic Testing

What is Genomics?

Genomics is the study of the structure, function, evolution, and mapping of genes, how genes interact with one another and the environment, and the role they play in health and disease. In the case of cancer, genomics looks at individual genes and groups of genes, how they are expressed in cells (how active they are), whether they are altered, and how these characteristics contribute to the development of cancer, cancer recurrence, and response to cancer treatment. Actionable insight from genomic information is achieved by understanding which specific genes inter-relate and how those interactions influence tumor biology and clinical outcomes in different kinds of cancer.

Genetic vs. Genomic Testing

Genomics and genetics may sound similar and are related, but they provide different information.

Genetics, the study of inherited gene alterations, can help tell a patient his/her risk for getting cancer, while genomics, the study of relevant genes in the patient's tumor tissue, can help a patient choose a course of care after diagnosis.

Oncotype DX® diagnostic tests look at the activity of certain genes in previously diagnosed cancer tumor tissue to provide personalized information that is not available from any other test or measure.

Genetics	Genomics
Study of inherited traits, such as hair or eye color, that are passed from one generation to the next through genes.	Study of the activity and interaction of certain genes in the body, including their role in certain diseases.
A patient's risk for certain cancers can be inherited, or passed through genes.	Once a patient has cancer, the activity and interaction of certain genes in the tumor tissue influences the behavior of the tumor, including how likely it is to grow and spread and respond to treatment.
The test for the BRCA1 and BRCA2 genes is a genetic test that can help to predict a patient's risk for getting breast or ovarian cancer.	In early-stage breast cancer, the Oncotype DX Breast Recurrence Score can help to predict the aggressiveness of a patient's tumor and whether or not he/she will benefit from chemotherapy.
Once genetic risk for cancer is known, a patient can take steps to lower that risk, such as making lifestyle changes.	With the personalized information from Oncotype DX tests, a patient and his/her doctor can decide what kind of treatment is necessary following surgery.

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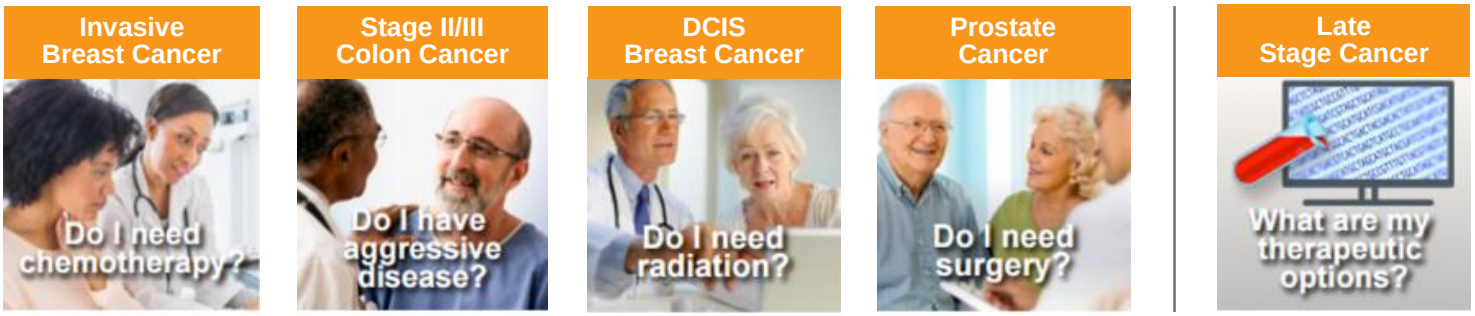
What is Cancer Genomics?

The key to using clinical genomics to improve cancer treatment and outcomes lies in determining which specific sets of genes and gene interactions affect the behavior of different kinds of cancers. Genomic Health conducts studies to determine which patterns of gene expression within a specific tumor type are linked to the likelihood that the cancer will spread or return, or that it will respond to a specific therapy. The results of these genomic studies and research are then used to develop and clinically validate tests that provide the genomic profile of an individual's tumor, helping physicians to tailor treatment to each patient's disease to deliver the best outcomes, rather than forcing a "one-size-fits-all" approach that often results in over- or under-treatment.



Using Genomics to Improve Every Step of the Cancer Management Process

The trend toward a genomic approach to cancer is growing every day, as researchers are increasingly revealing the complex mechanisms that drive the growth of specific cancers and turning their discoveries into new clinical tools for improving the diagnosis, monitoring and treatment of cancer. Specifically, liquid biopsy assays – non-invasive tests that use blood, urine, or saliva – are showing promise as an alternative approach to traditional tissue biopsies, potentially providing more tumor information with fewer biopsy complications. The planned launch of Oncotype SEQ™, a blood-based mutation panel for patients with a range of late-stage cancers in mid-2016, represents Genomic Health's entry into the liquid biopsy field as well as its ongoing commitment to making cancer care smarter through its Oncotype IQ™ Genomic Intelligence Platform.

The Oncotype IQ portfolio of genomic tests and services currently consists of the company's flagship line of Oncotype DX gene expression tests that have been used to guide treatment decisions for more than 600,000 cancer patients worldwide. Genomic Health is expanding its test portfolio to include additional liquid and tissue-based tests. With innovations such as these, experts in the field expect that clinical genomics will play a role in each step of the cancer management process going forward.