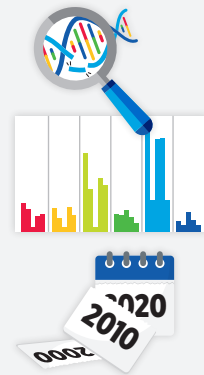


UNRAVELING THE COMPLEXITIES OF CANCER GENOMICS

Recent work from an international team of scientists has provided critical insights into cancer genomics with potential implications for early detection, interception, and treatment. The researchers analyzed the whole genome from >2,600 tumor samples spanning 38 different types of cancer. Among the most important findings were the following:

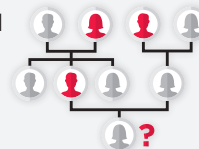
- Most tumors contain at least **one identifiable mutation in their genomes that appears to drive tumor growth**, and on an average each cancer genome was found to contain between four and five such “driver” mutations.
- Unique patterns of mutations referred to as **“mutational signatures” are often associated with processes or events that may lead to cancer development**, such as defective DNA repair mechanisms or exposure to cancer risk factors such as environmental carcinogens, toxicants in tobacco smoke, or ultraviolet radiation.
- By analyzing the vast array of genetic changes, the researchers were able to determine the chronology of cancer-causing mutations. They found that **many mutations can occur years, if not decades, prior to a cancer diagnosis**.



Results from three recent studies have provided a **deeper understanding of the inherited genetic mutations that predispose women to breast cancer**, the prevalence of such mutations in the general population, and the earliest cellular and molecular changes in presumably healthy breast tissue, prior to tumor development, among individuals with inherited mutations. These data are critical for the development of early diagnostic testing or cancer prevention interventions for women who are susceptible to breast cancer development.



In a recent paper, researchers outlined new details regarding the **contribution of inherited genetic mutations in the development of childhood cancers**. These data can be used not only to select the most appropriate treatment for certain patients, but also to tailor prevention and screening for patients and/or their family members who harbor similar mutations and even for future family planning purposes.



Data from a recent publication provide significant **new insight into the development of blood cancers**. Notably, the study reported that certain mutations associated with leukemia or other blood cancers are also detected, albeit at low levels, among seemingly healthy individuals, showcasing a potential for precancer surveillance and/or interception.

