Targeted Therapies for Cancers Containing NRG1 Fusions

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Technology description

Researchers at TGen, in collaboration with the Mayo Clinic, have identified a new method of targeted cancer treatment by selecting a patient population based on the presence of Neuregulin-1 (NRG1) somatic gene fusion events (i.e., NRG1 fusions). Tumors of the patients in this identified population may be treated with targeted therapies, including Epidermal Growth Factor Receptor (EGFR) inhibitors and ErbB inhibitors, as an alternative to surgery.

NRG1 is an activating ligand for HER3 and HER4. NRG1 induces heterodimerization of HER3 and HER4 with EGFR or HER2 to initiation cell proliferation, migration, and invasion. Recently it has been discovered that some cancer patients have NRG1 fusions, but no targeted therapies have been proposed. However, ErbB inhibitors are drugs that are currently indicated for cancers overexpressing EGFR or HER2 or carrying specific mutations in EGFR. Such drugs provide the potential for a new avenue of treatment for patients with cancers, such as biliary tract cancers, that are not typically diagnosed until late stages due to delayed manifestation of symptoms when the only current curative treatments (e.g., resection, liver transplantation) are ineffective.

This technology developed by TGen, in collaboration with the Mayo Clinic, has the potential to increase the availability of targeted therapies for cancer patients that might respond to EGFR and/or ErbB inhibitors. NRG1 fusions have been identified as potential drivers in patients that have bile duct cancer (e.g., cholangiocarcinoma), hepatocellular cancer, colon cancer, breast cancer, pancreatic cancer, ovarian cancer, and lung cancer. By collecting a sample from a patient for genetic analysis to identify an NRG1 fusion, therapeutic agents can be selected for targeted therapy to exploit an error in the normal functioning of the targeted tumor cells. Results of such a targeted therapy have been show to eliminate and reduce tumor lesions in number and in size; increase the patient’ s performance status and appetite; reduce the patient’ s pain; and reduce monitored tumor markers.

Institution

The Translational Genomics Research Institute

Inventors

Jessica Aldrich

Alan Bryce
Oncology Department
Michael Barrett
Biochemistry and Molecular Biology
Mitesh Borad
Keith Stewart
Scottsdale Hematology/Oncology
George Vasmatzis
Molecular Medicine
John Carpten
Professor and Department Chair
Translational Genomics
Sara Byron
Postdoctoral Fellow
Breast Cancer Genetics Lab (CCBD)
David Craig

联系我们

叶先生

电 话：021-65679356
手 机：13414935137
邮 箱：yeyingsheng@zf-ym.com