

Research Topic Descriptions

Susan G. Komen for the Cure® funds research specifically focused on reducing breast cancer incidence and the number of lives lost to the disease. This research focuses on understanding what causes breast cancer, finding ways to prevent it, developing new tools for identifying cancers early when they can be more easily eliminated, and developing more effective, less toxic treatments for those diagnosed with breast cancer. Topics corresponding to each of the following descriptions have been assigned to each research grant to explain the general focus of the grant.

Chemoprevention: Chemoprevention studies are discovering and testing new drugs that block specific molecular interactions and biological pathways that contribute to the development of cancer cells. These new drugs act in specific ways to combat different triggers for cancer cell development, for example genetic alterations or molecular consequences of obesity. The hope is that these new drugs will stop cancer before it even starts.

Nutritional Prevention: Nutritional prevention studies are assessing the role of diet and nutrition in breast cancer prevention. Some studies seek to understand the underlying basis of diet's and body weight's role in breast cancer development, while others are testing the ability of modifications in diet and body weight to reduce breast cancer risk. The hope is that we can develop interventions that allow individuals to reduce their risk through diet and lifestyle changes.

Breast Cancer Risk: Risk studies seek to identify genetic, lifestyle, and environmental factors that increase an individual's risk for getting breast cancer as well as studies to develop tests to better assess an individual's risk for getting breast cancer. Factors that increase risk include age, family history, having one of the BRCA genes, not having had children, or obesity. Individuals can control some of these factors but cannot control others. The hope is that we will be able to identify and control factors that increase risk for getting breast cancer.

Pathobiology: Pathobiology (pathologic biology) studies focus on discovering the genetic and molecular alterations that occur when cells begin to over-multiply as cancer cells and how these alterations contribute to the spread of cancer cells throughout the body. These studies also identify and test ways to target specific genetic and molecular alterations as an approach to breast cancer treatment. New classes of therapies, such as aromatase inhibitors like anastrozole and letrozole, have resulted from understanding the underlying genetic and molecular basis of cancer.

Biomarkers: Biomarker studies identify specific biological molecules that are associated with cancer. Some biomarkers identify early breast cancer, even before it can be found by mammography. Other biomarkers are used to identify which treatments will be most effective or whether breast cancer has come back after treatment.

Still other biomarkers are being studied to identify individuals at high risk for getting breast cancer. The hope is that a simple blood test can be used to identify the presence of these biomarkers and based on which biomarkers are present to tailor screening approaches or treatments.

Endocrine Therapies: Endocrine therapies, typically provided after first treatments, target hormone receptors and pathways to get rid of cancer cells and the recurrence of breast cancer in women with estrogen-receptor positive breast cancer. Estrogen receptor positive breast cancers are the most common subtype of breast cancer, accounting for 60 to 75% of all new breast cancers. These studies seek to improve the effectiveness of hormone therapies to eliminate cancer cells, prevent metastasis, and prevent breast cancer from coming back.

Immunotherapies: Immunotherapies seek to use the body's own defense system to reject cancer. These studies develop and test antibodies that attach to specific molecular targets that promote cancer. Herceptin(trastuzumab) and Avastin (bevacizumab) are examples of immunotherapies. These drugs attach to receptors on the surface of cancer cells and effectively 'turn off' the cancer cell. The hope is that immunotherapies will provide the very therapies that target the specific mechanisms causing cancer, particularly for hormone resistant breast cancers.

Nonsystemic Therapies: Unlike systemic therapies which are delivered to the entire body (e.g., chemo or hormone therapies), nonsystemic therapies are localized to the specific site of the tumor. These studies are looking at novel approaches to more effectively target therapies, such as radiation, to eliminate tumors and minimize adverse effects to normal cells. The hope is that therapies can be developed that target only the tumor, resulting in fewer side effects and better cosmetic outcomes.