Susan G. Komen for the Cure
Research Grants – Fiscal Year 2011

This research grant was approved by Komen's national board of directors for FY2011 Research Programs funding. This grant will be funded upon the execution of grant agreements between Komen and the grantee institutions.

The role of SLIT/ROBO signaling in generation of breast cancer stem cells

Investigator(s): Lindsay Hinck, PhD
University of California at Santa Cruz, CA
Grant Mechanism: Post Doctoral Fellowship - Basic Research

Fellow: Gwyndolen Harburg, PhD
Awarded**:** $180,000.00
Research Focus: Etiology

Public Abstract:
Identifying the cells that give rise to cancer is critical for development of effective therapies. Current treatments often eliminate visible tumors, but are ineffective at stopping recurrent cancer growth. This has led to the hypothesis that there is a treatment-resistant population of cells – cancer stem cells. Recent studies show that a number of breast cancers share a stem cell "signature" and that more advanced breast cancers contain larger numbers of cancer stem cells. Very little is known about the mechanisms that control stem cell growth in the breast, but we have identified a signaling pathway, the SLIT/ROBO pathway, that appears to play a crucial role in maintaining normal growth. When this pathway is lost, breast stem cells gain longevity, which may lead to their transformation into cancer stem cells. In support of this, SLIT/ROBO signaling is one the most common signaling pathways lost in ductal carcinomas, which accounts for 80% of all breast cancers. In this proposal, we will explore the mechanisms through which SLIT/ROBO signaling controls breast stem cells and examine the behavior of breast stem cells from human breast tumors that have lost SLIT/ROBO signaling to determine if this loss leads to expansion of a cancer stem cell population. The results we obtain from this study will give us greater understanding of how mammary stem cell growth is normally regulated and will identify new therapeutic targets for treatment of breast cancer.

KG111372