CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP110069

Project Title:
Subcellular trafficking studies of Her2 and anti-Her2 antibodies

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas at Dallas

Lay Summary:

Despite intensive efforts over the past several decades, a need persists for the development of new and improved methods to treat cancer. For example, around 40,000 people in the US are predicted to die from breast cancer annually. It is well established that in multiple cancer types, including breast, colon and ovarian, proteins called growth factor receptors on the surface of the cancerous cells can signal to the cell to grow in an uncontrolled way. One such important receptor is called HER2. Due to its central role in tumor development, targeting HER2 has provided the impetus for the development of therapeutics. However, despite major efforts in this area, a need persists to improve response rates. In part, the problems associated with the development of highly effective therapeutics to target HER2 stem from the fact that we still do not have a good understanding of how this receptor behaves in cells, and in some cases, controversies about this exist. The current study is therefore directed towards gaining a better understanding of the properties of HER2 in terms of its localization and movement within cells both in the presence and absence of currently used therapeutics. These studies should give important insight into how HER2 moves from the cell surface to within the cell, which in turn relates to turning off the activity of the receptor with consequent anti-tumor effects. To date, such studies have often been hindered by the inavailability of suitable techniques. Over the past decade, we and others have developed experimental approaches that enable protein movements to be tracked in real time as the proteins move within and across cells. These approaches will be used here to address multiple open questions concerning HER2 trafficking. In turn, this could lead to the development of improved therapeutics. Significantly, our studies have broad applicability to multiple tumor types that include colon, breast, ovarian and lung cancers.