**Lay Description of Important Outcomes**

Summary of important findings

* Determined that approximately 6% of metastatic breast cancers harbor *ROS1* alterations.
* Identified 1100 novel *ROS1* alterations occurring in metastatic breast cancers.
* Focused on and created 40 novel *ROS1* nonsynonymous mutations to test if these specific mutations increase ROS1 kinase activity, kinase expression, and cell growth. *These studies are ongoing.*
* Identified a cohort of 60 metastatic breast cancer samples with and without *ROS1* alterations to quantitate ROS1 RNA expression levels and determine ROS1 cell surface protein levels. *These studies are ongoing.*

Impact  
This investigation has already had a positive impact on understanding the type and incidence of *ROS1* alterations and which *ROS1* alterations affect ROS1 kinase expression in metastatic breast cancers. This project may aid the development of precision medicine clinical trial approaches that could change treatment paradigms in metastatic breast cancer patients with *ROS1* alterations or ROS1 expression.