Award ID:
RP130624

Project Title:
Diagnosis and Prognosis of Cancers through Glycomics and
Glycoproteomics

Award Mechanism:
Individual Investigator

Principal Investigator:
Mechref, Yehia

Entity:
Texas Tech University

Lay Summary:

Brain metastasis is a life-threatening condition for women with advanced metastatic breast cancer. Since current chemotherapeutic regimens lack efficacy in established brain metastatic lesions, new strategies allowing the reduction or eradication of the formation of brain metastases of breast cancer are needed. The development of any effective strategy is highly dependent on identifying the molecular structure and physical properties of metastatic breast cancer cells which able to extravasate through the blood-brain barrier (BBB). Aberrant glycosylation for decades has been recognized as the attribute of many mammalian diseases, including osteoarthritis, cystic fibrosis and cancer. This proposal focus on understanding the biological attributes of glycosylation in breast cancer metastasis. Glycomic tools (developed by the PI) will be utilized in this study to assess differences in the glycomic profiles associated with breast cancer cell lines with different clinicopathological features and correlate these differences to clinical samples both tissues and blood serum.. Such effort is aimed at facilitating better understanding of the biological roles of glycosylation in breast cancer metastasis, particularly brain metastasis. Also, evaluation of the levels of intracellular monosaccharides and nucleotides will aid in better understanding the roles of these substrate in the aberrant glycosylation associated with cancer development and progression. Glycoproteomic methods will be also utilized to define the glycoproteomic signatures of cells and clinical biopsies (tissues and blood) that distinguish themselves from each other. The data will allow better understanding of the role of aberrant glycosylation and breast cancer bran metastasis and type.