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Major Professor: Dr. Manish Patankar, Ph.D.

Degree Objective: M.S., Endocrinology and Reproductive Physiology

Background: Bachelors Creative Writing and Premedical Studies, Miami University of Ohio

Current Research Project:

Title: Exploring the Biochemistry and Immunologic Properties of MUC16 to Develop Improved Diagnostic Tests for High Grade Serous Ovarian Cancer.

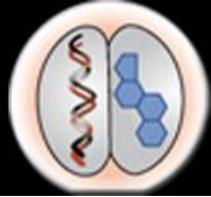
High-grade serous ovarian cancer (HGSOC) is the most lethal of gynecological malignancies, taking the lives of nearly 15,000 women each year in the United States. It is the fifth leading cause of cancer-related deaths in women. Ovarian cancer is often referred to as “the disease that whispers” because the symptoms reported to be experienced are more often nonspecific and associated with other conditions. Early-stage symptoms usually present in a vague or ill-defined manner, making the disease extremely dangerous and difficult to detect. Unlike pap tests for cervical cancer or mammograms for breast cancer, there is currently no effective method to screen for ovarian cancer. Two FDA-approved diagnostic assays that measure serum levels of cancer antigens CA125 and HE4 are widely used to monitor HGSOC progression in patients; however, they lack the specificity and sensitivity that is critical for early detection screening modalities. Nonetheless, CA125 remains the gold standard for monitoring HGSOC as no other biomarker matches its specificity and sensitivity potential.

CA125 is a tiny peptide epitope that belongs to the massive transmembrane mucin molecule, MUC16, which is overexpressed by ovarian tumors. MUC16 has a molecular weight upwards of 3 million Da, with a large peptide backbone and heavy glycosylation. There are many facets of this molecule that are not yet understood from a diagnostic and biological perspective.

To better understand this molecule, our project is focused on: 1) developing a streamlined protocol to isolate MUC16 from ascites samples of ovarian cancer patients and 2) using a new microscopy technique to quantify minute amounts of MUC16 that are captured by circulating immune cells. The completion of this work will aid in the development of a novel early diagnostic for HGSOC.

Grants Received:

Presentations:



Fritz-Klaus, R. L., Felder, M., Kapur, A., Etzel, M., Whelan, R., Hensen, P., Krauledat, P., Patankar, M. Purification and Characterization of MUC16 from Peritoneal Fluid of Ovarian Cancer Patients. Endocrinology and Reproductive Physiology Seminar: Fall 2019. Oral Presentation.

Fritz-Klaus, R. L., Felder, M., Kapur, A., Etzel, M., Patankar, M. Developing a Streamlined Protocol for Purification of the Mucin, MUC16, from Peritoneal Fluid. Endocrinology and Reproductive Physiology Symposium: Spring 2018. Poster Presentation.