Epithelial ovarian cancer is the sixth most common cause of cancer worldwide with the highest mortality rate within gynecological cancers. Most patients are often diagnosed when the disease has already metastasized to distant sites, resulting in a poor 5 year survival rate of 15-30% when diagnosed at late stages III and IV as compared to 80-95% when diagnosed at early stages I and II.

Post-translational modifications, such as glycosylation, have been shown to be associated with cancer. Aberrant glycosylation is the result of alterations in glycosylation enzymes which lead to altered glycan structures. Since a majority (90%) of ovarian cancers are epithelial in origin, cell surface N-glycans display unique epitopes upon malignant transformation and have the potential to be exploited as glycan biomarkers. Besides that, these surface N-glycans can also be utilized for the development of therapeutic drugs which target specific glycosyltransferases involved in the cellular glycosylation pathway.

AIM

• Characterize and quantify cell surface N-glycosylation of normal ovarian surface epithelial cells, ovarian cancer cells and serous ovarian cancer tissue.

• Identify unique N-glycans structures that are present in both ovarian cancer cells and tissue based on the separation using negative ion mode PGC-LC-ESI-MS/MS fragmentation patterns, diagnostic ions and retention times.

RESULTS

A) Glycosylation MS profiles reveal differences between ovarian cancer cell lines and tissues

B) Identification of specific N-glycan epitopes found in ovarian cancer cell lines and tissues

1. Characterize the N-glycan pattern of ovarian cancer cell lines and tissues.
2. Identify diagnostic N-glycans as useful markers for ovarian cancer.

CONCLUSION AND FUTURE DIRECTIONS

• The data demonstrates the potential utility of mass spectrometry for the detection of cancer-specific glycan alterations as diagnostic ovarian cancer biomarkers and therapeutic anti-glycan antibody targets.

• Future work will be focused on analyzing ovarian cancer tissue samples obtained from patients (derived from the ovary, fallopian tube and peritoneum) to identify specific N-glycans which could facilitate their detection.

REFERENCES AND ACKNOWLEDGEMENTS