N-Glycosylation signatures of ovarian cancer tissues as defined by MALDI imaging mass spectrometry

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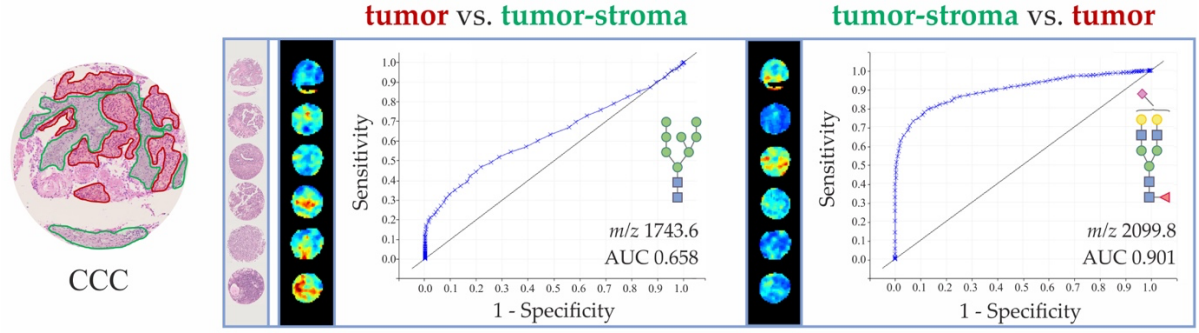
The particularly high mortality of epithelial ovarian cancer (EOC) is in part linked to limited understanding of its molecular signatures. We implemented MALDI mass spectrometry imaging (MALDI-MSI) in combination with sialic acid derivatization in formalin-fixed paraffin-embedded tissue microarray specimens of less common EOC histotypes, namely low-grade serous, clear cell (CCC), endometrioid, mucinous histotypes as well as non-malignant borderline ovarian tumor [1]. α2,6- and α2,3-sialylated N-glycans were enriched in tissue regions corresponding to tumor and adjacent tumor-stroma, respectively. Interestingly, analogous N-glycosylation patterns were observed in tissue cores of BOT, suggesting that regio-specific N-glycan distribution might occur already in non-malignant ovarian pathologies. All in all, our data provide proof that the combination of MALDI-MSI and sialic acid derivatization is suitable for delineating regio-specific N-glycan distribution in EOC and BOT tissues and might serve as a promising strategy for future glycosylation-based biomarker discovery studies.



ROC curves and MALDI-MSI pictures of the most discriminatory N-glycan structures as determined for tumor and tumor-stroma in CCC specimens.

Bibliographic references:

[1] M Grzeski , E.T. Tauber, E.I. Braicu, J. Sehouli, V Blanchard#, O Klein# (2022) Cancers, 14(4):1021. # equally contributed.