Imaging in cancer immunology: Phenotyping of multiple immune cell subsets in-situ in FFPE tissue sections

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Purpose
Obtaining phenotypic information about the various immune cells that play these roles in and around the tumor has been a challenge. We present here a methodology for delivering quantitative per-cell marker expression and phenotyping from cells imaged in situ in FFPE tissue sections

Experimental Design
We present the simultaneous labelling, analysis and validation of CD4, CD8, CD20, PD-L1, Foxp3, cytokeratin and DAPI in breast cancer; and CD8, CD34, PD-L1, FOXP3 and DAPI in head and neck squamous cell carcinoma

Results
Each example will show the application of the multiplexed staining (7 antigens), per-cell quantitation and cellular phenotyping from multispectral images of FFPE tissue sections, as well as methods to explore the spatial distributions of the phenotyped cells in and around the tumor

Conclusion
This approach shows a reliable method for the phenotyping and quantification of multiple subsets of immune cells simultaneously in situ in FFPE tissue sections. This methodology can be extended using Opal™ multimarker staining, Vectra® or Mantra® multispectral imaging and inForm® Tissue Finder™ analysis to up to 6 biomarkers simultaneously. We believe that these results support the feasibility of a practical and viable clinical workflow, in which immune response assessment is automated by computer and results are reviewed by pathologists to assure data quality

References
Novartis Genoptix Shows Multiplexed IHC Test Better Predicts Immunotherapy Response – citing the PerkinElmer Vectra