**Journal *Cell* Features New Immunohistochemistry Imaging Technology from IONpath that Images 40+ Proteins on a Single Slide**

*Paper describes the only multiplexed mass spectrometry imaging technology with unrivaled sensitivity, throughput, and resolution.*

**Menlo Park, California, Sept. 6th, 2018 --** IONpathTM, a venture-backed commercial-stage pathology startup, today announced that a paper detailing the performance of its new Multiplexed Ion Beam Imaging (MIBITM) technology was accepted by the journal *Cell* and will be featured in the September 6 issue. This study will also be shared during a webinar presented by Dr. Mike Angelo on October 2nd, 2018.

The study leveraged IONpath’s MIBIscopeTM instrument to define tumor and immune cell spatial compositions leading to a discovery of a cell signature that predicts therapeutic response for triple-negative breast cancer.

REVOLUTIONIZING TISSUE BIOPSY ANALYSIS

MIBI technology was invented in Prof. Garry Nolan’s lab and developed by Drs. Sean Bendall and Mike Angelo in the Department of Pathology at Stanford University. MIBI uses secondary-ion mass spectrometry (SIMS), a type of mass spectrometry traditionally used in the semiconductor industry, to image antibodies tagged with monoisotopic metal reporters, permitting 40+ proteins to be simultaneously measured.

The IONpath MIBIscope platform, coupled with pathologist-validated reagents and downstream image analytics, will enable pathologists and scientists to better understand the complexities of the tissue microenvironment by delivering subcellular resolution, spatial and structural information than previously possible.

The MIBIscope is currently being piloted by top research institutes and biopharmas to enable discoveries in oncology, neuroscience, immunology, microbiology and a number of other fields in which high-fidelity multiplexed imaging data is needed.

In addition, the MIBIscope has been selected as the only highly multiplexed IHC imaging platform for the National Cancer Institutes (NCI) Cancer Immune Monitoring and Analysis Center (CIMAC).

“For the first time, scientists will be able to simultaneously visualize many markers (with 40 plus channels available) on a single FFPE tissue slide with high sensitivity and resolution empowering unique discovery in immuno-oncology research,” said Harris Fienberg, IONpath’s CEO.

STUDY RESULTS

Triple-negative breast cancer (TNBC) is known to be an aggressive and invasive form and represents about 15-20% of all breast cancers. It is generally diagnosed based on the lack of expression of three “receptors” known to fuel most breast cancer tumors: estrogen, progesterone, and HER2‐neu.

While it is known the immune system plays a critical role in cancer progression, getting a comprehensive view of the tumor-immune microenvironment is difficult using current technology. Challenges include autofluorescence, poor resolution resulting in incomplete spatial and contextual information for understanding protein expression within cells in FFPE Tissue.

In this study, Stanford scientists used MIBI technology to comprehensively profile the tumor microenvironment of 41 triple-negative breast cancer patients by simultaneously imaging 36 proteins at a subcellular resolution in diagnostic surgical pathology samples.

By using a multi-step analysis, including cell segmentation, single cell analysis and spatial analysis, the authors revealed how tumor expression and immune composition are interrelated within tissue context, that correlates with overall survival in TNBC. The authors showed how a multiplexed imaging approach can be used to stratify patient populations and identify a unique patient population that will respond to therapy.

 “The work by Keren et al highlights the value of characterizing the intact tumor microenvironment with a comprehensive antibody panel and defining meaningful spatial relationships between tumor and infiltrating immune cells. The approach, MIBI-TOF, will be invaluable for analyzing potential mechanisms of immune evasion and responses to immunotherapy in multiple cancers”, said Dr. Margaret Shipp, Professor of Medicine and Director Lymphoma Program, Dana-Farber Cancer Institute.

The MIBI images collected are shared online and can be downloaded through a web-interface MIBItracker software available on the IONpath company website.

OTHER APPLICATIONS

MIBI is also currently being used to enable a variety of other applications including applications in neuroscience, where it is ideal for analyzing co-expression of dozens of proteins in brain biopsies (which are problematic for fluorescent-based technology) and autoimmunity where MIBI permits comprehensive analysis of the immune cells involved in the tissue-immune system interface. Additionally, further work is currently underway to identify biomarkers and stratify patients populations in clinical trials using MIBI.

ABOUT: IONpath™ is a venture-backed, commercial-stage company, founded by Stanford researchers out of the lab of Dr. Garry Nolan, focused on revolutionizing pathology with Multiplexed Ion Beam Imaging (MIBI) technology. MIBI is a multiplexed imaging platform with unmatched resolution, sensitivity, and throughput.

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