



Behind the scenes with the PC-mass tag developers

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The advent of spatial multiomics has revolutionized fundamental biological discovery and exploration of disease mechanisms by providing a means to investigate the distribution and interaction of biomolecules in intact tissue. However, major approaches such as MALDI Imaging of small molecules and top-down targeted fluorescence immunohistochemistry (IHC) require separate workflows on different tissue sections, making data collection take longer and requiring multiple platforms. This talk will highlight the development of a new spatial biology approach based on MALDI Imaging of novel photocleavable mass-tags (PC-MTs) for facile labeling. This approach, termed MALDI HiPLEX-IHC, enables highly multiplexed, multiomic and multimodal imaging of a single tissue specimen using one integrated workflow, enabling the spatial distribution and interaction of small molecules and macromolecules to be investigated.

Biography:

Dr. Mark Lim (Ph.D.) is the Executive Vice President and Chief Scientific Officer at AmberGen Inc. He has over 20 years' experience in the biotechnology industry and has been awarded over 15 patents which underlie key technologies in the biotechnology industry, including in the fields of proteomics, genomics/transcriptomics and diagnostics. His early work on photocleavable linkers and protein engineering contributed to the commercialization of a variety of novel reagents including PC-Biotin, PC-Phosphoramidites and fluorescent suppressor tRNAs. These reagents currently underlie several novel commercial techniques widely used in the proteomics/transcriptomics fields. Dr. Lim now leads AmberGen's mass spectrometric-based tissue imaging and blood-based biomarker detection and diagnostics projects. He is co-inventor of AmberGen's PC-PURE technology for photo-affinity biomarker enrichment which facilitates enhanced diagnostics as well as AmberGen's photocleavable bead mass spectrometry technology for multiplex biomarker detection. Dr. Lim has successfully developed novel blood-based immunodiagnostics for cancer and allergy. He also spearheaded an R&D effort which led to

the discovery of two novel autoantigen biomarkers for the autoimmune liver disease primary biliary cirrhosis, with the diagnostic assays currently undergoing FDA-clearance and CE Mark. Most recently, he led the development of a novel method for tissue diagnostics and spatialomics which is based on mass spectrometry imaging of whole proteins using photocleavable mass-tags [Yagnik, Liu et al. (2021) *J Am Soc Mass Spectrom* 32(4): 977-988, <https://pubs.acs.org/doi/10.1021/jasms.0c00473>].