Next level imaging Mass Spectrometry: Single cells in focus with SpatialOMx

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Studying molecular profiles at single cell resolution is imperative to understand how spatially structured communities of individual cells act and interact in the context of their networked environment. Label free MALDI imaging has been widely recognized as a valuable tool for identifying variety of compounds including metabolites, lipids and proteins from tissue. However, due to the lack of molecular sensitivity and specificity, it's still challenging to achieve single cell resolution at an appreciable dynamic range of analyte. In addition, the analysis of large data generated from millions of different cells can be challenging and time-consuming. Here, I want to present work we are doing with MALDI-2 on timsTOF fleX to increase sensitivity which, in turn, enables us to obtain single cell molecular profiles (and images) at 5-10um resolution. The image guided spatialOMx workflow also helps us to identify region of specific cell phenotype from the MALDI images, which then can be collected using laser microdissection (LMD) for 4D-proteomics study in the same timsTOF fleX instrument. It is truly next level imaging on a single instrument.