



## **Unraveling multi-level tissue heterogeneity at single-cell and low input using the timsTOF SCP**

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Diverse cellular identities individually and together impart tissue functionality. To understand the specific roles of those cell types we require methods that enable deepscale analysis of protein and post-translational modifications at low-multicell to single-cell input levels. An ideal solution would need to tightly integrate and optimize nanoliter sample preparation with minimal sample losses upon transfer to ultrasensitive LC-MS/MS instrumentation for data generation together with analysis tools that accurately reflect sample biology. To begin to address these needs, we have introduced the proteoCHIP in conjunction with a picoliter and single-cell dispensing platform, the cellenONE<sup>®</sup> that together constitute a sample preparation platform for single-cell proteomics (SCP) that enables very high peptide recovery. To further minimize batch effects while improving on reproducibility and throughput, we now combine our proteoCHIP sample preparation with dedicated diaPASEF acquisition on the timsTOF SCP for single cell and low input proteome profiling. This combination of technologies provides greatly improved sensitivity on single samples and data completeness across large sample cohorts. We have tailored these sensitivity driven methods to characterize phosphorylation dynamics and both HLA-I and HLA-II immunopeptidomics at decreasing input requirements. With these tools in hand, we now focus on a better understanding of heterogeneity in signaling, cancer, autoimmunity, and infectious diseases.

### **Biography:**

Claudia is a PostDoc in Steve Carr's group at the Broad institute of MIT and Harvard since the beginning of the year, where she will be working on low input and single cell proteomics workflows. Prior to that she conducted her PhD research at the Research Institute of Molecular Pathology (IMP) in Vienna with Karl Mechtler. In collaboration with Cellenion using their picoliter dispensing robot, the cellenONE<sup>®</sup>, she co-developed a complete solution for multiplexed single-cell sample preparation, the proteoCHIP.