High-throughput and robust nanoflow chromatography combined with trapped ion mobility spectrometry and PASEF for in-depth lipidomics from 1µL human plasma

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Comprehensive analysis of the lipidome in a robust and high throughput manner is a longstanding goal in biomedical research. Adding ion mobility spectrometry to conventional LC-MS workflows enhances the potential to resolve otherwise coeluting isomers. We have recently introduced a novel scan mode termed PASEF that synchronizes trapped ion mobility spectrometry (TIMS) with MS/MS precursor selection and thereby achieves scan rates that are sufficient to fragment almost all precursor in even short LC-MS runs. Combined with nanoflow LC, this enables in-depth lipidomics from minimal sample amounts. However, nanoflow sensitivity often comes at the cost of throughput and robustness. Here, we combine 4D PASEF lipidomics with a novel LC system to address these challenges.