Maximizing Nanoflow Spray Stability and Sensitivity using Automated Emitter Rinsing  
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Introduction
Nanoflow LC-MS has demonstrated improved sensitivity over traditional high-flow LC-MS methods in numerous applications. Reproducibility, robustness, and sensitivity are critical for accurate quantitation in nanoflow LC-MS workflows. Here we investigate the ability of automated rinsing to improve spray stability and detectability on a high-performance, hybrid triple-quadrupole (XLR) equipped with a heated spray chamber. Inspired by a laminar flow of deionized water, using automated emitter rinsing for four replicate experiments, we present data demonstrating significant improved spray stability and a higher repeatability and reproducibility. The effects of automated rinsing on data quality are further explored in MRM monitoring using a simple peptide digest.

Methods - 1
Instruments:
- Mass Spectrometry: AB SCIEX 4000 QTRAP (AB SCIEX)
- Source Parameters: Optimized curtain gas, ion spray voltage, heater temperature, etc.
- Reagent: Deionized water (18.2 MΩ cm, Milli-Q Advantage A10, Millipore)

Rinsing:
- Rinse volume: 50 µL
- Rinse duration: 15 s
- Rinse interval: 1 min

Results With Emitter Rinsing

Results Without Emitter Rinsing

Effect of Emitter Rinsing on MRM Data Quality

Conclusions
The benefits of automated tip rinsing in between every sample injection for nanoflow LC-MS have been demonstrated in numerous instances. The decrease in the drift of precursor ion and the iZ value of the precursor ion as well as the iZ value of the product ion have been significantly improved. The overall stability of the entire spray system has been improved, resulting in more consistent and reproducible MRM peak intensities. This improvement in spray stability and sensitivity is critical for accurate quantitation in nanoflow LC-MS workflows.