Mass Spectrometry of Nucleic Acids: Emerging Challenges and New Opportunities

Hosted by the Oligonucleotides and Nucleic Acids Interest Group

Date: Tuesday, June 2nd 2026

Organizers: Kevin D. Clark (Tufts University) and Keeley Murphy (Thermo Fisher Scientific)

Workshop Summary: This Tuesday evening workshop brought together academics, industry scientists, and key stakeholders in nucleic acids mass spectrometry to focus on understanding the emerging challenges and opportunities in this rapidly expanding field. Approximately 120 attendees joined us for this Tuesday evening workshop and were eager to participate in the discussion. We began by a recap of the results of a survey we sent out through the ASMS app. The results illustrated the broad range of hardware, software, and standards used by our community to solve problems in nucleic acids MS experiments. The data also served to guide discussion around the major challenges faced in this field, including but not limited to chromatographic separations, the sequencing of long oligonucleotides, and the lack of suitable/sourceable standards.

We then launched into a panel discussion that included representatives from academia, industry, and regulatory sectors. Panelists from UConn, UC Riverside, Abzena, and Genentech provided a single slide introduction about themselves and a challenge they routinely face in characterizing nucleic acids by mass spectrometry. Panelists introduced topics ranging from best practices for sequencing long therapeutic RNAs, key considerations for sample preparation, how to establish modification-function relationships, and determination of higher order structure of nucleic acids. We then opened the floor for questions, which brought about lively discussion. Audience members raised questions ranging from introductory “how-to” insights to highly technical application-specific, providing engaging commentary for scientists at all levels of experience in the field. We concluded the meeting with 15 min of networking time, though many attendees stay much longer and asked to include more networking opportunities in future meetings.