Ambient Ionization and Sampling Interest Group Workshop Report 2026

Analytical Selectivity in Ambient Ionization: From Ion Generation to Mass Analysis

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Presider

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Workshop Overview

The 2026 workshop brought together approximately 50 participants for five lightning talks and a panel discussion on analytical selectivity in ambient ionization mass spectrometry. The program considered how sampling, ion generation, transmission, and mass analysis affect which compounds are detected. It extended the 2024 discussion on analytical niches of ambient ionization, as well as the 2025 emphasis on complementary workflows to ambient methodologies by discussing how selectivity can be managed throughout an ambient ionization experiment. The workshop intended to showcase examples of such selectivity control via both lightning talks for the most part presented by trainees, as well as a panel discussion with senior researchers as panelists.

Lightning Talks

The 5-minute presentations (selected amongst accepted poster abstracts) illustrated this theme throughout a variety of applications (e.g. skin analytes, drugs of abuse, contaminants and explosives) and ambient ionization techniques (e.g. paper spray, cone spray, DART, ASAP). Overall, the talks showcased interesting strategies to achieve selective analyses across all experimental stages (preconcentration, automated sampling and analysis, derivatization, and computational interpretation of data). The presenters and their talks are summarized in the table below.

Speaker and affiliation	Presentation
Lahiru Wedasingha *Indiana University Indianapolis*	Electrokinetic loading and Faradaic ion concentration polarization coupled with paper spray mass spectrometry
Forough Doustkhahvajari *University of Pittsburgh*	Rapid screening of environmental exposures through ambient ionization analysis of skin
Matthew Carlo *NAWCWD China Lake*	Automated analysis using 3D printed cone spray ionization mass spectrometry
Wen Dong *Ohio University*	Quantitative cannabinoid analysis using zone heating assisted DART mass spectrometry and in situ flash derivatization
Liam Heaney *Loughborough University*	Rapid screening of prohibited substances using atmospheric solids analysis probe mass spectrometry

Highlights from the Lightning Talks

The lightning talks illustrated the breadth of current ambient ionization research and its potential to make chemical analysis faster and more accessible. Lahiru Wedasingha focused on improving the sensitivity of paper spray mass spectrometry, while Forough Doustkhahvajari explored rapid skin analysis for monitoring environmental exposures. Matthew Carlo highlighted automation as a route to increasing sample throughput and integrating ambient ionization into routine analytical workflows. Wen Dong discussed ambient ionization for quantitative cannabinoid analysis, and Liam Heaney examined its use in screening for prohibited substances in sports. Together, the presentations showed how advances in sampling, ionization, automation, and data interpretation can expand practical applications while emphasizing the importance of matching each method to the analytical question.

Panel Discussion

Panelists

- Liam Heaney, Loughborough University
- Stephanie Rankin Turner, University of Pittsburgh
- Bindesh Shrestha, Waters Corporation
- Christina Ferreira, Purdue University
- Facundo Fernández, Georgia Institute of Technology

Major Discussion Points

The panel discussion was open to both questions from the panelists and the audience, with the main discussion organically centering on the strength of ambient ionization when combined with point of care applications, as well as the challenges that such marriage still represents. Panelists discussed how close the combination of ambient ionization and portable instrumentation is to practical use, connecting the workshop's focus on analytical selectivity with the prospect of bringing analysis closer to the point of need. The questions also addressed broader topics, such as what actually defines ambient ionization, how should one select one ambient ionization method over another or over a non-ambient alternative approach, and which initial assumptions about ambient ionization methodologies have changed through practical experience. Finally, panelists were invited to reflect on, to their own view, which is the field's greatest advancement and what do they envision as future directions. These broader questions provided context not only for the discussion on selectivity, but also for the challenges that the field still needs to overcome to transition from demonstrations and method development to widespread practical applications.

ASMS and Session Survey Results

The ASMS survey included 19 workshop respondents. Mean ratings were 4.22 out of 5 for quality, 4.41 for topics, and 4.06 for format. Written feedback supported continuing the workshop and suggested preparing further questions for the panel and introducing more varied content across years. These comments offer useful direction for refreshing the program and facilitating discussion.

The presider also encouraged participants to complete a survey regarding their interest in maintaining more constant communication as an interest group, as well as feedback on future workshop iterations. Respondents (n = 17) indicated strong interest in maintaining community contact, with email as the preferred communication channel. Feedback supported retaining the combination of short talks and open discussion, with a roundtable suggested as an additional option. The overall takeaway was to keep the community connected between ASMS meetings and preserve an interactive format while keeping up the introduction of new topics for the next workshop.