The Drug Metabolism and Pharmacokinetics (DMPK) Interest Group (IG) Workshop at the 74th ASMS Annual Conference, San Diego, CA, 2026

The Drug Metabolism and Pharmacokinetics (DMPK) Interest Group (IG) Workshop was held on Monday, June 1, 2026, from 5:45 to 7:00 pm in San Diego, California. The coordinator, Yongle Pang (Kymera Therapeutics), and co-coordinator, Renmeng Liu (Gilead Sciences), presided over the workshop. Approximately 100 attendees joined the workshop. The workshop theme was "Advancing DMPK and Bioanalytical Strategies for New Therapeutic Modalities Through Mass Spectrometry." Four invited speakers presented scientific perspectives on specialized mass spectrometry applications in DMPK and bioanalysis. The session concluded with an interactive panel discussion and Q&A.

1. Review of the DMPK IG Goals

The DMPK Interest Group provides a discussion forum for mass spectrometry practitioners working in drug metabolism, pharmacokinetics, and qualitative and quantitative bioanalysis, including non-regulated bioanalysis. Its goals include:

- Discussing recent advances in techniques and methodologies for metabolite identification and pharmacokinetic bioanalysis.
- Interpreting and applying relevant guidance documents, including MIST, ICH M3, drug–drug interaction guidance, and human ADME/mass balance expectations.
- Sharing best practices across industry and academia.
- Providing input on ASMS conference programming of interest to DMPK scientists.
- Coordinating with related groups to complement scientific scope and broaden community outreach.

2. 2026 and Future DMPK IG Coordinators

2026: Yongle Pang (Coordinator), Kymera Therapeutics: ypang@kymeratx.com
Renmeng Liu (Co-coordinator), Gilead Sciences: renmeng.liu4@gilead.com
2027: Renmeng Liu (Coordinator), Gilead Sciences: renmeng.liu4@gilead.com
Zhihui Zhang (Co-coordinator), Bristol Myers Squibb: zhihui.zhang@bms.com

3. 2026 DMPK IG Workshop Agenda and Discussion

The workshop featured four invited speakers representing diverse areas of pharmaceutical research and development. The presentations provided complementary perspectives on analytical method development, emerging technologies, and applications of mass spectrometry in drug discovery and development.

1. Joe Cannon (Bristol Myers Squibb): "Product Ion Filtering for Low-Level ADC Payload Metabolites."

Joe Cannon presented product ion filtering as an analytical strategy for investigating low-abundance ADC payload metabolites. The presentation highlighted the importance of sensitive and selective mass spectrometric detection when analyzing trace-level metabolites in complex biological matrices. This topic illustrated how targeted acquisition and data-processing

strategies can enhance metabolite detection and support the characterization of ADC disposition.

2. Long Yuan (Biogen): “Novel Methodologies and Applications for LC-MS Bioanalysis of Oligonucleotides.”

Long Yuan discussed advances in hybridization LC-MS/MS methodologies for the quantitative bioanalysis of antisense oligonucleotides (ASOs) and small interfering RNAs (siRNAs). The presentation highlighted how hybridization-based enrichment combined with LC-MS/MS detection can improve assay sensitivity and selectivity while addressing limitations associated with conventional ligand-binding and direct LC-MS/MS approaches. Technical innovations included the use of peptide nucleic acid (PNA) and locked nucleic acid (LNA) capture probes to improve siRNA recovery, as well as melting temperature-guided optimization of hybridization conditions. Applications spanning GLP tox studies, capillary microsampling, in vitro ADME studies, and PET imaging demonstrated the versatility of these methodologies in supporting oligonucleotide drug discovery and development.

3. Lucinda R. Hittle (Discovery and Development Insights): “Beyond the Fifth Dimension: DMPK Strategies for Peptide Therapeutics.”

Lucinda Hittle discussed the unique DMPK challenges associated with peptide therapeutics and the importance of integrating mass spectrometry into peptide drug discovery and optimization. The presentation highlighted key ADMET considerations, including metabolic stability, membrane permeability, nonspecific binding, and clearance mechanisms, as well as strategies such as macrocyclization, lipidation, and PEGylation to improve pharmacokinetic properties. Analytical challenges in LC-MS/MS bioanalysis, including multiple charge states, internal standard selection, and sample preparation, were also addressed. Examples demonstrated the application of parallel artificial membrane permeability assays (PAMPA), ion mobility mass spectrometry for identifying metabolic soft spots in cyclic peptides, and immunoaffinity LC-MS/MS for quantification of peptide therapeutics and assessment of target engagement. The presentation emphasized the importance of close collaboration between DMPK scientists and medicinal chemists to guide peptide design and optimize drug-like properties.

4. Shuguang Ma (Gilead Sciences): “Applications of Stable-Labeled and Radiolabeled Drugs for Mechanistic and Regulatory DMPK Studies.”

Shuguang Ma highlighted innovative applications of stable isotope-labeled and radiolabeled compounds in mechanistic and regulatory DMPK investigations. Examples included isotope pattern recognition for metabolite structural elucidation and a novel hydrogen–deuterium exchange (HDX) approach for determining chiral racemization kinetics without requiring enantiopure standards. The presentation also introduced an integrated double-tracer clinical study design combining an oral radiolabeled dose with an intravenous microdose of a stable isotope tracer. Using Inavolisib as an example, this strategy enabled simultaneous assessment of human mass balance, AME, and absolute bioavailability within a single study, demonstrating opportunities to improve the efficiency of clinical ADME investigations.

Building on the scientific advances and analytical strategies highlighted by the four speakers, the workshop transitioned into an interactive panel discussion exploring the broader impact of emerging technologies on the future of DMPK and bioanalysis. A key topic was the growing role of artificial intelligence (AI) in pharmaceutical research and its potential to transform traditional scientific workflows. Participants generally agreed that while AI offers significant opportunities to improve efficiency in areas such as scientific report writing, data analysis, and quality assurance and quality control (QA/QC), it is unlikely to replace DMPK and bioanalytical scientists in the foreseeable future. Instead, AI is expected to serve as a powerful complementary tool, enhancing productivity while scientific expertise, critical thinking, and human judgment remain essential for interpreting complex data, addressing analytical challenges, and guiding drug discovery and development.

5. Potential Topics for Future ASMS Programs

- Protein biomarker quantification using MS in DMPK
- Metabolism of new modalities
- Precision medicine and LC/MS
- Cell and Gene therapy
- Proteomic analysis of covalent drugs
- Unusual reactions in mass spec for bioanalysis (cyanide release, oxidation)

6. Current DMPK Interest Group Officers

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