



Revolutionizing Metabolomics: AI Meets Mass Spectrometry



In a compelling webinar moderated by James Strachan of The Analytical Scientist, industry experts shed light on groundbreaking developments in metabolomics analysis. The presentation featured insights from two speakers who are pushing the boundaries of metabolite analysis through innovative AI applications:

Dr. Jennifer Campbell, Chief Scientific Officer at Matterworks, and **Dr. Naama Kanarek**, an Assistant Professor at Harvard Medical School and Boston Children's Hospital.

"If you really want to make a dent in how we study metabolomics, reduce the cost and make it more available to more labs..." "Automation and AI [are] going to really solve the problem for us and is, I think, the future direction of metabolomics"
- Dr. Naama Kanarek

applications of these advancing technologies. Dr. Kanarek's expertise in applying "genetic perturbations, biochemical assays, molecular biology, functional genomic screens, and metabolite profiling by mass spectrometry" showcases the multidisciplinary nature of modern metabolomics research. Her work underscores the **importance of combining robust methodologies with cutting-edge technology to tackle the challenges of metabolomic quantitation at scale.**

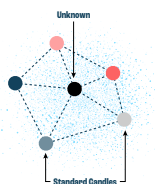
The collaboration between Matterworks and the Kanarek Lab exemplifies how **industry-academic partnerships** can accelerate scientific progress. Their joint work, detailed in a preprint titled "A Scalable Approach to Absolute Quantitation in Metabolomics," represents a significant step forward in **making complex metabolomic analysis more accessible and efficient for researchers.**

A lively Q&A session concluded the webinar, with participants engaging the speakers on topics ranging from the practical applications of deep learning to the scalability of isotopic labeling techniques.

One attendee inquired about growth areas for machine learning in biology. Dr. Kanarek



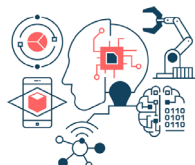
Universal
Calibrators



Standard
Methods



Cloud-Based
Software



Dr. Jennifer Campbell kicked off the presentation by exploring the intersection of deep learning and metabolomics. She explained how the multidisciplinary team at Matterworks leverages **artificial intelligence to interpret complex datasets**, paving the way for scalability in absolute quantitation.

Dr. Naama Kanarek brought valuable

perspectives from the research frontline. Her laboratory's work in **tracking cellular metabolism and adaptation** demonstrates the **practical**



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acknowledged current hurdles but noted that emerging tools are lowering the barrier to entry. She stated that **automation and high-throughput methods are crucial to reducing time, cost, and human error in metabolomics.**

Dr. Campbell echoed this sentiment, emphasizing that Pyxis is designed as a vendor agnostic technology and that Matterworks are expanding coverage to broader metabolic pathways and matrices. Pyxis has been benchmarked on a wide range of samples, including mammalian plasma, CSF, dry blood spots, urine, and cell media. She added "We are eager to test it on new matrices and haven't found significant limitations so far."

As mass spectrometry continues to evolve, the integration of AI-powered technology promises to remove traditional barriers to entry, potentially accelerating discoveries in fields ranging from medical research to drug development. This webinar highlighted how the convergence of advanced instrumentation and artificial intelligence is reshaping the future of metabolomics research.

About the Speakers

Dr. Naama Kanarek is Assistant Professor in the Pathology Department at Boston Children's Hospital and Harvard Medical School. Dr. Kanarek trained at the Hebrew University, Israel, where she earned a BSc in medical science, an MSc in proteomics and microbiology, and a PhD in immunology and cancer research. Dr. Kanarek's postdoctoral research was performed under the supervision of Prof. David Sabatini at MIT's Whitehead Institute.

Dr. Kanarek's laboratory at Harvard Medical School is interested in folate metabolism, and the metabolic adaptations of cells as they move around and migrate to new sites. They apply genetic perturbations, biochemical assays, molecular biology, functional genomic screens, and metabolite profiling by mass spectrometry to support their research.

Dr. Jennifer Campbell is Chief Scientific Officer at Matterworks, a multidisciplinary company focused on applying the power of deep learning for interpreting complex, unstructured data. Prior to Matterworks, Jenn worked at Novartis Institutes of Biomedical Research, heading up MS and separations in Cambridge, Massachusetts. She has also worked on newborn screening assays at Perkin Elmer and was Director of Proteomics at BG Medicine. Her career started with MS instrument development at the University of British Columbia under Prof. Don Douglas. She then spent eight years at Applied Biosystems, immersed in aspects of the MALDI TOF/TOF product line development. She has authored numerous papers, patents, and book chapters.

Watch the Full Webinar

Find the full-length webinar at:
www.matterworks.ai/2025-webinar