ACS MEASUREMENT SCIENCE Au
AN OPEN ACCESS JOURNAL OF THE AMERICAN CHEMICAL SOCIETY

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Editorial

ACS Measurement Science Au: The First Issue Exemplifies Diversity of Scope and Excellence in Measurement Science Research

Cite This: *ACS Meas. Sci. Au* 2021, 1, 1−2

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Following from the launch of *ACS Measurement Science Au*, along with the eight other ACS Au journals in January,[1] I am excited to be writing this editorial for the first issue of *ACS Measurement Science Au*. Robert (Bob) Kennedy, Ciara O'Sullivan, and I have had a great six months getting the journal started, and we are looking forward to future issues. This first issue contains a letter and four full-length research articles. It is exciting because it not only showcases the quality and breadth of measurement science topics—electrochemistry, mass spectrometry, lab-on-a-chip devices, spectroscopy, etc.—that we aim to publish in *ACS Measurement Science Au* but also highlights the importance of open science. Two of the articles in the issue underscore the importance of sharing data and software with the measurement science community.

In the first published letter, Patrick Unwin and co-workers[2] develop scanning ion conductance microscopy to study dopamine release from artificial synapses. This effort in single entity electrochemistry allows for a more thorough understanding of heterogeneities in the surface chemistry of the carbon fiber ultramicroelectrodes that are commonly used to study neuron exocytosis via other electroanalytical chemistry techniques like fast-scanning cyclic voltammetry (FSCV).

Next follows the first accepted and published research article in *ACS Measurement Science Au* by Parastoo Hashemi and co-workers,[3] who share a new data analysis software, "The Analysis Kid", for FSCV with the bioelectrochemistry community. While FSCV is a common electroanalytical chemical technique for studying exocytosis in neurochemistry, the data analysis procedures have primarily been developed by individual research groups without easy access for the broader bioelectrochemistry community. Now, for the first time, the Hashemi group brings these data analysis procedures to the broader community via a novel, free, open-source cloud software package that semiautomates background subtraction and visualization of FSCV data. The software also performs interactive calibration and parametric analysis and, importantly, Michaelis−Menten kinetics for dopamine and serotonin analysis. Its application is demonstrated for dopamine release in rodent brains but can be used for detecting the concentration of analytes in any FSCV application.

In the following article, Ryuji Igarashi, Masahiro Shirakawa, and co-workers[4] use their own data sets for machine-learning optimization of multiple parameters. This work is an excellent contribution to the field of spectroscopy and microscopy, showing the possibility of using machine-learning techniques to process spectroscopic and microscopic data to improve signal quality. The authors use magnetic resonance measurements of fluorescent nanodiamonds as their proof-of-concept data to demonstrate the usefulness of their machine-learning method, but this could easily be applied to other spectroscopic and microscopic techniques in the future. The work also shows the importance of making data sets and analysis tools publicly available for machine-learning opportunities and discovery. Both of these articles[3,4] really excite me, as open access publishing is only one dimension of open science. I am excited to see our authors embracing open science and showing the community the importance of it.

In the next article, Andrew de Mello, Thomas Huthwelker, and co-workers[5] present for the first time the combination of X-ray absorption spectroscopy with droplet-based microfluidics for in situ reaction monitoring with millisecond time resolution by monitoring calcium carbonate precipitation to showcase the concept and utility of the method. The field of droplet-based microfluidics has been expanding in the past decade, but this work is especially important because it allows for the study of nucleation events that are critical throughout the chemistry and biology community, especially in the formation of new materials at the nano- and microscale.

Finally, this issue also highlights the importance of mass spectrometry and "-omics" in measurement science with an article by Gary Patti's group.[6] This article focuses on the use of multiple reaction monitoring methods to allow for using affordable triple quadrupole mass spectrometers for the challenging and important task of doing untargeted metabolomics without sacrificing coverage instead of targeted metabolomics studies.

Overall, these studies help demonstrate the excellence of measurement science research and the depth and breadth of the scope of *ACS Measurement Science Au*. This includes critical methods development, as well as fundamental studies to understand the advantages and limitations of techniques for quantitative analysis. Finally, on behalf of our editorial team, I wish to conclude by thanking the reviewers who played an essential part in the release of this first issue by upholding thorough peer review. I hope you are as excited as I am with the terrific contributions published in this issue, and you will

Published: August 18, 2021

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https://doi.org/10.1021/acsmeasuresciau.1c00022
ACS Meas. Sci. Au 2021, 1, 1−2

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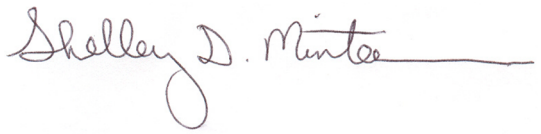

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Notes

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