SEMINAR PROGRAM

DEPARTMENT OF CHEMISTRY & BIOCHEMISTRY
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CHEMISTRY & BIOCHEMISTRY

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We Are Pleased to Announce a Seminar
Presented By

Laura-Isobel McCall
University of Oklahoma

Friday, September 23, 2022
4:15 pm
National Weather Center
Room 1313

Chemical Cartography of Host-Parasite-Microbiome Interactions: Fundamental and Translational Insights

Spatial context is essential to understand host-microbe-environment interactions and link chemical structure to biological function. Using an approach called "chemical cartography", my research combines liquid chromatography tandem mass spectrometry (LC-MS/MS), 3D modeling and data analytics with infection biology, to identify the spatial distribution of small molecules (metabolites), how they relate to infectious disease pathogenesis, and how these results can be used to guide drug development and biomarker discovery. In this seminar, I will illustrate the utility of chemical cartography through the example of Chagas disease.

Chagas disease is a parasitic disease caused by *T. cruzi* parasites and associated with localized disease symptoms to the heart apex, the colon and the oesophagus. Prior to my work, it was unknown why disease occurred at these sites. Using chemical cartography, I revealed that all three of these sites show persistent metabolic alterations, even after parasites are cleared. Furthermore, specific metabolic pathways were disturbed, including acylcarnitine and glycerophosphocholine metabolism. Building on these findings for drug development, I showed that carnitine-based treatment regimens prevent acute-stage mortality in Chagas disease through a novel, pro-tolerance mechanism of action. These findings will help address critical needs in the field of Chagas disease treatment. More broadly, these results demonstrate the utility of chemical cartography to understand disease localization and guide drug development, with broad applications across disease models.

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Refreshments will be served at 4:00 pm

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