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# CHEMICAL CARTOGRAPHY APPROACHES TO GUIDE RATIONAL DRUG DEVELOPMENT

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The world is facing an antimicrobial crisis. Most antimicrobial drug development focuses on developing agents that kill pathogens. Unfortunately, new antimicrobials are rapidly hampered by the emergence of drug resistance. However, disease symptoms actually result from the combination of pathogen-derived effects and host mechanisms that kill pathogens but lead to collateral damage. These latter mechanisms represent a unique opportunity to develop resistance-proof treatments. Such approaches have however been under-studied. In this virtual seminar, we will discuss how spatial metabolomic approaches (“chemical cartography”) can be used to identify metabolic pathways associated with tissue damage, to guide the development of damage-reducing treatments and to understand treatment failure. This approach represents a new paradigm using metabolomics to guide the development of novel treatment approaches for infectious diseases, with broad applicability.

**6:30-7:00 pm Social time** *Join early to meet Oklahoma chemistry students and professionals from around the state.*

**7:00-8:00 pm Presentation**  
**The meeting will be virtual via zoom.**

*This meeting has a waiting room. Please wait for the host to let you in.*

[ZOOM LINK](#) Meeting ID: **976 6976 5473** Passcode: **475869**



zoom meeting link

## Laura-Isobel McCall Biographical Sketch

Dr. McCall is an Assistant Professor of Chemistry and Biochemistry at the University of Oklahoma, who focuses on applications of mass spectrometry to study disease pathogenesis and to guide drug development, with a focus on parasitic infections. She received her PhD from McGill University in Canada, followed by postdoctoral training at the University of California, San Francisco and the University of California, San Diego, before joining OU in 2017. Her research uses a novel integration of analytical chemistry and 3-dimensional modeling (“chemical cartography”) to characterize *in situ* tissue damage, an approach that enables the identification of local disease-associated metabolic

alterations that would be missed by standard bulk tissue or biofluid analyses. These data are then used to better understand the mechanisms of efficacy of current treatment regimens and to guide drug development to target disease-associated pathways. She has received several prestigious awards, including being selected in 2020 as one of *Chemical and Engineering News*’ “Talented 12”: one of the “dozen young rising stars who are using chemical know-how to change the world”, in 2021 by *Infection and Immunity* as a “Future leader in the field of host-microbe interactions” and in 2021 by the Burroughs Wellcome Fund as an Investigator in the Pathogenesis of Infectious Disease.