



# Houk-Jung Organic Colloquium

## Battery-Inspired Strategies for Electrocatalytic C–C and C–N Bond-Forming Reactions

**Abstract:** The seminar will describe our efforts towards the development of scalable, mild, and general electrosynthetic methodologies for C–C and C–N/X coupling reactions. These electrosynthetic methodologies are largely possible because of a synergy between redox-active mediators developed by the energy storage community and transition metal catalysts. It will be shown that yields from electrocatalytic reactions are greatly improved by the incorporation of co-catalytic quantities of soluble battery compounds that mediate electron transfer with the coupling catalyst or protect the coupling catalyst from over-oxidation/reduction and degradation.

Employing mediators with properly tuned redox potentials and electron-transfer kinetics, we demonstrate electrocatalytic cross-electrophile coupling reactions of (hetero) aryl halides and alkyl halides that represent the state of the art in the area. Additionally, we demonstrate a broad scope for Chan-Lam coupling of amines and arylboronic acids in the absence of a chemical oxidants. Our studies reveal unique mechanisms that are only accessible under electrochemical conditions that enable cross coupling of tertiary electrophiles or arylchlorides: challenging substrates that are currently incompatible with any form of reductive activation.

Christo Sevov, Assistant Professor  
Department of Chemistry and Biochemistry  
Ohio State University

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4:00 PM | CS 24  
& via Zoom