

## **Chem 218: Student Exit Seminar**

# **“Strategies for Modulating Stabilities of Soft and Hard Hybrid Materials with Boron Clusters”**

**By Mary Grumbles  
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Carbon chemistry is ubiquitous across the development of modern materials. In comparison, use of boron building blocks is underdeveloped, owing to the historic instability of simple boranes. Polyhedral boranes, however, fundamentally differ from their borane precursors and exhibit exceptional chemical stability as a result of three-dimensional, delocalized aromaticity. My talk will highlight the utility of polyhedral boranes to generate hybrid materials with unique stability profiles. Specifically, I will discuss the use of polyhedral boranes as matrices for ion shuttling, highlighting the tolerance of these species to repeated electrochemical cycling in the presence of both moisture and water. After, I will discuss efforts to amend unprotected peptides with polyhedral boranes. My talk will highlight the distinct physical and chemical properties of the resulting bioconjugates, emphasizing the ability of these species to slow proteolytic degradation. Finally, I will describe ongoing efforts within the Spokoyny lab to develop and investigate these hybrid borane materials.



**Thursday, February 18<sup>th</sup>, 2021  
12:00 p.m. (PST)**