



Grant Domecus

EXPAND Mentor

Synthesis of a heterobimetallic MOF

Professor Seth Cohen/Cohen Lab (2022-2023)

What you will do

Metal Organic Frameworks (MOFs) are a class of materials comprised of organic linkers and inorganic metal clusters or secondary building units (SBUs). The dual nature of MOFs provides a unique opportunity to become comfortable with organic synthesis as well as inorganic synthesis. You will become familiar with **organic synthesis by synthesizing a novel thione-pyrrole based ligand which you will then use to learn inorganic synthesis of metal complexation, ultimately synthesizing a heterometallic MOF using the molecular metal complex as the template.** The thione-pyrrole ligand has been shown to be a very strong binding motif that can form metal complexes stable to chromatography. Utilizing this strong bond we can design and synthesize a ligand with one side bearing this group and the other side bearing another, weaker, metal binding group in order to be able to form a heterometallic MOF out of a singular ligand. During this 10-week project you will develop the necessary skills to develop and execute a plan of synthesis, utilizing both organic and inorganic techniques.

Skills you will acquire

- Common MOF characterization techniques (PXRD, BET, TGA, etc.)
- Chromatography
- Recrystallization
- Crystallography
- Common organic characterization techniques (NMR, MS, FTIR, etc.)
- Chemdraw