The synthesis of one or more privileged hydroamination ligands to be used in the construction of an enzymatic-like metal-organic framework (MOF) to be used in the transformation of petrochemical by-products into biologically relevant products. MOFs are of particular interest for this application due to their high level of customization. Metal-organic frameworks are composed of metal vertices connected by organic ligands, with open cavities that can later be modified. To develop the desired metal-organic framework, a mixed ligand approach will be used where each cavity of the MOF is made of two different ligands. One will be privileged chiral ligand that is known to be good in the hydroamination reaction. The other ligand, will be a modifiable ligand that we can functionalize once the MOF has been assembled. We can functionalize the pore to give it a specific shape, or to give additional moieties that can activate the reaction. In this way, the MOF can act as an enzyme, by being shape selective and having "side-group" that promote the reaction.

As of now, a privileged hydroamination ligand derived from 2,2'-Bis(diphenylphosphino)-1,1'-binaphthyl (BINAP) has been synthesized and synthesis of a second ligand from 5-bromo-2-iodobenzoic acid is in progress. Looking forward, this ligand will be incorporated into an existing metal-organic framework by solvent assisted ligand exchange (SALE) to form the desired enzymatic-like MOF. From this project I have learned that organic synthesis is a challenging process with many obstacles to overcome, but I enjoy the challenge of problem solving what may have gone wrong.