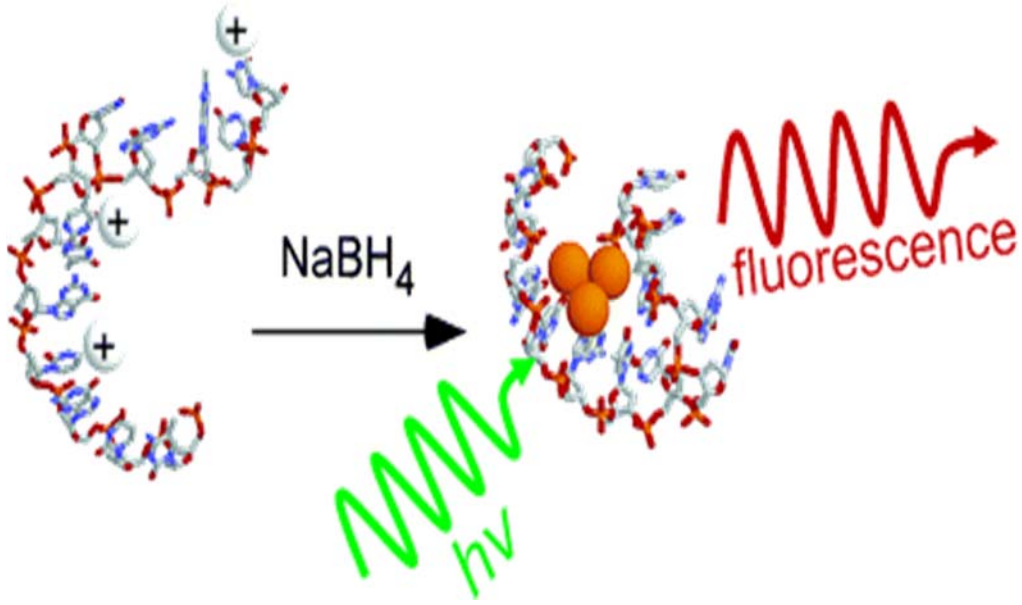
FURMAN

Chemistry Department
2021 Summer Research Program

Jeff Petty Research Group

Silver Nanoclusters

Manipulating the size and shape of matter on the nanometer scale offers exciting possibilities. For metals, the transition from bulk material to isolated atoms results in the separation of highly polarizable, continuous, plasmon-supporting bands into discrete energy levels. We are particularly interested in small metal nanoclusters (<10 atoms) and their unique optical and catalytic properties. For example, silver nanoclusters exhibit very strong absorption and emission and high photostability, making them nearly ideal fluorophores with applications in high-density optical data storage and biological labeling. In addition, metal nanoclusters have catalytic activity distinct from bulk metals. Biological molecules offer a route to produce chiral nanoclusters that could act as enantioselective catalysts.



This summer we are continuing to examine how the sequence effects the formation of the silver nanoclusters. To characterize the samples, we use atomic emission, lasers, calorimetry, and chromatography.