

Joseph McCrate, Chemical Engineering

University: University of Missouri-Columbia

Year in School: Senior

Hometown: Cape Girardeau, MO

Faculty Mentor: Dr. Hao Li, Mechanical Engineering

Funding Source: Life Sciences Undergraduate Research Opportunity Program

Surface modification of hydroxyapatite particles for biomaterial applications

Joseph McCrate and Hao Li

The interface between a filler material and a matrix can have a substantial impact on the properties of composites. This is especially true of nanoscale materials due to their increased ratio of surface area to mass. The goal of this research is to develop a method for modifying the surface of hydroxyapatite particles with nanometer scale features in order to improve the interaction between the particles and a polymer matrix that is widely employed in dental composites. This was done by adsorption of organic molecules onto the hydroxyapatite surface after nucleation. The results will serve as a guide for tailoring the surface chemistry of future nanomaterials to improve composites.