In orthopaedics, materials that have been traditionally used, presents some qualities like functionality and acceptance from the body. Metals like Titanium or Stainless Steal alloys, have been used to replace bone structures due to their mechanical properties as well as their relatively good biocompatibility with surrounding tissues. However there are some other aspects that metals can not improve. Nowaday, investigation in biomaterials field begins to look at the development and modification of composite materials for its application in such field. The aim of this study it is to fabricate a composite material whose matrix corresponds to an epoxy resin and reinforcement to carbon fibers. At the same time, the composite has incorporated an ABS phase. It is intended to use the third component as 3D printing material for the prosthesis support, thus avoiding machining that is so necessary in other materials as metals. Fort the fabrication of the entire system, resine infusion technique was used. After the composite material fabrication, a hydroxyapatite coating was made. Mechanical and biocompatibility test are going to be made in the material with and without the coating with the aim of evaluate its potential in orthopaedics applications. Biocompatibility will be evaluated by cultivating human cell lines and toxicity will be determined through MTT technique. For stress and strain test, the Universal Shimadzu Tension Machine will be used. The hardness will be evaluated using the Vicker durometer and the coating will be evaluated with SEM using the EDS probe. It is intended to show the system potential for bone applications.

Keywords: Biomaterials, Composites, Hydroxyapatite

References:


Presenting author’s email: jcoronel@uabc.edu.mx