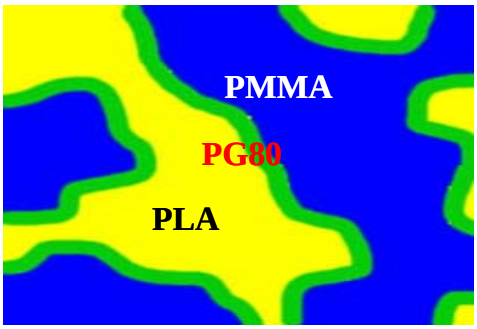
BIOMATERIALS: Poly L-Lactide/poly methyl methacrylate composites for hard tissue replacement



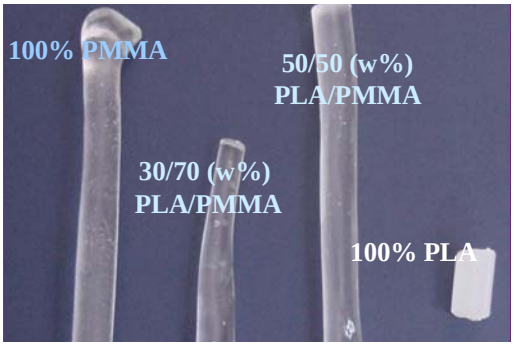
Overview

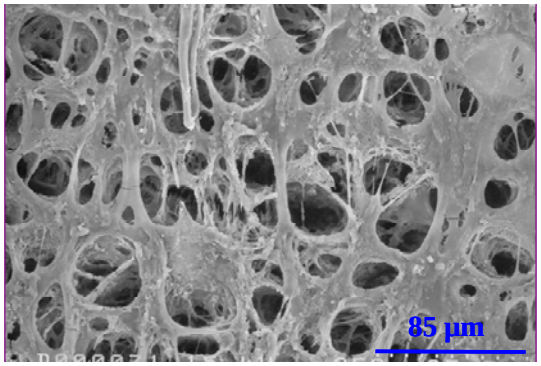
The biomedical field of tissue engineering has advanced rapidly in recent years and many new and exciting opportunities exist. One such opportunity, addressed by AMIPP researchers, is the development of functional hard tissue replacement materials that in addition to being compatible with the body environment react with the target tissue to promote its growth and bonding. A promising system is that of poly L-lactide [PLA] and poly methyl methacrylate [PMMA]. This project seeks to engineer these polymers into a unique biomimetic structure via immiscible polymer processing that promotes adhesion and growth of target tissue.

Progress

A range of composite materials have been processed and evaluated in the laboratory, including co-continuous composite compositions from two different molecular weight poly L-lactides. By novel processing methods, immiscible composites have been made that appear single phase lower left, but which actually consist of three or four phases. By engineering each of these phases for selective leaching by body fluids in-vivo, or by solvents in-vitro, the porosity and cell compatibility can be enhanced. Tests on cell cultures in-vitro to date have supported the validity of this premise.

Tables and Figures





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