

Orthopedic Implants – Tissue Implants and Prosthetics

This Mines invention is generally directed to a method for the production of tissue implants and prosthetics, including, but not limited to, orthopedic implants and prosthetics which have a controlled and directional gradient of porosity, chemistry and structure (and, therefore, mechanical properties) moving through all or one or more portions of the implant, as well as the implants produced by such a method. The implant may consist of a prosthesis with a non-uniformly porous outer surface or coating and may be used in any application in which porous orthopedic implants are indicated such as hip/knee replacement or craniomaxillofacial reconstruction. The desired effect is to create an implant which more closely mimics the natural structure of bone, and which improves the quality of the bone growth that occurs within the implant. The porous implant is produced by a novel, rapid combustion synthesis reaction process that would potentially establish and facilitate “chair-side surgery”, i.e., CAT scan, synthesis of near net shape implant and surgery taking place within the hospital environment and within a few hours of the patient entering the hospital.

Porous implants and implant coatings approved for clinical use employ uniformly porous materials. Depuy Porocoat, Sulzer CSTi, Interpore Pro Osteon are commercially available examples.



Inventors: Dr. Reed Ayers, Steven J. Simske, John Moore