

Tissue Intergrated 3DP Porous Polyethylene Implant

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Synthetic polymers are widely used in biomedical applications due to their advantages compared to other materials including low cost and ease of processability, good corrosion resistance and high properties to weight ratio. Among several polymeric biomaterials, polyethylene is a biocompatible polymer which has a long history of being utilized in many biomedical applications ranging from simple components for example containers and packaging, catheters or tubing drains to advanced implants for example artificial hip and knee joint prostheses, or esophagus segments. Although dense polyethylene is known to be a bioinert material which does not interact with host tissue, polyethylene in its appropriate porous form has been shown to be able to integrate well with surrounding host tissues and could widen its uses as bioactive implants. In this presentation, porous polyethylene structure which was fabricated by both direct and indirect three dimensional printing (3DP) is demonstrated. Its properties and applications as tissue integrated implants which permitted soft or hard tissue ingrowth in tissue regeneration and replacement will be discussed.