A 3DP-based procedure for the fabrication of artificial UHMWPE trabecular bone tissue

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In this report we describe the results pertaining to developing a 3D printing based procedure for the manufacture of open-cell porous scaffolds from UHMWPE simulating anisotropic trabecular bone tissue. The new method consisted of FFF fabrication of a 'negative' matrix using sacrificial PLA polymer, followed by UHMWPE powder filling and hot molding, and final leaching to remove the matrix. Electron microscopy imaging of the resulting structure confirmed the creation of a robust open cell structure with pore diameters of the order of 300 μm. The implications of this advancement are further discussed.