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**Bioactive Coating on Porous Materials with an Interconnected Pore System to Improve Osseointegration**

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**Abstract.** The purpose of the present study was to evaluate the role of bioactive surface coating and geometric design of orthopedic implants. In return, a 3-dimensional model with a interconnected macroscopic por system (IMPS) was designed. The model was created by using the place holder method with titanium powder and ammonium bicarbonate. After sintering one group of the IMPS-model was penetrated with plasma to create hydrophilic surface. The second group was coated with the biomaterial NanoBone and the third was an untreated controll group. All three groups were used for an experimental pilot study in rabbit femora to determine the osseointegration process after 4 and 12 weeks. The biomaterial coated group points an approximately 10 % higher bone to implant contact compared with the two other groups