Supplementary Information:

**Figure S1.** Close-ups of porous titanium bead-based implants before and after implantation.

**Figure S2.** Macrographs of the explants, Acid-etched and anodised samples were more integrated and harder to remove from the surrounding tissue.

**Figure S3.** Quantification of total protein and collagen amounts in the explanted samples. Especially, the anodised samples had significantly more collagen and total protein in both no serum and serum conditions.

**Figure S4.** Macro and nanoscale effects of anodization. Anodization produced nanoscale tubes with an average diameter of 50±16 nm, which is a more regular structure compared to acid-etched surfaces.

**Figure S5.** Surface treatment with other acids (HF and H₂SO₄) can lead to significant changes on the Titanium bead surfaces.

**Figure S6.** Contact angle measurements on non-porous titanium surface before and after surface treatment.