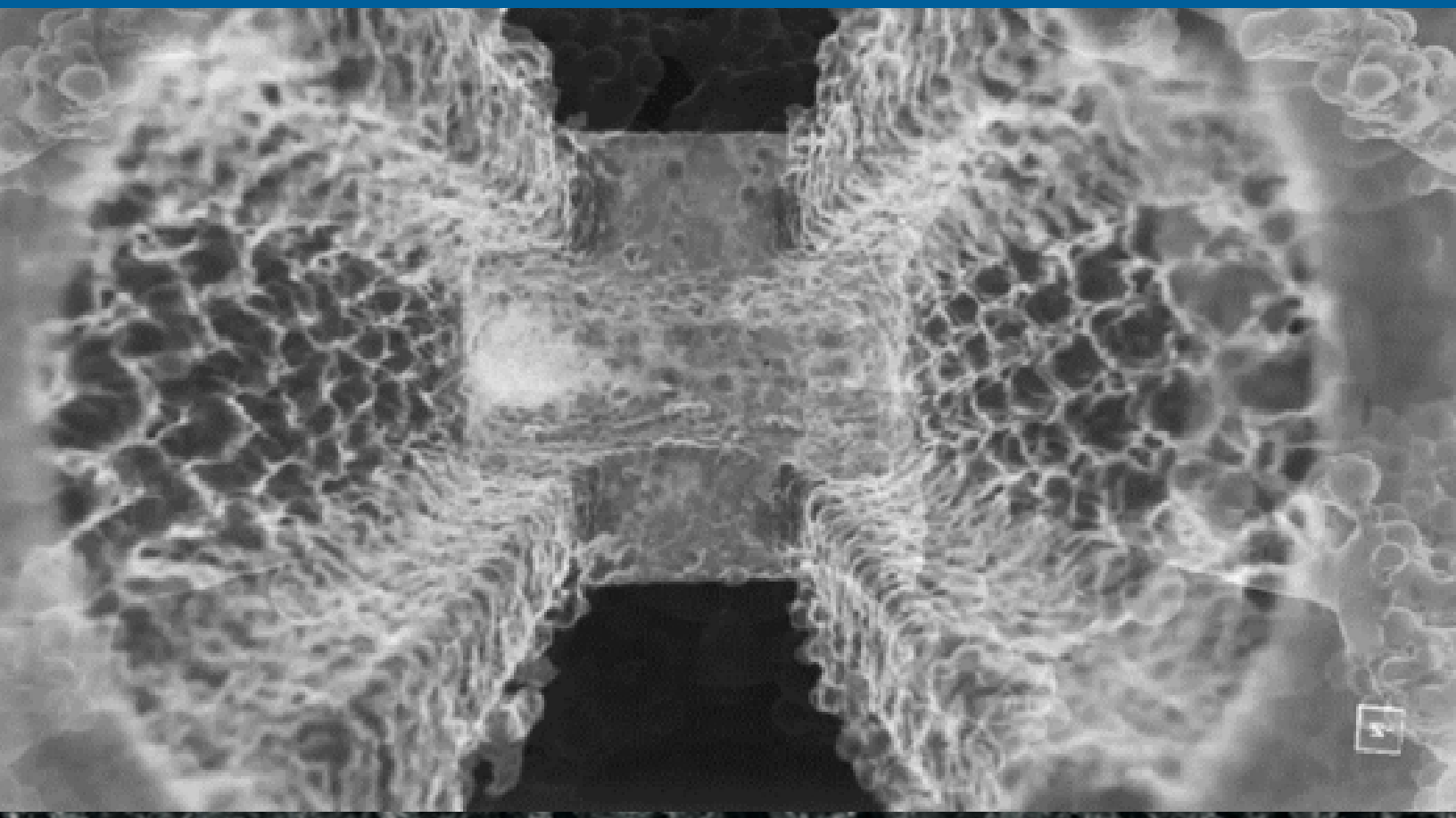
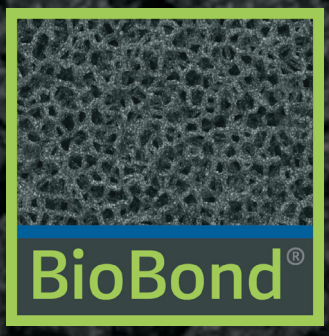


Advancing 3D-Printed Titanium Spinal Fusion Implants

Osteointegration
Osteoconduction
Osteopromotion

BIOBOND®

Proprietary Porous
Trabecular Structure



ChoiceSpine™

BioBond® Cell Study

The BioBond® surface technology cell study evaluated the osteoblastic differentiation of human mesenchymal stem cells (hMSC) on the ChoiceSpine 3D printed titanium alloy (Ti6Al4V) porous trabecular structure. The BioBond® surface technology utilizes additive manufacturing to create distinct and intentionally designed submicron, micro, and macro interconnected architecture to optimize surface contact, load sharing, and osseointegration potential.The study aimed to characterize the ability of these surfaces to promote bone growth while minimizing inflammatory and fibrogenic responses across a controlled range of pore dimensions and porosity. Critical indicators of implant success, including cell adhesion, proliferation, and differentiation, were monitored via protein expression.

SEM imaging analysis confirmed cell adhesion, interconnectivity, and 3-dimensional interaction with the semi-ordered porous surface topography over 7-. 14-, and 28-day time points (Figure 1). This proliferation pattern suggests that the porous structures supported surface-level cell adhesion and thorough cell penetration and interaction, mimicking natural bone architecture and providing evidence of the osteointegration that would likely occur in vivo (Figure 2).

Our findings confirm that the hierarchically porous structure effectively mimics native bone architecture with peak and valley topography at a microscale level, which fosters mesenchymal stem cell adhesion, proliferation, and osteoblastic differentiation. The BioBond® osteoconductive and osteopromotive surface properties have been combined with additive manufacturing expertise to develop a complete product portfolio of state-of-the-art spinal implants.

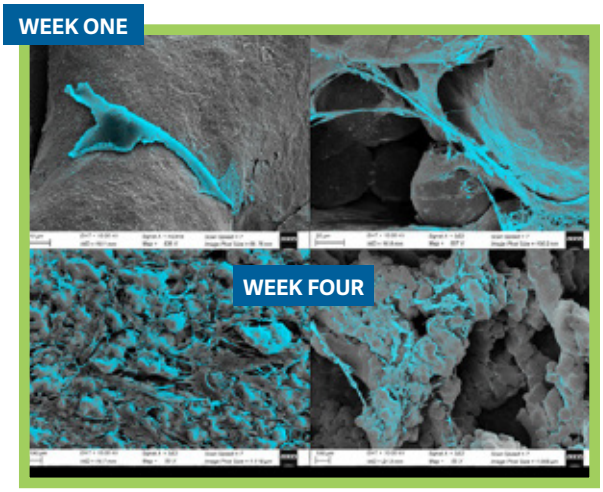


Figure 1: hMSC proliferation and migration through porous hierarchal structure
A) 1-week time point and B-D) 4-week timepoints

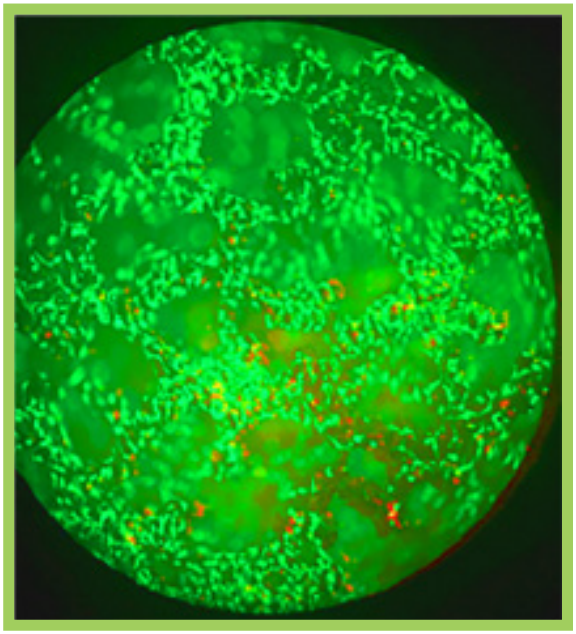
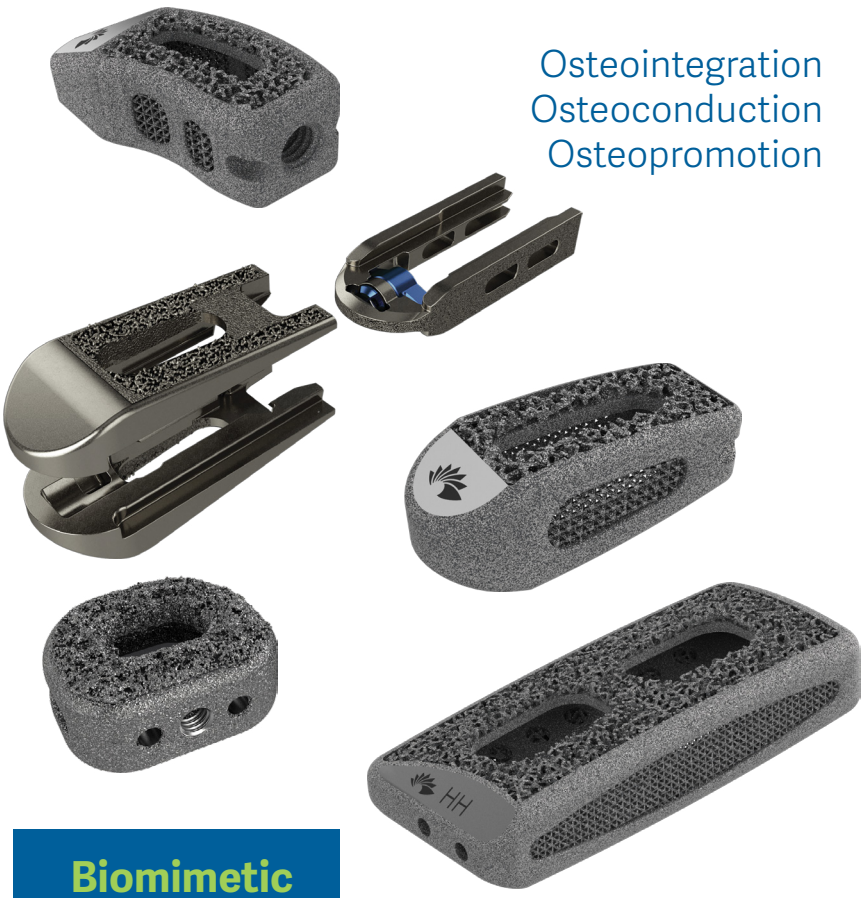


Figure 2: Live (Green)/dead (Red) immunofluorescent stain showing hMSC growth and proliferation on osteoconductive porous trabecular structure.



Osteointegration
Osteoconduction
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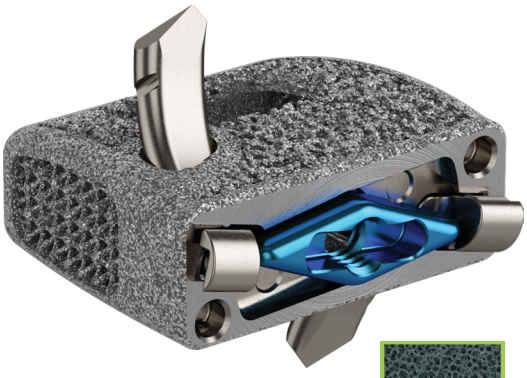


Biomimetic Porosity

BioBond®

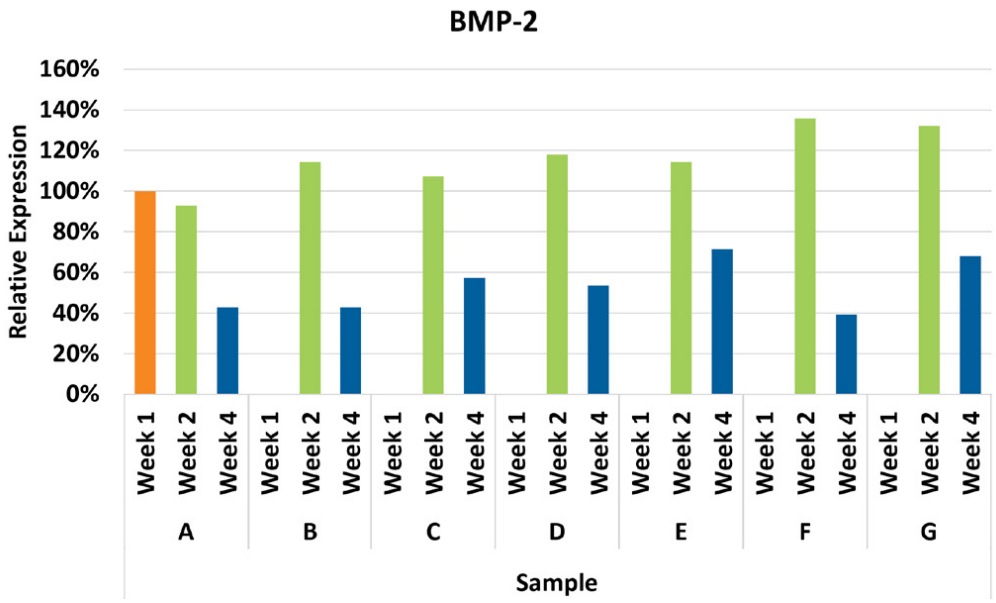
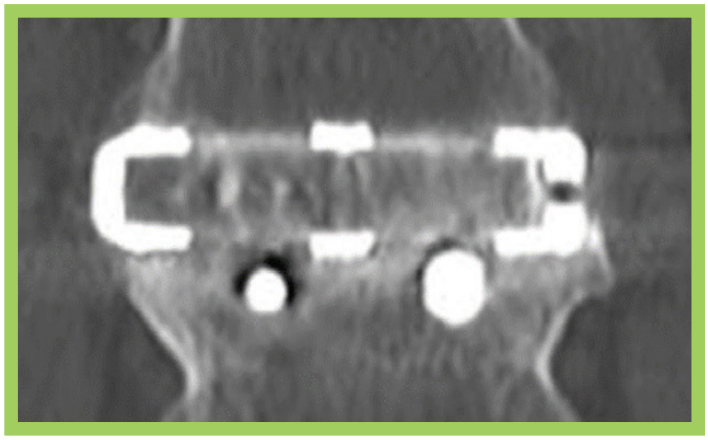
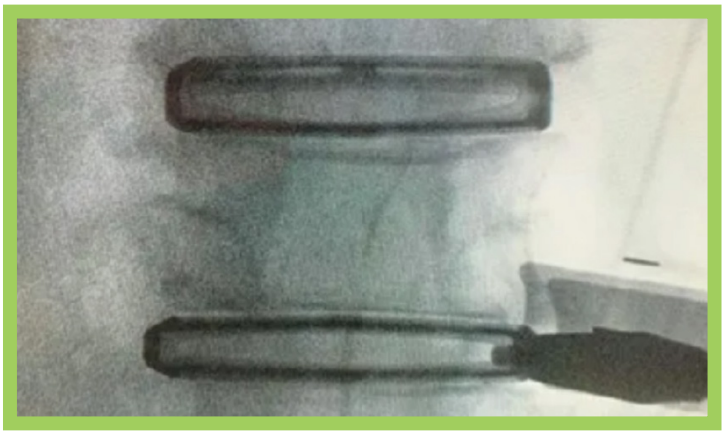


Figure 3: Bone Morphogenic Protein (BMP) response as a function of porosity and timepoint.





TigerShark® L 3D Printed Lateral Interbody Spacer has 17 and 22mm width with built-in 0°, 6°, and 12° lordotic options in multiple lengths and heights. The device features a large center opening for packing bone graft material and is compatible with the Veo® Lateral Access System for minimizing psoas disruption. Supplemental fixation required.

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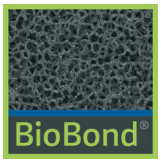
Proprietary Porous
Trabecular Structure



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Find the complete whitepaper study at choicespine.com/biobond