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**CHARACTERIZATION OF A NEW POROUS TANTALUM BIOMATERIAL  
FOR RECONSTRUCTIVE ORTHOPAEDICS**

*Authors*

Bobyn JD, Hacking SA, Krygier JJ, Chan SP, Toh KK, Tanzer M

*Publication*

Scientific Exhibition: 66th Annual Meeting of the American Academy of Orthopaedic Surgeons; February 4-8, 1999; Anaheim, CA

*Purpose/Premise*

This scientific exhibit reviews the fabrication methods, physical properties, mechanical properties, canine studies, and clinical applications of a porous tantalum biomaterial.

*Material and Methods*

Fifty published papers that evaluated the status of a new porous tantalum biomaterial were reviewed and consolidated.

*Outcomes*

Based on their own in-house research at McGill University and a detailed review of the published literature on *Trabecular Metal*™ Material (at that time called *Hedrocel*® Material), the material was shown to have a porous structure that resembles trabecular bone. Porosity and pore size were determined to allow vascularized tissue ingrowth and high attachment strength, and the microtexture of the struts was shown to be conducive to bone formation. The material was found to have a high strength/weight ratio, high ductility, low modulus of elasticity, and high coefficient of friction against bone.

*Conclusion/Recommendation*

It was concluded that the strength characteristics of the material are superior to porous polymers and ceramics and comparable to higher-density porous metals. The low modulus facilitates load transfer while avoiding stress shielding. The high coefficient of friction increases initial stability.

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