

Dr. Aaron Nauth

“The Use of Autologous Endothelial Progenitor Cells (EPCs) for the Healing of a Bone Defect in a Large Animal Model: A Comparison with Iliac Crest Bone Graft”

In the recent years, Dr. Nauth has focused most of his basic science research activity on biologic strategies to enhance fracture and soft tissue healing, primarily with stem cell therapy. More specifically, he has been investigating endothelial progenitor cells (EPCs) as a therapeutic alternative to overcome the limitations of current standard approaches, such as bone grafting. In this context, bone marrow-derived EPCs have shown promising results in a small animal model of a critical-size bone defect by dramatically improving healing compared to a control treatment.

Dr. Nauth and his team have been further optimizing this strategy. In the same model, they have defined an optimal cell dose and suspension medium to be used for implantation. They have also demonstrated that EPCs are superior to mesenchymal stem cells, the most common cell type investigated for bone healing. Moreover, they evaluated the effectiveness of different EPC subtypes and they confirmed the benefits of EPCs by treating bone defects in a delayed fashion, reproducing the most common clinical scenario. To progress towards clinical trials, EPC-based therapy is now being tested in a large animal model to validate these outcomes.

In parallel, Dr. Nauth is investigating the potential of EPCs to improve rotator cuff repair. He is also working to address clinical challenges faced by orthopaedic surgeons from a basic science perspective. This includes projects related to the induced membrane (Masquelet) technique or the use of intra-wound antibiotics to prevent surgical-site infection.