

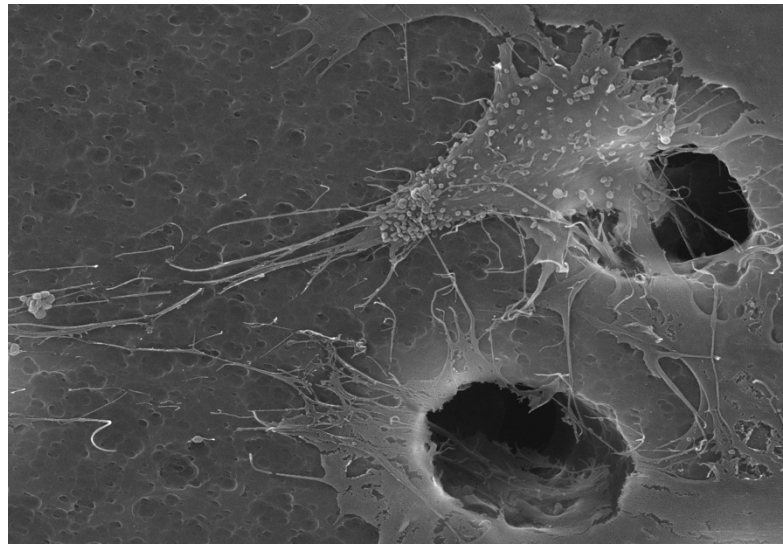


QUANTITATIVE & SYSTEMS BIOLOGY COLLOQUIUM: Mesenchymal stromal cells as model systems and therapeutics

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About The Speaker:

In college, I studied Engineering in Molecular Biotechnology at the University of Chile, in Santiago, Chile, where I started doing research on MSCs in 2001. I then did my PhD at the Max Planck Institute of Molecular Cell Biology and Genetics, in Dresden, Germany. My thesis focused on the interaction of MSCs with leukemic cells. After graduating in 2008, I came to do a postdoc with Dr. Jan Nolte at the Institute for Regenerative Cures at UC Davis and in 2012 became faculty at the same institution. The focus of my laboratory is on human bone marrow-derived MSCs and their in vivo counterparts, skeletal stem/progenitor cells. We have made major contributions to the development of MSC-based therapies, especially combining MSCs with gene therapies. My lab has also extensively studied their fundamental biology, including metabolic regulation, gene expression, proteome, and glycan profile. This expertise has enabled us to uncover key molecular and sub-cellular underpinnings of rare bone diseases. Our most common laboratory techniques include cell and molecular biology methods, recombinant DNA technologies, and analysis of complex biological datasets (omics). We also use in vivo animal models to study cell retention, cell migration, ectopic bone formation, bone repair, critical limb ischemia, and bone diseases.



Abstract:

Over 1,000 clinical trials have shown that Mesenchymal Stromal Cells (MSCs) are remarkably safe, but most often, the cells exhibit only modest efficacy. Our lab has specialized in enhancing MSC potency by genetic engineering in a clinically-compliant manner, using a platform that is analogous to those used for CAR-T cell therapies. We will illustrate this approach with MSCs that over-express vascular endothelial growth factor (VEGF) to treat critical limb ischemia. In addition, because MSCs can robustly differentiate into osteoblasts, we also use them to study two rare bone diseases: Fibrous Dysplasia and Snyder-Robinson syndrome. Together with complementary mouse models, these systems have allowed us to uncover new insights into disease mechanisms while testing potential therapeutics.

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September 17, 2026

Time:

10:30 AM – 11:45 AM

Location:

SSB 130