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Musculoskeletal

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Injuries and diseases of tendons and ligaments are some of the most commonly diagnosed problems of the musculoskeletal system. Despite this, clinically-approved disease-modifying therapies are completely unavailable for these painful and debilitating conditions. Persistence of this unmet medical need is due in large part to a poor understanding of tendon biology. A combination of basic and applied research is essential towards developing novel and robust therapeutic strategies.

The central underlying theme of research in the Salazar Lab is the discovery of novel drug targets and therapeutic strategies for the musculoskeletal system, with a current focus on injuries and diseases of tendons and ligaments. Towards this aim, we engage in multiple strategic activities, such as building research collaborations with clinical and academic partners that enable us to profile the molecular landscape of human tendinopathy. We develop and characterize preclinical animal models of tendon injury and repair, and apply pharmacology to assess disease mechanisms as putative therapeutic entry points. Comparative medicine is implemented to develop molecular and imaging-based biomarkers that are highly conserved across multiple vertebrate species, allowing us to follow disease evolution and detect therapeutic intervention from lab bench to clinic. Last but not least, we work closely with partners to develop high-throughput cell-based phenotypic screening assays to search for novel drug targets in tendon. And of course, data science is at the heart of everything we do. Importantly, these activities are made possible through an inter-disciplinary matrix of collaborators across NIBR.

Current research topics include: inflammatory cascades underlying the pathogenesis of connective tissue disease; role of developmental programs in connective tissue repair & regeneration; transcriptional control of tendon development and repair.

Selected Publications

Reactivation of a developmental Bmp2 signaling center is required for therapeutic control of the murine periosteal niche
Salazar VS, Capelo LP, Cantù C, Zimmerli D, Gosalia N, Pregizer S, Cox K, Ohte S, Feigenson M, Gamer L, Nyman JS, Carey DJ, Economides A, Basler K, Rosen V.
Elife. 2019 Feb 8;8:e42386

BMP signalling in skeletal development, disease and repair
Salazar VS, Gamer L, Rosen V
Nat Rev Endocrinol. 2016 Apr;12(4):203-21

Specification of osteoblast cell fate by canonical Wnt signaling requires Bmp2
Salazar VS, Ohte S, Capelo LP, Gamer L, Rosen V.
Development. 2016 Dec 1;143(23):4352-4367

Click here for additional publications.

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List of links present in page

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4. https://pubmed.ncbi.nlm.nih.gov/27802170/
5. https://www.ncbi.nlm.nih.gov/myncbi/1hQ8yGIQTQko7y/bibliography/public/