

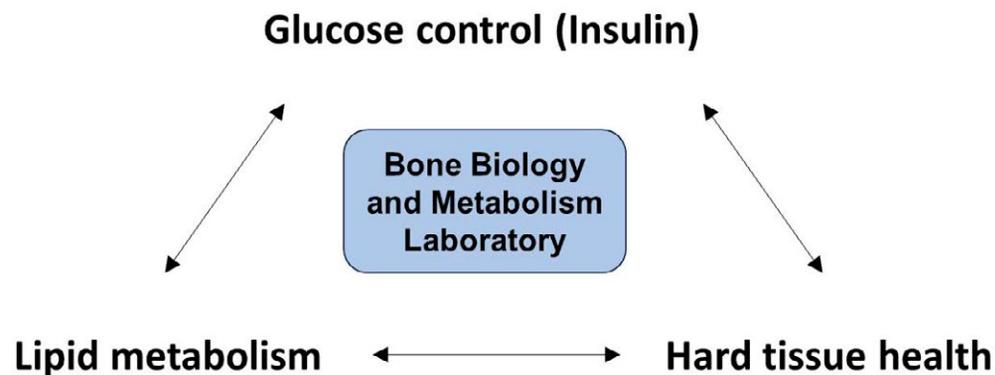


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RESEARCH OVERVIEW

Our research focuses on the molecular mechanisms of insulin signaling and its implications in metabolic and skeletal disorders. Using approaches such as mouse genetics, cell biology, and biochemistry, we aim to understand how insulin signaling is regulated in different tissues and how its dysregulation contributes to disease. We recently identified a mechanism that enables cell type-specific biased insulin signaling, including in bone cells. Additionally, we discovered an insulin-mimetic peptide that activates the insulin receptor through a mechanism distinct from insulin. This peptide may offer therapeutic potential for rare genetic disorders involving insulin receptor mutations and serves as a tool to investigate how selective modulation of receptor tyrosine kinases can lead to biased signaling outcomes. Our current studies include evaluating how improved insulin sensitivity affects oral cancer progression, identifying new regulatory targets within insulin signaling pathways, and examining the role of insulin signaling in inflammatory responses and periodontal tissue homeostasis under diabetic conditions.



RESEARCH CONTENTS

1. Discovery of regulatory targets in insulin signaling pathways
2. Therapeutic impact of diabetes treatment in oral cancer
3. Insulin signaling, inflammation, and periodontal tissue homeostasis

[Key words] Insulin signaling; Metabolic disease; Insulin-mimetic peptide; Oral cancer

KEY PUBLICATIONS

1. Park J, Hall C, Hubbard B, LaMoia T, Gaspar R, Nasiri A, et al. MAD2-Dependent Insulin Receptor Endocytosis Regulates Metabolic Homeostasis. *Diabetes*. 2023;72(12):1781-94.
2. Park J, Li J, Mayer JP, Ball KA, Wu J, Hall C, et al. Activation of the insulin receptor by an insulin mimetic peptide. *Nat Commun*. 2022;13(1):5594.
3. Park J, Zhang X, Lee SK, Song NY, Son SH, Kim KR, et al. CCL28-induced RARbeta expression inhibits oral squamous cell carcinoma bone invasion. *J Clin Invest*. 2019;129(12):5381-99.