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goodman23@snu.ac.kr**RESEARCH OVERVIEW**

I mainly study salivary gland physiology, but my research is also highly multi-disciplinary covering salivary gland morphogenesis, regeneration, nanozyme, tissue engineering, Sjogren's syndrome, and general bioengineering. Saliva, one of the most important bodily fluids, is produced by the salivary glands. Salivary gland dysfunction leads to hyposalivation or xerostomia, which causes the deterioration of both oral and systemic health. Therefore, it is highly desirable to develop therapeutics to regenerate or replace damaged salivary gland tissues.

My first goal is to elucidate key factors involved in branching morphogenesis of developing embryonic salivary glands. Since the process of regeneration recapitulates developmental process, our team is testing whether those newly discovered morphogens have regenerative potential in salivary glands. My second research goal is to engineer such regenerative or protective factors with cutting-edge nanotechnology and biomimetic approaches, enhancing and optimizing their bioactivity for industrialization and clinical application. Therefore, development and application of new types of nanozymes or biomaterials is another wing of our research interest. Lastly, we are trying to apply those discovered salivary gland regenerative/ protective factors on other epithelial organs such as intestine, kidney, lung, and pancreas. I believe that salivary gland will become a key organ bridging orofacial area and entire body system, allowing us to expand field of dentistry.

RESEARCH CONTENTS

1. Elucidation of key mechanisms of salivary gland branching morphogenesis
2. Engineering and optimization of salivary gland regenerative factors for clinical application
3. Applying biological findings from salivary gland research to other epithelial organs

[Key Words] Salivary gland; Branching morphogenesis; Nanozyme; Tissue engineering; Organoid; Sjogren's syndrome

KEY PUBLICATIONS

1. Han, S. I., Lee, S. W., Cho, M. G. et al. Epitaxially strained CeO₂/Mn₃O₄ nanocrystals as an enhanced antioxidant for radioprotection. *Advanced Materials*, 2020, 32.31: 2001566.
2. LEE, Sang-woo, et al. Developmental role of hyaluronic acid and its application in salivary gland tissue engineering. *Acta Biomaterialia*, 2020, 115: 275-287.
3. LEE, Sang-woo, et al. NiCHE platform: nature-inspired catechol-conjugated hyaluronic acid environment platform for salivary gland tissue engineering. *ACS Applied Materials & Interfaces*, 2020, 12.4: 4285-4294.