2025 Pilot Research Grant

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Project Title: Innovative microphysiologic systems recapitulate the salivary gland microenvironment to define pathogenesis by endotype and test novel therapeutic agents in Sjögren disease

Sjögren disease (SjD) patients suffer from the lack of tears and saliva, due to immune-related infiltrate of the glands responsible for their production. Immune cells are attracted to the cells in the gland responsible for making tears and saliva (epithelial cells) causing their lack of function. The relationship between salivary gland epithelium and the immune system is still largely unknown. To date, there are no effective options to treat or prevent these manifestations. Lately, the development of salivary gland organoids (mini "organs" made only of salivary gland epithelial cells) has helped advancing our knowledge on the causes of SjD establishment, but they do not allow researchers to simultaneously study the role of the immune cells in SjD. With this project, we want to develop a complex technology to evaluate the relationship between salivary gland organoids together with immune cells, to understand the mechanisms by which they interact. Moreover, with this technology we have the opportunity to study drugs efficacy on multiple organ systems simultaneously including the immune cells and epithelial cells. Finally, SjD is highly variable from patient to patient, and we can use this model system to create an individualized "patient" to test how drugs were in SjD patients with different disease characteristics.