

Does Age Create More Noise in the Brain?

Filler words and filler sounds are common, it is rare to encounter someone who does not perform them. Previous research shows that birds may use filler sounds when they are singing, similar to how humans do when we speak. We think that the brain uses filler words and filler sounds as a type of correction mechanism, and the use of filler words and filler sounds changes with age.

Our hypothesis was that young adult Zebra finches make more mistakes while singing than adult Zebra finches. For the study, we recorded Zebra finches of different ages

singing inside acoustic chambers for several days.

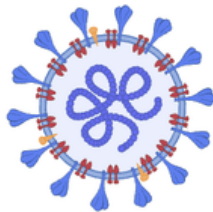


UCSF HIGH SCHOOL INTERN PROGRAM

Understanding Central Nervous System (CNS)

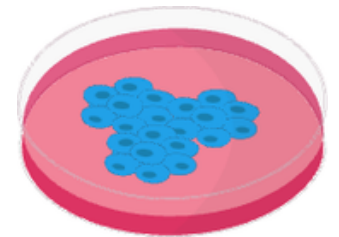
Autoimmunity Potentially Induced By SARS-CoV-2

SARS-CoV-2 is known to affect the human's central nervous system (CNS). Previous studies on neurological symptoms demonstrated in COVID-19 patients, such as "brain fog" and mental health disorders, suggested that uncontrolled immune responses pre- and post-SARS-CoV-2 exposure were associated with severe health outcomes. As the cause of these symptoms remains unknown, **our group aims to understand the mechanism by which SARS-CoV-2 infection leads to severe neurological disorders in patients through CNS autoimmunity.**



Comparative Analysis of Gene-Targeting Strategies for iPSC Line Generation

Induced pluripotent stem cells (iPSCs) are pluripotent stem cells generated directly from somatic cells, capable of differentiating into various tissue types. iPSCs were first generated by Shinya Yamanaka and Kazutoshi Takahashi at Kyoto University, Japan in 2006. **We aim to compare and use two gene-targeting strategies to generate iPSC lines carrying various fluorescent reporter proteins for studying gut development.**



PAST PROJECTS

CRISPR Efficiency in NK-92 Cells

Immunotherapy, where the immune system is harnessed to fight cancer, has shown some clinical successes. However, its success is not universal; responses vary from patient to patient. A better understanding of the immune system is needed to improve outcomes. CRISPR-Cas9 is a revolutionary tool used for genetic editing. Its simplicity and speed has made knocking out genes a much easier approach to understanding the molecular mechanisms of the immune

system. **The goal of our study was to optimize CRISPR editing conditions for NK-92s, an immune cell line.**

