37TH ANNUAL RESEARCH DAY

ABSTRACTS

Friday, April 1, 2022

Speakers
Abstract for Dr. Bruce Dye

Description: Not all study designs can provide useful information for clinical decision-making or support social policy changes. However, information generated from a broad range of study designs can, overtime, support an evolving knowledge base that can adequately facilitate improve clinical and policy decision-making. This presentation is a grand tour of the taxonomies of research designs, their application, and relative value in advancing informed decision-making that has potential to affect the public's health.

Abstract for Dr. Matthew Hoffman

Dr. Hoffman's laboratory at the NIDCR, the Matrix and Morphogenesis Section, studies salivary gland development, aiming to identify targets for both gene- and cell-based regenerative therapies. The laboratory focuses on fibroblast growth factor signaling and how interactions among multiple cell types, including nerves, myoepithelium, acinar and duct cells, orchestrate development, which provides a template for tissue regeneration. Dr. Hoffman will present data on his lab’s ongoing studies to understand of mechanisms of salivary gland development and regeneration. In addition, he will discuss the role of research in advancing oral health and provide insights into the mission of the NIDCR in promoting oral health research.

Abstract for Dr. Jennyfer Mitchell

Mutations in the human transcription factor encoding gene ALX3 are associated with abnormal facial development. ALX3 deficiency is linked to the autosomal recessive disorder frontonasal dysplasia (FND). We recently reported that the zebrafish transcription factor encoding gene alx3 is also critical for development of the anterior neurocranium, a structure equivalent to the frontonasal region of the human skull. We discovered that alx3 functions in anterior neurocranium progenitors, or frontonasal neural crest cells, to regulate distinct differentiation timing and cellular morphologies among different frontonasal neural crest cell subpopulations. alx3 belongs to the alx gene family; other alx genes, namely alx1 and alx4a, have different expression patterns in the developing neurocranium. Altogether, these findings motivate the hypothesis that alx genes function to establish different cellular identities among frontonasal skeletal progenitors, a patterning code for the neurocranium.

Abstract for Dr. Devatha Nair

Dental caries is a global, multifactorial disease that affects people throughout their lifetime, causing severe pain, discomfort, and in extreme cases, even death. We have demonstrated that an acrylated hydroxyazobenzene (AHA) coating on the teeth can physically displace oral biofilms upon visible light exposure and inhibit caries causing bacteria Streptococci mutans. Additionally, the dynamic surface of the AHA acts as a
movable scaffold that stimulates dentin bridge formation, demonstrating the regenerative potential of AHA for clinical dental application.