Title: Impact of social determinants of health on genome plasticity

Presenting author name: Kenneth S. Ramos, MD, PhD

Affiliation details of Presenting author: Texas A&M Health Science Center, Institute of Biosciences and Technology, United States

Co-authors' details

Affiliation details of Co-authors (Designation such as University/ department, Institution or Hospital State, Country)

Abstract:

Human genomes exhibit considerable degrees of plasticity, that is, the ability to evolve and adapt in response to social determinants of health, that is, the conditions where people are born into as well as those where they live, learn, work, play, worship, and age. Genome plasticity is associated with the mobilization of transposable elements, sequences in the human genome that roughly constitute half of the human genome. Transposable element mobilization can be triggered by changes in epigenetic regulation that involve discrete histone covalent modifications and changes in DNA methylation states that result in profound changes in genome architecture and function. Of particular interest, are the Class I transposable elements that spread in eukaryotic genomes through RNA intermediates using a "copy-and-paste" mechanism known as retrotransposition. Among the retrotransposons, members of the Long Intersperse Element 1 (LINE-1) family have been characterized as the most active non-long terminal repeat (non-LTR) autonomous elements identified to date[2]**.** This presentation will examine similarities or differences in regulatory control, chromatin dynamics, or 3D architecture associated with LINE-1 mediated retrotransposition events and the biological consequences of such alterations.

Biography

Kenneth S. Ramos, MD, PhD, is Professor of Translational Medical Sciences, Alkek Chair of Medical Genetics, Executive Director of the Institute of Biosciences and Technology at Texas A&M Health Science Center, and Assistant Vice Chancellor for Health Services for the Texas A&M University System. He is an accomplished physician-scientist and transformational leader, with designations in the National Academy of Sciences and National Academy of Medicine. He is recognized throughout the world for his scientific contributions in the areas of genomics, precision medicine and toxicology.

With formal training in pharmaceutical sciences, chemistry, biochemistry, pharmacology, and medicine, Dr. Ramos is helping to steer the changing landscape of medicine and healthcare. He leads several translational, clinical, and educational programs that integrate diverse approaches to elucidate genomic mechanisms of disease. Dr. Ramos has provided academic, executive, administrative, and scientific leadership in genetics and genomic medicine and toxicology at several institutions, and over the course of his career has influenced the career of numerous clinicians and scientists engaged in medical, veterinary, and pharmaceutical practice. He is committed to initiatives that advance modern technological applications to improve quality of healthcare and reduce disease burden and health-associated costs.

Dr. Ramos' research has paved the way for ground breaking research on LINE-1 retroelements and their role in chromatin remodelling, DNA damage and repair, and genetic reprogramming. His group was the first to establish a role for retinoblastoma proteins as master regulators of epigenetic silencing of LINE-1 and later characterized novel targets for regulation of cancer cells. He is currently examining the utility of circulating LINE-1 protein as prognostic and diagnostic biomarkers of cancer, which combined with imaging may improve precision for early cancer detection. This knowledge is being used to develop targeted therapies for cancer.