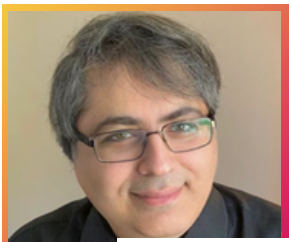
FIU Engineering & Computing
Department of Biomedical Engineering

Wallace H. Coulter Foundation
Biomedical Engineering Seminar Series

Steven Zanganeh Ph.D., Dr. Zanganeh obtained his PhD in Bioengineering from the University of Connecticut. He then was a NIH awarded postdoc at Stanford University where he developed a translational nano-immunotherapy platform for cancer treatment. He continued his research on immunoengineering at Memorial Sloan Kettering Cancer Center. In 2020 he joined UMass Dartmouth as an assistant professor of bioengineering. His current research is focused on revealing the critical role of sex on immune-related disease.



11/04/2022

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Friday, November 4th, 2022 | 9:00 AM | EC 2300

Sex-Specific Cancer Immunoengineering

ABSTRACT: Recently, new immunomodulatory therapies combined with engineering strategies have revealed significant potential for the use of biomaterials to govern aspects of the immune response in the treatment of cancer and other immune-related ailments. Immunoengineering is an emerging field of research in medicine that can unlock new tools for biomedical discovery and innovation, and has the potential to safely and effectively treat myriad diseases, from cancer to infectious diseases to autoimmune diseases, in novel ways. While there has been rapid recent progress in the field of Immunoengineering, there are also numerous challenges in the field. One persistent difficulty is understanding the sex-specific aspects of immune function. Recent findings suggest that investigating sex differences in a variety of diseases, including cancers, has the capacity to improve therapy for both sexes and lead to sex-specific protective mechanisms. For example, it has been shown that sex plays a critical role in dictating tumor incidence, growth, cellular and molecular phenotypes, and the therapeutic efficacy of identical treatments. The discrepancies between sexes are related to several genetic variations, including abnormal reactivation of X-linked genes, differences in duplication/deletion of segments on X or Y chromosomes, differences in mutated genes, various transcription factor-binding patterns, and sex-specific roles of hormones as well as developmental and physiological variations. Despite advances in nanomedicine, fewer Nanoparticles (NPs) than expected have been approved for immunoengineering. Given our current incomplete understanding of the nano-bio interface of most therapeutic NP technologies, together with the neglect of several critical overlooked factors (e.g., the effect of cell sex) in protocols and outcome interpretations, it is not surprising that fewer NPs than expected have been successfully translated from bench to bedside. We believe that comprehensive studies of the role of cell sex on NPs' biological identity and immunotherapeutic efficacies are necessary in order to develop more clinically translatable immunoengineering platforms. In other words, in-depth mechanistic understanding of sex-specific nano-bio interfaces is required to understand how NPs can be designed to improve treatments and survival in a sex-specific manner.

Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

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9:00 AM | https://bme.fiu.edu/seminars