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**Date** Friday, November 15, 2024

**Time** 12:00 to 1:00 PM

**Location** SEC 201

**Title:** Convergence of Medicine and Engineering: Impacting Patient Care & Implantable Microanalytical Systems in Trauma and Allograft Stratification

**Abstract:** In the academy, convergence at the intersection of engineering and medicine has institutionalized The School of Engineering Medicine (ENMED) at Texas A&M University with a uniquely blended curriculum. That curriculum is faithful to the preparation of clinicians and to the preparation of engineers. At Anderson University, an undergraduate engineering curriculum places the liberal arts at the center of preparation of the “Socratic Engineer”. In research, development and modeling of a minimally invasive penta-analyte biochip system, the Physiological Status Monitoring (PSM) BioChip™, allows for monitoring key biomarkers of physiological stress during hemorrhagic trauma and vascular allograft transplantation. Intended to allow for patient stratification/segmentation, individual biomedical and biosensor elements employ nano-enabled Sensing, Measuring, and Actively Responding Technical (SMART) hydrogels that may be electroconductive and bioactive. In each case, molecular engineering of the ABIO-BIO (solid-to-soft) interface improves adhesion, analytical reproducibility, and functional device performance. These examples serve to showcase how convergence in research, particularly at C3B®, leads to the development of innovative solutions with applications in healthcare, biotechnology, and related fields. The collaborative efforts of researchers from diverse disciplines contribute to a more impactful and sustained approach to addressing complex challenges.

**Bio:** Dr. Elie is a consultant at the American International Institute of Medical Sciences, Engineering, and Innovation with 15 years of industrial R&D experience and 18 years in academia, holding positions like professor, department head, associate dean, dean, and vice president at institutions such as VCU, Clemson, Texas A&M, and Anderson University. He has taught in Chemical, Bio, and Electrical and Computer Engineering, co-founded the School of Engineering-Medicine at TAMU, and established a convergent liberal-arts engineering college at AU. He holds a Sc.D. from MIT, an M.Sc. in Chemical Engineering from UMIST, and a B.Sc. with First Class Honors in Applied, Analytical, and Biochemistry from UWI. With 225+ peer-reviewed publications, 8 patents, and fellowships in IEEE, AIMBE, BMES, The RSC, and The RSM, his research focuses on physiological monitoring, polymeric nanobiomaterials for drug delivery, and integrated microanalytical systems. His h-index is 52, with over 10,000 citations (as of 09/2024).