

UCSD NANOENGINEERING/CHEMICAL ENGINEERING
Virtual **SEMINAR SERIES**
Friday, December 10th, 2021
Seminar Presentation: 11:00am - 12:00pm PDT



“Understanding & Rewriting the Molecular Music of Muscle Stem Cells in Aging”

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Abstract: Adult stem cells are powerful engines of endogenous repair that our body uses when presented with injury, but in old age, these engines become dysfunctional. This presentation will frame several vignettes of how skeletal muscle stem cell dysfunction occurs in old age and bioinformatics-based strategies to abate this behavior. In the first example, I will discuss the use of integrative genomic analysis to elucidate molecular mechanisms that contribute to changes to muscle stem cells in old age. In the second example, I will present how subsets of muscle stem cells adopt a neuro-regenerative fate in age and neurodegeneration using lineage tracing and single-cell RNA sequencing. Last, I will introduce how manipulation of muscle stem cell signaling can partially rejuvenate this population. Integrating these studies may ultimately provide foundations to discover and engineer new therapeutics for treatment of sarcopenia and aging.

Biosketch: Carlos Andres Aguilar is an Assistant Professor of Biomedical Engineering, core member of the BioInterfaces Institute and Cellular and Molecular Biology Program at the University of Michigan – Ann Arbor. He earned his B.S.E. in mechanical engineering at the University of Michigan – Ann Arbor and his M.S.E. and Ph.D. in biomedical engineering at the University of Texas – Austin, where he won the George J. Heuer, Jr. Ph.D. Endowed Graduate Fellowship and HENAAC Graduate Student Leadership Award. After completing his PhD, Professor Aguilar was a member of the technical staff in the Bioengineering Systems and Technologies Group at M.I.T. Lincoln Laboratory. Since arriving at Michigan, Professor Aguilar has instantiated an inter-disciplinary research group that centers on understanding and engineering the molecular networks governing skeletal muscle processes with a particular focus on transcriptional and epigenetic regulation of muscle stem cells. Current projects include the analysis and manipulation of muscle stem cells after trauma and in aging and are funded by the NIH, NSF, CDMRP, PRMRP, DARPA and several foundations. Professor Aguilar is the recipient of the NSF CAREER Award, 3M Faculty Nontenured Award, American Federation for Aging Young Faculty Award, and Genentech Research Award. He is an associate scientific advisor for ScienceTranslational Medicine and co-chair for 2022 the Tissue Engineering and Regenerative Medicine International Society Annual Meeting. In his free time, Professor Aguilar enjoys spending time with his family, playing soccer and watching Michigan sports.