

NSF Graduate Research Fellowship Program (GRFP) Award in 2023



Mr. Andre Roots

B.S. in Cellular and Molecular Biology from HU in 2022

Bioengineering PhD student, University of Pennsylvania

NSF-GRFP: Biomaterials are synthetic or natural substances that regulate biological processes, including cell fate transitions. The biophysical cues provided by such materials must be optimized to realize the goals of stem cell transplantation and other personalized medicine applications. I have proposed to develop new dynamically responsive materials using protein engineering techniques and an optimized 3D human skeletal muscle microtissue platform to study the effects of biophysical material properties on cells.

Bio: Andre Roots was born in Petersburg, Virginia. He attended Hampton public schools and ultimately received a Bachelor of Science in Cellular and Molecular Biology from Hampton University in 2022. He continues his academic career as a Bioengineering PhD student at the University of Pennsylvania in the Madl lab. The lab broadly focuses on engineering cellular microenvironments to recapitulate aging and disease. He uses a combination of protein engineering, and stem cell biology to design novel biomaterials platforms that mimic the dynamic changes in the mechanics and microstructure of the human skeletal muscle stem cell environment during aging and disease progression. Beyond his academic pursuits, Andre is also an active member of several organizations, including the Fontaine Society, Penn Science Policy and Diplomacy Group, and the Office of Diversity, Equity, and Inclusion at Penn Engineering. In his free time, he enjoys "a wide range of activities from video gaming to gymnastics."