

Dr. Ali Akbar Ashkarran

Michigan State University

Tuesday, January 9, 3:00 pm. Osborne A204

Nanomedicine: implications of protein corona



The protein/biomolecular corona, which develops as a biological layer on the surface of nanoparticles when exposed to biological fluids, significantly influences how these nanoparticles interact with biological systems. This crucial change is key in determining the nanoparticles' safety, biodistribution, and their effectiveness in diagnosis and treatment. This talk emphasizes the critical need for detailed characterization of the protein corona's composition, as it is essential for accurately predicting the fate of nanoparticles in the realm of nanomedicine. The protein corona's unique ability to concentrate proteins that are present in low abundance is vital for disease diagnosis and the discovery of biomarkers. Additionally, the talk will delve into innovative emerging technologies, including magnetic levitation and charge transport measurements, which show great potential in the realm of biomarker discovery and early disease detection. The presentation will also outline future directions in enhancing biomarker discovery and early disease detection, focusing on strategies that harness the nanoparticles' protein corona, magnetic levitation techniques, and bioelectronics.

Short Bio

Dr. Ali Akbar Ashkarran is a Fixed-Term Assistant Professor in the Precision Health Program and the Department of Radiology at Michigan State University. His academic journey began with completing his undergraduate and master's degrees in solid-state physics, culminating in a Ph.D. in nanoscience and nanotechnology from Sharif University of Technology. Following his doctoral studies, Dr. Ashkarran pursued postdoctoral training in two renowned departments at Harvard University: the Department of Chemistry and Chemical Biology, and the Center for Nanomedicine. Before moving to the United States, he was an Assistant Professor of Physics at the University of Mazandaran. Dr. Ashkarran's research spans several disciplines, focusing on the integration of nanomedicine, protein corona analysis, magnetic levitation, and bioelectronics, with a particular interest in developing innovative disease detection and diagnostic devices.