

Biography

Nasim Annabi is an Assistant Professor in the Department of Chemical and Biomolecular Engineering at the University of California, Los Angeles (UCLA). She received her Ph.D. in Chemical Engineering from the University of Sydney (Australia). From 2011-2014, she was a postdoctoral fellow at Harvard Medical School and the Wyss Institute for Biologically Inspired Engineering. Before joining UCLA in 2018, she was an Assistant Professor in the Department of Chemical Engineering at Northeastern University. Her multidisciplinary research program at UCLA aims to integrate novel chemistries with microscale technologies to develop the next generation of biomaterials for medical applications. In addition, her group has devised innovative strategies for the development of surgical sealants for the repair and sealing of elastic tissues.

Dr. Annabi has published over 150 articles in peer-reviewed journals. As of Sep 2022, she has been cited over 17,785 times, and her H index is already 68. Her innovations have resulted in 20 patents and generated significant commercial interest. She is a co-founder of GelMEDIX, a biotechnology company committed to innovating the next generation of ocular and regenerative therapies.

Dr. Annabi has been recognized with several national and international awards, including the 2022 Woman in NanoScience Award at the Global Conference for Nanotechnology, the 2021 Young Investigator Award from the Society for Biomaterials (SFB), the 2021 Biomaterials Science Lectureship Award from the Royal Society of Chemistry (RSC), the 2020 Nanoscale Science and Engineering Forum (NSEF), Young Investigator Award of American Institute of Chemical Engineers (AIChE), the Australian Prestigious Endeavour Award, and the National Health and Medical Research Council Early Career Award. In addition, her team has received major grants from the National Institute of Health (NIH), the Department of Defense (DoD), and the American Heart Association (AHA).

Microengineered bioadhesive hydrogels for drug delivery and tissue engineering

Nasim Annabi Department of Chemical and Biomolecular Engineering, UCLA

Tissue engineering is an interdisciplinary field incorporating concepts from engineering, biological sciences, and medicine with the goal of engineering biological substitutes to maintain, restore and promote normal tissue function. Polymer-based biomaterials have played an important role in the development of tissue constructs that mimic the structures and physical properties of the native tissues. However, there are still many challenges in micro-engineering biomaterials with tunable physical and biological properties for the development of fully functional tissue constructs. The combination of advanced biomaterials with micro- and nanoscale technologies has been shown to hold great potential to address the current challenges in tissue engineering. Our research focuses on developing biomimetic elastin-based biomaterials and nanocomposite hydrogels with controlled architecture, and physical and biological properties, utilizing recombinant proteins. These advanced biomaterials are integrated with different micro- and nano-fabrication technologies to engineer biomimetic tissue constructs for engineering soft and elastic tissues. Furthermore, we have developed new chemistries to improve the adhesion of these biomaterials to the tissue surfaces and use them as multi-functional bioadhesives for the sealing and repair of soft tissues such as lungs, heart, skin, and cornea. In addition, our group has designed different nano delivery planforms which can be incorporated into these bioadhesives for gene and drug delivery applications. In this presentation, I will outline our recent work on the development of adhesive and elastic hydrogels for tissue engineering, along with their clinical applications as tissue adhesives and surgical sealants.