



Nick A. Melosh

Associate Professor
Materials Science and Engineering
Stanford University

Address:
476 Lomita Mall, Room 223
Stanford, CA USA 94305

(650) 724-3679
email: nmelosh@stanford.edu
<http://www.stanford.edu/group/melosh>

Career

1996	BS	Chemistry	Harvey Mudd College, California
2001	PhD	Materials Science	University of California, Santa Barbara
2001	Post-doctoral Fellow	Chemistry	University of California, Los Angeles
2003- 2012	Assistant Professor	Materials Science	Stanford University, CA
2012-present	Associate Professor	Materials Science	Stanford University, CA

Research Interests

Our group is interested in engineering cell access and dynamic bio-electronic interfaces. I am very interested in how to design new inorganic structures that will seamlessly integrate with biological systems to address problems that are not feasible by other means. This involves both fundamental work such as to deeply understand how lipid membranes interact with inorganic surfaces, electrokinetic phenomena in biologically relevant solutions, and applying this knowledge into new device designs. Examples of this include “nanostraw” drug delivery platforms for direct delivery or extraction of material through the cell wall using a biomimetic gap-junction made using nanoscale semiconductor processing techniques. We also engineer materials and structures for neural interfaces and electronics pertinent to highly parallel data acquisition and recording. For instance, we have created inorganic electrodes that mimic the hydrophobic banding of natural transmembrane proteins, allowing them to ‘fuse’ into the cell wall, providing a tight electrical junction for solid-state patch clamping.