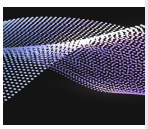
George M. O'Brien Kidney National Resource Center
Northwestern University
University of Southern California

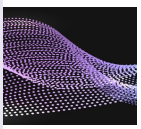
Supported by Award NIDDK/NIH U54 DK137516

Northwestern University – University of Southern California O'Brien Kidney National Resource Center

Susan Quaggin, MD (contact PI), Pinelopi Kapitsinou, MD, and Eun Ji Chung, PhD

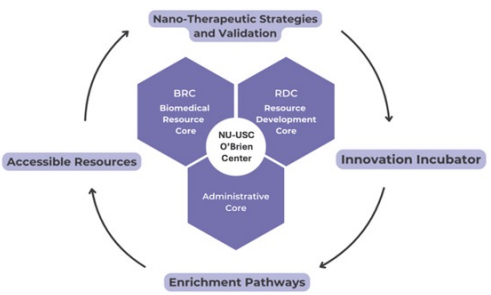


Revolutionizing kidney disease research by integrating physical sciences with advanced technologies, enabling cell-specific therapies and molecular targeting, and providing broad access at regional and national levels.



WHO WE ARE A national resource center within the George M. O'Brien Kidney Resource Alliance (OKRA) that brings together experts in kidney research and the physical sciences to advance kidney health.

WHAT WE DO Provide cutting-edge nanotechnology and physical science resources to advance kidney research, foster interdisciplinary innovation, and develop novel therapeutic strategies to address unmet challenges in kidney disease.



BIOMEDICAL RESOURCE CORE (BRC)

NANOTECHNOLOGY & SPECIALIZED SERVICES

- Molecular Target Identification: Identify specific targets for enhanced therapy delivery.
- Nanocarrier Selection: Choose optimal nanocarriers based on specific research needs.
- Synthesis and Coupling of Targeting Moieties: Customize targeting ligands for precise action.
- Therapeutic Payload Incorporation: Load therapeutics into nanocarriers for effective delivery.
- 34 transgenic mouse lines and models
- Consultation for target validation

SCI-HIGH

SUMMER ENRICHMENT PROGRAM

- Hands-on kidney research internship for rising high school seniors in Chicago, IL
- Students contribute to real-world projects alongside experienced scientists and researchers.
- Designed to help students develop practical research skills, build confidence, and explore their potential in science.

RESOURCE DEVELOPMENT CORE (RDC)

NANOCARRIERS TO DELIVER SHORT RNAS TO THE KIDNEY

- Develop targeted nanoparticles for delivering short RNAs to specific kidney cell types.
- Optimize delivery of siRNA and microRNA into kidney-specific cell types e.g. proximal tubular epithelial cells and cortical collecting duct cells
- Provide consultation services to determine effectiveness in preventing or reversing kidney diseases in vivo

PROTEOFORMS FOR KIDNEY RESEARCH

- Detection >1,500 plasma proteoforms spanning acute inflammatory response, cholesterol efflux, & blood coagulation; captures known kidney disease proteins, including ApoL1
- Develop high-resolution proteoform imaging achieving <20 μm spatial resolution in kidney tissues
- Optimize proteoform detection using advanced tandem-MS for deeper coverage in kidney models
- High-throughput LC-MS profiling of histone modifications in mouse kidney tissue from aging, acute kidney injury (AKI), and chronic kidney disease (CKD) models, covering more than 100 histone marks, including lysine mono-, di-, tri-methylation, acetylation, & H3 arginine/glutamine methylation, enabling discovery of epigenetic mechanisms underlying kidney disease.

REQUEST CONSULTATION: www.uab.edu/okra/resources/okra-resources |nephroHUB.org | nephroHUB@northwestern.edu