UAB-UCSD O'Brien Center for Acute Kidney Injury Research

NIH U54 DK137307 http://www.OBrienAKI.org

The University of Alabama at Birmingham

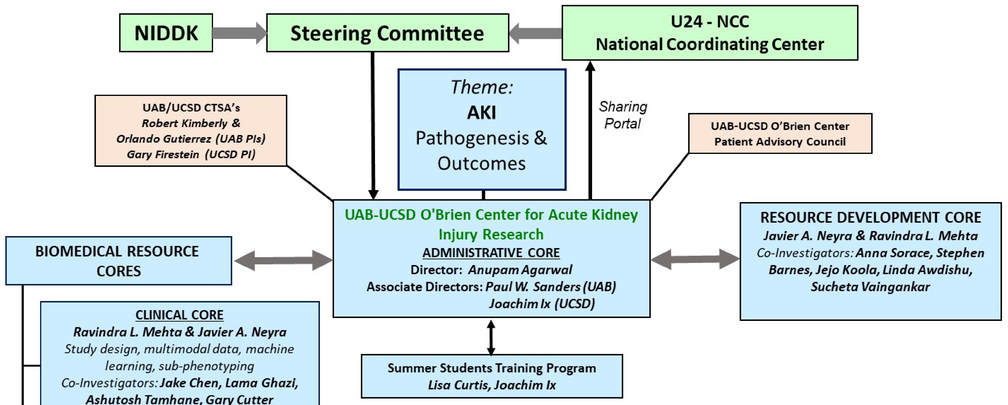
Program Director: Anupam Agarwal, MD, University of Alabama at Birmingham
Associate Directors: Paul W. Sanders, MD, University of Alabama at Birmingham
Joachim H. Ix, MD, University of California, San Diego

UC San Diego School of Medicine

Overview

The University of Alabama at Birmingham (UAB)-University of California at San Diego (UCSD) O'Brien Center for Acute Kidney Injury (AKI) Research is an interdisciplinary center of excellence in AKI-related research, and beginning in 2023, is a member of the **O'Brien Kidney Consortium** as one of the seven U54 National Resource Centers (NRCs).

The **overall theme** of this Center is to focus on **pre-clinical, translational, and clinical research in AKI**. This Center shares **resources, methods, and innovations with the Consortium** under the guidance of the Steering Committee, National Coordinating Center (NCC), and NIDDK **to attract new scientific expertise into the field**.



AIMS:

- ***Integrate our two institution-based O'Brien Center into the O'Brien Kidney Consortium***
- ***Foster meaningful interactions among investigators in the O'Brien Kidney Consortium.***
- ***Share the Center's intellectual resources and infrastructure***
- ***Utilize the Resource Development Core to respond to the evolving needs of investigators***
- ***Develop tomorrow's thought leaders through the Summer Student Training Program (SSTP).***

Contact information

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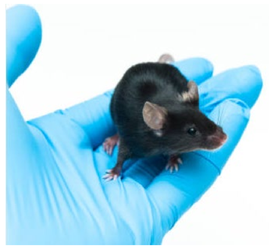


Resource Development Core

Co- Directors: Javier Neyra, MD, UAB (jneyra@uab.edu)
Ravindra L. Mehta, MD, UCSD (rmehta@ucsd.edu)

OBJECTIVE: To provide **a *dynamic* resource and platform to develop, test and refine innovations that will accelerate pre-clinical and clinical research**. In the *pre-clinical* area, new analytical approaches in metabolomics as well as functional *in vivo* imaging will be incubated to probe unique biological characteristics of disease development. In the *clinical* area, tools for federated machine learning using big EHR data will be developed.

AIMS:

- **Develop an incubator for novel technologies to support pre-clinical research in AKI.**
- **Develop an incubator for digital workspace technologies to support EHR data analyses in AKI.**

Pictures from https://www.istockphoto.com

Biomedical Resource Core B: Pre-Clinical Studies of AKI

Co-Directors: Paul W. Sanders, MD, UAB (psanders@uab.edu)
Volker Vallon, MD, UCSD (vvallon@ucsd.edu)

OBJECTIVE: To provide investigators with a resource for **animal models, small animal imaging and renal physiology** studies relevant to AKI.

AIMS:

- **Animal Models Resource** to study murine models of AKI.
  - **training in the use of rodent models of AKI**
    - ischemia/reperfusion injury
    - sepsis
    - renal transplantation
  - **state-of-the-art multi-modality small animal imaging**
    - high frequency ultrasonography and microCT
    - gamma-ray imaging (gamma camera, microSPECT/CT)
    - optical imaging (bioluminescence and fluorescence)
- **Renal Physiology Resource** to determine renal **physiological changes in AKI.**
  - **physiology core**
    - micropuncture techniques
    - measurements of GFR
    - tubular reabsorption
    - renal hemodynamics (tubuloglomerular feedback, kidney oxygen consumption and nitric oxide in rodents)
  - **isolation of primary renal and vascular cells**

Administrative Core

OBJECTIVE: To provide **logistic, administrative, financial, and scientific oversight**

AIMS:

- **Promote opportunities that attract early-stage and new investigators to AKI research.**
- **Promote diversity of scientists pursuing AKI-related research.**
- **Collaborate with the National Coordinating Center and the Consortium to educate the community about AKI research**
- **Optimize training and educational opportunities in kidney research for medical students through a Summer Student Training Program (SSTP).**

Biomedical Resource Core A: Clinical Studies of AKI

Co- Directors: Javier Neyra, MD, UAB (jneyra@uab.edu)
Ravindra L. Mehta, MD, UCSD (rmehta@ucsd.edu)

OBJECTIVE: To support investigators in the O'Brien Kidney Consortium in the **conduct of clinical and translational research in AKI** to catalyze the translation of bench discoveries to applications that impact outcomes in human AKI.

AIMS:

- **Provide access to clinical data of patients at risk for or with AKI and consultation for their use.**
- **Provide access to biospecimens of patients at risk for or with AKI and consultation for their use.**
- **Provide novel bioinformatics tools for the utilization of 'big data' with a focus on personalized medicine in AKI and team science research.**

Enrichment

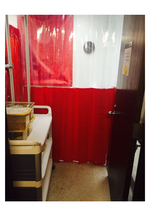
Co- Directors: Lisa M Curtis, PhD, UAB (lmcurtis@uab.edu)
Joachim H. Ix, MD, UCSD (joix@ucsd.edu)

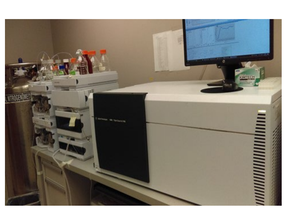
OBJECTIVE: To promote a future interest in kidney research through the Summer Student Training Program (SSTP)

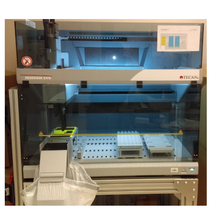
AIMS:

- **Engage medical students at UAB and at UCSD**
  - 10- to 12-week program
  - Bench and clinical research related to kidney disease.
- **Expand research and training support beyond that provided by the U54 Award to offer enrichment activities**

UAB O'Brien Center Medical Student Summer Research Program







We established an isolation facility **("Bubble Room")** within the UMCF, with the help of funding from the HSF-GEF award mechanism. This allows animals to be received from myriad animal facilities, subject to the procedure, kept in isolation for limited time without contacting other animal facilities, thus limiting any exposure between colonies during procedures.

Left: Agilent 6460C triple quad tandem **mass spectrometer system.**

Right: Tecan liquid handling robot for **creatinine analysis** (provided by a competitive award through the UAB Health Services Foundation General Endowment Fund).

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