NIDDK Investments in CKD and AKI

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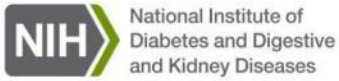
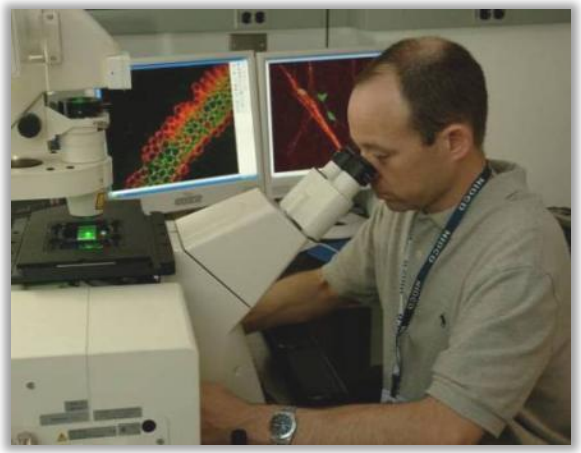


NIH Mission

"Science in pursuit of ***fundamental knowledge*** about the nature and behavior of living systems…"



"…and the ***application of that knowledge*** to extend healthy life and reduce the burdens of illness and disability."

National Institute of Diabetes and Digestive and Kidney Diseases

NIDDK Investments in CKD

CRIC Chronic Renal Insufficiency Cohort Study

CureGN

CKD Biomarkers Consortium

Targeting Fibrosis in Kidney, Bone Marrow, and Urological Diseases

CKiD Chronic Kidney Disease in Children

FIND Family Investigation of Nephropathy and Diabetes (FIND)

DiaComp

UNITED STATES RENAL DATA SYSTEM

PERL PREVENTING EARLY RENAL LOSS IN DIABETES

GUDMAP GenitoUrinary Molecular Anatomy Project

CKD Pilot Trials Consortium

NIDDK Investments in CKD Research

- Longitudinal cohort studies: CRIC, CKiD
- CKD Pilot Trials Consortium
  - COMBINE: Effect of 2 drugs that reduce Phos on CKD
  - BASE: Effect of sodium bicarbonate on CKD
  - TARGUT: Effect pre-biotic on CKD
- Large Clinical Trials
  - PERL: Effect of allopurinol on Type 1 DN
  - PIECES: Effect of EHR intervention to enhance CKD care
- CKD Biocon Consortium, Fibrosis consortium
  - Facilitate biomarker discovery and validation

NIDDK Investments in AKI Research

- Longitudinal cohort study: ASSESS AKI
- Vagus nerve stimulation
- Basic studies
  - GUDMAP
- CKD Biocon Consortium, Fibrosis Consortium
  - Facilitate biomarker discovery and validation
- Large Studies
  - ATN Trial

Meeting objectives:

- Identify pragmatic solutions for using existing health IT systems to improve CKD population management
- Develop a repository to aggregate shared strategies and resources to facilitate CKD PHM efforts

More information and registration:

http://www.niddk.nih.gov/news/events-calendar/Pages/ckd-populations-2015.aspx

Proposed Kidney Manhattan Project

- Absolute/relative paucity of AKI/CKD therapeutics
- Genetics, epidemiology, and animal model approaches validated only two targets (ApoL1 and FGF23)
- 40+ yr history: Kidney biopsy unlikely to change care
- **Need human tissue**
  - AKI
  - CKD
- **Need methods to conquer heterogeneity**
  - Kidney is anatomically complex; many cell types
  - Omic approaches challenging

Furosemide Stress Test and Biomarker Predictions

	Progression to AKI Stage 3					Progression to AKI Stage 3 or Death				
Biomarker	AUC±SEM	*P* Value for Biomarker Alone	*P* Value Compared With FST alone	AUC of Biomarker and FST±SEM	*P* Value for Biomarker and FST Compared With FST Alone	AUC±SEM	*P* Value for Biomarker Alone	*P* Value Compared With FST alone	AUC of Biomarker and FST±SEM	*P* Value for Biomarker and FST Compared With FST Alone
FST (2-hr UOP)	0.87±0.05	<0.001	NA	NA	NA	0.81±0.06	<0.0001	NA	NA	NA
Urine NGAL	0.65±0.06	0.04	0.002	0.84±0.05	0.10	0.69±0.06	0.006	0.07	0.82±0.06	0.89
Urine IL-18	0.65±0.07	0.04	0.009	0.85±0.05	0.89	0.63±0.07	0.07	0.009	0.82±0.06	0.87
Urine KIM-1	0.63±0.06	0.07	0.007	0.86±0.05	0.79	0.64±0.06	0.04	0.04	0.82±0.06	0.81
Uromodulin	0.54±0.07	0.54	0.002	0.85±0.05	0.94	0.54±0.07	0.58	0.004	0.85±0.06	0.31
Urine IGFBP-7	0.62±0.09	0.20	<0.001	0.88±0.05	0.57	0.65±0.08	0.07	0.19	0.79±0.08	0.80
Urine TIMP-2	0.70±0.08	0.03	0.02	0.83±0.06	0.20	0.66±0.08	0.06	0.18	0.80±0.08	0.75
Urine IGFBP-7×TIMP-2	0.69±0.08	0.04	0.01	0.90±0.06	0.35	0.68±0.08	0.03	0.27	0.78±0.08	0.93
Urine Creatinine	0.48±0.08	0.77	<0.001	0.84±0.06	0.85	0.54±0.07	0.56	0.007	0.83±0.06	0.23
Urine ACR	0.56±0.07	0.45	0.002	0.84±0.06	0.32	0.50±0.07	0.96	0.002	0.82±0.06	0.32
FeNa	0.51±0.07	0.92	<0.001	0.83±0.06	0.47	0.49±0.07	0.84	0.009	0.80±0.06	0.31
Plasma NGAL	0.75±0.08	0.007	0.10	0.86±0.07	0.53	0.69±0.08	0.03	0.27	0.80±0.08	0.76

Furosemide Stress Test and Biomarkers for the Prediction of AKI Severity. Koyner/Chwala JASN 2015

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