<table>
<thead>
<tr>
<th>Study Title</th>
<th>Principal Investigator</th>
<th>University Affiliation</th>
<th>Year funded</th>
<th>Keywords</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nutrition Assessment in Chronic Renal Insufficiency Cohort (CRIC) Study Population</td>
<td>Cheryl Anderson, PhD, MPH</td>
<td>The Johns Hopkins University</td>
<td>2002</td>
<td>nutrition, cerebrovascular disease, protein-energy malnutrition, metabolism</td>
</tr>
<tr>
<td>A Structural Approach to Renal Bone Disease in CRIC</td>
<td>Mary Leonard, MD, MSCE</td>
<td>Children’s Hospital of Philadelphia</td>
<td>2003</td>
<td>renal bone disease, renal osteodystrophy, bone mineral density</td>
</tr>
<tr>
<td>Hypertension and Hypercholesterolemia Control in Patients with CKD</td>
<td>Paul Muntner, PhD</td>
<td>University of Alabama at Birmingham</td>
<td>2003</td>
<td>hypertension, hypercholesterolemia, cardiovascular disease, hemodynamics, nutrition</td>
</tr>
<tr>
<td>CRIC Heart Failure Detection Cohort and the CRIC Heart Failure Progression Cohort</td>
<td>Michael Shlipak</td>
<td>University of California, San Francisco</td>
<td>2003</td>
<td></td>
</tr>
<tr>
<td>Development and Validation of GFR Estimating Equations</td>
<td>Andrew Levey, MD</td>
<td>Tufts University</td>
<td>2004</td>
<td>estimated glomerular filtration rate, meta analysis, equation</td>
</tr>
<tr>
<td>Carotid Intima-Media Thickness in Chronic Kidney Disease</td>
<td>Sylvia Rosas, MD, MSCE</td>
<td>University of Pennsylvania</td>
<td>2004</td>
<td>carotid intima-media thickness, carotid plaque, progression, cardiac outcomes</td>
</tr>
<tr>
<td>Hispanic Recruitment in CRIC</td>
<td>Julio Vijil, Jr., MD</td>
<td>University of Illinois, Chicago</td>
<td>2004</td>
<td>recruitment, Hispanic</td>
</tr>
</tbody>
</table>

*Please note that this list is limited to approved CRIC ancillary studies that have received funding. The CRIC Steering Committee reviews and approves new proposals on a rolling basis and maintains a separate list of approved but not yet funded proposals which are also considered when vetting new submissions.*
CRIC Funded Ancillary Studies

**Study Title**

**Principal Investigator**

**University Affiliation**

**Year funded**

**Keywords**

*Cognitive Function in Chronic Renal Insufficiency*
Kristine Yaffe, MD  
University of California, San Francisco  
2005  
cognitive function, gfr, depression

*Pulse Wave Velocity and Chronic Kidney Disease*
Raymond Townsend, MD  
University of Pennsylvania  
2005  
pulse wave velocity, hypertension, cardiovascular disease

*Sleep Disturbances as a Non-traditional Risk Factor in CKD*
Eve Van Cauter, PhD  
University of Chicago  
2005  
sleep, risk factor, c-reactive protein

*Diabetic and Hypertensive Retinopathy and CRI*
Juan E. Grunwald, MD  
University of Pennsylvania  
2005  
retinopathy, hypertension, diabetes, ophthalmology  
*Hispanic Chronic Renal Insufficiency Cohort*
James Lash, MD  
University of Illinois, Chicago  
2005  
hispanic, cardiovascular disease, progression

*Cytokine Gene Polymorphism in the CRIC Cohort*
Dominic Raj, MD  
George Washington University  
2006  
cytokine, polymorphism, inflammation

*Genetics of Atherosclerosis in Renal Disease*
Muredach P. Reilly, MBBCH, MSCE  
University of Pennsylvania  
2006  
genetics, atherosclerosis, metabolic syndrome, inflammation
CRIC Funded Ancillary Studies

**Study Title**  
**Principal Investigator**  
**University Affiliation**  
**Year funded**  
**Keywords**

**Vitamin D Deficiency, Physical Performance and Cardiovascular Disease**  
Mary Leonard, MD, MSCE  
Children’s Hospital of Philadelphia  
2006  
vitamin D, calcidiol, frailty, PTH

**Sodium and Cardiovascular Disease in Patients with CKD**  
Jiang He, MD, PhD  
Tulane University  
2006  
Sodium, electrolyte excretion, potassium, cardiovascular disease, cardiac outcomes

**Study of Advanced Chronic Renal Insufficiency**  
Chi-yuan Hsu, MD, MSc  
University of California, San Francisco  
2006  
progression, transition to ESRD, GFR

**KDQOL and the Spanish-Speaking CKD Population**  
Julio Vijil, Jr., MD  
University of Illinois, Chicago  
2007  
KDQOL, hispanic, HCRIC

**Health Literacy and Acculturation in Hispanic Patients with Chronic Kidney Disease**  
Claudia Lora, MD  
University of Illinois, Chicago  
2007  
HCRIC, health literacy, Hispanic, acculturation, risk factor, cardiovascular disease

**Genomics of myocardial transcription factors in cardiac remodeling**  
Thomas P. Cappola, MD, ScM  
University of Pennsylvania  
2007  
genetics, cardiac remodeling, transcription factors

**Pulse Wave Velocity and Chronic Kidney Disease**  
Stephanie DeLoach, MD  
Thomas Jefferson University  
2007  
pulse wave velocity, cardiovascular disease
CRIC Funded Ancillary Studies

**Study Title**

**Principal Investigator**

**University Affiliation**

**Year funded**

**Keywords**

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**Corin Allele and Heart Disease**
Daniel L. Dries, MD
Yale University
2007

- genetics, cardiovascular disease, natriuretic peptide system, cardiac hypertrophy, corin

---

**CRIC Plus – Race Group Analysis**
Vanessa Grubbs, MD, MPH
University of California, San Francisco
2007

- racial disparities, progression, CRIC-plus, ESRD

**Carotid Intima-Media Thickness in Chronic Kidney Disease (Renewal)**
Sylvia Rosas, MD, MSCE
University of Pennsylvania
2007

- carotid intima-media thickness, carotid plaque, progression, cardiac outcomes

---

**Using 2-D Gel to Identify Patterns of Urine Protein Excretion that Predict Loss of GFR**
Chi-yuan Hsu, MD, MSc
University of California, San Francisco
2008

- two-dimension differential gel electrophoresis, GFR, proteinuria

---

**Molecular Predictors of Progressive Renal Failure in the Chronic Renal Insufficiency Cohort**
Matthias Kretzler, MD
University of Michigan
2008

- progression, molecular predictors, biomarkers

---

**Clinical Outcomes of Pre-ESRD CKD Patients with Hepatitis C Infection**
Akinlolu O. Ojo, MD, PhD, MPH
University of Michigan
2008

- HCV, pre-ESRD

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**Genetic of Lipoprotein Metabolism and CVD in CKD**
Daniel J. Rader, MD
University of Pennsylvania
2008

- lipoproteins, metabolism, genetics

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CRIC Funded Ancillary Studies

Study Title
Principal Investigator
University Affiliation
Year funded
Keywords

Role of FGF-23 in Mineral Metabolism and CVD in Pre-dialysis CKD
Myles S. Wolf, MD, MMSc
University of Miami
2008
FGF-23, phosphate therapy, hyperphosphatemia, left ventricular mass

The Renin-Angiotensin-Aldosterone System and Cardiac Arrhythmias
Rajat Deo, MD
University of Pennsylvania
2009
atrial fibrillation, renin, aldosterone, angiotensin, cardiovascular disease

CKD, Metabolic Syndrome and Cardiovascular Disease
Harold I. Feldman, MD, MSCE
University of Pennsylvania
2009
metabolic syndrome, insulin resistance, cardiovascular disease, progression

GWAS in CKD: The CRIC Study
Harold I. Feldman, MD, MSCE
University of Pennsylvania
2009
GWAS, genetics, GFR, progression

Chronic Kidney Disease Biomarker Validation
Chi-yuan Hsu, MD, MSc and Kathleen D. Liu, MD, PhD, MAS
University of California, San Francisco
2009
biomarkers, kidney injury

The Role of Neuregulin in Human Cardiac Remodeling and Heart Failure
Bonnie Ky, MD, MSCE
University of Pennsylvania
2009
NRG-1, cardiac remodeling

Hypertension in Advanced Chronic Kidney Disease
Nisha Bansal, MD, MAS
University of California, San Francisco
2010
hypertension, progression, ESRD, blood pressure, cardiovascular disease

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Study Title
Principal Investigator
University Affiliation
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Keywords

The Effect of Sickle Cell Trait upon Progression of Chronic Kidney Disease
Vimal Derebail, MD, MPH
University of North Carolina
2010
risk factors, sickle cell trait, hemoglobinopathy

Elevated Nighttime BP – Clinical and Demographic Features, Correlates, and Changes Over Time
Paul E. Drawz, MD, MHS
Case Western Reserve University
2010
hypertension, blood pressure, nighttime ABP

Joint Analysis of Longitudinal Outcomes and Clinical Events in Chronic Kidney Disease Cohorts
Tom Greene, PhD
University of Utah
2010
longitudinal analysis, statistical methods, multi-state models, causal models

Health Literacy, Acculturation and Social Support in Hispanics with Chronic Kidney Disease
Claudia Lora, MD
University of Illinois, Chicago
2010
HCRIC, health literacy, Hispanic, acculturation, risk factors, cardiovascular disease

Validation of the Beck Depression Inventory in Hispanics with Chronic Kidney Disease
Ana C. Ricardo, MD, MPH, MS
University of Illinois, Chicago
2010
Beck depression inventory, Hispanic, depression,

Carbamylated LDL and Cardiovascular Events
Sudhir V. Shah, MD
University of Arkansas
2010
carbamylated LDL, cardiovascular disease, risk factors, atherosclerosis

Pulse Wave Velocity (Renewal)
Raymond Townsend, MD
University of Pennsylvania
2010
pulse wave velocity, hemodynamics, blood pressure
CRIC Funded Ancillary Studies

**Study Title**
**Principal Investigator**
**University Affiliation**
**Year funded**
**Keywords**

*Modifiable and Novel Risk Factors for and Consequences of Acute Kidney Injury in the Setting of Chronic Kidney Disease: a CRIC Ancillary Study*
Amanda Hyre Anderson, PhD, MPH
University of Pennsylvania
2011
acute kidney injury, progression, mortality

*Do patient safety events account for adverse outcomes in CKD?*
Jeffrey Fink, MD
University of Maryland
2011
safety incidents, outcomes, metabolic disturbance

*Abrupt Transition to ESRD from CKD*
Chi-yuan Hsu, MD, MSc
University of California, San Francisco
2011
ESRD, transition

*CKD Blood Biomarker Discovery (sub-protocol of the CKD Biomarkers Consortium)*
Lesley Inker, MD, MS
Tufts University
2011
biomarkers, progression, proteomics

*Hispanic Chronic Renal Insufficiency Cohort (Renewal)*
James Lash, MD
University of Illinois, Chicago
2011
Hispanic, cardiovascular disease, progression

*Novel Paradigm to Understand Diabetic Complications*
Kumar Sharma, MD
University of California, San Diego
2011
mitochondria, urine metabolomics, nephropathy, retinopathy

*Cognitive Decline in Chronic Renal Insufficiency (Renewal)*
Manjula Tamura, MD, MPH and Kristine Yaffe, MD
Stanford University
2011
cognitive function, gfr, decline, oxidative stress markers

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**Keywords**

*Health Disparities in Chronic Kidney Disease*
James Lash, MD
University of Illinois, Chicago
2012
socioeconomic status, health literacy, health disparities

*Acidosis, Net Acid Excretion and Morbidity in CKD*
Julia Scialla, MD, MHS
Duke University
2012
metabolic acidosis, nutrition, bone and mineral metabolism, urinary electrolytes, progression, cardiovascular disease, mortality

*Genetics of Race and Disordered Mineral Metabolism in CKD*
Myles S. Wolf, MD, MMSc
Northwestern University
2012
phosphate, FGF23, klotho, CKD, CVD, genetics, ancestry, racial disparities

*Mexico Chronic Renal Insufficiency Cohort (MCRIC)*
James Lash, M.D.
University of Illinois, Chicago
2012
Chronic kidney disease progression, Hispanics, Mexico

*Metabolomic Studies in Chronic Kidney Disease*
Harold I. Feldman, MD, MSCE
University of Pennsylvania
2012
metabolomics

*Gender Disparities and Endogenous Estrogen in Chronic Kidney Disease Outcomes*
Ana Ricardo, MD, MPH, MS
University of Illinois, Chicago
2013
Sex hormones, gender disparities
CRIC Funded Ancillary Studies

**Study Title**
**Principal Investigator**
**University Affiliation**
**Year funded**
**Keywords**

*Meditators & Prognostic Value of Muscle Mass & Function in Chronic Kidney Disease*
Perry Wilson, M.D.
Yale University
2013
Sarcopenia, creatinine generation rate, chronic kidney disease, myostatin, caspase-3, activin A, inflammation, tnf-alpha, tgf-beta, frailty

*FGF-23 and Clinical Outcomes in ADPKD Patients*
Myles S. Wolf, MD, MMSc
Northwestern University
2013
FGF23, CKD, ADPKD, phosphate

*Validation of the Kidney Knowledge Survey (KiKS) in Hispanics with Chronic Kidney Disease.*
Claudia Lora
University of Illinois at Chicago
2013
Hispanics, Chronic Kidney Disease Knowledge, Spanish language

*Estimating GFR from a Panel of Endogenous Filtration Markers (Panel eGFR)*
Lesley Inker
Tufts Medical Center
2013
GFR, beta trace protein, beta 2 microglobulin, cystatin C, creatinine

*Serum Bicarbonate and Cardiovascular Risk in Patients with Chronic Kidney Disease*
Mirela Dobre, M.D.
Case Western Reserve University
2013
metabolic acidosis, metabolic alkalosis, cardiovascular disease, mortality

*Role of Sclerostin in Disordered Mineral Metabolism in CKD*
Tamara Isakova, MD, MMSc
Northwestern University
2013
CKD, sclerostin, FGF23, PTH, phosphate

*Pathophysiological Role of Prorenin*
Alfred Cheung, M.D.
University of Utah
2013
Prorenin, chronic kidney disease, retinopathy, cardiovascular disease, diabetes

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**Year funded**

**Keywords**

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*Enhancing appreciation of the clinical significance of acute kidney injury*
Raymond Hsu
University of California, San Francisco
2013
Acute kidney injury (AKI), chronic kidney disease (CKD)

*Vitamin D catabolism in chronic kidney disease*
Ian de Boer
University of Washington
2013
Vitamin D, mineral metabolism, CKD

*Plasma KIM-1 and Chronic Kidney Disease*
Sushrut Waikar
Brigham and Women’s Hospital
2014
Tubular injury; biomarkers of progression

*Novel metabolites associated with renal outcomes*
Tammy Sirich
Stanford University
2014
mass spectrometry, metabolomic, CKD

*Is there a digital divide in chronic kidney disease?*
Clarissa Diamantidis
Duke University
2014
CKD, health information technology, e-literacy, patient safety

*Performance of Vitamin D-Binding Protein (DBP) ELISA by Genotype: Validation using Mass Spectrometry*
Mary Leonard, Michelle Denburg
Stanford University/Children’s Hospital of Philadelphia
2014
Vitamin D, vitamin D-binding protein, genotype

*Visceral adiposity and fitness among CRIC participants (phase 3)*
Sankar Navaneethan
Cleveland Clinic
2014
Obesity, fitness, and kidney disease

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<tbody>
<tr>
<td><strong>Trimethylamine N-oxide and Disease Progression in the CRIC Study</strong></td>
<td>Wilson Tang, M.D.</td>
<td>Cleveland Clinic</td>
<td>2014</td>
<td>Intestinal microflora, trimethylamine N-oxide</td>
</tr>
<tr>
<td><strong>Measures of fibrosis and clinical outcomes in chronic kidney disease</strong></td>
<td>Amanda Hyre Anderson, PhD, MPH</td>
<td>University of Pennsylvania</td>
<td>2015</td>
<td>fibrosis, CKD progression, cardiovascular disease, galectin-3, CTGF or CCN2, collagen type III, MMP-2</td>
</tr>
<tr>
<td><strong>Heart failure and arrhythmias in CKD</strong></td>
<td>Nisha Bansal, MD, MAS</td>
<td>University of California, San Francisco</td>
<td>2015</td>
<td>heart failure, prediction, cardiac arrhythmias, biomarkers</td>
</tr>
<tr>
<td><strong>Whole-exome sequencing study of diabetic nephropathy</strong></td>
<td>Tanika Kelly</td>
<td>Tulane University</td>
<td>2015</td>
<td>diabetic nephropathy; next-generation sequencing; whole-exome sequencing; rare variants; low frequency variants</td>
</tr>
<tr>
<td><strong>Longitudinal Changes in Metabolomic Biomarkers and CKD Progression</strong></td>
<td>Eugene Rhee</td>
<td>Massachusetts General Hospital/Broad Institute</td>
<td>2015</td>
<td>metabolomics, CKD, CKD progression</td>
</tr>
<tr>
<td><strong>Oxalate in CKD Pathogenesis and Progression</strong></td>
<td>Sushrut Waikar</td>
<td>Brigham and Women’s Hospital</td>
<td>2015</td>
<td>oxalate; chronic kidney disease; cardiovascular disease; decline in GFR</td>
</tr>
<tr>
<td><strong>Epigenetic dysregulation in diabetic kidney disease</strong></td>
<td>Katalin Susztak</td>
<td>University of Pennsylvania</td>
<td>2015</td>
<td>cytosine methylation, epigenetics</td>
</tr>
</tbody>
</table>

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CRIC Funded Ancillary Studies

**Study Title**  
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**University Affiliation**  
**Year funded**  
**Keywords**

*Prognostic biomarkers in chronic kidney disease*  
Farsad Afshinnia  
University of Michigan  
2015  
chronic kidney disease, progression, end stage renal disease, biomarker, metabolomics, Mass spectrometry

**Pilot Study on Proteomics of Kidney Disease Progression in the CRIC Study**  
Rajat Deo  
University of Pennsylvania  
2015  
proteomics, progressive kidney disease, SOMAscan

**Identifying Modifiable Biomarkers/Mediators for Cardiovascular Disease in Chronic Kidney Disease**  
Peter Ganz  
University of California, San Francisco  
2016  
cardiovascular risk prediction model; chronic kidney disease; proteomics

**Tubular Secretion and Chronic Kidney Disease Complications**  
Bryan Kestenbaum  
University of Washington  
2016  
R01  
tubular secretion, biomarkers, kidney, hippurate

**Assessing the accuracy of information in the CMS Medical Evidence Report (form CMS-2728)**  
Chi-yuan Hsu  
University of California, San Francisco  
2016  
K24  
incident ESRD, co-morbidity, information bias

**Novel Diagnostics and Therapeutic Targets for Calcification in CKD**  
Tamara Isakova  
Northwestern University  
2016  
R01  
vascular calcification; calcification propensity; calciprotein particles
Assessment of nicotine exposure from toenail clippings of CRIC participants
Edgar Jaimes
MSKCC
2016
Pilot
nicotine, smoking, chronic kidney disease (CKD)

Metabolomics for Identifying Biomarkers of Dietary Intake & Kidney Disease Progression
Casey Rebholz
Johns Hopkins University
2016
K01
diet; metabolomics; kidney disease progression

The Gut Microbiome and the metabolome in CKD
Amanda Anderson
University of Pennsylvania
2016
R01
gut microbiota, metabolomics, metabolic profiling, CKD