Urine Biomarkers for Endoplasmic Reticulum Stress-Associated Kidney Diseases

**Background:** Over 20 million adults in the U.S. suffer from chronic kidney disease (CKD) and the prevalence has been increasing. Endoplasmic Reticulum (ER) stress plays an important role in the pathogenesis of various kidney diseases, including focal segmental glomerulosclerosis (FSGS) and diabetic nephropathy, leading causes of CKD, membranous nephropathy, minimal change disease, acute kidney injury, autosomal dominant tubulointerstitial kidney disease, congenital nephrotic syndrome (CNS), and polycystic kidney disease. Early diagnosis, when kidney biopsy is not yet clinically indicated, will greatly benefit from a simple-to-use non-invasive test. Researchers from Washington University have identified three independent urine biomarkers for sensitive and non-invasive detection of ER stress-related kidney disease.

**Technology Description:** Using animal models and human clinical samples of kidney diseases caused by ER stress, physician-scientist Dr. Chen has shown that each of the three biomarkers is detected in urine well before the development of full-blown disease or decline of kidney function. This demonstrates their use as early detectors of ER stress-related kidney diseases. Thus, each of these biomarkers, independently, has important clinical utility and can be incorporated into simple diagnostic tests for early identification of patients with high risk for development of renal dysfunction, for early therapeutic intervention, and for monitoring disease progression or treatment response.

**Key Advantages:**
- Early diagnosis of ER stress-related kidney disease for effective therapeutic intervention
- Easy, sensitive and non-invasive testing only requires a urine sample
- Clinical use for risk stratification, prediction of patients and for monitoring treatment response
- Mouse and human data

**Publications:**

**Press:** Division of Nephrology news (WashU), American Society of Nephrology (ASN)

**Patent:** Patents-pending

**Lead Inventor:** Ying (Maggie) Chen, M.D., Ph.D.; Assistant Professor of Medicine, Director of Nephrotic Syndrome Clinic, Division of Nephrology, Washington University School of Medicine in St. Louis.

**Licensing Contact**
Renatus W. Sinkeldam, PhD, rsinkeld@wustl.edu
Tel: 314-747-0667

**Application Space**
Biomarker, Urine, Kidney Diseases, Endoplasmic Reticulum Stress

**WUSTL Case #s**
014414, 016375, 016376