

Diagnostic for Acute Renal Failure

TECHNICAL FIELD

Diagnostic—Acute Renal Failure (2005-0103)

BACKGROUND

Acute renal failure (ARF) occurs when the kidneys are unable to function normally because of insufficient blood supply, structural damage, or obstructed urine flow. ARF is usually associated with other medical conditions, such as diabetes, high blood pressure, infection, and immune disorders. Acute renal dysfunction also occurs in ~40% of adults following cardiac surgery and in ~10% of infants and children with congenital heart disease, a population particularly vulnerable due to the number of surgeries required to repair congenital anomalies.

Currently, there exist no early markers for ARF, resulting in a delay in treatment. Current methods measuring serum creatinine are unreliable indicators of acute changes in renal function. This invention provides a set of biomarkers for the early prediction of ARF, fulfilling this unmet medical need.



APPLICATIONS

Diagnosis of acute renal failure

ADVANTAGES

- **Early diagnosis**
- **Sensitive and specific markers**
- **Rapid and non-invasive testing**

INVESTIGATOR

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STATUS

Patent applications pending.

CONTACT

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TECHNOLOGY

Dr. Devarajan and his colleagues have identified novel early biomarkers for acute renal failure using urinary proteomics. Samples from pediatric patients undergoing cardiopulmonary bypass (CPB) for correction of congenital heart disease were analyzed at three time points. Using currently accepted diagnostics, only 5 of 15 patients exhibited early elevated creatinine levels indicative of acute renal injury. Analysis of the urine samples using SELDI-TOF-MS revealed an early increase in 4 proteins that occurred in all 15 patients. The sensitivity and specificity of these proteins for predicting ARF at early time points was 100%.

In addition to identifying highly sensitive and specific biomarkers, the method used for testing is sensitive, reproducible, rapid, and non-invasive.

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THE INVENTOR

Prasad Devarajan, MD

Louise M. Williams Professor of Pediatrics and Developmental Biology
Director of Nephrology & Hypertension

BACKGROUND

Premedical Studies: Bombay University, India, 1979

MD: Bombay University, India, 1985



Dr. Devarajan began working at Cincinnati Children's Hospital Medical Center in 2002 as Williams Professor of Pediatrics and Developmental Biology and Director of Nephrology and Hypertension. He has previously held positions at SUNY Stony Brook, Yale University School of Medicine, and Albert Einstein College of Medicine. He was also awarded "2005 Best Doctors" by Best Doctors in America, Inc.

He is currently a reviewer for a number of journals and a member of several scientific organizations.

Dr. Devarajan's major research interest is the cellular and molecular biology involved with acute renal failure (ARF). His laboratory includes full-time technicians, post doctoral fellows, and Ph.D. research associates and is funded by several grants from NIH and other funding agencies.