Urine mRNA Profiles for Differential Diagnosis of Kidney Allograft Dysfunction

Ruchuang Ding, Manikkam Suthanthiran, Thangamani Muthukumar
Weill Cornell Medical College, New York, NY

Background

- Acute cellular rejection (ACR), acute antibody mediated rejection (AMR), and acute tubular injury (ATI) are the common causes of acute allograft dysfunction
- Because different causes of dysfunction requires different treatments, it is imperative to differentiate the causes
- Invasive kidney biopsies pose challenges, including bleeding and other complications, sampling errors, inter-observer variability in interpretation, logistics and costs

Invention

- Urinary cell mRNA based signature(s) for the noninvasive differential diagnosis of acute kidney graft dysfunction

Figure 1. Flowchart showing the two-step approach for the discovery and validation of urinary cell diagnostic signatures for the differential diagnosis of acute kidney graft dysfunction

Figure 2. Six gene signature distinguishes acute rejection from acute tubular injury

Figure 3. This 6-Gene signature is clinically beneficial compared with the current strategy

Figure 4. Five Gene Signature Distinguishes ACR from AMR

Figure 5. Both the Signatures are NOT Influenced by Time to Biopsy or the Type of Immunosuppression

Summary/Conclusion

- We have discovered and validated urinary cell mRNA based signatures for the differential diagnosis of acute dysfunction of kidney allografts.
- If validated in an independent data set, the signatures can be incorporated in clinical decisions for managing kidney transplant recipients with acute allograft dysfunction, potentially avoiding substantial number of biopsies.

Potential Advantages

- Noninvasive and cost-effective (PCR vs. biopsy)
- Highly accurate; heterogeneity in patient and transplant traits or characteristics does not undermine the ability to differentiate

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Carol Dempster, Senior Technology Commercialization and Liaison Officer, (212)746-1297, cjd44@cornell.edu