INTRODUCTION
With increasing disparity between the donor pool and the number of patients waiting for transplant, transplant centers have been expanding the criteria for acceptability of kidneys. Donors presenting with acute kidney injury (AKI) is one such group. The selection criteria for donors with AKI from previous studies are highly variable and included normal baseline creatinine, adequate urine output, donors younger than 50 years, absence of history of hypertension or diabetes, and/or acceptable pump parameters. The severity of AKI is not always well defined. The majority of kidneys were from donors with less severe AKI. In addition, data on kidney function, follow-up pathology findings and long-term graft survival are limited. We started using kidneys from selected deceased donors with AKI for transplantation in 2004. Over the years the selection criteria were broadened and the proportion of kidney transplants from deceased donors with AKI has progressively increased. In this study, we wanted to determine if we could use kidneys from donors with severe AKI without compromising post-transplant outcomes. We reasoned that gene expression profiles of patient biopsies, 1 and 4 months post-transplant, would reveal the resolution of donor AKI-induced injury as well as signals of early graft dysfunction if present.

METHODS
One and four month formalin-fixed paraffin embedded (FFPE) biopsies from 48 kidney transplant recipients (24 AKI donors, 24 controls) were profiled on Affymetrix U133PM Plus arrays. AKI criteria can be found in Abstract #14-WTC-1369-WTC. All samples were processed using the new SensationPlus FFPE Amplification kit. All samples passed the quality control filter for Affymetrix arrays and none were excluded from the analysis. Data analysis was done using Partek Genomics Suite and pathway mapping by Ingenius Pathway Analysis (IPA).

RESULTS
The creatinine levels between these AKI and the non-AKI groups were the same as early as one month after transplantation. However, gene profiling, of recipients of AKI vs. non-AKI donor organs at one month revealed 898 differentially expressed genes (p-value <0.005; FDR <10%). These results reveal how much more information is revealed about the state of a transplant by molecular profiling of a biopsy compared to creatinine levels.

In contrast, profiling of the 4-month biopsies revealed no significantly differentially expressed genes.

Molecular mapping to functional categories revealed that these genes mapped to cellular maintenance, remodeling and development. Many molecules that were associated with the immune inflammatory processes were upregulated in the AKI donors.

CONCLUSION
In conclusion, 1-month biopsies of recipients of AKI kidneys show many differentially expressed genes associated with cell death/stress, inflammation and disrupted metabolic processes typical of kidney injury. By four months these injury/inflammation signals have resolved. These results support the routine use of properly selected AKI donors.