**Abstract Title:** EARLY RESULTS FROM THE CLINICAL TRIALS IN ORGAN TRANSPLANTATION (CTOT-01) TRIAL IDENTIFY NONINVASIVE MARKERS AS CORRELATES OF 6-MONTH RENAL ALLOGRAFT PATHOLOGY

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**Body:** CTOT01 is an NIH funded prospective observational study testing the utility of noninvasive blood and urinary monitoring to predict kidney transplant injury. Adult and pediatric crossmatch negative recipients of first kidney transplants from 8 centers are being enrolled, with locally determined immunosuppression. The primary endpoint is cumulative incidence of acute rejection (AR) or incremental fibrosis based on evaluation of implantation and 6 mo protocol biopsies (increase in Banff ci/ct scores >2 vs implantation). Blood and urine samples are obtained pretransplant (preTx) and serially posttransplant (postTx) for a panel of assays including HLA antibodies, IFNgamma ELISPOT, and urine inflammatory molecule/chemokine gene and protein expression. Enrollment has reached 235 (of a projected 300) and the 6 mo biopsy has been obtained on >90% of eligible patients. Thus far, results have been analyzed on 100 patients. Mean age is 46 yrs, 60% are male, 67% obtained grafts from living donors, and 82% received induction antibodies (anti-IL2R or rATG). 17/100 patients (17%) had biopsy proven AR (Banff grade 1A or higher, including 4 detected on the 6 mo biopsy). In total, 32/100 (32%) reached the composite study endpoint. >90% of monitoring samples have been collected. No patient developed de novo donor-directed alloantibodies. Univariate analyses reveal that preTx donor-reactive ELISPOT correlate with both AR ($p=0.04$) and the composite endpoint ($p=0.02$). Higher postTx mean values (obtained during mo 1-6) of several Luminex-assessed urinary proteins correlated with AR (IP-10, $p=0.04$; MIG, $p<0.02$) or with the composite endpoint (IP-10, $p=0.005$; MCP1, $p=0.01$, MIG, $p<0.04$). There were trends for correlations between posTx mean mRNA for granzyme B ($p=0.095$) and IP-10 ($p=0.099$) and the composite endpoint. Using logistic regression, a predictive model for the composite endpoint was developed using preTx ELISPOT, postTx mean IP-10 protein and mean mRNA for granzyme B and IP-10. Using ROC analysis, the model has an AUC of 0.86, sensitivity of 92% and specificity of 72%. These results suggest that noninvasive blood and urine monitoring, employing multiple assays, can be used to assess risk of renal allograft injury. Once validated, analogous noninvasive monitoring should be useful for guiding individualized treatment based on likelihood of subsequent allograft injury.