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**68**  
Role for urinary biomarkers in diagnosis of acute rejection in the transplanted kidney

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#### Abstract

Despite the introduction of potent immunosuppressive medications within recent decades, acute rejection still accounts for up to 12% of all graft losses, and is generally associated with an increased risk of late graft failure. Current detection of acute rejection relies on frequent monitoring of the serum creatinine followed by a diagnostic renal biopsy. This strategy is flawed since an alteration in the serum creatinine is a late clinical event and significant irreversible histologic damage has often already occurred. Furthermore, biopsies are invasive procedures that carry their own inherent risk. The discovery of non-invasive urinary biomarkers to help diagnose acute rejection has been the subject of a significant amount of investigation. We review the literature on urinary biomarkers here, focusing on specific markers perforin and granzyme $\beta$  mRNAs, FOXP3 mRNA, CXCL9/CXCL10 and miRNAs. These and other biomarkers are not yet widely used in clinical settings, but our review of the literature suggests that biomarkers may correlate with biopsy findings and provide an important early indicator of rejection, allowing more rapid treatment and better graft survival.

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Key words: Urinary biomarkers; Acute renal allograft rejection; Serum creatinine; Graft

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