

SIGNIFICANCE STATEMENT

The renal biopsy provides critical diagnostic and prognostic information for clinicians when patients develop kidney disease. Today, biopsies are read using a combination of light microscopy, electron microscopy, and indirect immunofluorescence with a limited number of antibodies. These techniques were all perfected decades ago. More recently, new techniques in single-cell genomics have been transforming scientists' ability to characterize cells. Rather than measure expression of several genes at a time by immunofluorescence, it is now possible to simultaneously measure expression of thousands of genes in thousands of single cells by single-cell RNA-sequencing (scRNA-seq). We show that comprehensive scRNA-seq of a single human kidney transplant biopsy is feasible and that it allows the molecular characterization of this heterogeneous tissue.