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Comparison of immune cell profiling between human and mouse kidneys

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Objectives: Understanding of immunological mechanisms in kidney diseases has been much achieved using mouse kidneys. However, the profiling immune cell subset within human kidneys remains undetermined particularly in comparison to the mouse kidney results.

Methods: Normal human kidneys were obtained from radically nephrectomized patients with urological malignancy. Subsequently, human kidney immune cells were analyzed using multicolor flow cytometry and compared with subsets from 8-week male C57BL/6 mice.

Results: In normal human kidney, more than 40% of immune cells were CD3⁺ T cells. Kidney CD4⁺ and CD8⁺ T cells comprised 60% and 40% of total T cells. Among them, ≥ 70% of T cells displayed effector memory phenotype, of which 40% was kidney-resident. All of these T cell proportions were higher than in mouse kidneys. Other T cell subsets such as $\gamma\delta$ T, natural killer (NK) T, and Foxp3⁺ T cells were less than 5% among human kidney T cells. CD11b⁺ myeloid cells were most predominant cell type in mouse kidney, whereas both the proportion of human CD14⁺ or CD16⁺ myeloid cells was less than 20% of total immune cells. The proportions of other immune cell subsets such as B cells and NK cells also differed between human and mouse kidneys.

Conclusions: The present profiling results will be helpful in the future studies on translating the mouse results to the real human condition.