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The podocyte: glomerular sentinel at the crossroads of innate and adaptive immunity

Focal segmental glomerulosclerosis (FSGS) is a common glomerular disorder that manifests clinically with the nephrotic syndrome and has a propensity to recur following kidney transplantation. The pathophysiology and therapies available to treat FSGS currently remain elusive. Since the podocyte appears to be the target of apparent circulating factor(s) that lead to recurrence of proteinuria following kidney transplantation, this article is focused on the podocyte. In the context of kidney transplantation, the performance of preand post-reperfusion biopsies, and the establishment of in vitro podocyte liquid biopsies/assays allow for the development of clinically relevant studies of podocyte biology. This has given insight into new pathways, involving novel targets in innate and adaptive immunity, such as SMPDL3b, cGAS-STING, and B7-1. Elegant experimental studies suggest that the successful clinical use of rituximab and abatacept, two immunomodulating agents, in our case series, may be due to direct effects on the podocyte, in addition to, or perhaps distinct from their immunosuppressive functions. Thus, tissue biomarker-directed therapy may provide a rational approach to validate the mechanism of disease and allow for the development of new therapeutics for FSGS. This report highlights recent progress in the field and emphasizes the importance of kidney transplantation and recurrent FSGS (rFSGS) as a platform for the study of primary FSGS.

KEYWORDS: podocyte, kidney, adaptive immunity, innate immunity, immune pathway

Biography

Dr. George W. Burke III is a nationally recognised transplant surgeon and Professor of Surgery at the University of Miami Miller School of Medicine, USA. He serves as a senior leader at the Miami Transplant Institute, one of the world's leading centres for organ transplantation, where he has played a pivotal role in advancing kidney and pancreas transplantation and improving outcomes for patients with end-stage organ disease.