KSN 2017 Abstract

Podocytes and the local complement regulation

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The complement system is an important part of the immune defense. It contributes not only to local inflammation, removal and killing of pathogens, but it also assists in shaping of the adaptive immune response. The complement cascade is traditionally known to be a system of serum proteins that provide strong protection against invading pathogens through direct cell lysis and the mobilization of innate and adaptive immunity. However, recent new work indicates that the complement system has additional novel physiological roles beyond those in systemic host defense. We propose that the location of complement activation dictates its function.
Renal diseases with complement activation are often associated with proteinuria. For example, complement mediated damage to podocytes in membranous nephropathy leads to severe proteinuria. Little is known about the damage and protection of glomerular cells, and particular podocytes against systemic and local glomerular complement activation. Complement factor H (CFH) is known to protect local cells from complement activation and it was shown that podocytes in vivo and in vitro express CFH. In this talk, I will describe the new modes and locations of local complement activation and particular highlight the role of podocyte secreted factor H in local glomerular complement activation.