

Vasoactive intestinal peptide-treated bone marrow dendritic cells ameliorate adriamycin-induced nephropathy

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Dendritic cells (DCs) are professional antigen presenting cells, which play an important role in triggering adaptive immune response, and bone marrow DCs have been shown to accumulate in tubulo and periglomerular interstitium in lupus nephritis and glomerulonephritis, and rat crescentic glomerulonephritis. Murine bone marrow DCs can be modified by Vasoactive Intestinal Peptide (VIP), a neuropeptide found in ovarian nerves, to VIP-modified dendritic cells (VIP-Dregs) with tolerogenic properties. VIP-Dregs have been widely reported as treatment for experimental autoimmune diseases, including EAE and host-versus-graft rejection. Now we investigated an effect of VIP-Dregs in protection against renal injury in the Adriamycin-induced murine model of chronic kidney diseases. Bone marrow DCs derived from BALB/c mice were modulated *in vitro* with Apoptotic cells (1 million/ml) into VIP-Dregs. Mice underwent *ex vivo* adoptive transfer with 1 million VIP-Dregs/per mice. After 4 weeks, these VIP-Dregs localized to the kidney cortex and lymph nodes draining the kidney, and protected the kidney from injury during adriamycin nephropathy. Histologically, glomerulosclerosis, tubular atrophy, interstitial expansion, proteinuria, and creatinine clearance were significantly reduced in mice with adriamycin nephropathy subsequently treated with VIP-Dregs. Additionally, VIP-Dregs convert CD4+CD25+ T cells into Foxp3+ regulatory T cells and suppress the proinflammatory cytokine production of endogenous renal macrophages. This may explain their ability to protect against renal injury in adriamycin nephropathy.

Biography

Dong Zheng is a renal researcher who graduated in 2002 from Nanjing Military College, The Second Military University in Clinical Medicine. Then he completed his Masters from The University of Manchester in the UK in 2006, where he studied the courses of Investigative Ophthalmology and Vision sciences and became interested in Molecular Biology. From 2007 to 2011, he was pursuing a Ph.D. in renal diseases in The University of Sydney in Australia, and particularly, in using immune cells of treating diverse types of chronic kidney diseases. He was awarded Ph.D. in May 2011. Now he works as a postdoc researcher at Tongji University in China and is conducting research focusing in the treatment of renal diseases with regulatory immune cells and cellular oxidative stress on animal models.

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