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Targeting the macrophages in ocular neovascularization

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Purpose: To evaluate the role of macrophages in alkali-induced corneal neovascularization (CrNV).

Methods: CrNV was induced by alkali injury and compared in wild-type (WT), knock out (KO) mice or protein/antibody intervened mice. CrNV 2 weeks after injury was detected by CD31 immunostaining. Angiogenic factor expression in the early phase after injury was quantified by real-time PCR and western blot. Angiogenesis factors production of macrophages after stimuli was detected.

Results: Each of TNF- α /TNF-R1, IL-1/IL-1RA, CCR2/CCL2, CCR5/CCL3, CXCR3/IP-10, CXCR4/SDF-1 α , and CX3CR1/FKN signals were time kinetic expressed during the alkali induced CrNV. TNF-R1 KO, CCR2 KO, CCR5 KO, CCL3 KO or anti-TNF- α , anti-SDF-1 α treatment result in impaired CrNV, while CX3CR1 KO, SDF-1 α or IP-10 treatment result in enhanced CrNV. Macrophages expressed TNF R, IL-1RA, CCR2, CCR5, CXCR4 and CX3CR1. TNF- α ; CCL3, IL-1 α , IL-1 β and SDF-1 α induced macrophage proangiogenic factor expression, while FKN induced the macrophage anti-angiogenic factor expression.

Conclusions: Proinflammatory factors and chemokines stimulated macrophage angiogenesis associated factor expression are involved in alkali induced CrNV. Macrophage CXCR3 and CX3CR1 signals are protective in alkali induced CrNV. Our results suggest macrophage can be a therapeutic target in ocular neovascularization. Intervention ocular neovascularization by macrophages re-education is worth further investigated.

Biography

Peirong Lu received his PhD degree from Kanazawa University in 2004. He has completed his Post-doctoral training at Soochow University. Currently, he is the Professor and Director of Department of Ophthalmology, the First Affiliated Hospital of Soochow University. His research focuses on ocular neovascularization and cataract and is well funded. He has published more than 20 papers including *Invest Ophthalmol & Vis Sci*, *Journal of Immunology*, *Cornea*, *Molecular Vision* and *American Journal of Pathology*.

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