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The use of the complement inhibitor VCP against light-induced retinal degeneration in albino rats

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The complement system, a component of the innate immune response, has been shown to play a pivotal role in degenerative diseases of the CNS, including age-related macular degeneration (AMD) in the retina. Controlling the activation of the complement system has been suggested to be a therapeutic approach to slow the degenerative process. In this study, we assessed the effects of the vaccinia virus complement control protein (VCP), using an animal model of dry AMD; the light-induced retinal degeneration rat model (LD). In this paradigm (1000lux white light continuous for 24hrs), complement activation has been reported, and was implicated in the progression of the disease. To test the effect of VCP on the LD retina, the drug was administered intravitreally 16hrs before exposure to damaging light. Following a recovery period of either 0 or 7 days, animals were euthanized, and eyes were processed for analysis. Retinal damage was assessed by histology and the TUNEL technique to detect cell loss and pathological changes. Immunohistochemistry using complement protein-specific antibodies for C3d and C5b-9 were used to reveal evidence of complement activation. Injected eyes maintained normal retinal morphology, showed reduced photoreceptor cell death, and had a significant reduction of complement protein deposition near the photoreceptors and the underlying RPE and choroid, when compared to control non-treated eyes. The protective effect of VCP in the light-damaged rat retina indicates that VCP may be a valuable therapeutic tool against retinal degeneration.

Biography

Nilisha has recently completed her Bachelor of Medical Science degree with First Class Honours, at the John Curtin School of Medical Research at the Australian National University in Canberra, Australia. She hopes to pursue a Ph.D. starting in 2013, with a research focus on complement system control as a therapy against retinal degeneration, which will involve a further investigation into the protective potential of VCP.

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