OMICS Group Conferences
Accelerating Scientific Discovery
3rd International Conference on
Clinical & Experimental Ophthalmology
April 15-17, 2013 Hilton Chicago/Northbrook, USA

Evaluating potential therapies in a mouse model of focal retinal degeneration with age-related macular degeneration (AMD)-like features

Chi-Chao Chan

National Institutes of Health, USA

Abstract

Although the mouse has no macula leutea, its neuroretina and retinal pigment epithelium can develop lesions mimicking certain features of age-related macular degeneration (AMD). Differences between *Ccl2* and *Cx3cr1* double deficient mouse on *rd8* background (DKO *rd8*) and *Crb1*^{rd8} photoreceptor and RPE pathology, as well as increased A2E and immune dysfunction, show that DKO *rd8* recapitulates some human AMD-like features in addition to *rd8* retinal dystrophy/degeneration. Different therapeutic interventions have been demonstrated effective on the AMD-like features of DKO *rd8* mice. The use of the DKO *rd8* model and C57BL/6N (WT) mice as group controls (4 groups) to test treatments such as high omega-3 polyunsaturated fatty acid (n-3) diet has, for example, shown the beneficial effect of n-3 on AMD-like lesions by anti-inflammatory action of docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA). The use of the DKO *rd8* mice as self-control by treating one eye and using the contralateral eye as the control for the same mouse allows for appropriate interventional experiments and evaluates various novel therapeutic agents. Two examples will be presented: (1) tumor necrosis factor-inducible gene 6 recombinant protein (TSG-6) arrests the AMD-like lesions via modulation of ocular immunological gene expression, e.g., IL-17a; (2) adeno-associated virus encoding sFLT101 (AAV5.sFLT101) stabilizes the AMD-like lesions via lowering retinal extracellular signal-regulated kinase (ERK) phosphorylation and iNOS expression. Therefore, the DKO *rd8* mouse model can be useful and appropriate for therapeutic compound screening in the management of human AMD.

Biography

Chi-Chao Chan earned her M.D. from Johns Hopkins University and ophthalmology residency from Stanford University School of Medicine. She has completed two post-doctoral fellowships: ophthalmic pathology at Wilmer Institute, Johns Hopkins and clinical ocular immunology at National Eye Institute, National Institutes of Health. Chan is the Chief of Immunopathology Section, Laboratory of Immunology and Head of Histopathology Core, National Eye Institute, the federal government medical research institute in the US. She has published 579 papers in peer-reviewed journals and one textbook. She also serves as an editorial board member for 15 medical journals.