

### **Research on Dry AMD at the Lions Eye Institute**

Dry age-related macular degeneration (AMD) is one of the most common causes of irreversible blindness. Unlike the wet form of AMD, the dry form of AMD can progress very slowly and it can impair reading ability for many years before it is detected. Research at Lions Eye Institute is being conducted into exploring the risk factors for dry AMD, characterising different types of dry AMD, clinical trials of novel drug treatment and the potential of cell replacement therapy.

Macula is a specialised area of the light sensing retina that serves central vision, allowing us to read, see people's faces and drive a car. As dry AMD develops, many people will require greater contrast in the text they read and brighter light to see objects clearly at night. Some will notice distortion and blur patches of vision in the centre causing "letters on the page to jump around". One eye is often affected more severely than the other and hence many people will ignore these symptoms of early dry AMD until the better seeing-eye is losing sight.

Several risk factors for development of dry AMD have been proposed including smoking and family history. Research has shown specific formulation of vitamins and minerals may be beneficial in retarding progression of high risk early AMD to late stage AMD. However, use of these supplements should be discussed with a retinal specialist who can distinguish high risk early AMD from other macular diseases such as pattern dystrophy or central serous retinopathy that can often be confused with the common type of AMD. Experimental laser treatment are also being investigated and Lions Eye Institute is currently part of a multi-centre multi-national study examining nanosecond laser inducing regression of early stage of AMD. It is thought that these lasers stimulate removal of debris within the retina and reverse subtle age-related impairment of the vision.

Evolution of early stage into late dry form of AMD occurs over many years or decades. Lions Eye Institute is examining features in the patient or in the eye that may predict patients who are likely to progress faster than others. We know that are specific genetic profile and features within the eye that can only be seeing using specialised retinal camera that can predict progression rate. Researches in the most appropriate interpretation of these images are amongst the top priorities for the Imaging Group at the Lions Eye Institute. We have acquired several state-of-the art retinal cameras and recruited experts in imaging analysis to set up an Imaging Group to facilitate our investigation into risk profiling of patients with dry AMD

Once retinal cells become damaged in dry AMD, novel treatment targeting inflammatory and cell survival signal pathways in the eye are being investigated in multi-centre and multi-

national clinical trials to arrest further progression. Several clinical trials are starting to recruit patients with geographic atrophy, a specific type of dry AMD where extensive cell damaged has occurred in the macula. Being part of these clinical trials will enable patients to contribute to the development of new drugs and monitored closely even if they do not receive the active medication during the trial. Lions Eye Institute has actively engaged with pharmaceutical companies to bring to Perth the opportunities for Western Australians to participate in these clinical trials with the potential for patients to receive new treatment for dry AMD.

cell therapy has the potential to prevent further vision loss as well as restoring vision in people blinded by dry AMD. The Tissue Engineering Laboratory at the Lions Eye Institute is actively developing tissue replacement to reconstruct damaged macula with retinal cells grown from the patient's own cells. This autologous stem cell transplantation approach is a long term project and many years of development is anticipated before it can be tested in human subjects.