Genetic finding implicates innate immune system in major cause of blindness

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Scientists have identified one of the genes implicated in age-related macular degeneration, the most common cause of blindness in developed countries.

The research, published online today in the *Lancet*, adds to the growing understanding of the genetics of age-related macular degeneration (AMD), which the researchers believe should ultimately lead to novel treatments for the disease.

Almost two-thirds of people aged 80 years or older are affected by AMD to some degree, with more than one in ten left blind by the disease. In the UK, the annual economic burden from the disease has been estimated to be as high as £80 million, a figure set to increase as our ageing population expands. The total yearly costs of health-care usage are seven-times higher for patients with AMD than for those unaffected.

Researchers have previously identified a number of other genes or genetic loci (regions of the genome) which affect a person's susceptibility to the disease. Now, in research part-funded by the Wellcome Trust, researchers at the University of Southampton have shown that a particular variant of the gene SERPING1, carried by just under a quarter of the population, appears to offer protection against the disease.

The University of Southampton team and colleagues from the University

of Iowa found evidence of proteins expressed by SERPING1 in the retina and the choroid layer (the vascular layer next to the retina), the two areas affected by AMD. These proteins are involved in regulating a part of the body's innate immune system known as the "complement system". The findings suggest that the complement system is malfunctioning, attacking the retina and choroid layer.

"It seems counterintuitive that a generalised innate immunity defence system should result in a localised disease of the eye in the elderly," Says Professor Andrew Lotery from the University of Southampton, corresponding author on the study. "However, it is becoming increasingly clear from research that this is the case. Previous AMD genes have already implicated the 'alternate' complement pathway, and our paper shows that the 'classical' complement pathway is also involved in this process."

Source: Wellcome Trust