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The Ageing Photoreceptor in a rodent model

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With age many retinal neurons are lost. In man the rod photoreceptor population in the perimacular region is subject to approximately 30 % loss over life. Those that remain have been reported to suffer from extensive convolutions and localised swellings of their outer segments abnormally increasing their disc content and outer segment length. Here we examine quantitatively age related changes in rat rod photoreceptors.

The rat retina is ~97% rod dominated. Here, aged rods showed significant reductions in outer segment length. The discs in their outer segments had a similar density, irrespective of whether they were young or old, however, in aged animals a higher proportion were misregistered. Surprisingly, in all of the tissue examined, we found no evidence for any convolution of outer segments or localised swelling as reported in man, rather all remained straight.

There are methodological differences between the research reported here and that undertaken on human retinae. There are also major differences in overall retinal architecture between man and rodents that could contribute to differences in the ageing process of individual cells.

If it is the case that individual photoreceptors age differently in rodents compared to man, it may pose significant problems for the use of this animal model in studies of ageing and age related outer retinal disease.