

**P013** Differentiation and stress mediated induction of heat shock protein expression in retinal pigment epithelial cells  
**N. Kanuga, T.A. Bailey, P.J. Luthert and M.E. Cheetham**  
*Division of Pathology, Institute of Ophthalmology, UCL, London*

Environmental factors have been implicated in the increasing incidence of blindness caused by age-related macular degeneration (AMD). Therefore, we examined the effect of stress on the expression of HSP27 and HSP70 in retinal pigment epithelium (RPE) cells, which are thought to be central to AMD pathogenesis. A marked upregulation in the constitutive levels of both HSP27 and HSP70 correlated with increased cellular differentiation. The response to stress also varied according to differentiation, as undifferentiated cells were more vulnerable to chronic oxidative stress. Undifferentiated cells showed a significant increase in HSP27 protein levels following heat shock and oxidative stress. In differentiated cells there was a small increase in HSP27 levels after heat shock, but not after oxidative stress. HSP70 was induced by heat shock in both undifferentiated and differentiated cells, but no significant upregulation was observed after oxidative stress. Immunofluorescence revealed a differential response in the localization of HSPs following heat shock. Nuclear translocation of both HSP27 and HSP70 was observed in undifferentiated cells. This was particularly pronounced for HSP70. In contrast, no nuclear translocation of HSP27 or HSP70 was observed in differentiated cells following heat shock. These data suggest that high steady state levels of HSPs in differentiated ARPE-19 cells could influence the vulnerability of RPE cells to stress. Furthermore, the differentiation related increase in HSP expression and differences in subcellular localization may reflect specialized chaperone requirements in differentiated RPE.