ATP release occurs following stimulation in several cellular systems. This study investigated whether the cell-lines FHL-124 (human lens), and hTERT-RPE (retinal pigment epithelium) could release ATP under stress-related conditions. A role for ATP in modulating growth was also investigated. Additionally, the expression of the cell surface ectonucleotidase CD73 was analysed.

Aqueous humour samples obtained from cataract patients were assayed for ATP using a luciferase detection kit (Roche). FHL-124 and hTERT-RPE cells were cultured with serum-supplemented media and serum-starved for 24 hours prior to exposure to experimental conditions. NaCl (6.25-50 mM) was added to cultures to simulate osmotic stress and medium assayed for ATP. For growth analyses the cells were cultured for 4 days in the presence of ATP, ATP analogues or UTP and stained with Coomassie Blue. Expression of CD 73 was determined by immunocytochemistry.

The mean level of ATP in the aqueous humour was $37.8 \pm 7.7\text{ nM}$ ($n=52$). Increasing concentrations of NaCl gave a dose-dependent increase in the release of ATP from both cell-types. ATP, ADP and adenosine (all 100pM) inhibited proliferation of FHL-124 cells, while UTP had no effect. However, in hTERT cells all analogues inhibited growth. CD73 was observed on both cell types. ATP was found to be present in the aqueous humour and was released from lens and RPE cells after osmotic shock. In both cell types ATP, ADP and Adenosine inhibited growth, while UTP only inhibited growth of RPE cells. Formation of Adenosine from released ATP could occur via ectonucleotidases expressed in both cell-lines.