Selective changes in expression of a potassium channel in an inner ear pumping epithelium

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K^+ channels play a crucial role in the *stria vascularis*, an ion transporting epithelium responsible for the unique ionic composition and electric potential of inner ear endolymph (Marcus & Shen, 1994). In this study we used qRT-PCR to investigate mRNA expression for one subunit (KCNQ1) of the K^+ channel subtype (KCNQ1/KCNE1) in primary cultures of guinea pig *stria vascularis*. Guinea pig specific primers were developed and expression levels were measured relative to mRNA levels of a ribosomal (S16) housekeeping gene. We found a dramatic and consistent reduction in relative level of expression of the potassium channel gene with time in culture, suggesting a specific down-regulation associated with the culture conditions. Purinergic receptors are thought to be involved in regulation of strial function (Housley *et al.*, 2002). We therefore tested the hypothesis that the reduction of K^+ channel mRNA was the result of release of ATP and activation of purinergic receptors, by including the ATP hydrolyzing enzyme APyrase in the culture medium. When APyrase was present, there was a trend to less reduction of K^+ channel expression for short times in culture although this was not statistically significant. For longer culture times, there was large inter-specimen variability with some cultures showing less and some more reduction of relative K^+ channel expression compared to controls. The mechanism of the observed selective reduction in strial K^+ channel expression requires further investigation.

Housley GD *et al.* (2002) *Audiol. Neurootol.* **27**: 55-61
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