

S02-4 Identification of vesicular nucleotide transporter (VNUT) in taste cells

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Taste receptor cells are chemosensory epithelial cells that sense distinct taste quality such as umami, sweet, bitter, sour and salty. These cells could be divided morphologically into light, dark and intermediate (or type I, II, III) cell. It is well studied and now widely accepted that the type II cells have receptors for sugars, amino acids and bitter compounds. Whereas several reports have suggested involvement of ATP in taste signal transduction and its release from taste cells, there is paucity of molecular information about how these signals are transduced to taste nerves such as glossopharyngeal nerves or chorda tympani nerves which innervate taste papillae. Since vesicular nucleotide transporter (VNUT) has been recently identified, we are now able to identify the tissues and the cell types where ATP is stored and being released.

In the present study we have explored VNUT expression in the taste tissue where ATP supposed to be released for signal transduction. We found that within tongue epithelium VNUT mRNA is expressed in circumvallate papillae but not in surrounding epithelium. By using antibodies raised against VNUT we found that VNUT is selectively expressed in type II taste cells but not in type III cells. Furthermore, we show that during taste bud development VNUT expression is always accompanied by the expression of type II taste cell markers. Our results, together with previous studies, strongly suggest the role of VNUT in type II taste cell signal transduction.