doi:10.1093/chemse/bjs001

IN THIS ISSUE

Articles Highlighted

G protein-coupled receptors in human fat taste perception

Page 123

Understanding macronutrient intake is of considerable general interest in the context of the overweight problem. Whereas the orosensory mechanisms mediating the recognition of carbohydrates and proteins in form of their building blocks, sugars and amino acids, involve G protein-coupled receptors (GPCRs), relatively little is known about the perception of the third macronutrient, fat. It is long-held believe that recognition of fat involves textural, olfactory, and post-ingestive cues. Only very recently did work in rodents reveal the importance of some long chain fatty acids (LCFAs) for a gustatory component of fat perception and propose various cognate candidate fat taste receptors. Galindo *et al* now addressed these problems in humans by combining sensory studies with expression profiling and *in vitro* receptor assays. The authors dissociated a ''scratchy'' from a ''fatty'' component attributed by taste panelists to fatty acids of different chain lengths and fatty acid derivatives. Intriguingly, the ''fatty'' descriptor was specific for LCFAs. Moreover, the authors found that compounds described as ''fatty'' by the panelists were potent activators of GPR120 *in vitro*, a GPCR sensitive to fatty acids, whereas compounds scored as ''scratchy'' were not. Finally, GPR120 mRNA and protein appeared to be expressed in taste buds, the principle organs of taste detection. Taken together the study concludes that GPR120 is a *bona fide* receptor candidate involved in human fatty acid perception.

A green tea polyphenol as activator of transient receptor potential channel A1

Page 167

Trigeminal mechanisms add largely on gustatory transduction to bring about flavor perception. Numerous popular beverages including red wine and green tea contain polyphenolic compounds that elicit bitterness, one of the established five basic tastes, as well as astringency, which is thought to be of somatosensory origin. Whereas the bitterness of epigallocatechin gallate (EGCG), a prototypical polyphenol with health beneficial effects, has been attributed to the activation of a specific bitter taste receptor, the basis for the astringent sensation of this compound remained less well understood. Kurogi *et al* now used enteroendocrine STC-1 cells as a model to identify transduction mechanisms induced by EGCG and related poly phenolic compounds. They found that, among other polyphenols, EGCG was the most active principle that evoked cellular calcium responses in STC-1 cells which were not mediated by the 67-kDa laminin receptor, an established pharmacological target of EGCG. The calcium responses were, however, blocked by inhibitors of transient receptor potential channel (TRP) A1. Moreover, human embryonic kidney 293 and 3T3 cells which are insensitive to EGCG acquired sensitivity to this compound when transfected with DNA vectors encoding TRPA1. The properties of the responses in the transfected cells resembled those of STC-1 cells. From their data and based on the observation that taste and enteroendocrine cells share chemosensor molecules the authors propose TRPA1 to be important for the astringency of polyphenolic compounds such as EGCG.

Condensed tannins and the astringency of red wine

Page 191

Also Soares *et al* were interested in the mechanisms contributing to astringency, particularly the ability of polyphenols to bind to and precipitate salivary proteins. They supplemented red wine with certain polyphenols, so called condensed tannins, i.e., oligomeric procyanidins, one of which is the above mentioned EGCG, and investigated the effect of this manipulation on the concentration of salivary proteins and sensory perception of test subjects. Soares *et al* found that astringency intensity was correlated with a decrease in acidic proline-rich proteins and statherin at low concentrations of condensed tannins. However, when spiked with higher concentration of condensed tannins, the astringency of red wine correlated better with changes in glycosylated proline-rich proteins. Thus, the work reveals an unexpected level of complexity of this sensation suggesting that different families of salivary proteins are involved in different stages of the development of astringency.

Wolfgang Meyerhof