



Good Food, Good Life

Nestlé Scientists Unravel the Secrets of Taste Buds

Lausanne, SWITZERLAND 20 April 2007 - In the April edition of the JOURNAL OF COMPARATIVE NEUROLOGY, a research team from the Nestlé Research Center (Lausanne, Switzerland) reports on the molecular basis of salty taste. The researchers discovered that so called Claudins, a family of molecules usually found to seal the contact between epithelial cells, are distributed in a unique and specific way throughout the taste bud. Specific members of the claudin family are used to seal the taste pore, whereas others facilitate specific pathways within the taste bud for certain molecules. The full contribution is available on the [Journal of Comparative Neurology internet site](#).

Much is known on the mechanisms by which taste buds on the tongue are stimulated by sweet, bitter, sour and the savory umami taste, yet only little understanding on the molecular level is available for salty taste. Coding of taste signaling, or the way individual tastes are projected into the brain, is believed to begin in the taste bud. The Scientists at Nestlé Research Center used a novel approach. Instead of analysing the content of the cells constituting a taste bud, they analysed the matrix between the cells. They found that claudins, which reinforce the contact between cells, are distributed in a specific pattern throughout the bud. Claudins specific for Sodium diffusion were observed to surround a subset of taste bud cells.

The scientists conclude that salt is channelled through the claudin network to activate only a specific subset of taste cells. According to Dr Johannes le Coutre, the head of the team, "This adds a totally new dimension to the long standing question of taste coding. So far, we thought that individual taste cells are uniquely equipped with specific receptors sensitive to sweet, bitter, sour or umami molecules only. Our findings suggest that specific tastants may stimulate different cell groups, depending on the surrounding network of claudin molecules. We cannot anymore only study the cell activity in taste signal coding, but we also have to understand the regulation of the cell environment."

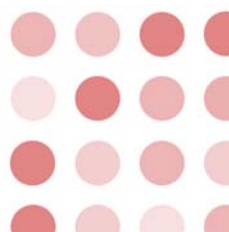
This discovery has the potential for an enormous impact on public health. Excess dietary sodium is linked to high blood pressure and cardiovascular diseases in some countries. Salt reduction calls for molecules that taste salty without containing sodium. These have remained elusive because of the lack of understanding on the molecular physiology of salt taste. The Nestlé team is intensively following up the claudin hypothesis. After sweet, bitter, sour and umami, the salty taste may finally lift the veil of its intimate molecular secrets.

Reference of the article:

Claudin Based Permeability Barriers in Taste Buds. Stéphanie Michlig, Sami Damak and Johannes le Coutre, J. Comp. Neurol. April 2007, Vol 502, Issue 6, published online April 20, 2007

About the Nestlé Research Center

Established in 1987, the Nestlé Research Center (NRC), Lausanne, Switzerland, is one of the world's leading research institutions in food, nutrition and life sciences. With a diverse staff of leading researchers from a broad range of scientific competencies, NRC possesses a unique blend of talent and expertise. Knowledge on nutrition and health, food science, food/consumer interaction and food quality and safety are combined at the Nestlé Research Center to help develop Good Food as a source of Good Health throughout life.





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