 doi:10.1093/chemse/bjq083

IN THIS ISSUE

Articles highlighted

DoOR, a Database of Odor Response Profiles in *Drosophila*

Page 551

Many of us in the scientific community make, for a long time, regular use of databases hosting annotated data sets on genomes, transcriptomes, and proteomes. These databases pioneered the acquisition, administration, maintenance, and presentation of DNA, RNA, and polypeptide sequence data. Although sequence information is complex, it is simple in structure and easily collected. The establishment of databases hosting physiological data dragged behind, because physiological data are very complex in structure, obtained by numerous methods, based on different read-outs, and recorded under different conditions in various laboratories all over the world. In this issue of *Chemical Senses* Galizia and colleagues provide DoOR, a database of odor responses. DoOR is a consensus metadatabase that contains merged data from heterogenous physiological studies of odor responses profiles in *Drosophila*. The program and the data sets are freely available on the internet. Although Drosophila has been chosen as a model because of its advanced data sets, the procedure can be adapted to other species as well. Even though the repository still lacks data on odor concentrations, odor mixtures, and temporal parameters, it will serve as a reference work for olfactory physiologists and allow modeling the combinatorial nature of olfactory coding. For further details see also the commentary by Hansson and Stensmyr on page 541 of this issue of *Chemical Senses*.

PKD1L3 Knockout Mice

Page 565

Whereas our understanding of the molecular and cellular aspects of sweet, umami, and bitter taste in the periphery progressed impressively, less is known about sour taste including the receptor(s). To date none of the various candidates has been demonstrated unequivocally to fulfill this function. A member of the polycystic kidney disease (PKD)-like gene family, *PKD2L1,* is specifically expressed in a subset of taste cells distinct from sweet-, bitter- or umami-dedicated cells. Genetic ablation of these cells selectively abolished gustatory nerve responses to acidic stimuli demonstrating that the *PKD2L1* expressing cells represent the sour sensors. On the posterior tongue *PKD2L1* is coexpressed with another member of the PKD-like gene family, *PKD1L3*. Coexpression of both genes is required in mammalian cells for generating a functional ion channel that is gated by acidic stimuli. Together, the available data make the two PKD-like polypeptides *bona fide* candidates for a sour taste receptor. Nelson et al now generated *PKD1L3* gene-targeted mice and examined the animals for their behavioral and neural responses to taste stimuli. When compared to wild type mice the mutant animals showed no significant reduction in taste responsiveness including responses to acids. Thus, the data disagree with a role for PKD1L3 in sensing acids or any other taste stimuli. Moreover, the function of this protein in taste remains unknown and future work is required to uncover the role of PKD1L3 in taste cells. For further details see also the commentary by Dotson on page 545 of this issue of *Chemical Senses*.

Sweet Taste Genetics

Page 579

Ingestive behavior affects health and disease risk. It involves liking and disliking of food which in turn is influenced by the sense of taste. Humans like sweets and some individuals appear to do so even more than others do. A mechanistic basis for liking is, however, largely missing but could involve genetic factors. A promising approach to this problem has now been performed by Fushan and colleagues. They examined the effect of sequence variation in the *GNAT3* gene which encodes the prominent taste signaling molecule, alpha-gustducin, on sweet taste perception in humans. To this end the authors sequenced the *GNAT3* gene in their population of 160 individuals and scored their sweet taste sensitivities. They found a significant association of sucrose sensitivity scores with sequence variations in the *GNAT3* gene. The *GNAT3* polymorphisms collectively explain 13% of the variation in sucrose perception and emphasize the importance of genetic factors for taste perception. For further details see also the commentary by Reed and Margolskee on page 549 of this issue of *Chemical Senses*.

Wolfgang Meyerhof