Analysis of Inter-Helical Loop Segments in Membrane Proteins

Recent crystallography and diffraction studies of membrane proteins have revealed that the structure of specific medium loop segments between transmembrane helices fold back into membrane positions and play an important role in membrane protein folding and biological function. However, previous structure prediction methods of membrane proteins have not classified the type of loop segments. We have developed a new method for classification and prediction system of the specific medium loop segments in membrane proteins from amino acid sequence. To classify the loop segments, multi discriminant analysis with three factors, loop length, average hydrophobicity and intensity of amphiphilicity, was used.

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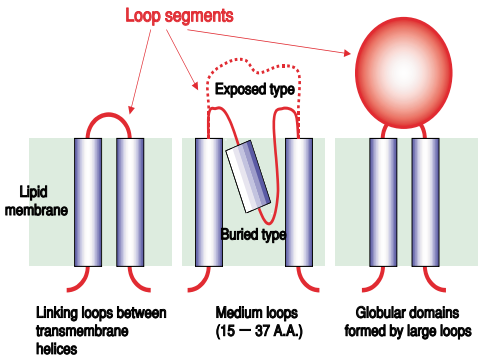
AIST Today Vol. 2, No. 3 (2002) 11



Classification of loop segments in membrane proteins

Molecular Basis of Odor Discrimination in Olfaction

- Research of Primary Odors Corresponding to RGB in Color for the Basis of Innovating the Architectures of Artificial Noses -

There are hundreds of olfactory receptors which detect various odorants in the olfactory system. Their responsiveness should correspond to primary odor information as three types of photoreceptor cells react to primary colors respectively. Using a panel of odorants with similar molecular structures, the analysis of odorant responsiveness of 13 identified olfactory receptors have revealed the principle of odor discrimination in olfaction. The results indicate that the olfactory system uses a combinatorial receptor coding scheme to encode odor identities.

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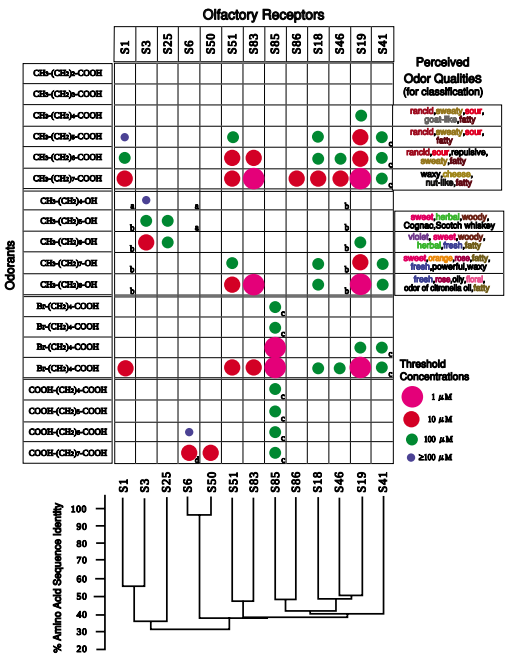

Odorant Tuning Specificities and Amino Acid Sequence Identities of 13 Olfactory Receptors Revealed Partial Receptor Codes for Odorants.
a: not tested
b: tested at 10 μM, but not 100 μM
c: not tested at 10 μM or 1 μM
d: not tested at 1 μM