

## **How does your nose work? Network of human odorant-receptor interactions**

Ji Hyun Bak  
*KIAS*

An important task of olfactory sensing is the discrimination of different odors. An odor captures the chemical state of the environment in a mixture of smell molecules, called odorants. Olfactory sensing is realized by the selective binding of odorants to a set of olfactory receptors, which in turn activates the corresponding olfactory sensory neurons, constructing the brain's first representation of the odor. Despite the high-dimensional nature of olfactory sensing, recent measurements with human olfactory receptors suggest that the odorant-receptor interaction is sparse; only a small fraction of all available pairs interact. By combining studies of model systems and analyses of experimental data, we study the statistics and the network properties of these odorant-receptor interactions, with a goal of elucidating the statistical basis of effective olfactory sensing.