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MOLECULAR
HORIZONS



SEMINAR SERIES 2023

17 OCTOBER

SPECIAL SEMINAR 4:00 – 5:00PM AEDT

Assistant Professor Tian Hua

iHuman Institute

School of Life Science & Technology

ShanghaiTech University

Shanghai, China

Tian Hua is an independent investigator at iHuman institute and tenure-track assistant professor in the School of Life Science and Technology at ShanghaiTech University. She obtained her PhD in Biochemistry and Molecular Biology (2017) from the Institute of Biophysics, Chinese Academy of Sciences. Her research mainly focusses on the structural pharmacology of GPCRs, especially targets that are related to neurological and immune diseases, as well as chemosensory receptors, such as taste receptors.



Structure biology studies on cannabinoid receptors and putative cannabinoid receptor GPR12

Cannabinoid receptors, CB1 and CB2, serve as key components of the endocannabinoid system and are the principal targets of delta 9-tetrahydrocannabinol (delta9 -THC), a psychoactive chemical from *Cannabis sativa* with a wide range of therapeutic applications. CB1 and CB2 play crucial roles in a variety of physiological processes, including appetite, pain-sensation, memory and immunomodulation. However, they differ in their tissue distribution and exert distinct functions in the endocannabinoid system, where CB1 and CB2 are expressed predominantly in the central nervous system and the immune system, respectively. In addition, some orphan receptors, such as GPR3, GPR6 and GPR12 may be putative cannabinoid receptors. Using cryo-EM and X-ray crystallography techniques, we captured the structures of CB1 and CB2 complexed with various ligands in different conformational functional states, revealing the ligand recognition/selectivity and receptor activation mechanism. The structure of GPR12 and its comparison with CB1 and CB2, which will improve our understanding of the endocannabinoid system, will also be discussed.