OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference on
Medicinal Chemistry & Computer Aided Drug Designing

October 15-17, 2013 Hampton Inn Tropicana, Las Vegas, NV, USA

Understanding the hot and cold properties from chinese herbal medicine (CHM) based on modulating TRP channels

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Chinese herbal medicine (CHM), as one of the great herbal systems of the world, is playing an important role in current health care system in many countries. In the view of CHM theory, each item of herb has its own property, such as hot and cold properties, which are the important factors for prescribing herbal formulae and clinical treatment. Understanding the scientific connotation of hot and cold properties is helpful to elucidate the active constituents and mechanism. However, the biological activities that are related to the property remain a mystery because of a lack of appropriate methods.

In this research, TRPV1 and TRPM8 were investigated to study the relationship of TRP channels with hot and cold properties from CHM. Firstly, the 3D pharmacophore models of TRPV1 and TRPM8 agonists were generated respectively to recognize the common pharmacodynamic characteristics. After validation, the pharmacophore model was used as a 3D query to screen the traditional Chinese medicine database (TCMD, version 2009), which contains 23,033 compounds from 6,735 medicinal plants. Then, the perfect hits were evaluated using the cell-based calcium assay. Finally, two compounds from *Curcuma* and *Berberine* were confirmed to be novel TRPM8 agonists. Also the EC50 values of the two compounds were determined to be less than 10uM. For TRPV1 receptor, three hits were verified to be TRPV1 agonists by text mining.

After a careful comparison, we found that the herbs with hot property were inclined to activate TRPV1 receptor, which exhibit the effects of reducing vascular lipid accumulation and attenuates atherosclerosis. While the herbs with cold property preferred to activate TRPM8 receptor and have been used as analgesic, antibacterial and hypolipidemic agents. Also the understanding of hot/cold property based on TRP channels need more experimental data to study.

Biography

Xing Wang is now working on his Ph.D. in Beijing University of Chinese Medicine. His research is focused on “Discovery of bioactive compounds and molecular mechanism in Chinese herbal medicine”. During the school period, he has published seven research papers and won the national scholarship.

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