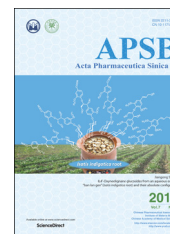




Chinese Pharmaceutical Association  
Institute of Materia Medica, Chinese Academy of Medical Sciences

Acta Pharmaceutica Sinica B

[www.elsevier.com/locate/apsb](http://www.elsevier.com/locate/apsb)  
[www.sciencedirect.com](http://www.sciencedirect.com)



MEETING REPORT

# Highlights for the 6th International Ion Channel Conference: ion channel structure, function, disease and therapeutics



Limei Wang, Kewei Wang\*

Department of Pharmacology, Qingdao University School of Pharmacy, Qingdao 266021, China

Received 2 August 2017; accepted 15 August 2017

## KEY WORDS

Ion channel;  
Structure;  
Function;  
Channelopathy;  
Drug target;  
Mechanotransduction;  
Voltage-gated Ca<sup>2+</sup> channel;  
Anoctamin-1;  
Calcium activated chloride channel;  
M-type potassium channel;  
GIRK channel;  
Voltage-gated sodium channel

**Abstract** To foster communication and interactions amongst international scholars and scientists in the field of ion channel research, the 6th International Ion Channel Conference (IICC-2017) was held between June 23–27, 2017 in the eastern coastal city of Qingdao, China. The meeting consisted of 450 attendees and 130 speakers and poster presenters. The program consisted of research progress, new findings and ongoing studies that were focused on (1) Ion channel structure and function; (2) Ion channel physiology and human diseases; (3) Ion channels as targets for drug discovery; (4) Technological advances in ion channel research. An insightful overview was presented on the structure and function of the mechanotransduction channel *Drosophila* NOMPC (No mechanoreceptor potential C), a member of the transient receptor potential (TRP) channel family. Recent studies on Transmembrane protein 16 or Anoctamin-1 (TMEM16A, a member of the calcium-activated chloride channel [CaCC] family) were summarized as well. In addition, topics for ion channel regulation, homeostatic feedback and brain disorders were thoroughly discussed. The presentations at the IICC-2017 offer new insights into our understanding of ion channel structures and functions, and ion channels as targets for drug discovery.

© 2017 Chinese Pharmaceutical Association and Institute of Materia Medica, Chinese Academy of Medical Sciences. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

\*Corresponding author.

E-mail address: [wangkw@qdu.edu.cn](mailto:wangkw@qdu.edu.cn) (Kewei Wang).

Peer review under responsibility of Institute of Materia Medica, Chinese Academy of Medical Sciences and Chinese Pharmaceutical Association.

## 1. Introduction

Ion channels, present in membranes of all cells, are pore-forming membrane proteins that allow passage of ions, such as calcium, sodium and potassium, through the pore. The functions of ion channels include control of resting membrane potential, the shaping of action potentials and other electrical signals, controlling the flow of ions across secretory and epithelial cells, and regulating cell volume<sup>1</sup>. The International Ion Channel Conference (IICC) is a conference series focused on ion channel research. The aim of the conference is to foster communications and interactions amongst ion channel researchers in the world, and to showcase the latest groundbreaking discoveries and technological breakthroughs with a particular focus on ion channel structure, function and therapeutics. A brief conference history of IICC is summarized in Fig. 1. The IICC started in 2007 and is held in every two years at a city in mainland China. The number of participants of the IICC increased continually from less than 200 attendees in 2007 to 450 in 2017, indicating the growing interests and increasing impact of the conference in the field of ion channel research. This year, the 6th IICC, chaired by Dr. Kewei Wang at Qingdao University and Dr. Jian Yang at Columbia University, was held between June 23 to 27 in Qingdao, China.

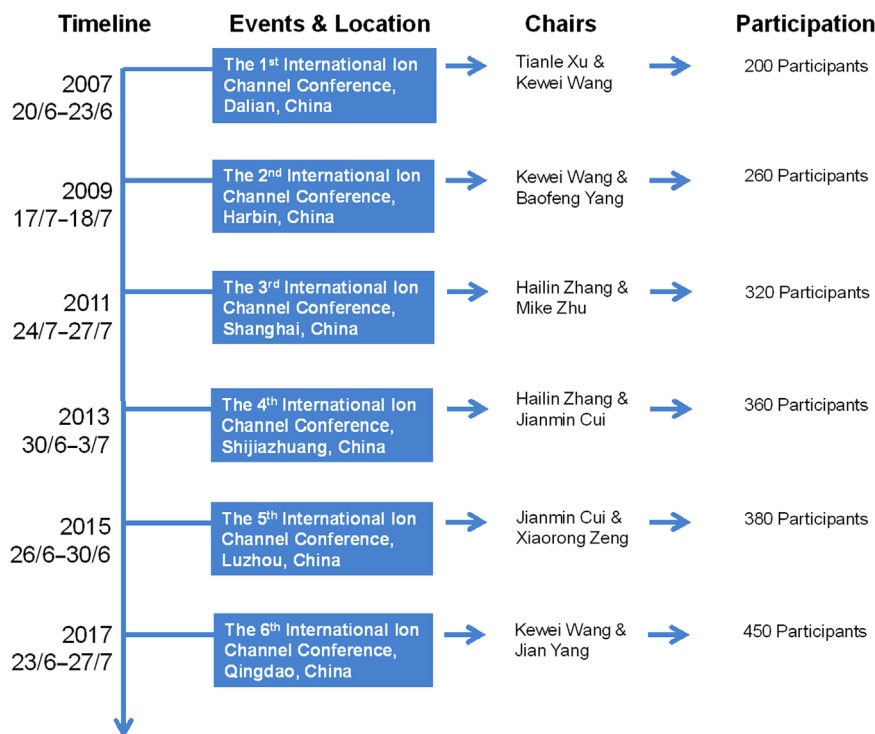
The 2017 IICC was organized as a series of topical symposia, aiming at communicating updated findings from understanding of ion channel structures, molecular mechanisms, physiology and channelopathies to new perspectives for future research and therapeutics. At the meeting, leading scholars in the field such as Lily Jan, Yuh Nung Jan and Richard W. Tsien presented their keynote lectures. Lily Jan, a professor at University of California San Francisco, is an expert in physiological functions of potassium channels and calcium-activated chloride channels. The research topics of Dr. Yun Nung Jan (also a professor at UCSF) include: (1) molecular mechanisms underlying dendrite morphogenesis

with an emphasis on the role of kinases, (2) regulators of axon and dendrite regeneration, and (3) mechanotransduction channels. Professor Richard W. Tsien, currently at New York University, studies calcium channel regulations, homeostatic feedback and brain disorders.

A roster and introduction of all invited speakers and symposium chairs are listed in the website of <http://www.iicc2017.org>. Four major themes were presented at IICC-2017: (1) Ion channel structure and function; (2) Ion channel physiology and human diseases; (3) Ion channels as targets for drug discovery; (4) Technological advances in ion channel research. In this report, we will briefly highlight the events of IICC-2017.

## 2. Highlights for symposium Session I: ion channel structure and function

In this session, Dr. Yuh Nung Jan first introduced the progress made by his group in the study of mechanotransduction channels, especially NOMPC (No mechanoreceptor potential C), a member of the transient receptor potential (TRP) family. In his talk, he pointed out that *Drosophila* turns out to be an excellent system for studying mechanotransduction channels. They have identified NOMPC as mechanotransduction channel for gentle touch<sup>2</sup>, sound response<sup>3</sup> as well as defecation behavior<sup>4</sup> in *Drosophila*. Two models were revealed to interpret how force gates mechanotransduction channels. One is the membrane-tension model: force applied to the membrane generates a change in membrane tension that is sufficient to gate the channel. The other model is the tether model: force is transmitted *via* a tether to gate the channel<sup>5</sup>. As ankyrin repeats (ARs) are essential for NOMPC mechano-gating, which requires the integrity of microtubules associated to the plasma membrane, a tethered mechanism for mechano-transduction channel activation of NOMPC was revealed. Furthermore, the



**Figure 1** A brief history of the International Ion Channel Conference from 2007 to 2017.

Download English Version:

<https://daneshyari.com/en/article/8508016>

Download Persian Version:

<https://daneshyari.com/article/8508016>

[Daneshyari.com](https://daneshyari.com)