Acta Pharmacologica Sinica (2018) 39: 659–660
 1671-4083/18
www.nature.com/aps

Editorial

# A new platform for international collaboration on pharmacology and drug development: 2017 China-Canada-USA Pharmacology/Physiology Conference

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*Acta Pharmacologica Sinica* (2018) 39: 659–660; doi: 10.1038/aps.2018.34

This Special Issue attributes to the 2017 China-Canada-USA Pharmacology/Physiology Conference (CCUPPC), one of the initiatives of promoting scientific exchanges and research collaborations in the field of pharmacology, physiology and drug development. The conference brought scientists from China, Canada, and USA together, and created a new platform for international collaboration.

The conference took place at the University of Toronto, known as the birthplace for insulin and the alma mater of Dr. Norman Bethune, and is also one of the world's top research-intensive universities, from June 25 to June 30, 2017. The conference was sponsored by the University of Toronto (Faculties of Medicine and Pharmacy; Departments of Physiology, and Pharmacology and Toxicology) and was co-organized with the Chinese Pharmacological Society, the Canadian Physiological Society, the Canadian Society of Pharmacology and Therapeutics, and the North American Chinese Pharmacological Association. The conference was also supported by the Guangdong Pharmacological Society, the North American Chapter Chinese Pharmacological Society, Acta Pharmacologica Sinica, the Toronto Chinese Professors Association, and Society of Chinese Bioscientists in America Toronto Chapter.

In this special issue, all articles have been peer-reviewed and provide the current views on critical topics in pharmacology and drug development that have been extensively discussed at the conference.

Stroke has been one of the leading causes of death worldwide, and threatened the health of the aging population. However, the mechanism leading to ischemic and hypoxic brain damage in stroke and related disorders remains not fully understood, thus hindering the development of efficient treatment and prevention of stroke. Tymianski's group from the University of Toronto emphasized that stroke creates a complex interplay of multiple pathways, and discussed the discovery of NA-1 as a potential neuroprotectant in acute stroke[1]. Jiangang Shen group from Hong Kong University highlighted the important role of reactive nitrogen species/caveoline-1/matrix metalloproteinase signalling cascades in ischemic stroke injury, and discussed the potential of a few natural compounds in stroke treatment by targeting the pathways[2]. Hong-Shuo Sun and Zhong-Ping Feng groups from the University of Toronto summarized the current progresses of drug uses to promote stem-cell-based therapy following stroke[3]. The Sun and Feng groups also discussed the role of a number of ion channels, including $K_{ATP}$[4], TRPM2[5] and Cl channels[6], and the effects of their modulators in ischemic and hypoxic brain injury in adult and neonatal models. Shirley Wu group from the University of Toronto further discussed the advances of nanotechnology in efficient drug delivery for brain disorders[7].

Mental health and other neurodegenerative disorders have been the main focuses in neuropharmacological studies. Albert Wong group from the Centre for Addition and Mental Health and the University of Toronto discussed potential drug targets for schizophrenia[8] and anxiety-related behaviour[9]. Yufeng Tong group from the Structural Genomics Consortium at the University of Toronto reviewed that dysfunction of ubiquitylation system that plays an integral role in proteostasis is progressive in Huntington's disease and unravelling the molecular mechanisms the pathogenesis of proteostasis provided insight in new potential therapeutic avenues in the disease[10]. Michael Jackson group from University of Manitoba highlighted the current advances of TRPM 2 channels as a drug target in a number of neurological diseases including Alzhemer disease, Parkinson disease, and bipolar disorder[11].

Phoenixin is a newly discovered novel peptide released

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from reproductive glands. Jin Jun Luo group from Lewis Katz School of Medicine at Temple University and Denise Belsham group from the University of Toronto independently reviewed the discovery of the peptide. Denise Belsham group emphasized the functions and mechanisms of action underlying effects of phoenixin[12], whereas Jin Jun Luo group stressed the possible role of the peptide in the "itch sensation" that transmits from the skin to brain[13].

Another major research topic in pharmacology is to better understand the mechanisms of action underlying effects of natural products. For instance, Tianru Jin from the University of Toronto pointed out that the curry compound, curcumin, has been drawing the most attention from bio-medical researchers and drug developers, and discussed how curcumin and dietary polyphenol research has enriched our knowledge of insulin signalling[14]. Catherine Chan group from University of Alberta showed that epicatechin, an ingredient of dark chocolate, exhibited pro-glucose-stimulated insulin secretion independent on antioxidant activity[15]. Zhong Zuo group from the Chinese University of Hong Kong provided a comprehensive overview of the anti-inflammatory effects, pharmacokinetic properties, and clinical efficacy of arctigenin and arctiin from Arctium lappa L[16].

Salvia miltiorrhiza Burge (Danshen) is an eminent medicinal herb and used broadly in cardiovascular and cerebrovascular disorders. Pei-qing Liu group from Sun Yat-Sen University provided a systematic up-to-date review on the cardiovascular actions and therapeutic potential of the major bioactive constituents of Danshen[17]. Yao-ming Du and Guan-lei Wang groups from Guangdong Academy of Medical Sciences and Sun Yat-Sen University, respectively, reported a novel marine compound, Xyloketal B, isolated from mangrove fungus Xylaria sp. exhibiting antihypertensive effects via both endothelial NO-sGC-cGMP pathway and smooth muscle calcium signalling[18]. Chunxiang Zhang group from the University of Alabama at Birmingham further revealed the microRNA expression profile and demonstrated that miR-145 mediated a critical signalling pathway in serum-induced contact inhibition disruption. They concluded that the contact inhibition of vascular smooth muscle cells may represent a novel therapeutic approach for vascular disease[19]. In addition, Mingyao Liu group from the University of Toronto reviewed the history and current progress of organ preservation, and discussed the future directions of the most effective therapy for patients with end-stage diseases to meet the increased demands in medical practice[20].

We would like to thank the editorial staffs of Acta Pharmacologica Sinica for their support for and assistance during the process of the issue production. We look forward to furthering the international collaboration in future research endeavours.

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