CARDIOVASCULAR MEDICINE

Vascular Medicine - Basic Research

05

Principal Investigator

Professor Xiaoqiang Yao

Team Members

Fan Ying | Zhaoyue Meng | Mingxu Xie | Yunting Zhang | Jingxuan Li | Xiao Li | Shengjie Cheng | Jun Zhang | Zhenchuan Lei | Chun-yin Lo | Him Cheung

Research Progress Summary

Atherosclerotic cardiovascular disease is currently one of the most common causes of morbidity and mortality worldwide. Active immunisation via delivery of antigens in a vaccine platform is an attractive treatment strategy to introduce humoral and cellular immunity alleviating atherosclerotic progression. TRPM2 is a ROS-activated ion channel that may promote atherosclerotic progression. Recently, the team led by Professor Xiaoqiang Yao is in the process of developing the strategy of active immunisation with a TRPM2 peptide in a vaccine platform for the potential treatment of atherosclerosis. Although the present study is preclinical, they expect this to be developed into a clinical treatment option in future. The research is supported by grants from The Innovation and Technology Fund (ITF) and the Health and Medical Research Fund (HMRF).

Research and Scholarship

Academic Editorship

Member's Name	Details	
	Role	Journal
Xiaoqiang Yao	Editor	Scientific Reports
		Frontiers in Pharmacology
		World Journal of Pharmacology
		World Journal of Hypertension
		Archives of Stem Cell Research
		Journal of Cancer Sciences

Reviewer of Journal / Conference

Member's Name	Details	
	Role	Journal / Conference
Xiaoqiang Yao	Reviewer	Circulation Research
		Journal of Cell Sciences
		Cell Reports
		Cardiovascular Research
		Journal of Physiology
		British Journal of Pharmacology
		Scientific Reports
		Laboratory Investigation
		Frontiers in Pharmacology

Grants and Consultancy

Name	Project Title	Funding Source	Start Date (dd/mm/yyyy)	End Date (dd/mm/yyyy)	Amount (HK$)
Xiaoqiang Yao	Active Immunization with TRPM2 Peptide Antigens as a Potential Treatment Strategy for Atherosclerotic Progression in a Mouse Model	Hong Kong Innovation and Technology Fund	01/01/2019	31/07/2020	1,400,000
	Targeting TRPM2 as a Potential Therapeutic Strategy for Spontaneous Atherosclerosis	Food and Health Bureau – Health and Medical Research Fund	01/09/2019	31/08/2022	1,181,050
	Role of TRPC5 in Endothelium-dependent Contraction in Hypertensive Model of Mice	Research Grants Council – General Research Fund	01/01/2020	31/12/2022	1,042,225
	Centre for Organelle Biogenesis and Function	Research Grants Council – Area of Excellence Grant	01/01/2014	31/12/2021	47,250,000
	Plant Bioreactor for Pharmaceutical Proteins	Research Grants Council – Research Impact Fund	01/06/2019	31/05/2024	5,000,000
	Dissecting the Mechanism and Function of GAPDH in Cyclic ADP-Ribose (cADPR)-mediated Ca^{2+} Signaling in Mammalian Cells	Research Grants Council – General Research Fund	01/01/2018	31/12/2020	969,425
	The Role of TRPC7 Channels in Regulating the Functions and Maturation of Embryonic Stem Cell-derived Cardiomyocytes	Research Grants Council – General Research Fund	01/01/2018	30/06/2020	854,494

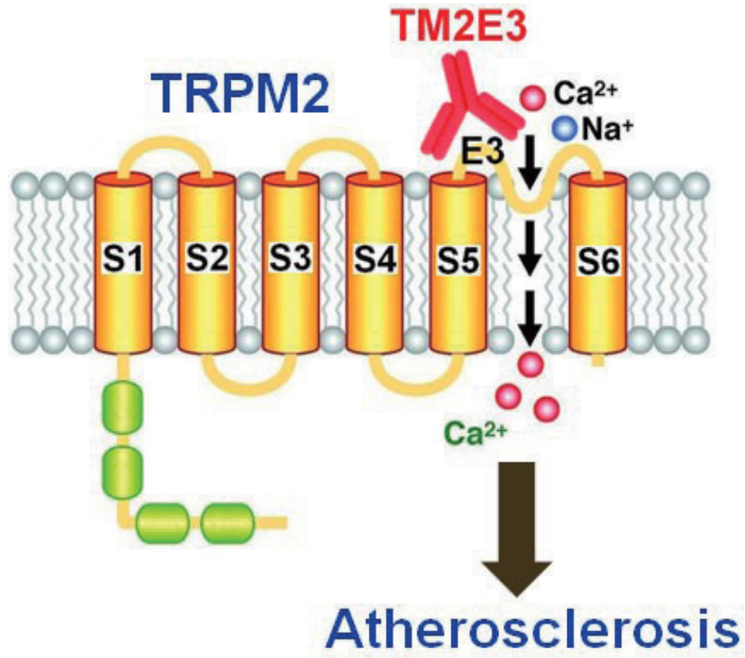
Publications

A. Journal Papers

1. Yan F, Lu J, Zhang Y, Li X, Chan WH, Zhao Q, Kwan HY, Liu H, Yao X. Resveratrol stimulates the Na^{+}-Ca^{2+} exchanger on the plasma membrane to reduce cytosolic Ca^{2+} in rat aortic smooth muscle cells. *Journal of Cardiovascular Pharmacology*. 2020;76(5):610-616. doi:10.1097/FJC.0000000000000897.

2. Guo J, Zhao R, Zhou M, Li J, Yao X, Du J, Chen J, Shen B. TRPP2 and STIM1 form a microdomain to regulate store-operated Ca^{2+} entry and blood vessel tone. *Cell Communication and Signaling*. 2020;18(1):138. doi:10.1186/s12964-020-00560-7.

3. Qu D, Wang L, Huo M, Song W, Lau CW, Xu J, Xu A, Yao X, Chiu JJ, Tian XY, Huang Y. Focal TLR4 activation mediates disturbed flow-induced endothelial inflammation. *Cardiovascular Research*. 2020;116(1):226-236. doi:10.1093/cvr/cvz046.



A schematic Figure showing that a peptide derived from the E3 region of TRPM2 can induce neutralising antibody to slow down atherosclerotic progression.

Source: Professor Xiaoqiang Yao