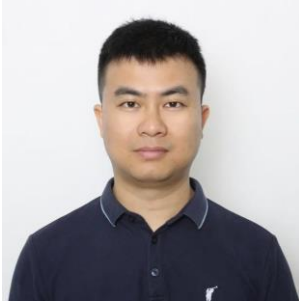


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研究方向:

离子通道蛋白广泛表达于人体的每一个细胞，对维持人体的众多生理活动至关重要。离子通道的异常开关可能导致严重的疾病（如心脏病，癫痫，癌症等），因此它们是新药创制与治疗疾病的重要靶点。自 2009 年以来，侯博士一直从事心脑血管系统中关键离子通道的工作机制、病理机理以及相应疾病新治疗方案的研究。解决了领域内几个关键的难题，受到了广泛认可：1) 结合膜片钳电生理技术、分子生物学技术和结构生物学方法，深入研究离子通道的工作机制。例如，以心脏中关键钾离子通道 KCNQ1 为模型，建立了以药理学精确调控为基础的新方法，精确阐明了其 VSD-pore 耦合机制：“Hand-and-Elbow” mechanism。该机制对电压激活型和本体激活型离子通道都广泛适用 (*Nature Communications* 2017, 2020; *Elife* 2019, 2020)。2) 结合电生理方法、干细胞技术和临床数据分析，阐明离子通道疾病的生理功能、病理机制并开发创新治疗方案。例如，解析了 KCNQ1 通道在压力状态下（交感神经激活）引起的磷酸化调控机制：the phosphorylation axis，并以此开发了以外源小分子恢复 LQT1 高危突变体缺失的磷酸化敏感性的新方案 (*PNAS* 2022, *Circulation Research* 2024)。3) 离子通道新药研发。作为重要的药物靶点，离子通道的新药研发对治疗人类重大疾病有重要意义。团队从中药来源化合物中筛选到多个可以高效调控离子通道功能的小分子，对中药机制的阐明和中药的新产品开发有意义 (*Pharmacological Research* 2023)。

代表性研究论文:

- Ling Zhong#, Zhenzhen Yan#, Dexiang Jiang, Kuo-Chan Weng, Yue Ouyang, Hangyu Zhang, Xiaoqing Lin, Chenxin Xiao, Huaiyu Yang, Jing Yao, Xinjiang Kang, Changhe Wang, Chen Huang, Bing Shen, Sookja Kim Chung, Zhi-Hong Jiang, Wandi Zhu, Erwin Neher, Jonathan R Silva*, Panpan Hou*. Targeting the IKs Channel PKA Phosphorylation Axis to Restore Its Function in High-Risk LQT1 Variants. *Circulation Research*. 2024 Sep 13;135(7):722-738.
- Panpan Hou*, Lu Zhao, Ling Zhong, Jingyi Shi, Hong Zhan Wang, Junyuan Gao, Huilin

- Liu, Joan Zuckerman, Ira S Cohen, Jianmin Cui*. The fully activated open state of KCNQ1 controls the cardiac “fight-or-flight” response. *PNAS Nexus*. 2024 Oct 9;3(10).
- Zhenzhen Yan#, Ling Zhong#, Wandi Zhu, Sookja Kim Chung, **Panpan Hou***. Chinese herbal medicine for the treatment of cardiovascular diseases – targeting cardiac ion channels. *Pharmacological Research*. 2023. 106765.
 - Demin Ma#, Ling Zhong#, Zhenzhen Yan, Jing Yao, Yan Zhang, Fan Ye, Yuan Huang, Dongwu Lai, Wei Yang*, **Panpan Hou***, Jiangtao Guo*. Structural mechanisms for the activation of human cardiac KCNQ1 channel by electro-mechanical coupling enhancers. *PNAS*. 2022. 119(45).
 - Panpan Hou**, Po Wei Kang, Audrey Deyawe Kongmeneck, Nien-Du Yang, Yongfeng Liu, Jingyi Shi, Xianjin Xu, Kelli McFarland White, Mark A. Zaydman, Marina A. Kasimova, Guiscard Seebohm, Ling Zhong, Xiaoqin Zou, Mounir Tarek*, and Jianmin Cui*. Two-stage electro-mechanical coupling of a Kv channel in voltage-dependent activation. *Nature Communications*. 2020; 11: 676.
 - Panpan Hou**, Jodene Eldstrom, Jingyi Shi, Ling Zhong, Kelli McFarland, Yuan Gao, David Fedida, Jianmin Cui*. Inactivation of KCNQ1 potassium channels reveals dynamic coupling between voltage sensing and pore opening. *Nature Communications*. 2017. 8(1):1730.
 - Panpan Hou**, Jingyi Shi, Kelli McFarland White, Yuan Gao, Jianmin Cui*. ML277 specifically enhances the fully activated open state of KCNQ1 by modulating VSD-pore coupling. *eLife*. 2019. Jul 22;8.
 - Keenan C. Taylor#, Po Wei Kang#, **Panpan Hou#**, Nien-Du Yang, Georg Kuenze, Jarrod A. Smith, Jingyi Shi, Hui Huang, Kelli McFarland White, Dungeng Peng, Alfred L. George Jr., Jens Meiler, Robert L. McFeeters, Jianmin Cui*, and Charles R. Sanders*. Structure and Physiological Function of the KCNQ1 Channel Voltage Sensor Intermediate State. *eLife*. 2020. Feb 24;2.
 - Haowen Liu#, **Panpan Hou#**, Xiying Guo#, Zhiwen Zhao, Bin Hu, Xia Li, Lu-Yang Wang, Jiuping Ding*, Sheng Wang*. Structural Basis for Calcium and Magnesium Regulation of a Large Conductance Calcium-Activated Potassium Channel with $\beta 1$ Subunits. *J. Biol. Chem*. 2014. 289:16914-16923.
 - Junnan Li, Zhenni Yang, Shaoying Zhang, Yangliang Ye, Jiangnan He, Yan Zhang, Huayun Han, Wan Kong, Jiangru Liu, Yu Min, Juwen Shen, Lianghe Mei, Zongsheng Chen, Panpan Hou, Jiangtao Guo, Qiansen Zhang & Huaiyu Yang*. Small molecule inhibits KCNQ channels with a non-blocking mechanism. *Nature Chemical Biology*. 2025.(5)3874.
 - Shaoying Zhang, Demin Ma, Kun Wang, Ya Li, Zhenni Yang, Xiaoxiao Li, Junnan Li, Jiangnan He, Lianghe Mei, Yangliang Ye, Zongsheng Chen, Juwen Shen, **Panpan Hou**, Jiangtao Guo, Qiansen Zhang, Huaiyu Yang*. A small-molecule activation mechanism that directly opens the KCNQ2 channel. *Nature Chemical Biology*. 2024.(3)7265.
 - Demin Ma, Yueming Zheng, Xiaoxiao Li, Xiaoyu Zhou, Zhenni Yang, Yan Zhang, Long Wang, Wenbo Zhang, Jiajia Fang, Guohua Zhao, **Panpan Hou**, Fajun Nan, Wei Yang, Nannan Su, Zhaobing Gao, Jiangtao Guo. Ligand activation mechanisms of human KCNQ2 channel. *Nature Communications*. 2023 14:6632
 - Julian A. Schreiber, Melina Möller, Mark Zaydman, Lu Zhao, Zachary Beller, Sebastian Becker, Nadine Ritter, **Panpan Hou**, Jingyi Shi, Jon Silva, Eva Wrobel, Nathalie Strutz-Seebohm, Niels Decher, Nicole Schmitt, Sven G. Meuth, Martina Düfer, Bernhard Wunsch, Jianmin Cui, and Guiscard Seebohm. A benzodiazepine activator locks Kv7.1 channels open by electro-mechanical uncoupling. *Communications Biology*. 2022. 5:3
 - Yangyang Lin#, Sam Z. Grinter#, Zhongju Lu#, Xianjin Xu#, Hong Zhan Wang, Hongwu Liang, **Panpan Hou**, Junyuan Gao, Chris Clausen, Jingyi Shi, Wenshan Zhao, Zhiwei Ma, Yongfeng Liu, Kelli McFarland White, Lu Zhao, Po Wei Kang, Guohui Zhang, Ira S. Cohen*, Xiaoqin Zou* & Jianmin Cui*. Modulating the voltage sensor of a cardiac

- potassium channel shows antiarrhythmic effects. *PNAS*. 2021 May 18;118(20).
15. Yongfeng Liu#, Xianjin Xu#, Junyuan Gao#, Moawiah M. Naffaa, Hongwu Liang, Jingyi Shi, Hong Zhan Wang, Nien-Du Yang, **Panpan Hou**, Wenshan Zhao, Ira S. Cohen*, Xiaoqin Zou*, Jianmin Cui*. A PIP2 substitute mediates voltage sensor-pore coupling in KCNQ activation. *Communications Biology*. 2020 Jul 16;3(1):385.
 16. Wandu Zhu, Andrea Mazzanti, Taylor L. Vwoelker, **Panpan Hou**, Jonathan D. Moreno, Paweorn Angsutararux, Kristen M. Naegle, Silvia G. Priori, Jonathan R. Silva*. Predicting Patient Response to the Antiarrhythmic Mexiletine Based on Genetic Variation: Personalized Medicine for Long QT Syndrome. *Circulation Research*. 2018. 124(4):539-552.
 17. Mark Zaydman, Marina Kasimova, Kelli McFarland, Zachary Beller, **Panpan Hou**, Holly E Kinser, Hongwu Liang, Guohui Zhang, Jingyi Shi, Mounir Tarek, Jianmin Cui*. Domain-domain interactions determine the gating, permeation, pharmacology, and subunit modulation of the IKs ion channel. *eLife*. 2014. 3:e03606.
 18. Rui Liu#, Zheng Zhang#, Huan Liu#, **Panpan Hou**, Jun Lang, Sheng Wang, Hongli Yan, Pengcheng Li, Zhigang Huang, Hongbing Wu, Mingqiang Rong, Jian Huang, Hong Wang, Longbao Lv, Mingfeng Qiu, Jiuping Ding*, Ren Lai*. Human beta-defensin 2 is a novel opener of Ca²⁺-activated potassium channels and induces vasodilation and hypotension in monkeys. *Hypertension*. 2013. 62:415-425.

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我们在寻找药学、生物物理学、分子生物学、结构生物学等相关专业有自驱力的硕士/博士学生和博士后加入我们一起解密离子通道!