
BIOGRAPHICAL SKETCH

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NAME Dan Hu	POSITION TITLE Research Scientist
eRA COMMONS USER NAME	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Department of Clinical Medicine, Medical College of Wuhan University, Wuhan, China	MD	1993-1998	Clinical Medicine
Department of Cardiology & Institute of Cardiology, Renmin Hospital of Wuhan University, Wuhan, China	PhD	1998-2003	Cardiology
Masonic Medical Research Laboratory, Utica, USA	Post-Doctoral Fellow	2004-2007	Experimental Cardiology

A. Positions and Honors.

Positions and Employment:

- 2003-2004 Attending and Research Member, Department of Cardiology & Institute of Cardiology, Renmin Hospital of Wuhan University, Wuhan, China
- 2004-2007 Post-Doctoral Fellow, Masonic Medical Research Laboratory, Utica, NY
- 2008 - Research Scientist, Masonic Medical Research Laboratory, Utica, NY

Membership:

- 2003-present Member of CSPE (Chinese Society of Cardiac Pacing and Electrophysiology)
- 2007-2008 Member of APS (the America Physiological Society)
- 2007-present Member of AHA (America Heart Association)
- 2008-present Member of CES (Cardiac Electrophysiology Society)

Honors:

- 1995-1997 Excellent student of Medical College of Wuhan University
- 1999 Excellent student leader of Medical College of Wuhan University
- 2001 Excellent graduate student of Wuhan University
- 2003 GENSHAN AWARD of Wuhan University, Wuhan, China
- 2007 Gordon K. Moe Young Investigator Award, Upstate New York Cardiac Electrophysiology Society (UNYCES), Rochester, NY

Scholarships

- 1995-1997 The 2nd prized Student Scholarship in Medical College of Wuhan University for consecutively 3 times (the rate 6%)
- 2001 The 1st prize of Union Educational Scholarship (sponsored by HongKong Union Pharmaceutical Limited Co. for academic performances; rate 2%)
- 2003 The first one to win GENSHAN AWARD of Wuhan University

B. Selected peer-reviewed publications (in chronological order). _

Publications-Articles

1. ***Hu D**, Huang C, Jiang H. Gene therapy to prevent restenosis after PTCA. *Medical Recapitulate*, 1999, 5: 446-448
2. ***Hu D**, Huang C, Jiang H. Ionic Remodeling of atrial fibrillation and its molecular mechanism. *Chinese Journal of Cardiac Pacing and Electrophysiology*, 2000, 14: 45-48
3. ***Hu D**, Huang C. Influence of evidence-based medicine on the study of cardiovascular diseases. *Medicine and Society*, 2001, 14: 6-9
4. ***Hu D**. Effect of evidence-Based Medicine on the treatment of cardiovascular diseases. *Chinese Journal of Hospital Administration*, 2001, 17: 667-669
5. ***Hu D**, Huang C, Jiang H. The role of angiotensin and its receptors in atrial fibrillation. *Chinese Journal of Cardiac Arrhythmias*, 2002, 6: 190-192
6. ***Hu D**, Huang C, Jiang H. Changes of calcium in atrium during atrial fibrillation. *Chinese Journal of Cardiac Pacing and Electrophysiology*, 2002, 16: 390-393
7. Cao Z, Xiao F, Peng F, Jiang D, Mao X, Liu H, Li W, **Hu D**, Wang T. Expression, purification and functional characterization of a recombinant scorpion venom peptide BmTXK β . *Peptides*, 2003, 24:187-192 PubMed ID:12668201
8. ***Hu D**, Huang C, Jiang H, Li GS, Cao ZJ, Li WX, Wang SM. Inhibitory effect of BmTXK β on transient outward potassium current in rabbit atrial myocytes. *Progress in Biochemistry and Biophysics*. 2003; 30: 266-271.
9. ***Hu D**, Huang C, Jiang H, Wang T. Effects of BmTXK β on potassium currents in rabbit atrial myocytes. *Chinese Journal of Cardiac Pacing and Electrophysiology*. 2003; 17: 121-124.
10. ***Hu D**, Huang C, Jiang H, Li GS, Cao ZJ, Li WX, Wang SM. Effects of BmTXK β on electrophysiological properties of rabbit atrial myocytes. *Chin Med J*. 2003; 11: 1691-1696. PubMed ID: 14642139_
11. Jiang H, ***Hu D**. Study of a new ARA: Eplerenone. *World Clinical Drugs*, 2004; 25: 19-22
12. ***Hu D**, Huang C, Li GS, Tu ZF, Mao ZF, Wang ZW. Study of Kir2.1, Kir3.4 and Kv4.3 potassium channel gene expression in atria of patients with chronic atrial fibrillation. *Journal of Wuhan University (Medical Science)*. 2005; 2: 133-138.
13. Cordeiro JM, Barajas-Martinez HM, Hong K, Burashnikov E, Pfeiffer R, Orsino AM, Wu YS, **Hu D**, Brugada J, Brugada P, Antzelevitch C, Dumaine R, Brugada R. Compound heterozygous mutations P336L and I1660V in the human cardiac sodium channel associated with the Brugada syndrome. *Circulation*. 2006; 114: 2026-2033. PMID1989773.
14. **Hu D**, Viskin S, Oliva A, Carrier T, Cordeiro JM, Barajas-Martinez H, Wu Y, Burashnikov E, Sicouri S, Brugada R, Rosso R, Guerchicoff A, Pollevick GM, Antzelevitch C. Novel mutation in the SCN5A gene associated with arrhythmic storm development during acute myocardial infarction. *Heart Rhythm*. 2007; 8:1072-1080. PMID1978483.

15. Hu D, Viskin S, Oliva A, Cordeiro JM, Guerchicoff A, Pollevick GD, Antzelevitch C. Genetic predisposition and cellular basis for ischemia-induced ST segment changes and arrhythmias. *J Electrocardiol.* 2007;40(6S1):S26-S29. PMID2121617.

16. Ravn L, Aizawa Y, Pollevick GD, Hoffman-Bang J, Cordeiro JM, Dixen U, Jensen G, Wu Y, Burashnikov E, Haunso S, Guerchicoff A, **Hu D**, Svendsen J, Christiansen M, Antzelevitch C. Gain of function in IKs secondary to a mutation in KCNE5 associated with atrial fibrillation. *Heart Rhythm.* 2008; 3:427-35. PMID2515863.

17. Barajas-Martinez HM, **Hu D (Co-first Author)**, Cordeiro JM, Wu Y, Kovacs RJ, Meltser H, Kui H, Burashnikov E, Brugada R, Antzelevitch C, Dumaine R. Lidocaine-induced Brugada syndrome phenotype linked to a novel mutation and polymorphism in the cardiac sodium channel. *Circ Res.* 2008; 103:396-404. NIHMS58188.

Comment in: Fozzard HA. [Increased sensitivity to local anesthetic drugs: bedside to bench.](#) *Circ Res.* 2008 ;103(4):325-7.

18. Hu D, Barajas-Martinez HM, Burashnikov E, Springer M, Wu Y, Varro A, Pfeiffer R, Koopmann TT, Guerchicoff A, Pollevick GD, Antzelevitch C. A mutation in the $\beta 3$ subunit of the cardiac sodium channel associated with Brugada ECG phenotype. *Circ Cardiovas Genet*, 2009; 2:270-278.

19. Oliva A, **Hu D (Co-first Author)**, Viskin S, Carrier T, Cordeiro JM, Barajas-Martinez H, Wu Y, Burashnikov E, Brugada R, Rosso R, Guerchicoff A, Pollevick G, Pascali VL, Antzelevitch C. *SCN5A* mutation associated with acute myocardial infarction. *Legal Medicine*, 2009,11(s1): s206-s209. PMID 19345130.

20. Hu D, Barajas-Martinez HM, Nesterenko VV, Pfeiffer R, Guerchicoff A, Cordeiro JM, Curtis AB, Pollevick GD, Wu Y, Burashnikov E, Antzelevitch C. The Influence of a Calcium Channel Polymorphism on Sodium Channel Mutation-Induced Conduction Disease. *PACE*, Accepted, 2009

***Corresponding Author**

Publications-Books

1. Huang Congxin & Hu Dan. Chapter 41: Evaluation on study of SPOTIF II. *Practice of cardiology in 2003 [by People's Medical Publishing house]*, 344-353. 2003.

2. Hu Dan, Jiang Hong, Chen Xin. Chapter 9-12: Congestive Heart Failure: pathology, physiology, diagnosis and treatment. *[by Science Publishing house]*, 134-201. 2004

C. Research Support.

1. "Remodeling Characteristics of Atrial Fibrillation and Study of Drug Intervention" (2005-2007). Young Doctor Fund by Wuhan University. Role: PI.

2. "Remodeling Characteristics of Atrial Fibrillation and Study of Drug Intervention" (2005-2007). Wuhan Dawn Scholar Fund of China by Wuhan Science and Technology Bureau (No. 20045006071-4). Role: PI.

3. "*Electrophysiological action of ranolazine in the canine atrium*" (1/1/2008 – 12/31/2008)

This study was designed to assess the electrophysiological actions of ranolazine in canine atrial and ventricular tissues and advance our understanding of the antiarrhythmic action of the drug.

By CV Therapeutics. Role: Co-Investigator

Area Of Expertise And Primary Interest

- Cardiac Electrophysiology and Pharmacology
- Mechanisms and approach to treatment of cardiac arrhythmia
- Molecular genetics and mutation analysis of the basis for cardiac arrhythmias and sudden cardiac death
- Molecular and cellular characteristics of ion channels in heart
- Gene expression and modulation
- Confocal microscope and cell culture

Current Research

- My work involves basic and clinical research aimed at understanding the basis for the development of cardiac arrhythmias secondary to genetic mutations involving ion channels within the cells of the heart. Genetic errors in the genes that encode cardiac ion channels can lead to electrical disturbances that can cause lethal arrhythmias such as ventricular fibrillation or less life-threatening arrhythmias such as atrial fibrillation. After finding gene mutations associated with various arrhythmic syndromes such as Brugada early repolarization, and Long QT syndromes, I use heterologous expression of the mutated genes and voltage clamp techniques to study the nature of the dysfunction of the ion channel. When the electrical defect observed is consistent with the phenotype of the patient in the clinic, we gain confidence that the genetic variation uncovered is responsible for the disease. Using these same techniques we are able to begin a search for drug therapies that may be used to correct the abnormality in these patients.
- In a recent study, we demonstrated for the first time that a mutation in *SCN5A*, the gene that encodes the α subunit, may be responsible for the development of repeated episodes of ventricular fibrillation, referred to as an electrical storm, in some patients experiencing a heart attack.
- In other studies, we uncovered a mutation that sensitizes the heart to the antiarrhythmic drug lidocaine, causing it to unmask the Brugada syndrome, an inherited arrhythmias syndrome that leads to sudden death of young adults. In yet another study, we demonstrated the basis for the more severe clinical phenotype of family members with compound mutations responsible for the Brugada syndrome.
- We also recently demonstrated that a mutation in *SCN5A* is responsible for conduction disease. The mutation caused a trafficking-defect, meaning that the ion channel protein produced was not properly transported to the membrane of the cardiac cell. The results provide support for the hypothesis that, in addition to the Brugada syndrome, loss of proper transport and functional expression of the hNav1.5 protein in the plasma membrane can result in cardiac conduction defects.
- In another exciting study, we have attempted to delineate the molecular basis for the different characteristics of sodium channels in cells from the upper (atrial) and lower (ventricular) chambers of the heart. We provide evidence in support of the hypothesis that differences in the stoichiometry of α/β subunits may contribute to difference in inactivation characteristics of atrial and ventricular sodium channels. This distinction is the basis for our efforts to identify atrial-selective sodium channel blockers for the management of atrial fibrillation.
- Recently, I have discovered BrS7. It provides evidence that a mutation in *SCN3B*, encoding the $\beta 3$ subunit of the sodium channel, can cause a loss of function in I_{Na} leading to a Brugada phenotype. It will assist with the diagnosis and ultimately with the approach to therapy by understanding the genetic basis for the Brugada syndrome.

Selected Publications

Cao Z, Xiao F, Peng F, Jiang D, Mao X, Liu H, Li W, **Hu D**, Wang T. Expression, purification and functional characterization of a recombinant scorpion venom peptide BmTXK β . *Peptides*, 2003, 24:187-192 PubMed ID12668201

Hu D, Huang C, Jiang H, Li GS, Cao ZJ, Li WX, Wang SM. Inhibitory effect of BmTXK β on transient outward potassium current in rabbit atrial myocytes. *Progress in Biochemistry and Biophysics*. 2003; 30: 266-271.

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Ravn L, Aizawa Y, Pollevick GD, Hoffman-Bang J, Cordeiro JM, Dixen U, Jensen G, Wu Y, Burashnikov E, Haunso S, Guerchicoff A, **Hu D**, Svendsen J, Christiansen M, Antzelevitch C. Gain of function in IKs secondary to a mutation in KCNE5 associated with atrial fibrillation. Heart Rhythm. 2008; 3:427-35. PMCID2515863.

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Hu D, Barajas-Martinez HM, Burashnikov E, Springer M, Wu Y, Varro A, Pfeiffer R, Koopmann TT, Guerchicoff A, Pollevick GD, Antzelevitch C. A mutation in the β 3 subunit of the cardiac sodium channel associated with Brugada ECG phenotype. Circ Cardiovas Genet, 2009; 2:270-278.

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Hu D, Barajas-Martinez HM, Nesterenko VV, Pfeiffer R, Guerchicoff A, Cordeiro JM, Curtis AB, Pollevick GD, Wu Y, Burashnikov E, Antzelevitch C. The Influence of a Calcium Channel Polymorphism on Sodium Channel Mutation-Induced Conduction Disease. PACE, Accepted, 2009