

HUICHUN XU, MD, PhD

Research Fellow

Center for Research on Genomics and Global Health
National Human Genome Research Institute, National Institutes of Health
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EDUCATION

PhD, Neuroscience, University of California, Davis, 2008

Dissertation: Gene Expression Profiling Studies of Preconditioning Hypoxia in Animals and Stroke in Humans.

MD, Internal Medicine, Integrated Seven Year Honors Program for Medicine Practice & Medical Research, Hunan Medical University, Changsha, 1997

Advanced Training in Clinical Research Certificate Program (ATCR), Clinical and Translational Sciences Institute (CTSI), University of California at San Francisco, Aug 2009-June 2010

PATENT PENDING (US/International) & Commercialization

Title: Methods for diagnosing ischemia by detecting expression levels of genes differentially expressed in ischemia. Primary Inventor. Priority No. and Date: US20070915366P, May 01, 2007; International Application No. and Filing Date: PCT/US2008/062064, on April 30, 2008, publication date 13.11.2008; publication number WO 2008/137465 (A1); European Patent Office, application data 30.04.2008, Application number and publication date 08747217 , 17.02.2010 ; 10014221, 20.04.2011 publication number EP 2152907; Hong Kong application number and date 10107142.0 26.07.2010 publication number and date HK1140796 22.10.2010/A; China publication number CN101688245 (A) ; Canada Publication number CA2685382 (A1) and date 2008-11-13

Commercialization development by Ischemia Care, LLC (ISC), which is an early stage personalized medicine and molecular diagnostics company focused on stroke and TIA (Transient Ischemic Attacks).

RESEARCH/TEACHING EXPERIENCE

Research Fellow: Center for Research on Genomics and Global Health, National Human Genome Research Institute, National Institutes of Health, 12/2010-present.

Instructor: Course “Genomics” in Department of Biology, College of Arts and Sciences, University of the District of Columbia, Fall, 2011-2012

Instructor for Summer Undergraduate and Graduate Program Interns' Journal

Club “Getting more with less: Microarray-based gene expression profiling”, National Institutes of Health, Summer, 2011

AHA-Bugher Foundation Stroke Fellow: Neurology Department in University of California, San Francisco and Neurology Department in University of California at Davis, 07/2009-12/2010

Postdoctoral Fellow: Neurology Department, University of California at Davis Medical Center, 02/2009-06/2009

Graduate Student Researcher: Neurology Department, University of California at Davis Medical Center, 09/2004-12/2008

Teaching Assistant: for “The Human Brain and Disease” , Department of Neurobiology, Physiology & Behavior, UC Davis, Fall 2007

HONORS

Scholarship from Cold Spring Harbor Laboratory for Workshop: Genetics of Complex Human Diseases, August 2012

Genome Recognition of Employee Accomplishments and Talents (GREAT) Award by NHGRI Senior Leadership Team of NIH (National Institutes of Health), May 2012

Outstanding Service Award in recognition of exceptional performance in supporting the training mission of National Human Genome Research Institute (NHGRI), NIH, June 2012

Mordecai Y. T. Globus New Investigator Award in Stroke, American Heart Association, International Stroke Conference 2010

National Science Foundation Education Travel Award for ABRF2010 Satellite workshop, Association of Biomolecular Resource Facilities(ABRF) 2010.

Competitively selected to attend the Second Annual NIH National Graduate Student Research Festival by NIH in October 2007.

Outstanding Medical Student Award in comprehensive performance evaluation, Hunan Medical University, Changsha, 1993.

ACADEMIC SERVICE

Reviewer for Scientific Journals: Brain Research, Annals of Neurology, Movement Disorders Journal, The Chinese Journal of Physiology, Medical Science Monitor, Genomics, International Journal of Chronic Obstructive Pulmonary Disease, Therapy (Now titled Clinical Practice), Journal of Pharmacognosy and Phytotherapy, Proceedings of the National Academy of Sciences(Biological Sciences), Clinical Interventions in Aging, Journal of

Diabetes & Metabolism

International Grant Reviewer for the Research Grants Council (RGC) of Hong Kong, 2008

Judge for the 7th Annual DNA Day Essay Contest for high school students hosted by American Society of Human Genetics, March 2012; **Judge** for District of Columbia Science, Technology, Engineering and Mathematics (STEM) Fair, Washington DC, USA, March 24, 2012; **Judge** for the 8th Annual Graduate Student Research Symposium hosted by National Institutes of Health, Bethesda, USA, January 11, 2012; **Judge** for the 2011 Postbac Poster Day hosted by National Institutes of Health, Bethesda, USA, May 18 2011

Serve on Genome Trainee Advisory Committee, National Human Genome Research Institute, National Institutes of Health, 2012

PROFESSIONAL AFFILIATIONS

American Society of Human Genetics

PUBLICATIONS

(1) Articles in Scientific Journal

Eksi S, Morahan BJ, Haile Y, Furuya T, Jiang H, Ali O, **Xu H**, Kiattibutr K, Suri A, Czesny B, Adeyemo A, Myers TG, Sattabongkot J, Su X, Williamson KC. (2012) Plasmodium falciparum gametocyte development 1 (Pfgdv1) and gametocytogenesis early gene identification and commitment to sexual development. PLoS Pathog 8(10): e1002964.

Xu H, Lu A, Sharp FR. (2011) Regional genome transcriptional response of adult mouse brain to hypoxia. BMC Genomics 12:499.

Weinsheimer SM*, **Xu H***, Achrol AS, et al. (2011) RNA expression profiling of blood in brain arteriovenous malformation patients. Translational Stroke Research 2:575-587. (* **co-first author**)

Chen G, Ramos E, Adeyemo A, Shriner D, Zhou J, Doumatey AP, Huang H, Erdos MR, Gerry NP, Herbert A, Bentley AR, **Xu H**, Charles BA, Christman MF, Rotimi CN. (2011) UGT1A1 is a major locus influencing bilirubin levels in African Americans. Eur J Hum Genet. 2011 Nov 16:206.

Jickling GC, Stamova B, Ander BP, Zhan X, Tian Y, Liu D, **Xu H**, Johnston SC, Verro P, Sharp FR (2011) Profiles of lacunar and nonlacunar stroke. Ann Neurol 70:477-485.

Zhan X, Jickling GC, Tian Y, Stamova B, **Xu H**, Ander BP, Turner RJ, Mesias M, Verro P, Bushnell C, Johnston SC, Sharp FR (2011) Transient ischemic attacks

characterized by RNA profiles in blood. *Neurology* 77:1718-1724.

Tian Y, Gunther JR, Liao IH, Liu D, Ander BP, Stamova BS, Lit L, Jickling GC, **Xu H**, Zhan X, Sharp FR (2011) GABA- and acetylcholine-related gene expression in blood correlate with tic severity and microarray evidence for alternative splicing in Tourette syndrome: a pilot study. *Brain Res* 1381:228-236.

Xu H, Stamova B, Jickling G, Tian Y, Zhan X, Ander BP, Liu D, Turner R, Rosand J, Goldstein LB, Furie KL, Verro P, Johnston SC, Sharp FR, Decarli CS (2010) Distinctive RNA expression profiles in blood associated with white matter hyperintensities in brain. *Stroke* 41:2744-2749.

Jickling GC, **Xu H**, Stamova B, Ander BP, Zhan X, Tian Y, Liu D, Turner RJ, Mesias M, Verro P, Khoury J, Jauch EC, Pancioli A, Broderick JP, Sharp FR (2010) Signatures of cardioembolic and large-vessel ischemic stroke. *Ann Neurol* 68:681-692.

Stamova B, **Xu H**, Jickling G, et al. (2010) Gene expression profiling of blood for the prediction of ischemic stroke. *Stroke* 41:2171-2177.

International Stroke Genetics Consortium, Wellcome Trust Case-Control Consortium 2 (2010) Failure to validate association between 12p13 variants and ischemic stroke. *N Engl J Med* 362:1547-1550.

Jickling GC, **Xu H**, Sharp FR (2010) Biomarkers of Ischemic Stroke. *US Neurology* 5:52-54

Jickling GC, Zhan X, Ander BP, Turner RJ, Stamova B, **Xu H**, Tian Y, Liu D, Davis RR, Lapchak PA, Sharp FR (2010a) Genome response to tissue plasminogen activator in experimental ischemic stroke. *BMC Genomics* 11:254.

Zhan X, Ander BP, Jickling G, Turner R, Stamova B, **Xu H**, Liu D, Davis RR, Sharp FR (2010) Brief focal cerebral ischemia that simulates transient ischemic attacks in humans regulates gene expression in rat peripheral blood. *J Cereb Blood Flow Metab* 30:110-118

Liu DZ, Tian Y, Ander BP, **Xu H**, Stamova BS, Zhan X, Turner RJ, Jickling G, Sharp FR (2010) Brain and blood microRNA expression profiling of ischemic stroke, intracerebral hemorrhage, and kainate seizures. *J Cereb Blood Flow Metab* 30:92-101

Lit L, Sharp FR, Apperson M, Liu DZ, Walker WL, Liao I, **Xu H**, Ander BP, Wong B (2009) Corticosteroid effects on blood gene expression in Duchenne

muscular dystrophy. *Pharmacogenomics J* 9(6):411-418.

Liu D-Z, Ander BP, **Xu H**, Shen Y, Kaur P, Deng W, Sharp FR (2009) Blood brain barrier breakdown and repair by src after thrombin-induced injury. *Annals of Neurology* 67(4):526-33.

Stamova BS, Apperson M, Walker WL, Tian Y, **Xu H**, Adamczyk P, Zhan X, Liu DZ, Ander BP, Liao IH, Gregg JP, Turner RJ, Jickling G, Lit L, Sharp FR (2009) Identification and Validation of Suitable Endogenous Reference Genes for Gene Expression Studies in Human Peripheral Blood. *BMC Med Genomics* 2:49.

Xu H, Tang Y, Liu D-Z, Ran R, Ander BP, Apperson M, Liu XS, Khoury JC, Gregg JP, Pancioli A, Jauch EC, Wagner KR, Verro P, Broderick JP, Sharp FR (2008) Gene expression in peripheral blood differs after cardioembolic compared with large-vessel atherosclerotic stroke: biomarkers for the etiology of ischemic stroke. *J Cereb Blood Flow Metab* 28:1320-8.

Robbins SH, Walzer T, Dembele D, Thibault C, Defays A, Bessou G, **Xu H**, Vivier E, Sellars M, Pierre P, Sharp FR, Chan S, Kastner P, Dalod M (2008) Novel insights into the relationships between dendritic cell subsets in human and mouse revealed by genome-wide expression profiling. *Genome Biol* 9:R17.

Liu DZ, Cheng XY, Ander BP, **Xu H**, Davis RR, Gregg JP, Sharp FR (2008) Src kinase inhibition decreases thrombin-induced injury and cell cycle re-entry in striatal neurons. *Neurobiol Dis* 30:201-11.

Sharp FR, **Xu H**, Lit L, Walker W, Pinter J, Apperson M, Verro P (2007) Genomic Profiles of Stroke in Blood. *Stroke* 38:691-3.

Ran R, Pan R, Lu A, **Xu H**, Davis RR, Sharp FR (2007) A novel 165-kDa Golgin protein induced by brain ischemia and phosphorylated by Akt protects against apoptosis. *Mol Cell Neurosci* 36:392-407.

Tang Y, **Xu H**, Du X, Lit L, Walker W, Lu A, Ran R, Gregg JP, Reilly M, Pancioli A, Khoury JC, Sauerbeck LR, Carrozzella JA, Spilker J, Clark J, Wagner KR, Jauch EC, Chang DJ, Verro P, Broderick JP, Sharp FR (2006) Gene expression in blood changes rapidly in neutrophils and monocytes after ischemic stroke in humans: a microarray study. *J Cereb Blood Flow Metab* 26:1089-102.

Sharp FR, **Xu H**, Lit L, Walker W, Apperson M, Gilbert DL, Glauser TA, Wong B, Hershey A, Liu D-Z, Pinter J, Zhan X, Liu X, Ran R (2006) The Future of Genomic Profiling of Neurological Diseases Using Blood. *Arch Neurol* 63:1529-36.

Sharp FR, Lit L, **Xu H**, Apperson M, Walker W, Wong B, Gilbert DL, Hershey A, Glauser TA (2006) Genomics of brain and blood: progress and pitfalls. *Epilepsia* 47:1603-7.

Du X, Tang Y, **Xu H**, Lit L, Walker W, Ashwood P, Gregg JP, Sharp FR (2006) Genomic profiles for human peripheral blood T cells, B cells, natural killer cells, monocytes, and polymorphonuclear cells: comparisons to ischemic stroke, migraine, and Tourette syndrome. *Genomics* 87:693-703.

Ran R, **Xu H**, Lu A, Bernaudin M, Sharp FR (2005) Hypoxia preconditioning in the brain. *Dev Neurosci* 27:87-92.

Ran R, Lu A, Zhang L, Tang Y, Zhu H, **Xu H**, Feng Y, Han C, Zhou G, Rigby AC, Sharp FR (2004) Hsp70 promotes TNF-mediated apoptosis by binding IKK gamma and impairing NF-kappa B survival signaling. *Genes Dev* 18:1466-81.

(2) Book Chapters

Sharp FR, **Xu H**, Liu X, Ran R (2007) Molecular biology of the penumbra. In: *The ischemic penumbra : pathophysiology, imaging and therapy* (Donnan GA, Baron J-C, Davis SM, Sharp FR, eds), New York: Informa Healthcare, 93-108.

Ran R, Lu A, **Xu H**, Tang Y, Sharp FR (2007) Heat-shock protein regulation of protein folding, protein degradation, protein function, and apoptosis In: *Handbook of neurochemistry and molecular neurobiology: acute ischemic injury and repair in the nervous system* (Chan PH, Lajtha A, eds), 3rd ed., New York: Springer, 89-107.

Tang Y, Gilbert D, Glauser T, Hershey A, Lu A, Ran R, **Xu H**, Sharp F (2006) Blood Genomic Fingerprints of Brain Diseases. In: *Surrogate Tissue Analysis: Genomic, Proteomic, and Metabolomic Approaches* (Burczynski ME, Rockett JC, eds), Boca Raton: CRC Press LLC., 31-46.

ABSTRACTS AND PRESENTATIONS

Xu H. Application of Gene Expression Profiling in Diagnosing and Studying Vascular Diseases and Their Risk Factors. 2012 First Annual World Congress: Understanding the Molecular Basis of Heart Disease and Cancer. Feb 17-18, 2012, Hawaii, USA. (**Invited Speaker**)

Xu H, Adeyemo A,Elkahloun A,Adeleye J,Balogun W,Huang H,Zhou J,Chen G,Shriner D,Adebamowo C,Chandrasekharappa S,Rotimi CN.Whole-genome expression profiling of skeletal muscle reveals potential link between insulin resistance and diabetes in over weight west Africans. (Abstract/Program #844F). Presented at the 12th International Congress of Human Genetics/61st Annual Meeting of The American Society of Human Genetics, October 12, 2011, Montreal, Canada.

Doumatey P, **Xu H**, Adeyemo A, Elkahloun A, Huang H, Rotimi CN. Whole genome gene expression profile of omental adipose tissue in obese Type 2 diabetic African Americans.(Abstract/Program #803T). Presented at the 12th International Congress of Human Genetics/61st Annual Meeting of The American Society of Human Genetics, October 12, 2011, Montreal, Canada.

Chen G,Ramos E,Adeyemo A,Shriner D,Zhou J,Doumatey A,Huang H,Gerry N,Herbert A,Beneley A,**Xu H**,Charles B,Christman M,Rotimi C.UGT1A1 is a Major Locus Influencing Bilirubin Levels in African americans.(Abstract/Program #969F). Presented at the 12th International Congress of Human Genetics/61st Annual Meeting of The American Society of Human Genetics, October 12, 2011, Montreal, Canada.

Ko N, **Xu H**, Ander BP, Stamova B, Jickling G, Zhan X, Tian Y, Kim H,Young WL, Sharp FR. . Exon Level Expression Profiles That Associate with Angiographic Vasospasm in Patients with Aneurysmal Subarachnoid Hemorrhage. Program No. Late Breaking Science LB P7. International Stroke Conference. Los Angeles: American Heart Association, 2011. (Late Breaking Science Poster)

Xu H, Stamova B, Jickling G, Tian Y, Zhan X,Ander BP, Liu D, Turner R,Sharp FR, DeCarli CS. Distinctive RNA Expression Profiles of White Matter Hyperintensities in the Blood of Human Subjects Using Genome Wide Microarray Analyses. Program No. A7. International Stroke Conference. San Antonio: American Heart Association, 2010. **(Oral Presentation)**

Xu H, Sharp FR. Regulation of cell survival related genes in cerebellum following hypoxia preconditioning. The XXIVth International Symposium on Cerebral Blood Flow, Metabolism, & Function, and the IXth International Conference on Quantification of Brain Function with PET(BRAIN'09 & BRAINPET'09), June 29-July 3 2009, Chicago, IL, USA. Journal of Cerebral Blood Flow & Metabolism 29:S565

Adamczyk PR, **Xu H**, Tian Y, Tang Y, Liu D, Ander BP, Khoury J, Gregg JP, Pancioli A, Jauch E, Wagner K, Verro P, Stamova B, Lit L, Achrol AS, Zhan X, Liao I, Jickling G, Young RTW, Broderick J, Sharp F. Gender Differences in Blood Gene Expression during Ischemic Stroke. In: 2009 AAN Annual Meeting. Seattle,USA. Online.

Xu H, Ran R, Lu A, Sharp FR. Genomic response to hypoxia preconditioning in the adult mouse brain. Program No. 413.6 2008 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2008. Online. **(Oral Presentation)**

Xu H, Gregg JP, Pancioli A, Jauch EC, Verro P, Broderick JP, Sharp FR. Etiology of Ischemic Stroke Determined Using Blood Gene Expression Profiling. Program No. P29. Abstracts of the International Stroke Conference 2008 39: 576-P29

Xu H, Khoury JC, Chang DJ, Verro P, Broderick JP, Sharp FR. Deferential molecular mechanisms for different etiologies of human ischemic stroke revealed by blood expression profiling. Program No. 549.13. 2007 Neuroscience Meeting Planner. San Diego, CA: Society for Neuroscience, 2007. Online. **(Oral Presentation)**

Xu H, Liao I, Lit L, Apperson M, Verro P, Chang J, Broderick JP, Sharp FR. Genomic profiles in the blood of patients with ischemic stroke differ depending upon whether they are atheroembolic or cardioembolic. 59th Annual Meeting of the American-Academy-of-Neurology, April 28 -May 05, 2007, Boston, MA, USA. Neurology 68 (12, Suppl. 1): A357 MAR 20 2007. **(Oral Presentation)**

Xu H, DeLemos C, Chang DJ, Verro P, Tang Y, Lu A, Ran R, Walker W, Gregg, JP, Reilly M, Pancioli AM, Khoury JC, Sauerbeck LR, Carrozzella JA, Spilker J, Clark JF, Wagner KR, Jauch EC, Broderick JP, Sharp FR. (2007) Blood Genomic "Imaging": Potential Surrogate Markers for the Differential Diagnosis of Acute Stroke. Program No. **Late Breaking Science** LB P5. International Stroke Conference. San Francisco: American Heart Association, 2007.

Sharp FR, **Xu H**, Tang Y, Verro P, Chang D, Apperson M, Pancioli A, Khoury JC, Sauerbeck LR, Carrozzella JA, Spilker J, Clark JF, Wagner KR, Jauch EC, Broderick JP. Prediction of Ischemic Stroke and Its Causes at 2 to 24 Hours Using Blood Genomic Profiles in Humans. Program No.P217. International Stroke Conference. San Francisco: American Heart Association, 2007.

Sharp FR, **Xu H**, Ran R (2006) Ischemic tolerance in brain: multiple pathways with a single mechanism versus multiple pathways with multiple mechanisms. Colloquium C03: Ischemic Tolerance in the Brain: Deciphering Endogenous Neuroprotective Pathways Induced by Preconditioning. 37th Annual Meeting of American Society for Neurochemistry (ASN), Portland, Oregon. March 11-15, 2006. Journal of Neurochemistry 96:S1 (10-11). **(Presentation)**

Xu H, Tang Y, Lu A, Ran R, Gregg JP, Sharp FR. Mining the genes underlying hypoxia preconditioning in the mouse brain. Program No. 98.4. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Sharp FR, Tang Y, Du X, Lu A, Ran R, **Xu H**, Lit L, Reilly M, Pancioli A, Khoury JC, Sauerbeck LA, Carrozzella J, Spilker J, Clark J, Wagner KR, Jauch EC, Verro P, Chang DJ, Broderick JP. (2005). Genomic expression profiles in blood change rapidly in neutrophils and monocytes following acute ischemic stroke. Program No. 358.9. 2005 Abstract Viewer/Itinerary Planner. Washington, DC:

Society for Neuroscience, 2005. Online.

Ran R, Tang Y, Du X, Franz D, Schapiro M, Gilbert D, Hershey A, Glauser T, **Xu H**, Lit L, Lu A, Sharp FR. Autism-related gene regulated in blood of tuberous sclerosis patients: genomic analysis using microarrays. Program No. 564.10. 2005 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2005. Online.

Ran R, Lu A, Tang Y, **Xu H**, Sharp FR. Cloning of a golgi protein that is induced in brain by ischemia. Program No. 158.21. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online.