BIOGRAPHICAL SKETCH

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NAME: Li, Hong

eRA COMMONS USER NAME (credential, e.g., agency login): HONGLI2

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
University of Nevada, Reno, NV	BS	05/1992	Biochemistry
University of Nevada, Reno, NV	PHD	05/1997	Biochemistry
Albert Einstein College of Medicine, Bronx, NY	Postdoctoral Fellow	05/1998	Pharmacology

A. Personal Statement

I have successfully managed 200+ high throughput proteomics projects, including several redox proteomics studies at the Center for Advanced Proteomics Research (CAPR), which provides the experience necessary to conduct the proteomic analysis of platelet thiols described in the current proposal. I have over 25 years of experience in protein mass spectrometry, protein expression analysis, and post-translational modifications (PTMs) profiling. I have considerable expertise in redox PTM proteomics. We have used direct mass spectrometry and biotin-switch-based methods to identify and quantify S-nitrosylation, free thiols, disulfides, and sulfonation in proteins and peptides, from diverse samples origins include cells, hearts, brains, spinal cords, and serum. With considerable expertise in redox proteomics, I have successfully collaborated with Dr. Junichi Sadoshima. In 2023, we published another paper on the proteomic analysis of ATG7/Trx1 complex in JCI. Given my expertise in proteomics, I am confident that we will help him with his thioredoxin grant. Besides successful research collaborations, I have successfully directed the NeuroProteomics Core Facility, funded by a P30 grant from the NIH-NINDS. I also serve as a leader heading the Proteomics Core in the Drug Toxicity Signature Generation Center at Mt. Sinai School of Medicine, one of the only six centers in the NIH LINCS program. In summary, my expertise in PTM proteomics, history of successful NIH grant management, research collaborations, and an extensive publication record from partnerships will guide CAPR scientists and staff to complete the aims proposed in the current proposal. Ongoing projects that I would like to highlight include: 2R01GM112415-05A1 Beuve (PI) 09/20/2020-08/31/24 NIH/NIGMS NO Signaling by a Soluble Guanylyl Cyclase -Thioredoxin Transnitrosation Complex The major goal of this project is to the discovery of novel cardioprotective pathway driven by specific S-nitrosation. Role: Co- Investigator

Peer reviewed publications that specifically highlight my experience collaborating with other researchers on identification of low abundant proteins and qualifications of successful management of the CAPR:

1. Nagarajan N, Oka S, Nah J, Wu C, Zhai P, Mukai R, Xu X, Kashyap S, Huang C, Sung E, Mizushima W, Titus A, Takayama K, Mourad Y, Francisco J, Liu T, Chen T, Li H, Sadoshima J. Thioredoxin 1 promotes autophagy through transnitrosylation of Atg7 during myocardial ischemia. Journal of Clinical Investigation. 2023; 133(3):-. Available from: https://www.jci.org/articles/view/162326 DOI: 10.1172/JCI162326
2. Oka SI, Sreedevi K, Shankar TS, Yedla S, Arowa S, James A, Stone KG, Olmos K, Sabry AD, Horiuchi A, Cawley KM, O'very SA, Tong M, Byun J, Xu X, Kashyap S, Mourad Y, Vehra O, Calder D, Lunde T, Liu T, Li H, Mashchek JA, Cox J, Saijoh Y, Drakos SG, Warren JS. PERM1 regulates energy metabolism in the heart *via* ERRα/PGC-1α axis. Front Cardiovasc Med. 2022;9:1033457. PubMed Central PMCID: PMC9676655.
3. Cui C, Wu C, Shu P, Liu T, Li H, Beuve A. Soluble guanylyl cyclase mediates noncanonical nitric oxide signaling by nitrosothiol transfer under oxidative stress. Redox Biol. 2022 Aug 2;55:102425. PubMed Central PMCID: PMC9372771.

4. Cui C, Liu T, Chen T, Lu J, Casaren I, Lima DB, Carvalho PC, Beuve A, Li H. Comprehensive identification of protein disulfide bonds with pepsin/trypsin digestion, Orbitrap HCD and Spectrum Identification Machine. J Proteomics. 2019 Apr 30;198:78-86. PubMed Central PMCID: PMC6414265.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2005 -	Associate Professor, RBHS-NEW JERSEY MEDICAL SCHOOL, Newark, NJ
2000 - 2005	Assistant Professor, RBHS-NEW JERSEY MEDICAL SCHOOL, Newark, NJ
1998 - 1999	Senior Scientist, Synaptic Pharmaceutical Corporation, Paramus, NJ

Honors

2019 - 2021	Grant Reviewer, Fulbright Binational Egyptian Student Program
2012 - 2018	Grant Reviewer, The Netherlands Organization for Health Research and Development, NWO Investment in Scientific Infrastructure
2021	Grant Reviewer, NIH CSR – Transformative Research Award (TRA)
2018	Grant Reviewer, Society for Redox Biology and Medicine
2017	Frant Reviewer, French Ministry of Higher Education and Research
2016	Grant Reviewer, NIH BIOMEDICAL TECHNOLOGY RESEARCH RESOURCE (P41) 2016-10 ZRG1 CB-D 40 P
2016	Grant Reviewer , NIH ZNS1 SRB-N (12): NINDS Institutional Center Core Grants to Support Neuroscience Research (P30) & High Impact Neuroscience Research Resource Grants (R24) ZRG1 F04B-D (20)
2014	Grant Reviewer, NIH Special Emphasis Panel: Biochemistry and Biophysical Chemistry Fellowships ZRG1 F04B-D (20)
2014	Grant Reviewer , NIH Competitive Renewal Study Panel, Development for Protein Affinity Reagents. ZRG12014 BST-K50
2014	Grant Reviewer, NIH Special Emphasis Panel: Review Committee for Environmental Exposure and Neurodegenerative Diseases (R21 & R01s) ZES1 LWJ K R 1
2011	Grant Reviewer, NIH CSR - Technology Development of New Affinity Reagents against the Human Proteome BST-M (51)
2011	Grant Reviewer, NIH NIEHS - Biomarkers Indicative of Mitochondrial Dysfunction. ZES1 LWJ-J (MI) 1
2009	Grant Reviewer, NIH NCRR Shared Instrumentation Program. ZRG1 BCMB-D (30) I
2009	Grant Reviewer, WELLCOME TRUST PROGRAMME GRANT
2000	Journal Reviewer, J Proteome Res., J Proteomics, J Neurosci. Method, J Chromatography, J Biol. Chem., Molec & Cell Neurisci, Bioinformatics, Cancer Therapy, Placenta, Antioxidant Redox Signaling, Molec. Vision, Free Radical Bio & Med, Rapid Comm. in Mass Spec, Apoptosis, Dev. Neurosci., Proteomics, BBA Proteomics, Amino Acids

C. Contribution to Science

1. A key focus of my group is to develop proteomics approaches to study global protein expression and protein-protein interactions. Many of these are collaborative studies have enabled the discovery of novel mechanistic insights in signal transduction, biomarkers, and human disease mechanisms. Our experience will allow them to design experiments and ensure optimal productivity.

    a. Cui C, Wu C, Shu P, Liu T, Li H, Beuve A. Soluble guanylyl cyclase mediates noncanonical nitric oxide signaling by nitrosothiol transfer under oxidative stress. Redox Biol. 2022 Aug 2;55:102425. PubMed Central PMCID: PMC9372771.

    b. Du S, Wu S, Feng X, Wang B, Xia S, Liang L, Zhang L, Govindarajalu G, Bunk A, Kadakia F, Mao Q, Guo X, Zhao H, Berkman T, Liu T, Li H, Stillman J, Bekker A, Davidson S, Tao YX. A nerve injury-specific long noncoding RNA promotes neuropathic pain by increasing Ccl2 expression. J Clin Invest. 2022 Jul 1;132(13) PubMed Central PMCID: PMC9246381.

c. Murari A, Goparaju NSV, Rhooms SK, Hossain KFB, Liang FG, Garcia CJ, Osei C, Liu T, Li H, Kitsis RN, Patel R, Owusu-Ansah E. IDH2-mediated regulation of the biogenesis of the oxidative phosphorylation system. Sci Adv. 2022 May 13;8(19):eabl8716. PubMed Central PMCID: PMC9094667.

d. Xiong Y, Liu T, Chen T, Hansen J, Hu B, Chen Y, Jayaraman G, Schürer S, Vidovic D, Goldfarb J, Sobie E, Birtwistle M, Iyengar R, Li H, Azeloglu E. Proteomic cellular signatures of kinase inhibitor-induced cardiotoxicity. Scientific Data. 2022 January 20; 9(1):-. Available from: https://www.nature.com/articles/s41597-021-01114-3 DOI: 10.1038/s41597-021-01114-3

2. My lab focuses on developing novel proteomics methods to study redox-signaling modifications with higher sensitivity and specificity. In diverse biological systems, we have developed qualitative and quantitative approaches to identify redox-sensitive cysteines and other post-translational changes within redox signaling proteins.

   a. Nakamura M, Liu T, Husain S, Zhai P, Warren JS, Hsu CP, Matsuda T, Phiel CJ, Cox JE, Tian B, Li H, Sadoshima J. Glycogen Synthase Kinase-3α Promotes Fatty Acid Uptake and Lipotoxic Cardiomyopathy. Cell Metab. 2019 May 7;29(5):1119-1134.e12. PubMed Central PMCID: PMC6677269.

   b. Cui C, Liu T, Chen T, Lu J, Casaren I, Lima DB, Carvalho PC, Beuve A, Li H. Comprehensive identification of protein disulfide bonds with pepsin/trypsin digestion, Orbitrap HCD and Spectrum Identification Machine. J Proteomics. 2019 Apr 30;198:78-86. PubMed Central PMCID: PMC6414265.

   c. Zhou J, Wu Y, Chen F, Wang L, Rauova L, Hayes VM, Poncz M, Li H, Liu T, Liu J, Essex DW. The disulfide isomerase ERp72 supports arterial thrombosis in mice. Blood. 2017 Aug 10;130(6):817-828. PubMed Central PMCID: PMC5553574.

   d. Wu C, Dai H, Yan L, Liu T, Cui C, Chen T, Li H. Sulfonation of the resolving cysteine in human peroxiredoxin 1: A comprehensive analysis by mass spectrometry. Free Radic Biol Med. 2017 Jul;108:785-792. PubMed Central PMCID: PMC5564515.

3. One key area of my research is understanding how thioredoxin 1 (Trx1) regulates redox signaling in cells and diseases. One of the most significant findings from my group is the discovery of a new mechanism that governs how Trx1 can serve as either a transnitrosylase or a denitrosylase under different cellular redox environments. The success of this project could lead to the discovery of a novel cell survival pathway driven by specific S-nitrosation.

   a. Huang C, Alapa M, Shu P, Nagarajan N, Wu C, Sadoshima J, Kholodovych V, Li H, Beuve A. Guanylyl cyclase sensitivity to nitric oxide is protected by a thiol oxidation-driven interaction with thioredoxin-1. J Biol Chem. 2017 Sep 1;292(35):14362-14370. PubMed Central PMCID: PMC5582831.

   b. Hammerling BC, Najor RH, Cortez MQ, Shires SE, Leon LJ, Gonzalez ER, Boassa D, Phan S, Thor A, Jimenez RE, Li H, Kitsis RN, Dorn GW II, Sadoshima J, Ellisman MH, Gustafsson ÅB. A Rab5 endosomal pathway mediates Parkin-dependent mitochondrial clearance. Nat Commun. 2017 Jan 30;8:14050. PubMed Central PMCID: PMC5290275.

   c. Beuve A, Wu C, Cui C, Liu T, Jain MR, Huang C, Yan L, Kholodovych V, Li H. Identification of novel S-nitrosation sites in soluble guanylyl cyclase, the nitric oxide receptor. J Proteomics. 2016 Apr 14;138:40-7. PubMed Central PMCID: PMC5066868.

   d. Shao D, Oka S, Liu T, Zhai P, Ago T, Sciarretta S, Li H, Sadoshima J. A redox-dependent mechanism for regulation of AMPK activation by Thioredoxin1 during energy starvation. Cell Metab. 2014 Feb 4;19(2):232-45. PubMed Central PMCID: PMC3937768.

4. A key focus of my group is to develop proteomics approaches to study protein phosphorylation and other modifications. Finding changes in key phosphorylation and PTM sites has enabled us to discover novel mechanistic insights into cell signaling and diseases.

   a. Davra V, Saleh T, Geng K, Kimani S, Mehta D, Kasikara C, Smith B, Colangelo NW, Ciccarelli B, Li H, Azzam EI, Kalodimos CG, Birge RB, Kumar S. Cyclophilin A Inhibitor Debio-025 Targets Crk, Reduces

Metastasis, and Induces Tumor Immunogenicity in Breast Cancer. Mol Cancer Res. 2020 Aug;18(8):1189-1201. PubMed Central PMCID: PMC8045419.

b. Geng K, Kumar S, Kimani SG, Kholodovych V, Kasikara C, Mizuno K, Sandiford O, Rameshwar P, Kotenko SV, Birge RB. Requirement of Gamma-Carboxyglutamic Acid Modification and Phosphatidylserine Binding for the Activation of Tyro3, Axl, and Mertk Receptors by Growth Arrest-Specific 6. Front Immunol. 2017;8:1521. PubMed Central PMCID: PMC5686386.

c. Sciarretta S, Zhai P, Maejima Y, Del Re DP, Nagarajan N, Yee D, Liu T, Magnuson MA, Volpe M, Frati G, Li H, Sadoshima J. mTORC2 regulates cardiac response to stress by inhibiting MST1. Cell Rep. 2015 Apr 7;11(1):125-36. PubMed Central PMCID: PMC4417361.

d. Del Re DP, Matsuda T, Zhai P, Maejima Y, Jain MR, Liu T, Li H, Hsu CP, Sadoshima J. Mst1 promotes cardiac myocyte apoptosis through phosphorylation and inhibition of Bcl-xL. Mol Cell. 2014 May 22;54(4):639-50. PubMed Central PMCID: PMC4074544.