Xinghui Sun, Ph.D.

Department of Biochemistry
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EDUCATION

Sept. 1994 – July 1999	**Bachelor of Science** Medicine and Laboratory Medical Science Zhenjiang Medical College (now Jiangsu Univesity), China
Sept. 1999 – July 2004	**Doctor of Philosophy** Biochemistry and Molecular Biology Fudan University, China

POSTDOCTORAL TRAINING

Nov. 2004 – Jan. 2009	**Postdoctoral Associate** Department of Physiology and Pharmacology West Virginia University Research area: cell migration and tumor biology Mentor: Dr. Jun Liu, Ph.D.
Feb. 2009 – Sept. 2013	**Postdoctoral Associate** Cardiovascular Division, Department of Medicine Brigham and Women's Hospital, Harvard Medical School. Research area: microRNA, vascular inflammation, metabolic disease Mentor: Dr. Mark W. Feinberg, M.D., Ph.D.

ACADEMIC APPOINTMENTS

Oct. 2013 – July 2016	Instructor, Harvard Medical School. Associate scientist, Department of Medicine, Cardiovascular Division, Brigham and Women's Hospital.
Aug. 2016 – Present	Assistant Professor (Tenure-Track), Department of Biochemistry, the University of Nebraska-Lincoln.

GRANTS

Current Funding

Title:	**Role of lncRNA Meg3 in obesity-induced endothelial senescence and insulin resistance.**
Funding Agency:	NIH NHLBI (3 Percentile)
Mechanism:	R01, **$1,955,473**
Dates:	07/01/2020 – 06/30/2024
Role:	PI (Sun), 2 summer months per year

Title:	**Novel roles of long noncoding RNAs in the regulation of mitochondrial function and cell senescence.**
Funding Agency:	Nebraska EPSCoR FIRST Award program
Mechanism:	FIRST Award, **$25,000**
Dates:	04/01/2020 – 03/31/2021
Role:	PI (Sun), 0 calendar month

Title:	**Ultrasound as a mechanotherapy for endothelial cell dysfunction.**
Funding Agency:	NIH
Mechanism:	R21, **$602,769**
Dates:	09/16/2020 – 09/15/2023
Role:	Co-Investigator (Sun), 0.25 summer months per year; PI (Ryan Pedrigi)

Completed Funding

Title:	**Long noncoding RNA, obesity-associated endothelial dysfunction, and atherosclerosis.**
Funding Agency:	NIH NPOD COBRE Phase II
Mechanism:	P20GM104320, NIH COBRE Subproject – Project 2, Director (Janos Zempleni), **$150,000**
Dates:	06/01/2019 – 05/30/2020
Role:	Project Leader (Sun), 3 summer months per year

Title:	**Endothelial long noncoding RNA Meg3, adipose tissue dysfunction, and obesity.**
Funding Agency:	NIH NPOD COBRE Phase I
Mechanism:	P20GM104320, NIH COBRE Subproject – Project 3, Director (Janos Zempleni) **$300,000**
Dates:	06/01/2017 – 05/30/2019
Role:	Project Leader (Sun), 3 summer months per year

Title:	**Role of microRNA-181b in diabetic vascular injury and repair.**
Funding Agency:	American Heart Association
Mechanism:	15SDG25400012, **$231,000**
Dates:	08/15/2016 – 06/30/2019
Role:	PI (Sun), 0 calendar month

Title:	**Generate Matrin-3 conditional knockout mice at UNMC mouse genome engineering core.**
Funding Agency:	University of Nebraska
Mechanism:	Core facility user grant, **$5,000**
Dates:	08/13/2018 – 06/30/2019
Role:	PI (Sun), 0 calendar month

Title:	**Generate Matrin-3 conditional knockout mice at UNMC mouse genome engineering core.**
Funding Agency:	University of Nebraska NPOD
Mechanism:	Research Tool Development Program, **$10,000**
Dates:	08/24/2018 – 05/31/2019
Role:	PI (Sun), 0 calendar month

Title:	**Identify genome-wide p53 binding sites in endothelial cells using ChIP-seq at UNMC next generation DNA sequencing core**
Funding Agency:	University of Nebraska
Mechanism:	Core facility user grant, **$5,000**
Dates:	01/12/2018 – 06/30/2018
Role:	PI (Sun), 0 calendar month

Title:	**Role of long non-coding RNA Meg3 in regulating endothelial function.**
Funding Agency:	University of Nebraska Foundation
Mechanism:	Layman Award, **$10,000**
Dates:	05/01/2017 – 04/30/2018

Role: PI (Sun), 0 calendar month

Pending Funding

Title: **Novel roles of hepatic matrin-3 in fatty liver and atherosclerosis.**
Funding Agency: American Heart Association
Mechanism: Postdoctoral fellowship award, **$144,736**
Dates: 05/01/2021 – 04/30/2023
Role: Sponsor (Sun), 0 calendar month; PI (Xiao Cheng)

Rejected Funding

2020

Title: **CAREER: Cell cycle-controlled subcellular localization of long noncoding RNA in mitochondrial function and cellular senescence.**
Funding Agency: National Science Foundation
Mechanism: CAREER award MCB-2046135, **$1,337,836**
Dates: 07/01/2021 – 06/30/2026
Role: PI (Sun), 0.6 summer months

Title: **Endothelial Meg3 and mitochondrial function in obesity.**
Funding Agency: American Heart Association
Mechanism: Transformational Project Award, **$300,000**
Dates: 07/01/2020 – 06/30/2023
Role: PI (Sun), 0.4 summer months

Title: **Stress-responsive long noncoding RNA Meg3 limits mitochondrial dysfunction and cellular senescence in vascular disease.**
Funding Agency: University of Nebraska
Mechanism: Collaboration Initiative, **$151,706**
Dates: 07/01/2020 – 06/30/2023
Role: PI (Sun), 0.4 summer months

PUBLICATIONS

A) Published Journal Articles Prior to UNL (selected among 27 publications)

1. **Sun XH**, Flynn DC, Castranova V, Millecchia LL, Beardsley AR, Liu J. Identification of a novel domain at the N-terminus of caveolin-1 that controls rear polarization of the protein and caveolae formation. J Biol Chem. **2007**, 282(10):7232-7241. [Article]
2. **Sun XH**, Liu ZY, Chen H, Beardsley AR, Qi Q, Liu J. A conserved sequence in caveolin-1 is both necessary and sufficient for caveolin polarity and cell directional migration. FEBS Lett. **2009**, 583(22):3681-9. [Article]
5. Wara AK, Foo S, Croce K, **Sun X**, Icli B, Tesmenitsky Y, Esen F, Lee JS, Subramaniam M, Spelsberg TC, Lev EI, Leshem-Lev D, Pande RL, Creager MA, Rosenzweig A, Feinberg MW. TGF-{beta}1 signaling and Kruppel-like factor 10 regulate bone marrow-derived pro- angiogenic cell differentiation, function, and neovascularization. Blood. **2011** Dec 8;118(24):6450-60.
7. **Sun X**, Icli B, Wara AK, Belkin N, He S, Kobzik L, Hunninghake GM, Vera MP; MICU Registry, Blackwell TS, Baron RM, Feinberg MW. MicroRNA-181b regulates NF-κB- mediated vascular inflammation. J Clin Invest. **2012** Jun 1;122(6):1973-90. [Article]
8. **Sun X**, He S, Wara AK, Icli B, Shvartz E, Tesmenitsky Y, Li D, Blackwell TS, Sukhova GK, Croce K, Feinberg MW. Systemic Delivery of MicroRNA-181b Inhibits NF-κB Activation, Vascular Inflammation, and Atherosclerosis in Apoe-/- Mice. Circ Res. **2014** Jan 3;114(1):32-40. [Article]
9. Khedkar SA*, **Sun X***, Rigby AC, Feinberg MW. Discovery of Small Molecule Inhibitors to Krüppel-Like Factor 10 (KLF10): Implications for Modulation of T Regulatory Cell Differentiation. J Med Chem. **2015** Feb

12;58(3):1466-78. doi: 10.1021/jm5018187. *, These authors contributed equally to this work. [Article]

10. **Sun X**, Lin J, Zhang Y, Kang S, Belkin N, Wara AK, Icli B, Hamburg NM, Li D, Feinberg MW. MicroRNA-181b Improves Glucose Homeostasis and Insulin Sensitivity by Regulating Endothelial Function in White Adipose Tissue. Circ Res. **2016** Mar 4;118(5):810-21. doi: 10.1161/CIRCRESAHA.115.308166. [Article]

B) Published Journal Articles at UNL (8 publications)

2017

11. Zhang Y, **Sun X**, Icli B, Feinberg MW. Emerging roles for microRNAs in diabetic microvascular disease - novel targets for therapy. Endocr Rev. **2017** Apr 1;38(2):145-168. doi: 10.1210/er.2016-1122. [Review]
12. **Sun X***, Haider Ali MSS, Moran M. The role of interactions of long non-coding RNAs and heterogeneous nuclear ribonucleoproteins in regulating cellular functions. Biochem J. **2017** Aug 11;474(17):2925-2935. doi: 10.1042/BCJ20170280. [Review] *, Corresponding author.

2019

13. Shihabudeen Haider Ali MS, Cheng X, Moran M, Haemmig S, Naldrett MJ, Alvarez S, Feinberg MW, **Sun X**. LncRNA Meg3 protects endothelial function by regulating the DNA damage response. Nucleic Acids Res. **2019** Feb 20;47(3):1505-1522. doi: 10.1093/nar/gky1190.
14. Moran M, Cheng X, Shihabudeen Haider Ali MS, Wase N, Nguyen N, Yang W, Zhang C, DiRusso C, **Sun X**. Transcriptome analysis-identified long noncoding RNA CRNDE in maintaining endothelial cell proliferation, migration, and tube formation. Scientific Reports **2019** Dec 20;9(1):19548. doi: 10.1038/s41598-019-56030-9.
15. Arumugam R, Yalaka B, Massilamany C, Haider Ali MSS, Lasrado N, Jayaraja S, Riethoven JJ, **Sun X**, Reddy J. An evidence for surface expression of an immunogenic epitope of sarcoplasmic/endoplasmic reticulum calcium-ATPase2a on antigen-presenting cells from naive mice in the mediation of autoimmune myocarditis. Immunobiology. **2019** Dec 13:151896. doi: 10.1016/j.imbio.2019.12.005.

2020

16. Haemmig S, Yang D, **Sun X**, Das D, Ghaffari S, Molinaro R, Chen L, Deng Y, Freeman D, Moullan N, Tesmenitsky Y, Wara AKMK, Simion V, Shvartz E, Lee JF, Yang T, Sukova G, Marto JA, Stone PH, Lee WL, Auwerx J, Libby P, Feinberg MW. Long noncoding RNA SNHG12 integrates a DNA-PK-mediated DNA damage response and vascular senescence. Sci Transl Med. 2020 Feb 19;12(531). doi: 10.1126/scitranslmed.aaw1868. PubMed PMID: 32075942.
17. **Sun X***, Harris EN*. New aspects of hepatic endothelial cells in physiology and nonalcoholic fatty liver disease. Am J Physiol Cell Physiol. **2020** Jun 1;318(6):C1200-C1213. doi: 10.1152/ajpcell.00062.2020. Epub 2020 May 6. *, Corresponding author.
18. Kim H, Jeon BT, Kim IM, Bennett SJ, Lorch CM, Viana MP, Myers JF, Trupp CJ, Whipps ZT, Kundu M, Chung S, **Sun X**, Khalimonchuk O, Lee J, Ro SH. Sestrin2 Phosphorylation by ULK1 Induces Autophagic Degradation of Mitochondria Damaged by Copper-Induced Oxidative Stress. Int J Mol Sci. **2020** Aug 25;21(17):E6130. doi: 10.3390/ijms21176130.

Complete List of Published Work in My Bibliography (total 35 publications):
https://www.ncbi.nlm.nih.gov/myncbi/xinghui.sun.1/bibliography/public/

C) Abstracts and Meeting at UNL

1. Mohamed Sham Shihabudeen Haider Ali, Xiao Cheng, Matthew Moran, Michael J. Naldrett, Sophie Alvarez, Mark W. Feinberg, Xinghui Sun. LncRNA Meg3 protects endothelial function by regulating the DNA damage response. **2018** AHA Scientific Sessions (Electronic poster presentation).
2. Nghi Nguyen, Matthew Moran, Xinghui Sun. The role of lncRNA CRNDE in obesity-associated endothelial dysfunction. April 6-9, **2019,** Experimental Biology meeting.
3. Nghi Nguyen, Matthew Moran, Xinghui Sun. The role of lncRNA CRNDE in obesity-associated endothelial dysfunction. April 15, **2019**, the UCARE undergraduate poster presentation at the University of Nebraska-Lincoln Undergraduate Research Fair. **(Nghi Nguyen won poster presentation award).**
4. Matthew Moran, Xiao Cheng, Mohamed Sham Shihabudeen Haider Ali, Nishikant Wase, Nighi Nguyen, Weilong Yang, Chi Zhang, Concetta DiRusso, Xinghui Sun. The long noncoding RNA CRNDE regulates angiogenesis in endothelial cells. Gordon Research Conference on Angiogenesis held August 04, 2019 - August 09, **2019**. (**Matthew Moran won poster award**).
5. Xiao Cheng, Mohamed Sham Shihabudeen Haider Ali, Matthew Moran, Martonio Ponte Viana, Jaydeep Kolape, Sarah L. Schlichte, Matthew C. Zimmerman, Oleh Khalimonchuk, Mark W. Feinberg, **Xinghui Sun**.

Long noncoding RNA Meg3 protects against hepatic endothelial senescence in obesity by regulating mitochondrial function. **2020** AHA Scientific Sessions (poster presentation).

D) Manuscript accepted or in revision

2020

1. Xiao Cheng, Mohamed Sham Shihabudeen Haider Ali, Matthew Moran, Martonio Ponte Viana, Sarah L. Schlichte, Matthew C. Zimmerman, Oleh Khalimonchuk, Mark W. Feinberg, **Xinghui Sun**. Title: Long non-coding RNA Meg3 deficiency impairs glucose homeostasis and insulin signaling by inducing cellular senescence of hepatic endothelium in obesity.
   Journal: Redox Biology (in revision)
2. Stefan Haemmig, Ali Hashemi Gheinani, Marina Zaromytidou, Gerasimos Siasos, Ahmet Umit Coskun, Michelle A. Cormier, David A. Gross, AKM Khyrul Wara, Antonios Antoniadis, **Xinghui Sun**, Galina K. Sukhova, Fred Welt, Ioannis Andreou, Carl Whatling, Li-Ming Gan, Johannes Wikström, Elazer R. Edelman, Peter Libby, Peter H. Stone, Mark W. Feinberg. Title: A novel lesional transcriptional signature separates atherosclerosis with and without diabetes in Yorkshire swine and humans.
   Journal: Arteriosclerosis, Thrombosis, and Vascular Biology/ATVB (in revision)
3. Dafeng Yang, Stefan Haemmig, Haoyang Zhou, Daniel Pérez-Cremades, **Xinghui Sun**, Lei Chen, Jie Li, Jorge Haneo-Mejia, Tianlun Yang, Ivana Hollan, Mark W. Feinberg. Title: Methotrexate attenuates vascular inflammation through an adenosine-microRNA dependent pathway.
   Journal: eLife (accepted)

STUDY SECTIONS and MANUSCRIPT Ad Hoc REVIEWER

National/International

2019 Early Career Reviewer, Vascular Cell and Molecular Biology (VCMB) study section, NHLBI/NIH, Bethesda, MD

Manuscript *Ad Hoc* Reviewer: Journal Name (Impact Factor in the previous year)

2018
EbioMedicine (6.183)
Genes (2.319)
International Journal of Molecular Sciences (3.687)

2019
EbioMedicine (6.68)
Cell Death and Differentiation (8.184)
Frontiers in Cell and Developmental Biology (5.18)
Cardiology Research and Practice (2.14)

2020
Molecular Therapy - Nucleic Acids (7.032)
DNA and Cell Biology (3.191)
Frontiers in Cell and Developmental Biology (5.18)
The Journal of Cellular and Molecular Medicine (4.59)
Journal of Leukocyte Biology (3.72)

HONORS AND AWARDS (UNL)

2017 Layman Award, University of Nebraska Foundation.

2020 EPSCoR FIRST award

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

Memberships

Jan. 2011- Present, American Heart Association, ID 174491617

COMMITTEE

Department of Biochemistry

Aug 2018 – Present	Member, Graduate Recruitment and Admissions Committee
May 2020 – July 2020	Member, 2020 Biochemistry-Molecular Science Educator Search Committee

Doctor of Philosophy Graduate Student Committees

Feb 2017 – Present	Chair, Graduate Committee for Matthew Moran (Biochemistry) **Chair: Dr. Xinghui Sun**
April 2018 – Jan 2020	Member, Graduate Committee for Jin-Seon Yook (Nutrition) **Chair: Dr. Soonkyu Chung**
May 2018 – Present	Member, Graduate Committee for Rajkumar Arumugam Rajasekaran (Vet & Biomedical Sciences) **Chair: Dr. Jay Reddy**
Aug 2018 – Dec 2020	Member, Graduate Committee for Fatima Cabral (Biochemistry) **Chair: Dr. Edward Harris (2020 thesis defense)**
Sep 2018 – Present	Member, Graduate Committee for Baolong Liu (Nutrition) **Chair: Dr. Jiujiu Yu**
Jan 2019 – Present	Member, Graduate Committee for Prakash Kumar Sahoo (Nutrition) **Chair: Dr. Sathish Kumar Natarajan**
May 2019 – Present	Member, Graduate Committee for Ekta Pandey (Biochemistry) **Chair: Dr. Edward Harris (2020 comprehensive exam)**

INVITED PRESENTATIONS

Prior to UNL

1. MicroRNA regulation of endothelial function in metabolic disorders. Jan 2015, the Diabetes and Obesity Center, University of Louisville.
2. Non-coding RNA regulation of endothelial function in insulin resistance and thrombosis. Nov 2015, the University of Cincinnati.
3. Non-coding RNA regulation of endothelial function in obesity-associated insulin resistance. Jan 2016, the Sargent College of Health and Rehabilitation, Boston University.
4. Non-coding RNA regulation of endothelial function in obesity-associated insulin resistance. Feb 2016, the University of Nebraska-Lincoln.

At UNL

5. Non-coding RNA-mediated regulation of endothelial function in cardiovascular and metabolic diseases. April 6th, **2017**, the University of South Dakota.
6. Non-coding RNA-mediated regulation of endothelial function in cardiovascular and metabolic diseases. May 5th, **2017**, Nebraska Center for Virology, the University of Nebraska-Lincoln.
7. LncRNA-regulated DNA damage response in obesity-associated insulin resistance. September 17, **2018**, School of Veterinary Medicine and Biomedical Sciences, the University of Nebraska-Lincoln.
8. Long noncoding RNA-regulated endothelial senescence in cardiometabolic disease. September 27, **2019**, the University of Nebraska Medical Center.

TEACHING ACTIVITIES

A. Undergraduate Coursework at UNL
Department of Biochemistry
Course (Role): **Metabolism and Biological Information, Biochemistry II, BIOC432 (Instructor)**
Lectures Given: 26 per semester

Years: 2017, 2018, 2019, 2020 (50 students) fall semester

Course (Role): **Seminar in Biological Chemistry, BIOC 992K (Modulator)**
Years: 2018 spring semester

B. Teaching Related to Undergraduate/Graduate/Postdoctoral Researchers at UNL

Prior to UNL

- Kelly koral, summer research student, Wheeling Jesuit University, Wheeling WV, 6-8/2007
- Mallory McCartney, summer research student, Davis and Elkins College, Elkins WV, 6-8/2008
- Nathan Belkin, summer research student, Amherst College, Amherst MA, 6-8/2009, 2010
- John Gubatan, summer research student, Harvard Medical School, 6-8/2011
- Jennifer Layman, summer research student, Stanford University, 6-8/2012
- Shaolin He, graduate student, Institute of Cardiovascular Diseases, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China, 09/2011-01/2013
- Nathan Belkin, part time research student, Harvard Medical School, 1-8/2013
- Alan Sit, summer research student, Boston University, 6-8/2013
- Monique Tulley, summer research student, University of New Mexico, 6-8/2014
- Yu Zhang, graduate student, the University of Hong Kong, 5-10/2014
- Jibin Lin, graduate student, Institute of Cardiovascular Diseases, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, China, 10/2014-02/2016
- Danny Wong, summer research student, Harvard Medical School, 06/2015-09/2015

At UNL

- Philamon Hemstreet, undergraduate freshman, University of Nebraska – Lincoln, 10/2016 – 6/2017
- Mohamed Sham Shihabudeen Haider Ali, postdoctoral associate, University of Nebraska – Lincoln, 10/2016 – 4/2019
- Ethan Wheeler, undergraduate, University of Nebraska – Lincoln, 10/2016 – 08/2018
- Melody Nguyen, University of Nebraska-Lincoln, 7/2017 – 5/2019
- Matthew Moran, graduate, University of Nebraska – Lincoln, 03/2017 –
- Xiao Cheng, postdoctoral associate, University of Nebraska – Lincoln, 06/2017 –
- Claire Landgren, undergraduate, Nebraska Wesleyan University, 09/2020 –
- Jiyao Zhu, postdoctoral associate, University of Nebraska – Lincoln, 12/2020 –