

Curriculum Vitae

Ruya Liu, BM, PhD

Assistant Professor, Department of Medicine

University of Maryland, Baltimore

Adjunct Assistant Professor, Department of Medicine

University of Pittsburgh

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Contact Information

Business Address: 670 W Baltimore St, HRFIII-7104
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Foreign Languages: Chinese – mandarin (native)

Education

2002 – 2007 BM, Clinical Medicine; Beihua University Faculty of Medicine, Jilin, China
2007 – 2012 PhD, Medicine, Shanghai Jiaotong University School of Medicine, Shanghai, China; Thesis Advisor – Dr. Xiaoying Li

Post Graduate Education and Training

2006 – 2007 Internship, Jilin No.2 Central Hospital, Jilin, China
2012 – 2013 Research Fellow, Massachusetts General Hospital, Boston, MA, USA
2013 – 2014 Postdoc, Houston Methodist Research Institute, Houston, TX, USA
2014 – 2015 Postdoc, Baylor College of Medicine, Houston, TX, USA

Specialty Certification

2005 National Computer Rank Certificate of Level II – C programming language / China

Medical or Other Professional Licensure

2008 International Registered Nutrition Consultant (Degree II) / International
2010 People's Republic of China Physician's Practice License / China

Employment History

Academic Appointments

2016 – 2017 Instructor in Medicine, Baylor College of Medicine, Houston, TX, USA
2017 – 2020 Research Instructor in Medicine, University of Pittsburgh, Pittsburgh, PA, USA
2021 – 2022 Research Assistant Professor in Medicine (non-tenure track), University of Pittsburgh, Pittsburgh, PA, USA

- 2022 – Adjunct Assistant Professor in Medicine, University of Pittsburgh, Pittsburgh,
present PA, USA
- 2022 – Assistant Professor in Medicine (tenure track), University of Maryland,
present Baltimore, MD, USA

Professional Society Membership

- 2017 – General Member, American Heart Association
present

Honors and Awards

- 2002 – 2007 Scholarships (every semester), Faculty of Medicine, Beihua University, China
- 2007 Outstanding Graduate (Top 1%), Faculty of Medicine, Beihua University, China
- 2012 Outstanding Graduate (Top 5%), Shanghai Jiaotong University School of
Medicine, China
- 2015 National Heart, Lung, and Blood Institute (NHLBI) Scholarship, Keystone
Symposium – Mitochondria, Metabolism and Heart Failure, NM, USA
- 2015 1st place Best Presentation, Department of Medicine Housestaff Research
Symposium, Baylor College of Medicine, TX, USA
- 2018 Basic Cardiovascular Sciences (BCVS) Abstract Travel Grant, AHA Scientific
Sessions, Chicago, IL, USA

Local and National Service

National Service

- 2015 – 2017 Ad hoc reviewer for journals: *Acta Oto-Laryngologica* (~1x per year), *Apoptosis*
(~4x per year), *Cellular and Molecular Biology* (~1x per year), *Cellular
Physiology and Biochemistry* (~1x per year), *Journal of Clinical Pharmacology
and Therapeutics* (~1x per year), *Medicine (Baltimore)* (~4x per year)
- 2021 Early Career Reviewer for NIH Integrative Myocardial
Physiology/Pathophysiology A (MPPA) study section
- 2022 Ad hoc reviewer for journal: *Molecular and Cellular Endocrinology* (~1x per
year)

Local Service

- 2019 Poster judging committee, Data & Dine Symposium, University of Pittsburgh,
PA, USA
- 2022 Poster and oral presentation judging committee, 28th American Heart Association
Annual Fellows Research Day, University of Pittsburgh, PA, USA
- 2022 Residency interviewer for an Internal Medicine ABIM Research Pathway
candidate, University of Maryland Baltimore, Baltimore, MD, USA

Teaching Service

Undergraduate Student Teaching

- 2015 – 2016 Advisor and Research Supervisor at Baylor College of Medicine
1 undergraduate: daily interaction
Nikhil Balasubramanyam, pre-med undergraduate research program
- 2019 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring semester and full-time in summer
Lingfei Sun, undergraduate research program
- 2020 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring semester
Zachary C Frey, University of Pittsburgh undergraduate researcher (Course# ARTSC0120)
- 2020 – 2021 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring and fall semesters
Leonie C Finke, University of Pittsburgh undergraduate researcher (Course# ARTSC0120, ARTSC0121). Leonie’s proposal entitled “Dying of a Big Heart: The Role of C5x in Cardiac Hypertrophy and Heart Failure” was awarded by **Fall 2021 Chancellor's Undergraduate Research Fellowship** (\$800).
- 2021 – 2022 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring and fall semesters
Deeksha Sessa, University of Pittsburgh undergraduate researcher (Course# BIOSC1901).
- 2021 – 2022 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring and fall semesters, and full-time in summer
Alay Gandhi, University of Pittsburgh undergraduate researcher (Course# BIOSC1901). Alay’s proposal entitled “Let's Mend the Heart: Identification of a Potential Target for Cardiac Regeneration” was awarded by **Summer 2021 Brackenridge Research Fellowship** (\$4,000).
- 2021 – 2022 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; spring and fall semesters, and full-time in summer
Gayatri Ratakonda, University of Pittsburgh undergraduate researcher (Course# BIOSC1901). Gayatri’s first proposal entitled “The Roles of Novel Protein C5x in Promoting Weight Loss” was awarded by **Spring 2022 University Honors College Research Fellowship** (\$1,000), and her second proposal entitled “Diving Deep in the Quiescence: How Cardiac Cells Divide” was awarded by **Summer 2022 Brackenridge Research Fellowship** (\$4,000).
- 2022 Mentor and Research Preceptor at University of Pittsburgh
1 undergrad: daily interaction; 2022 spring semester and full-time in summer; weekly interaction: virtual in 2022 fall
Christopher Katyal, University of Pittsburgh undergraduate researcher (Course# BIOSC1901). Chris’s proposal entitled “A Novel Approach to targeting Pulmonary Hypertension: Identifying Regulators for Soluble Guanylyl Cyclase (sGC) and Establishing an In Vitro Screening System for sGC” was awarded by **Summer 2022 Brackenridge Research Fellowship** (\$4,000).
- 2022 Mentor and Research Preceptor at University of Maryland, Baltimore
1 undergrad: weekly interaction; fall semester hybrid work
Vance Degen, University of Maryland College Park undergraduate researcher (Course# BSCI289)

Medical Student Teaching

2021 Fall Guest Mentor for MD/PhD & Physician Scientist Training Program “Research Basis of Medical Knowledge”, University of Pittsburgh School of Medicine; 2 hours

Resident and Fellow Teaching

2019 Advisor and Research Co-mentor at University of Pittsburgh
1 Clinical Fellows: 3 months daily interaction
Dr. EM Garcia-Perez, pediatric endocrine fellow at University of Pittsburgh Medical Center. Dr. Garcia-Perez’s work with me and Dr. Vijay Yechoor entitled “Yy1 Depletion in Pancreatic beta-cells Leads to Energy Source Switch from Glycolysis to Oxidative Phosphorylation” was awarded by Endocrine Society as **Outstanding Abstract in ENDO 2021**.

2021 – 2022 Advisor and Research Co-mentor at University of Pittsburgh
1 Clinical Fellows: 2021-2022, 5 months daily interaction
Dr. Georgios Triantafyllou, PACCM fellow at University of Pittsburgh Medical Center. Dr. Triantafyllou’s proposal “Targeting Mitochondria-Derived Reactive Oxygen Species as a Therapy for Combined Pre- and Post-Capillary Pulmonary Hypertension” was awarded by NIH **F32** in **2022** where I served as a co-mentor with Drs. Mark Gladwin and Adam Straub.

Post-Graduate Teaching

2008 – 2010 Research supervisor at Shanghai Jiaotong University School of Medicine
2 Master Students: two years daily interaction
Jin Li, Yanling Liu; Master Student Research Program

2013 Research supervisor at Houston Methodist Research Institute
1 PhD student: six months daily interaction
Hongshan Yin; Exchange Scholar Research Program

2020 Advisor and Research Preceptor at University of Pittsburgh
1 PhD student: three months daily interaction
Xueyang Zhang, University of Pittsburgh Tsinghua University visiting research scholar program

2022 Mentor and Research Preceptor at University of Pittsburgh and University of Maryland, Baltimore
1 research assistant: daily interaction
Alay Gandhi, premed gap year as full-time research assistant. University of Maryland School of Medicine Center for Biomolecular Therapeutics **Early Career Development Program Pilot Grant Trainee**.

2023 Spring Lecturer for “Muscle Cell Biology and Development” (Course #GPLS-715) at University of Maryland, Baltimore; 2 lectures (90min/lecture)

Grant Support**Active Grants:**

- 04/01/2019- (PI, 40%)
 03/31/2023 “Tea1 As a Novel Regulator of Mitochondrial Function in Cardiomyocytes”
 (NCE) American Heart Association Career Development Award 19CDA34770034
 Annual Direct Costs: \$70,000
 Total Direct Costs: \$210,000
- 07/01/2021- (PI, 20%)
 06/30/2023 “C5x as a Novel Regulator of Cardiomyocyte Homeostasis”
 University of Pittsburgh Medical Center Competitive Medical Research Fund
 Annual Direct Costs: \$12,500
 Total Direct Costs: \$25,000
- 12/01/2021- (PI, 20%)
 11/30/2023 “Mechanistic Investigation of C5x Regulation of Cardiomyocyte Renewal”
 University of Pittsburgh Department of Medicine Catalytic Grant
 Annual Direct Costs: \$16,930/yr1, \$13,711/yr2
 Total Direct Costs: \$30,641
- 09/02/2022- (PI; grant trainee Gandhi)
 “Uncovering the protein structure for a novel transcriptional modulator C5x”
 University of Maryland School of Medicine Center for Biomolecular Therapeutics
 Early Career Development Program Pilot Grant
 Total Direct Costs: \$5,000

Completed Grants:

- 02/01/2014- (Co-Inv, 10%; PI – VK Yechoor)
 01/31/2019 “Circadian Clock and Beta Cell Stress Adaptation”
 NIH/NIDDK R01DK097160
 Annual Direct Costs: \$250,000
 Total Direct Costs: \$1,250,000
 Role: experimentation, data interpretation, discussion, publication
- 01/01/2016- (Co-Inv, 50%; PI – VK Yechoor)
 12/31/2021 “Tea1 - A Regulator of Quiescence and Proliferation in Pancreatic Beta Cells”
 VA Merit 1I01BX002678
 Annual Direct Costs: \$150,000
 Total Direct Costs: \$750,000
 Role: project conceptualization, experimentation, data interpretation, discussion, publication
- 07/01/2021- (Co-Inv, 9%; PI – M Moulik)
 12/31/2021 “Tea1 and Cardiac Adaptation”
 NIH/NHLBI R01HL147946
 Annual Direct Costs: \$250,000
 Total Direct Costs: \$1,250,000

Role: project conceptualization, experimentation, data interpretation, discussion, publication

07/01/2021- (PI, 1%)
 06/30/2022 “C5x Emerging as a Novel Target for Cardiomyocyte Renewal and Heart Regeneration”
 Samuel and Emma Winters Foundation
 Annual Direct Costs: \$9,932
 Total Direct Costs: \$9,932

Publications

Peer-reviewed journal articles

1. Song M, Zhang X, **Liu R**. “A study on the correlation between death time and circadian rhythm in stroke patients.” Chin J of Misdiag. **2006** 6 (16), 3109-3110.
2. Li X, Lu Y, Sun H, Wang J, Yang J, Zhang H, Fan N, Xu J, Jiang J, **Liu R**, Li D, Liu M, and Ning G. “G protein-coupled receptor 48 upregulates estrogen receptor α expression via cAMP/PKA signaling in the male reproductive tract.” Development. **2010** Jan;137(1):151-7. PMID: 20023170
3. *Li N, ***Liu R**, Zhang H, Yang J, Sun S, Zhang M, Liu Y, Lu Y, Wang W, Mu Y, Ning G, Li X. “Seven novel DAX1 mutations with loss of function identified in Chinese patients with congenital adrenal hypoplasia.” J Clin Endocrinol Metab. **2010** Sep; 95(9):E104-11. PMID: 20573681 ***Equal contribution**
4. Li J, Lu Y, **Liu R**, Xiong X, Zhang Z, Zhang X, Ning G, Li X. “DAX1 suppresses FXR transactivity as a novel co-repressor.” Biochem Biophys Res Commun. **2011** Sep 9;412(4):660-6. PMID: 21856289
5. Zhang X, Zhang M, Zhang H, Liu Y, **Liu R**, Xu Y, Sun S, Ning G, Li X. “Effect of glucocorticoid replacement therapy on glucose-lipid metabolism in patients with 21-hydroxylase deficiency.” Chin J Endocrinol Metab. **2012**, 28(2): 108-11.
6. **Liu R**, Li X. “Genetic study progression of idiopathic hypogonadotropic hypogonadism.” Chin J Endocrinol Meta. **2012**, 28(3): 244-8. [Review Article]
7. Nam D, Chatterjee S, Yin H, **Liu R**, Lee J, Yechoor VK, Ma K. “Novel function of Rev-erba in promoting brown adipogenesis.” Sci Rep. **2015** Jun 10;5:11239. PMID: 26058812
8. Li R, Buras E, Lee J, **Liu R**, Liu V, Espiritu C, Ozer K, Thompson B, Nally L, Yuan G, Oka K, Chang B, Samson S, Yechoor V, Chan L. “Gene therapy with Neurogenin3, Betacellulin and SOCS-1 Reverses Diabetes in NOD Mice.” Gene Ther. **2015** Nov;22(11):876-82. PMID: 26172077
9. Lee J, **Liu R**, de Jesus D, Kim BS, Ma K, Moulik M, Yechoor VK. “Circadian control of β -cell function and stress responses.” Diabetes, Obesity and Metabolism. 17 (Suppl. 1): 123–133, **2015**. PMID: 26332977 [Review Article]
10. **Liu R**, Lee J, Kim BS, Wang Q, Buxton SK, Balasubramanyam N, Kim JJ, Dong J, Zhang A, Li S, Gupte AA, Hamilton DJ, Martin JF, Rodney GG, Coarfa C, Wehrens XHT, Yechoor VK & Moulik M. “Tead1 is required for maintaining adult cardiomyocyte function and its loss results in lethal dilated cardiomyopathy.” JCI Insight. **2017** Sep 7;2(17):e93343. PMID: 28878117

11. **Liu R**, Jagannathan R, Li F, Lee J, Balasubramanyam N, Kim BS, Yang P, Yechoor VK & Moulik M. “Tead1 is required for perinatal cardiomyocyte proliferation.” PLoS One. **2019** Feb 27;14(2):e0212017. PMID: 30811446
12. **Liu R**, Xiong X, Nam D, Yechoor V, Ma K. “SRF-MRTF signaling suppresses brown adipocyte development by modulating TGF- β /BMP pathway.” Mol Cell Endocrinol. **2020** Jun 27;110920. PMID: 32603734 **Corresponding**
13. **Liu R**, Jagannathan R, Sun L, Li F, Yang P, Lee J, Negi V, Garcia-Perez EM, Shiva S, Yechoor VK & Moulik M. “Tead1 is essential for mitochondrial function in cardiomyocytes.” Am J Physiol Heart Circ Physiol. **2020** Jul 1;319(1):H89-H99. PMID: 32502376
14. Xiong X, Li W, **Liu R**, Saha P, Yechoor V, Ma K. “Circadian clock control of MRTF-SRF pathway suppresses beige adipocyte thermogenic recruitment.” Journal of Molecular Cell Biology. **2022** Dec 29;mjac079. PMID: 36581314
15. Li F, **Liu R**, Negi V, Yang P, Lee J, Jagannathan R, Moulik M, Yechoor V. “VGLL4 and MENIN function as TEAD1 corepressors to block pancreatic β cell proliferation.” Cell Reports. **2023** Jan 18;42(1):111904. PMID: 36662616

Non-peer reviewed journal articles

1. Lee J, **Liu R**, Kim BS, Zhang Y, Li F, Jagannathan R, Yang P, Saha PK, Sabek O, Coarfa C, Creighton CJ, Huising MO, Shih H, Bottino R, Ma K, Moulik M, Yechoor VK. “Tead1 reciprocally regulates adult β -cell proliferation and function.” bioRxiv **2020**.03.05.979450. [Preprint]
2. Negi V, Lee J, **Liu R**, Perez-Garcia E, Li F, Jagannatha R, Yang P, Bottino R, Ma K, Moulik M, Yechoor V. “Bromodomain protein inhibition protects β -cells from cytokine-induced death and dysfunction via antagonism of NF- κ B pathway.” bioRxiv **2020**.11.05.363408. [Preprint]
3. Xiong X, Li W, **Liu R**, Saha P, Yechoor V, Ma K. “Circadian clock control of MRTF-SRF pathway suppresses beige adipocyte thermogenic recruitment.” bioRxiv **2022**.04.06.487359. [Preprint; the full article was published in Dec 2022]

Abstracts – Published in Scientific Journals

1. **Liu R**, Jagannathan R, Li F, Lee J, Yechoor VK, Moulik M. “Tead1-a Novel Cell-Autonomous Regulator of Mitochondrial Function in Cardiomyocytes.” Circulation **2018** 138 (Suppl_1), A16665-A16665
2. **Liu R**, Jagannathan R, Li F, Lee J, Yechoor VK, Moulik M. “Tead1 is Required for Cardiomyocyte Proliferation.” Circulation **2018** 138 (Suppl_1), A17290-A17290
3. Jagannathan R, **Liu R**, Lee J, DeVallance ER, Yang P, Li F, Negi V, Pagano PJ, Yechoor VK, Moulik M. “Tea Domain Family Member 1 (TEAD1): Novel Role in Regulating Cardiac Oxidative Stress Response.” Circulation **2019** 140 (Suppl_1), A15587-A15587
4. Jagannathan R, Lee J, **Liu R**, Yang P, Li F, Negi V, Yechoor V, Moulik M. “Tea Domain Family Member 1 (TEAD1) Regulates IGF1 and mTOR Pathway in the Heart.” Circulation **2019** 140 (Suppl_1), A15833-A15833
5. Negi V, Lee J, **Liu R**, Jagannatha R, Li F, Yang P, Perez-Garcia E, Moulik M, Yechoor V. “I-BET 762 Inhibits Inflammation-Induced Pancreatic Beta-Cell Apoptosis by Controlling Inflammatory Pathways.” Diabetes **2020** Jun; 69(Supplement 1)

6. Garcia-Perez EM, †**Liu R**, †Yechool V. Yy1 depletion in pancreatic beta cells leads to energy source switch from glycolysis to oxidative phosphorylation. Journal of the Endocrine Society, Volume 5, Issue Supplement_1, April-May **2021**, A327. †**Corresponding**
7. Li F, **Liu R**, Negi V, Yang P, Lee J, Moulik M, Yechool V. VGLL4 and MENIN Function as TEAD1 Corepressors to Block Pancreatic β -Cell Proliferation. Diabetes **2022**;71(Supplement_1):203-OR
8. Lee J, **Liu R**, Li F, Negi V, Jagannathan R, Huising M, Ma K, Shih B, Moulik M, Yechool V. Diabetes **2022**;71(Supplement_1):250-LB
9. Xiong X, Li W, **Liu R**, Yechool V, Ma K. The Circadian Clock Exerts Coordinated Control of Beige Adipocyte Development via Cytoskeleton-MRTF/SRF Signaling Cascade. Diabetes **2022**;71(Supplement_1):308-OR

Major Invited Speeches

Local

1. **Liu R**, “A tale of Multiple Cities: Multifaceted Roles of Tead1 in Maintaining Heart Function”; Endocrine Grand Round, Baylor College of Medicine, Houston, TX; 03/09/**2017**
2. **Liu R**, “Molecular Regulation of Cardiomyocyte Homeostasis and the Debut of a Novel Modulator”, Endocrine, Metabolism & Diabetes Research Series, University of Pittsburgh, Pittsburgh, PA; 10/21/**2020**
3. **Liu R**, “Discovery of a Novel Gene and its Role in Pancreatic Beta Cells - Behind the Scenes”, University-Wide Conference Lectures, University of Pittsburgh, Pittsburgh, PA; 05/14/**2021**
4. **Liu R**, “C5x – A Novel Regulator of Cardiomyocyte Function and Homeostasis”, KARAT (The K Awardee to R Advancement Training) Scientific Symposium, University of Pittsburgh, Pittsburgh, PA; 05/20/**2022**
5. **Liu R**, “Revelation of A Novel Gene and Its Role in Cardiac Renewal”, T32 Interdisciplinary Training Program in Muscle Biology Seminar Series, University of Maryland, Baltimore, MD; 09/07/**2022**

Proffered Communications – Not Published as Full Research Articles

National

1. **Liu R**, Li X. Mechanistic study on DAX-1 deficiency associated hypogonadotropic hypogonadism. The 7th Chinese Society of Endocrinology Annual Meeting, Nanjing, Jiangsu, China 08/31/**2009**. (Oral Presentation)
2. **Liu R**, Lu Y, Li N, Li D, Ning G, Li X. Mechanistic study on DAX-1 deficiency associated hypogonadotropic hypogonadism. The 8th Chinese Society of Endocrinology Annual Meeting, Dalian, Liaoning, China 08/27/**2010**. (Poster Presentation)
3. **Liu R**, Li N, Li D, Ning G, Li X. Research on the molecular mechanism involved in DAX-1 gene impairment caused hypogonadotropic hypogonadism. The 6th Huaxia Congress of Endocrinology, Shanghai, China 12/20/**2010**. (Oral Presentation)

4. **Liu R**, Zhang M, Sun S, Ning G, Li X. Genetic profiling for 107 idiopathic hypogonadotropic hypogonadism cases and the functional study on PROKR2 gene mutations. The 2nd Scientific Meeting of the Chinese Diabetes and Gonad Society. Yangzhou, Jiangsu, China. **2012**. (Poster Presentation)
5. **Liu R**, Lee J, Moulik M, Yechoor VK. The role of Hippo pathway effector Yap/Taz in pancreatic β cell. Keystone Symposium – Islet Biology: From Cell Birth to Death, Keystone, CO, USA 03/17/**2016**. (Poster Presentation)
6. **Liu R**, Lee J, Kim BS, Moulik M, Yechoor VK. Critical Role of Mamalian Hippo Pathway in Pancreatic Beta-Cell Proliferation and Function. ENDO, Boston, MA, USA 04/04/**2016**. (Oral Presentation)
7. **Liu R**, Lee J, Yang P, Li F, Sun L, Negi V, Jagannathan R, Moulik M, Yechoor VK. Yap/Taz is Dispensable for Pancreatic β -cell Function. 12th Annual Midwest Islet Club, Ann Arbor, MI, USA **2019**. (Poster Presentation)
8. Jain A, Saltzman AB, Choi JM, **Liu R**, Brooks-Worrell BM, Palmer JP, Yechoor VK, Jun SY, Hattery EG, Balasubramanyam A, Malovannaya A. Plasma Marker Identification of Beta-Cell Injury in Type 2 Diabetes in the GRADE Study, using Isobaric Boosting and Mass Spectrometry. American Society for Mass Spectrometry Conference, Houston, TX, USA **2020**. (Poster Presentation)
9. Njoku-Austin C, Mattila PE, **Liu R**, Ewing MC, Wood AN, Kanshana JS, and Kershaw EE. Global loss of CREBRF in mice impairs glucose homeostasis despite lower body weight through effects on beta cell mass. University of Pittsburgh, Dean's Summer Research Program Research Symposium, Pittsburgh, PA, USA; Sep **2020**. (Poster Presentation)