

Ziru Li, PhD
Faculty Scientist 1
Center for Molecular Medicine
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Education

September 2009 – June 2014 Ph.D., Dept. of Physiology
Peking University Health Science Center, Beijing, China
Dissertation: Roles of gut hormones: ghrelin and nesfatin-1 in hepatic lipid metabolism

September 2004 – July 2009 Bachelor of Clinical Medicine
MuDanJiang Medical University, Heilongjiang, China

Postdoctoral Training

July 2016 – Dec 2020 Postdoctoral Research Fellow, Dept. of Molecular & Integrative
Physiology, University of Michigan Medical School, Ann Arbor, MI
Mentor: Dr. Ormond A. MacDougald, Ph.D.

June 2014 – June 2016 Postdoctoral Research Fellow, Dept. of Surgery
University of Michigan Medical School, Ann Arbor, MI
Mentor: Dr. Weizhen Zhang, M.D./Ph.D.

Academic Appointment

Jan 2021 – July 2022 Research Investigator, Dept. of Molecular & Integrative
Physiology, University of Michigan Medical School, Ann Arbor, MI

August 2022 – Faculty Scientist 1, Center for Molecular Medicine, MaineHealth
Institute for Research, Scarborough, ME

November 2022 - Graduate Adjunct Faculty, Graduate school of Biomedical
Sciences and Engineering, University of Maine, Orono, ME

Grant:

American Diabetes Association Postdoctoral Fellowship (1-18-PDF-087),
“Global and local metabolic roles of bone marrow adipose tissue”,
1/1/2018—12/31/2020, Total cost: \$179,722. Principal Investigator: 100%
effort.

COBRE in Mesenchymal and Neural Regulation of Metabolic Networks
(P20GM121301). 8/1/2022—7/31/2025, Total cost: \$175,000/year. Project
Lead: 50% effort.

Select Awards and Honors

2007 – 2008 **National Scholarship**, China Ministry of Education
2008 – 2009 **National Scholarship**, China Ministry of Education

2010 – 2011	Guanghua Prize , Merit Scholarship of Peking University
2011 – 2012	Deangyangyongman Prize , Merit Scholarship of Peking University Health Science Center
2012 – 2013	National PhD Scholarship , China Ministry of Education Center
2013 – 2014	Shuhua Medical Prize , Merit Scholarship of Peking University
2019	Postdoctoral Award in Research Excellence , Department of Molecular & Integrative Physiology, University of Michigan Medical School
2020	Highest Ranking Basic/Translational Abstract—1st Place , Bone Marrow Adiposity (BMA) Society – 2020
2022	The First Place Poster Award , CDI-MOD Symposium – 2022

Memberships in Professional Societies

2010 – 2014	Member, Chinese Association for Physiological Sciences (CAPS)
2015 – 2017	Member, American Heart Association
2017 – 2020	Member, American Diabetes Association
2020 – present	Member, Bone Marrow Adiposity Society
2023 – present	Member, American Society for Bone and Mineral Research (ASBMR)
2023 - 2028	Editorial Board Member (EBM) of the Journal of Biological Chemistry (JBC)

Journal Reviewer

Journal of Biological Chemistry (2020-present)
 JCI insight (2020-present)
 Bone (2020-present)
 Journal of Bone and Mineral Research (2019-present)
 Biomedicine & Pharmacotherapy (2018-present)
 European Journal of Pharmacology (2019-present)
 Oncotarget (2016-2017)
 Journal of Clinical Medicine (2020-present)
 International Journal of Molecular Sciences (2020-present)
 Genes (2021-present)
 Cells (2021-present)
 Frontiers in Endocrinology (2022-present)
 Aging Cell (2022-present)
 Bone Research (2022-present)

Teaching Experience

Visiting Scholars

2011 – 2012	Mentor to Ling Gao, visiting scholar, Binzhou Medical School, China <i>Title: Effects of nesfatin-1 on glucose homeostasis.</i>
2011 – 2012	Mentor to Yan Qin, visiting scholar, Dali Medical School, China <i>Title: Ghrelin contributes to protection of hepatocellular injury induced by ischemia/reperfusion.</i>

Undergraduate Students

2012 – 2013	Mentor to Yuexin Wang, undergraduate student, Peking University <i>Title: Nesfatin-1 promotes brown adipocyte phenotype.</i>
2012 – 2013	Mentor to Wenying Liang, undergraduate student, Peking

- University
Title: mTOR signaling and inflammation.
- 2013 – 2014 Mentor to Sara Lutz, undergraduate student (UROP), University of Michigan
Title: Hepatic mTOR signaling and glucose/lipid metabolism.
- 2017 Mentor to Sara Kitterman, undergraduate student (SURF), University of Michigan
Title: The interactions between vertical sleeve gastrectomy and estrogen deficiency in bone metabolism.
- 2019 – 2020 Mentor to Katrina Granger, undergraduate student (SURF), University of Michigan
Title: Effects of G-CSF receptor on sleeve gastrectomy-induced bone loss.
- 2021 Kevin Qiu, undergraduate student (SURF), University of Michigan
Title: Effects of anti-SOST and anti-G-CSF receptor antibodies on sleeve gastrectomy-induced bone loss and marrow niche changes.
- 2022 Erica (Jingtong) Zhao, undergraduate student, University of Michigan
Title: The roles of bone marrow adipose tissue in bone metabolism

Graduate Students

- 2018 – 2020 Co-mentor to Wenzhen Yin, graduate student, Peking University
Title: Cross-talk between GI tract and bone/marrow niche.
- 2020 – 2023 Co-mentor to Tiange Feng, graduate student, Peking University
Title: mTOR signaling in gastric X/A-like cell affects bone/marrow niche.
- 2022 – 2023 Mentor to Siddhant Sharma, graduate student, University of New England.
- 2023 – present Mentor to Jeyrie Ramos Aponte, graduate student, University of New England.
Award: 2023-2024 Peter Morgane Student Research Fellowship
- 2023 – present Mentor to Ziyi (Kevin) Liu, graduate student, University of New England.

Postdoctoral Fellows

- 2022 – present Caroline Picoli, postdoctoral fellow, MaineHealth Institute for Research.
 Title: The roles of gut-bone axis in bone metabolism.
Award: Young Investigator Award, ASBMR 2023
- 2023 – present Tiange Feng, postdoctoral fellow, MaineHealth Institute for Research.
 Title: The effects of bone marrow adipose tissue on bone homeostasis.

Oral Presentations

- 2011 Regulation of gastric nesfatin-1/NUCB2 by mTOR signaling. Chinese Association of Pathophysiological Sciences: Digestive, Endocrinology and Reproductive Conference. Guangxi, China. November 2-7, 2011.
- 2016 Activation of mTOR protects liver from ischemia and reperfusion induced injury through NFκB pathway. Moses Gunn 27th Annual Research Conference. Ann Arbor, MI. May 17, 2016.

- 2017 Bone mass and marrow adipose loss after vertical sleeve gastrectomy surgery in mice. Summer Diabetes Symposium. Ann Arbor, MI. August 8, 2017.
- 2018 Does granulocyte-colony stimulating factor mediate vertical sleeve gastrectomy-induced loss of bone and marrow adipose? Cellular Aspects of Diabetes, Obesity and Metabolism Research Club. Ann Arbor, MI. March 6, 2018.
- 2018 Does granulocyte-colony stimulating factor mediate vertical sleeve gastrectomy-induced loss of bone and marrow adipose? Musculoskeletal Health Symposium. Ann Arbor, MI. April 6, 2018.
- 2018 Mechanisms by which vertical sleeve gastrectomy influences bone and the marrow niche. Sun Yat-sen University. December 21-22, 2018.
- 2019 Mechanisms by which vertical sleeve gastrectomy influences bone and the marrow niche. MDRC Annual Diabetes Symposium. Ann Arbor, MI. March 2, 2019.
- 2020 Do bone marrow adipocytes influence bone homeostasis and hematopoiesis? Integrative Aspects of Diabetes, Obesity and Metabolism Research Club. Ann Arbor, MI April 16, 2020 (Virtual talk).
- 2020 Cellular interactions in the bone marrow niche evaluated with a bone marrow adipocyte-specific knockout mouse model. MDRC Annual Diabetes Symposium. Ann Arbor, MI. May 21, 2020 (Virtual talk).
- 2020 Do bone marrow adipocytes influence bone homeostasis and hematopoiesis? GH/IGF-1 action in health, disease and aging meeting. New York University. May 28, 2020 (Invited talk).
- 2020 Cellular interactions in the bone marrow niche evaluated with a bone marrow adipocyte-specific knockout mouse model. The 6th International Meeting on Bone Marrow Adiposity (BMA2020, Marrow Adiposity: Bone, Aging and Beyond), September 9-10, 2020. (Plenary Oral)
- 2020 Bone Marrow Adipocytes: Friend or foe in bone homeostasis? MMCRI (Maine Medical Center Research Institute) Seminar Series Presents. October 30, 2020 (Invited talk).
- 2021 Bone Marrow Adipocytes: Friend or foe in bone homeostasis? Preventive Cardiology, Hypertension, Vascular Medicine Lipids/Atherosclerosis Conference (2021). March 3, 2021 (Invited talk).
- 2022 Lipolysis of bone marrow adipocytes is required to fuel bone and the marrow niche during energy deficits. ORL Seminar. Jan 4, 2022 (Invited talk).
- 2022 The gut-bone axis: how are bariatric surgery and bone loss linked? GSBSE retreat. Oct 29, 2022 (Invited talk).
- 2022 The gut-bone axis: how are bariatric surgery and bone loss linked? The 8th Biennial National IDeA Symposium of Biomedical Research Excellence (NISBRE) annual meeting. Dec 12, 2022 (Invited talk).

Poster Presentations

- 2012 Peripheral effects of nesfatin-1 on glucose homeostasis. Chinese Association of Pathophysiological Sciences: Digestive, Endocrinology and Reproductive Conference. Liaoning, China. June 21-25, 2012.
- 2013 Regulation of glucose metabolism by nesfatin-1. Experimental Biology. Boston, MA. April 20-24, 2013.
- 2014 Amelioration of nonalcoholic fatty liver disease by interference of ghrelin receptor. Moses Gunn 26th Annual Research Conference. Ann Arbor, MI. April 23, 2014.

- 2015 Differential regulation of hepatic lipid metabolism by ghrelin and nesfatin-1. Moses Gunn 27th Annual Research Conference. Ann Arbor, MI. April 1, 2015.
- 2017 Bone mass and marrow adipose loss after vertical sleeve gastrectomy surgery in mice is inversely correlated with splenomegaly. MDRC Annual Diabetes Symposium. Ann Arbor, MI. March 18, 2017.
- 2017 Bone mass and marrow adipose loss after vertical sleeve gastrectomy surgery in mice is inversely correlated with splenomegaly. Cold Spring Harbor Laboratory. Cold Spring Harbor, NY. May 16-20, 2017.
- 2018 Bone mass and marrow adipose loss after vertical sleeve gastrectomy surgery in mice. Keystone Symposium. Silverthorne, CO. January 21-25, 2018.
- 2018 Development, regulation, metabolism and function of bone marrow adipose tissues. Presented at the 16th European Congress of Toxicologic Pathology. Adipose Tissue and Central Nervous System Toxicity in Metabolic Disease. Copenhagen, Denmark. September 11 – 14, 2018.
- 2019 Mechanisms by which vertical sleeve gastrectomy influences bone and the marrow niche. MDRC Annual Diabetes Symposium. Ann Arbor, MI. March 2, 2019.
- 2019 Mechanisms by which vertical sleeve gastrectomy influences bone and the marrow niche. Third Annual Musculoskeletal Health Symposium. Ann Arbor, MI. April 29, 2019.
- 2022 Lipolysis of bone marrow adipocytes is required to fuel bone and the marrow niche during energy deficits. CDI-MOD Symposium (Data Blitz). Ann Arbor, MI. May 11, 2022.
- 2023 Gastric X/A-like cells mediate effects of gut-bone axis on skeletal homeostasis. 2023 Costas T. Lambrew Retreat. Portland, ME. May 3rd, 2023.

Peer-Reviewed Publications

1. Xu G, Li Y, An W, Zhao J, Xiang X, Ding L, **Li Z**, Guan Y, Wang X, Tang C, Zhu Y, Wang N, Li X, Mulholland M, Zhang W. Regulation of gastric hormones by systemic rapamycin. *Peptides* 12: 2185-92, 2010. PMCID: PMC2995266
2. Xu G, Wang Z, Li Y, **Li Z**, Tang H, Zhao J, Xiang X, Ding L, Ma L, Yuan F, Fei J, Wang W, Wang N, Guan Y, Tang C, Mulholland M, Zhang W. Ghrelin Contributes to Glucose Intolerance Induced by Rapamycin in Mice. *Diabetologia* 55:1813-1823, 2012. PMCID: PMC3496261
3. **Li Z**, Xu G, Li Y, Zhao J, Mulholland MW, Zhang W. 2012. mTOR-dependent modulation of gastric nesfatin-1/NUCB2. *Cell Physiol Biochem* 29: 493-500, 2012. PMCID: PMC3711577
4. Xiang X, Yuan F, Zhao J, **Li Z**, Wang X, Guan Y, Tang C, Sun G, Li Y, Zhang W. Deficiency in pulmonary surfactant proteins in mice with fatty acid binding protein 4-Cre-mediated knockout of the tuberous sclerosis complex 1 gene. *Exp Physiol*. 98: 830-41, 2013. PMCID: PMC3593000
5. **Li Z**, Gao L, Tang H, Yin Y, Xiang X, Li Y, Zhao J, Mulholland M, Zhang W. Peripheral effects of nesfatin-1 on glucose homeostasis. *PLoS One* 8: e71513, 2013. PMCID: PMC3744551
6. Qin Y, **Li Z**, Wang Z, Li Y, Zhao J, Mulholland M, Zhang W. Ghrelin contributes to protection of hepatocellular injury induced by ischemia/reperfusion. *Liver Int.* 34: 567-75, 2014. PMID: 23998356
7. **Li Z**, Xu G, Qin Y, Zhang C, Tang H, Yin Y, Xiang X, Li Y, Zhao J, Mulholland M, Zhang W. Ghrelin promotes hepatic lipogenesis by activation of mTOR-PPAR γ signaling pathway. *Proc Natl Acad Sci U S A* 111: 13163-8, 2014. PMCID: PMC4246976

8. Xu Y, **Li Z**, Yin Y, Lan H, Wang J, Zhao J, Feng J, Li Y, Zhang W. Ghrelin inhibits the differentiation of T helper 17 cells through mTOR/STAT3 signaling pathway. *PLoS One* 10: e0117081, 2015. PMID: PMC4319964
9. Zhang W, Chang L, Zhang C, Zhang R, **Li Z**, Chai B, Li J, Chen E, Mulholland M. Central and peripheral irisin differentially regulate blood pressure. *Cardiovasc Drugs Ther* 29:121-7, 2015. PMID: PMC4431576
10. Zhang W, Chang L, Zhang C, Zhang R, **Li Z**, Chai B, Li J, Chen E, Mulholland M. Irisin: A myokine with locomotor activity. *Neurosci Lett* 595: 7-11, 2015. PMID: PMC4836606
11. Xu G, **Li Z**, Ding L, Tang H, Guo S, Liang H, Wang H, Zhang W. Intestinal mTOR regulates GLP-1 production in mouse L cells. *Diabetologia* 58: 1887-97, 2015. PMID: 26037201
12. Xu G, Hong X, Tang H, Jiang S, Liu F, Shen Z, **Li Z**, Zhang W. Ghrelin regulates GLP-1 production through mTOR signaling in L cells. *Mol Cell Endocrinol* 416: 9-18, 2015. PMID: 26279396
13. Yin Y[#], **Li Z[#] (co-first author)**, Gao L, Li Y, Zhao J, Zhang W. AMPK-dependent modulation of Hepatic Lipid Metabolism by Nesfatin-1. *Mol Cell Endocrinol* 417: 20-6, 2015. PMID: 26363221
14. Jiang S, Zhai H, Li D, Huang J, Zhang H, **Li Z**, Zhang W, Xu G. AMPK-dependent regulation of GLP1 expression in L-like cells. *J Mol Endocrinol*. 2016;57(3):151-60. PMID: 27493247
15. Tang H, Yu R, Liu S, Huwatibieke B, **Li Z**, Zhang W. Irisin Inhibits Hepatic Cholesterol Synthesis via AMPK-SREBP2 Signaling. *EBioMedicine* 6: 139-148, 2016. PMID: PMC4856751
16. Wang Y, **Li Z**, Zhang X, Xiang X, Li Y, Mulholland MW, Zhang W. Nesfatin-1 promotes brown adipocyte phenotype. *Sci Rep* 6: 34747, 2016. PMID: PMC5099693
17. **Li Z**, Zhang J, Zhang W, Mulholland M. mTOR activation protects liver from ischemia and reperfusion induced injury through NFκB pathway. *FASEB J* 31: 3018-3026, 2017. PMID: PMC5471519
18. Sherman MA, Suresh MV, Dolgachev VA, McCandless LK, Xue X, **Ziru L**, Machado-Aranda D, Shah YM, Raghavendran K. Molecular Characterization of Hypoxic Alveolar Epithelial Cells After Lung Contusion Indicates an Important Role for HIF-1α. *Ann Surg* 267: 382-391, 2018. PMID: PMC6010036
19. Scheller EL., Khandaker S, Learman BS, Cawthorn WP, Andersen L, Pham HA, Robles H, Wang Z, **Li Z**, Parlee SD, Simon BR, Mori H, Bree AJ, Craft CS, and O.A. MacDougald. Bone marrow adipocytes resist lipolysis and remodeling in response to β-adrenergic stimulation. *Bone* 118: 32-41, 2018. PMID: PMC6062480
20. He R, Yin Y, Li Y, **Li Z**, Zhao J, Zhang W. Esophagus-duodenum Gastric Bypass Surgery Improves Glucose and Lipid Metabolism in Mice. *EBioMedicine* 28: 241-250, 2018. PMID: PMC5898028
21. Yu R, **Li Z**, Liu S, Huwatibieke B, Li Y, Yin Y, Zhang W. Activation of mTORC1 Signaling in Gastric X/A-like Cells Induces Spontaneous Pancreatic Fibrosis and Derangement of Glucose Metabolism by Reducing Ghrelin Production. *EBioMedicine* 36: 304-315, 2018. PMID: PMC6197745
22. **Li Z**, Yu R, Yin W, Qin Y, Ma L, Mulholland M, Zhang W. mTOR signaling in X/A-like cells contributes to lipid homeostasis in mice. *Hepatology* 69: 860-875, 2018. PMID: PMC6351211

23. **Li Z**, Liu S, Lou J, Zhang W, Mulholland M. LGR4 protects hepatocytes from injury in mice. *Am J Physiol Gastrointest Liver Physiol* 316: G123-G131, 2019. PMID: PMC6383381
24. Griffin C, Hutch CR, Abrishami S, Stelmak D, Eter L, **Li Z**, Chang E, Agarwal D, Zamarron B, Varghese M, Subbaiah P, MacDougald OA, Sandoval DA, Singer K. Inflammatory responses to dietary and surgical weight loss in male and female mice. *Biol Sex Differ* 10(1):16, 2019. PMID: PMC6446331
25. **Li Z**, Hardij J, Evers SS, Hutch CR, Choi SM, Shao Y, Learman BS, Lewis KT, Schill RL, Mori H, Corsa CAS, Bagchi DP, Romanelli SM, Kim K, Griffin C, Seeley RJ, Singer K, Sandoval DA, Rosen CJ, and MacDougald OA. G-CSF partially mediates effects of sleeve gastrectomy on the bone marrow niche. *Journal of Clinical Investigation* 129: 2404-2416, 2019. PMID: PMC6546463
26. Bagchi DP, **Li Z**, Corsa CA, Hardij J, Mori H, Learman BS, Lewis KT, Schill RL, Romanelli SM, MacDougald OA. Wntless regulates lipogenic gene expression in adipocytes and protects against diet-induced metabolic dysfunction. *Mol Metab* 20:100992, 2020. PMID: PMC7264081
27. Bagchi DP, Nishii A, **Li Z**, DelProposto JB, Corsa CA, Mori H, Hardij J, Learman BS, Lumeng CN, MacDougald OA. Wnt/ β -catenin signaling regulates adipose tissue lipogenesis and adipocyte-specific loss is rigorously defended by neighboring stromal-vascular cells. *Mol Metab.* 9:101078, 2020. PMID: 32919095
28. **Li Z**, MacDougald OA. Meeting abstracts from the 2020 International Meeting on GH/IGF: actions in the shadow of COVID19 - T11: Cellular interactions in the bone marrow niche evaluated with a bone marrow adipocyte-specific knockout mouse model. *Pituitary* 23, 2–35, 2020. PMID: 33174076
29. Yin Y, Wang Q, Qi M, Zhang C, **Li Z**, Zhang W. Ghrelin ameliorates nonalcoholic steatohepatitis induced by chronic low-grade inflammation via blockade of Kupffer cell M1 polarization. *J Cell Physiol.* 236(7):5121-5133, 2020. PMID: 33345314.
30. Mori H, Dugan CE, Nishii A, Benchamana A, **Li Z**, Cadenhead TS 4th, Das AK, Evans CR, Overmyer KA, Romanelli SM, Peterson SK, Bagchi DP, Corsa CA, Hardij J, Learman BS, El Azzouny M, Coon JJ, Inoki K, MacDougald OA. The molecular and metabolic program by which white adipocytes adapt to cool physiologic temperatures. *PLoS Biol.* 19(5):e3000988, 2021. PMID: 33979328
31. Corsa CAS, Walsh CM, Bagchi DP, Foss Freitas MC, **Li Z**, Hardij J, Granger K, Mori H, Schill RL, Lewis KT, Maung JN, Azaria RD, Rothberg AE, Oral EA, MacDougald OA. Adipocyte-Specific Deletion of Lamin A/C Largely Models Human Familial Partial Lipodystrophy Type 2. *Diabetes.* 2021 Sep;70(9):1970-1984. PMID: 34088712.
32. Bozadjieva-Kramer N, Shin JH, Shao Y, Gutierrez-Aguilar R, **Li Z**, Heppner KM, Chiang S, Vargo SG, Granger K, Sandoval DA, MacDougald OA, Seeley RJ. Intestinal-derived FGF15 protects against deleterious effects of vertical sleeve gastrectomy in mice. *Nat Commun.* 2021 Aug 6;12(1):4768. PMID: 34362888; PMID: PMC8346483.
33. Romanelli SM, Lewis KT, Nishii A, Rupp AC, **Li Z**, Mori H, Schill RL, Learman BS, Rhodes CJ, MacDougald OA. BAd-CRISPR: Inducible gene knockout in interscapular brown adipose tissue of adult mice. *J Biol Chem.* 2021 Dec;297(6):101402. PMID: 34774798

34. **Li Z**, Bowers E, Zhu J, Yu H, Hardij J, Bagchi DP, Mori H, Lewis KT, Granger K, Schill RL, Romanelli SM, Abrishami S, Hankenson KD, Singer K, Rosen CJ, MacDougald O. Lipolysis of bone marrow adipocytes is required to fuel bone and the marrow niche during energy deficits. *Elife*. 2022 Jun 22;11:e78496. PMID: 35731039.
35. **Li Z**, Bagchi DP, Zhu J, Bowers E, Yu H, Hardij J, Mori H, Granger K, Skjaerlund J, Mandair G, Singer K, Hankenson HD, Rosen CJ, and MacDougald OA. Constitutive bone marrow adipocytes suppress local bone formation *JCI Insight*. 2022 Nov 8;7(21):e160915. PMID: 36048537.
36. **Li Z**, Qiu K, Zhao J, Granger K, Yu H, Lewis AG, Myronovych A, Toure MH, Hatsell SJ, Economides AN, Seeley RJ, MacDougald OA. Antibodies to sclerostin or G-CSF receptor partially eliminate bone or marrow adipocyte loss, respectively, following vertical sleeve gastrectomy. *Bone*. 2023 Jan 26:116682. doi: 10.1016/j.bone.2023.116682. Epub ahead of print. PMID: 36709915.

Reviews and Book Chapters

1. **Li Z**, Luo J, Li Y and Zhang W. Ghrelin, a Gastric Hormone with Diverse Functions, *Chemical Biology*. ISBN: 978-953-51-0049-2. InTech. DOI: 10.5772/35067. 2012
2. **Li Z**, Li Y, Zhang W. Ghrelin receptor in energy homeostasis and obesity pathogenesis. *Prog Mol Biol Transl Sci* 114: 45-87. PMID: 23317782. 2013
3. **Li Z**, Mulholland M, Zhang W. Regulation of gastric nesfatin-1/NUCB2. *Curr Pharm Des*. 2013;19(39):6981-5. Review. PMID: 23537086. 2013
4. **Li Z**, Zhang W, Mulholland M. LGR4 and its role in intestinal protection and energy metabolism. *Frontiers in Endocrinology* 6: 131. PMCID: PMC4548225. 2015
5. **Li Z**, Mulholland M, Zhang W. Ghrelin O-acyltransferase (GOAT) and energy metabolism. *Sci China Life Sci* 59: 281-91. PMID: 26732975. 2016
6. **Li Z**, Zhang W. The 2016 Albert Lasker Basic Medical Research Award: Oxygen sensing-a mysterious process essential for survival. *Sci China Life Sci* 59: 1195-1197. PMID: 27783260. 2016
7. Craft CS, **Li Z**, MacDougald OA, and Scheller EL. Molecular differences between subtypes of bone marrow adipocytes. *Curr Mol Bio Rep* 4:16-23. PMCID: PMC6054309. 2018
8. **Li Z**, Hardij J, Bagchi DP, Scheller EL, MacDougald OA. Development, regulation, metabolism and function of bone marrow adipose tissues. *Bone*. 110: 134-140. PMCID: PMC6277028. 2018
9. Yin W, **Li Z***, Zhang W*. Modulation of Bone and Marrow Niche by Cholesterol. *Nutrients*. Jun 21;11(6). PMID: 31234305. 2019
10. Ji Y, Yin Y, **Li Z**, Zhang W. Gut Microbiota-Derived Components and Metabolites in the Progression of Non-Alcoholic Fatty Liver Disease (NAFLD). *Nutrients*. 25;11(8). PMID: 31349604. 2019
11. **Li Z***, MacDougald OA. Stem cell factor - the bridge between bone marrow adipocytes and hematopoietic cells; *HAEMATOL*. 104(9):1689-1691. PMID: 31473604. 2019
12. **Li Z**, MacDougald OA. Preclinical models for investigating how bone marrow adipocytes influence bone and hematopoietic cellularity. *Best Pract Res Clin Endocrinol Metab*. 2021 May 1:101547. PMID: 34016532. 2021

13. Feng T, Zhang W* and Li Z*. Potential Mechanisms of Gut-Derived Extracellular Vesicle Participation in Glucose and Lipid Homeostasis. *Genes* 2022, 13(11), 1964; <https://doi.org/10.3390/genes13111964>
14. Li Z *, Rosen CJ *. The Multifaceted Roles of Bone Marrow Adipocytes in Bone and Hematopoietic Homeostasis. *J Clin Endocrinol Metab.* 2023 Jun 14:dgad355. doi: 10.1210/clinem/dgad355. Epub ahead of print. PMID: 37315208.

* indicates corresponding author.

Present Research Projects

My long-term goal is to elucidate the mechanisms that underlie changes in the gut-bone axis with bariatric surgery-induced bone loss, and also identify important components in order to consider strategies that reduce skeletal complications. Bariatric surgery-associated skeletal complications have been observed since the early 1990s, and lead to up to two-fold increase in fracture risk. Current clinical management includes bone mineral density assessments, consumption of adequate dietary calcium, vitamin D, and protein, and performance of weight-bearing exercise. These countermeasures minimize, but do not fully prevent bone loss secondary to bariatric surgery. A better mechanistic understanding of bone loss associated with bariatric surgery is necessary to properly design and evaluate preventive and therapeutic strategies. Changes in gut hormones and microbiota are alternative mechanisms driving bone loss, but the effects of the major surgical site (the stomach) have been largely neglected. We propose that gastric hormones contribute to bariatric surgery-induced skeletal complications. We found gastric X/A-like cells (P/D₁ cell in humans), a unique endocrine cell population, contribute to the regulation of global lipid metabolism, marrow adiposity and bone formation, suggesting a stomach-bone axis. The future projects include:

- 1) Determine the effects of gastric X/A-like cell-derived secretory factors on VSG-induced bone loss.
- 2) Identify and characterize gastric hormones from X/A-like cells that regulate skeletal homeostasis.

The accomplishment of these projects will provide novel information about molecular phenotype of X/A-like cells and their secretome, particularly with relation to metabolic physiology post-bariatric surgery. This new knowledge will impact our understanding of cross-talk between the gut and the bone and regulators of bone health.