

Curriculum Vitae

Matthew D. Lynes

Office Address: 81 Research Drive, Scarborough, ME 04074

Home Address: 11 Lancaster Lane, Scarborough, ME 04074

Work Phone: 207-396-8100

Work E-Mail: matthew.lynes@mainehealth.org

Place of Birth: Albany, New York, USA

Education

2005	B.A.; Biology	Colby College
2012	Ph.D.; Cell & Molecular Biology (mentor: Eric Widmaier)	Boston University

Postdoctoral Training

2012-2016	Postdoctoral Fellow (mentor: Yu-Hua Tseng)	Joslin Diabetes Center
2014-2015	Visiting Scientist (mentor: David Breault)	Boston Children's Hospital

Professional Positions

2005-2006	Research Assistant	Broad Institute
2007-2012	Teaching Fellow	Boston University
2016-2021	Instructor in Medicine	Harvard Medical School
2016-2020	Research Associate	Joslin Diabetes Center
2020-2021	Assistant Investigator	Joslin Diabetes Center
2021-2022	Visiting Scientist	Joslin Diabetes Center
2021-	Faculty Scientist I	MaineHealth Institute for Research
2021-	Graduate Faculty	University of Maine
2022-	Affiliate Faculty	Roux Institute at Northeastern University

Professional Societies

2009-2011	The Obesity Society	Member
2011-	The Endocrine Society	Member
2013-2018	International Society for Stem Cell Research	Member
2014-	American Diabetes Association	Member
2022-	Bioscience Association of Maine	Member

Editorial Activities

Associate Editor of Biomedicine & Pharmacotherapy	2018-2020
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Journal Reviewer for:

Adipocyte, Antioxidants & Redox Signaling, Biochimica et Biophysica Acta: Molecular and Cell Biology of Lipids, Cell Reports, Contrast Media & Molecular Imaging, European Journal of Lipid Science and Technology, The FASEB Journal, International Journal of Endocrinology, Journal of Clinical Investigation, Journal of Molecular and Cellular Endocrinology, Life Sciences, Metabolism, Molecular Metabolism, Nature Communications, Proceedings of the National Academy of Sciences of the USA, Science of the Total Environment, Scientific Reports

Awards and Honors

Joslin Fellows Council Travel Award, 2016
Joslin Fellows Paper of the Year Award, 2017
Endocrine Society Early Investigator Award, 2017
American Diabetes Association Young Investigator Award, 2021

Grants

Completed

2012-2014 Trainee; NIH T32 DK007260 Joslin Diabetes Center Training Grant (PI: Keith Blackwell)
The goal of this grant was to establish preliminary data to support an individual fellowship application.

2014-2015 PI; Matthew Lynes NIH F32 DK102320 Ruth L. Kirschstein National Research Service Award
"Telomerase as a Marker of Brown and White Adipose Tissue Stem Cells"

The goal of this study is to characterize brown and white adipose tissue telomerase- expressing cells and to determine the inductive cues that govern their function and fate. The co-mentors for this study were Yu-Hua Tseng and David Breault.

2020-2022 PI; Matthew Lynes NIH P30DK036836 Joslin Diabetes Center Pilot and Feasibility Grant
“Genetic Determinants of 12,13-diHOME Biosynthesis in Human Obesity”

The goal of this study is to uncover the effect Ephx2 genotype on circulating 12,13-diHOME levels and to test the hypothesis that this effect drives differences in body mass index between individuals.

Ongoing

2017-2023 PI; Matthew Lynes NIH K01 DK111714 Mentored Research Scientists Career Development Award
“The Lipidomics of Adipose Tissue Thermogenesis”

The goal of this study is to identify potential lipids that act as secreted molecules to mediate, at least in part, the physiologic response to cold challenge. The co-mentors for this study were Yu-Hua Tseng and Gökhan Hotamışligil, and the mentor is currently Lucy Liaw.

2021-2023 Project Leader; Matthew Lynes NIH P20GM121301 MaineHealth COBRE Grant (PI: Lucy Liaw)
“Genetic regulators of vascular smooth muscle thermogenic differentiation”

The goal of this project is to identify the genetic regulators that control the thermogenic differentiation of vascular smooth muscle cells in mice using a lineage tracing approach.

Teaching Experience

2006-2011	Introductory Biology, Systems Physiology <i>Lab Instructor</i>	Boston University
2009-2010	Immunology <i>Discussion Section Teaching Fellow</i>	Boston University
2013	Introductory Biology <i>Guest Lecturer (Adipose Tissue Biology)</i>	Harvard Extension School
2015-2016	Cellular Biology <i>Guest Lecturer (Stem Cell Biology)</i>	University of Maine
2016-2021	Obesity and Adipocyte Biology <i>Guest Lecturer (Summer Student Didactic Session)</i>	Joslin Diabetes Center
2018	Chemistry Senior Seminar Series <i>Guest Lecturer (Adipocyte Biology)</i>	Colby College
2019	Translational Pharmacology <i>Guest Lecturer (Diabetes)</i>	Tufts Medical School
2022	BMS 630: Journal Club in Biomedical Science and Engineering <i>Class Instructor</i>	University of Maine
2022-	BMS 630: Journal Club in Biomedical Science and Engineering <i>Course Director</i>	University of Maine

Regional, National and International Invited Presentations

2009 “Site- and isoform-specific changes in expression of intestinal alkaline phosphatase induced by high-saturated fat diet in mice and its association with CD36.” Oral abstract presentation, The Obesity Society 2009 National Meeting, Washington, DC

- 2011 "Increased Capacity of Distal Intestinal Epithelium to Transport Long-Chain Fatty Acids in Obese Mice Fed a High-Fat Diet." Oral abstract presentation, The Endocrine Society ENDO 2011, Boston, MA
- 2013 "Mouse telomerase reverse transcriptase (mTert) expression marks quiescent adipogenic precursor cells in adipose tissue stromal vascular fraction." Poster, International Society for Stem Cell Research Annual Meeting, Boston, MA
- 2013 "Expression of mouse telomerase reverse transcriptase (mTert) in adipose tissue." Poster, Keystone Symposia on Adipose Tissue Biology and Diabetes. New Insights into Mechanisms of Disease and its Treatment, Keystone, CO
- 2014 "Insulin receptor deletion in the Myf5 lineage inhibits interscapular brown adipose tissue development and induces compensatory browning of white fat." Oral abstract presentation, American Diabetes Association Annual Meeting, San Francisco, CA
- 2015 "Cold Induced Brown and White Adipose Tissue Lipidomic Dynamics." Poster, American Diabetes Association Annual Meeting, Boston, MA
- 2016 "Measuring thermogenic fat metabolism using lipidomic and transcriptional profiling." Poster, Keystone Symposia conference on Diabetes and Obesity, Banff, Alberta, Canada
- 2017 "Measuring thermogenic fat metabolism using lipidomics." Poster, Keystone Symposia on Adipose Tissue Biology and Diabetes, Keystone, CO
- 2017 "12,13-diHOME is a cold induced lipokine that activates brown adipose tissue." Oral abstract presentation, Experimental Biology National Meeting, Chicago, IL
- 2018 "Identifying the signaling pathway activated by the lipokine 12,13-diHOME in brown adipose tissue." Presidential Award nominated poster, The Endocrine Society ENDO 2018, Chicago, IL
- 2018 "12,13-diHOME is a cold induced lipokine that activates brown fat." Invited speaker, Maine Medical Center Research Institute Seminar Series, Scarborough, ME
- 2019 "A CRISPR screen to identify genetic regulators of brown fat glucose transport." Poster, Keystone Symposia conference on Obesity and Adipose Tissue Biology, Banff, Alberta, Canada
- 2019 "A CRISPR screen identifies Rfwd2 as a regulator of brown fat glucose transport." Oral abstract presentation, American Diabetes Association Annual Meeting, San Francisco, CA
- 2020 "Thermogenic Pathways To Combat Obesity." Invited speaker, Maine Medical Center Research Institute Seminar Series, Scarborough, ME
- 2021 "The Physiologic Response to Cold Temperatures." Invited speaker, University of Connecticut Biology Department Seminar Series, Storrs, CT
- 2021 "Thermogenic Pathways To Combat Obesity." Invited speaker, Boston Nutrition Obesity Research Center Adipose Seminar Series, Boston, MA
- 2021 "Tracing telomerase reverse transcriptase (Tert) expression to a dormant preadipogenic origin." Poster, American Diabetes Association Annual Meeting, Virtual Meeting

- 2021 “Thermogenic Pathways To Combat Obesity.” Invited speaker, Ohio State University Diabetes and Metabolism Research Center Research in Progress Seminar Series, Columbus, OH
- 2022 “Thermogenic Pathways To Combat Obesity.” Invited speaker, Bioscience Association of Maine BIOME Virtual Coffee Hour, Virtual Meeting
- 2022 “Growing Healthy, Hot Fat.” Oral abstract presentation, MaineHealth Costas T. Lambrew Research Retreat, Virtual Meeting
- 2022 “Growing Healthy, Hot Fat.” Oral abstract presentation, Tufts University Cell, Molecular and Developmental Biology Program Retreat, North Falmouth, MA
- 2022 “Genetic Determinants of 12,13-diHOME biosynthesis in Metabolic Disease.” Poster, Gordon Research Conference on Lipidomics, Newry, ME
- 2022 “Lynes Lab Introduction.” Oral abstract presentation, UMaine Graduate School of Biomedical Sciences and Engineering Wellness Retreat, Bar Harbor, ME
- 2023 “Brown adipose tissue activation may modulate the beneficial effect of targeted temperature management in post-cardiac arrest syndrome.” Poster, Tufts University Cell, Molecular and Developmental Biology Program Retreat, Freeport, ME

Students Mentored

Graduate Students

Carolina Cora, University of Maine Graduate School of Biomedical Sciences, PhD Candidate, 2022-

Graduate Student Advisory Committees

Audrie Langlais, University of Maine Graduate School of Biomedical Sciences, PhD Committee Member (Mentor: Kathryn Motyl), 2022-

Madeleine Nowak, University of Maine Graduate School of Biomedical Sciences, PhD Committee Member (Mentor: Robert Koza), 2022-

Iris Montes, Tufts University Graduate School of Biomedical Sciences, PhD Committee Member (Mentor: Mali Raman), 2022-

Undergraduate Interns

Hannah Na, Bowdoin College, 2021-2022

Josephine Patten, Worcester Polytechnic Institute, 2022

Charlotte Hurson, Colby College, 2022

Wadak Harbi, University of Southern Maine, 2022-

Service

- 2021-2023-2022-2022-2022-
 MaineHealth Institute for Research Seminar Series Committee Member
 MaineHealth Institute for Research Seminar Series Committee Chairperson
 Bioscience Association of Maine BioME High School and College Showcase Judge
 Bioscience Association of Maine Development Committee Member
 MaineHealth Department of Medicine Professional Development Committee Member

Study Sections

- 2021 Faculty Early Career Development (CAREER) Program, National Science Foundation, Ad Hoc
 2022- American Heart Association Pre and Postdoctoral Fellowship in Cell Transport (Basic Science 6), standing member

- 2023- Joslin Diabetes Center Diabetes Research Center (DRC) P30DK036836 Pilot and Feasibility Grant, standing member
- 2023- Bioscience Association of Maine (BioME) Seed Grant, standing member
- 2023- Bioscience Association of Maine (BioME) Academic Grant, standing member

Publications

Peer reviewed research publications

- Gardner H, Shearstone JR, Bandaru R, Crowell T, **Lynes M**, Trojanowska M, Pannu J, Smith E, Jablonska S, Blaszczyk M, Tan FK, Mayes MD. 2006. Gene profiling of scleroderma skin reveals robust signatures of disease that are imperfectly reflected in the transcript profiles of explanted fibroblasts. *Arthritis & Rheumatology* 54:1961-73. DOI: 10.1002/art.21894.
- Lynes MD**, Narisawa S, Millán JM, Widmaier EP. 2011. Interactions between CD36 and global intestinal alkaline phosphatase in mouse small intestine and effects of high-fat diet. *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology* 301:R1738-47. DOI: 10.1152/ajpregu.00235.2011.
- Townsend KL, An D, Huang TL, **Lynes MD**, Goodyear LJ, Tseng YH. 2013. Increased Mitochondrial Activity in BMP7-Treated Brown Adipocytes, Due to Increased CPT1- and CD36-Mediated Fatty Acid Uptake. *Antioxidants & Redox Signaling* 19(3):243-57. DOI: 10.1089/ars.2012.4536.
- Castiglioni A, Hettmer S, **Lynes MD**, Rao TN, Tchessalova D, Sinha I, Lee BT, Tseng YH, Wagers AJ. 2014. Isolation of Progenitors that Exhibit Myogenic/Osteogenic Bipotency In Vitro by Fluorescence-Activated Cell Sorting from Human Fetal Muscle. *Stem Cell Reports* 2(1):92-106. DOI: 10.1016/j.stemcr.2013.12.006.
- Lynes MD**, Schulz TJ, Pan AJ, Tseng YH. 2015. Disruption of insulin signaling in Myf5-expressing cells leads to marked paucity of brown fat, but normal muscle development. *Endocrinology* 156(5):1637-1647. DOI: 10.1210/en.2014-1773.
- Xue R, **Lynes MD**, Dreyfuss JM, Shamsi F, Schulz TJ, Zhang H, Huang TL, Townsend KL, Li Y, Takahashi H, Weiner LS, White AP, Lynes MS, Rubin LL, Goodyear LJ, Cypess AM, Tseng YH. 2015. Clonal analyses and gene profiling identify genetic biomarkers of the thermogenic potential of human brown and white preadipocytes. *Nature Medicine* 21(7):760-768. DOI: 10.1038/nm.3881.
- Zhang X, Tian Y, Zhang H, Kavishwar A, **Lynes M**, Brownell AL, Sun H, Tseng YH, Moor A, Ran C. 2015. Curcumin analogues as selective fluorescence imaging probes for brown adipose tissue and monitoring browning. *Scientific Reports* 5:13116. DOI: 10.1038/srep13116.
- Schulz TS, Graja, A, Huang TL, Xue R, An D, Poehle-Konawitter S, **Lynes MD**, Tolkachov A, O'Sullivan LE, Hirshman MF, Schupp M, Goodyear LJ, Mishina Y, Tseng YH. 2016. Loss of BMP receptor type 1A in murine adipose tissue attenuates age-related onset of insulin resistance. *Diabetologia* 59(8):1769-1777. DOI: 10.1007/s00125-016-3990-8.
- Gao F, McDaniel J, Chen EY, Rockwell H, **Lynes MD**, Tseng YH, Sarangarajan R, Narain NR, Kiebish MA. 2016. Monoacylglycerol Analysis Using MS/MS(ALL) Quadruple Time of Flight Mass Spectrometry. *Metabolites* 6(3):E25. DOI: 10.3390/metabo6030025.
- Zhu Y, Gao Y, Tao C, Shao M, Zhao S, Huang W, Yao T, Johnson JA, Liu T, Cypess AM, Gupta O, Holland WL, Gupta RK, Spray DC, Tanowitz HB, Cao L, **Lynes MD**, Tseng YH, Elmquist JK, Williams KW, Lin HV, Scherer PE. 2016. Connexin 43 Mediates White Adipose Tissue Beiging by Facilitating the Propagation of Sympathetic Neuronal Signals. *Cell Metabolism* 24(3):420-433. DOI: 10.1016/j.cmet.2016.08.005.
- Lynes MD**, Leiria LO, Lundh M, Bartelt A, Shamsi F, Huang TL, Takahashi H, Hirshman MF, Schlein C, Lee A, Baer LA, May FJ, Gao F, Narain NR, Chen EY, Kiebish MA, Cypess AM, Blüher M, Goodyear LJ, Hotamisligil GS, Stanford KI, Tseng YH. 2017. The cold-induced lipokine 12,13-diHOME promotes fatty acid transport into brown adipose tissue. *Nature Medicine* 23(5):631-637. DOI: 10.1038/nm.4297.
- Townsend KL, Madden CJ, Blaszkiewicz M, McDougall L, Tupone D, **Lynes MD**, Mishina Y, Yu P, Morrison SF, Tseng YH. 2017. Reestablishment of Energy Balance in a Male Mouse Model With POMC Neuron Deletion of BMPR1A. *Endocrinology* 158(12):4233-4245. DOI: 10.1210/en.2017-00212.
- Ramirez AK, **Lynes MD**, Shamsi F, Xue R, Tseng YH, Kahn CR, Kasif S, Dreyfuss JM. 2017. Integrating Extracellular Flux Measurements and Genome-Scale Modeling Reveals Differences between Brown and White Adipocytes. *Cell Reports* 21(11):3040-3048. DOI: 10.1016/j.celrep.2017.11.065.
- Gao F, McDaniel J, Chen EY, Rockwell HE, Nguyen C, **Lynes MD**, Tseng YH, Sarangarajan R, Narain NR, Kiebish MA. 2018. Adapted MS/MS^{ALL} Shotgun Lipidomics Approach for Analysis of Cardiolipin Molecular Species. *Lipids* 53(1):133-142. DOI: 10.1002/lipd.12004.
- Bartelt A, Widenmaier SB, Schlein C, Johann K, Goncalves RLS, Eguchi K, Fischer AW, Parlakgöl G, Snyder N, Nguyen TB, Bruns OT, Franke D, Bawendi MG, **Lynes MD**, Leiria LO, Tseng YH, Inouye K, Arruda AP, Hotamisligil GS. 2018. Brown adipose tissue thermogenic adaptation requires Nrf1-mediated proteasomal activity. *Nature Medicine* 24(3):292-303. DOI: 10.1038/nm.4481.

16. Stanford KI, **Lynes MD**, Takahashi H, Baer LA, May FJ, Lehnig AC, So K, Chen EY, Gao F, Narain NR, Distefano G, Meyer C, Shettigar VK, Hirshman MF, Ziolo MT, Kiebish MA, Tseng YH, Coen PM, Goodyear LJ. 2018. 12,13-diHOME: An Exercise-Induced Lipokine that Increases Skeletal Muscle Fatty Acid Uptake. *Cell Metabolism* 27(5):1111-1120. DOI: 10.1016/j.cmet.2018.03.020.
17. Sustarsic EG, Ma T, **Lynes MD**, Larsen M, Karavaeva J, Havelund JF, Nielsen CH, Jedrychowski MP, Moreno-Torres M, Lundh M, Plucinska K, Jespersen NZ, Grevengoed TJ, Kramar B, Peics J, Hansen JB, Shamsi F, Forss I, Neess D, Keipert S, Wang J, Stohmann K, Brandslund I, Christensen C, Jørgensen ME, Linneberg A, Pedersen OB, Kiebish MA, Qvortrup K, Han X, Pedersen BK, Jastroch M, Mandrup S, Kjær A, Gygi SP, Hansen T, Gillum MP, Grarup N, Emanuelli B, Nielsen S, Scheele C, Tseng YH, Færgeman NJ, Gerhart-Hines Z. 2018. Cardiopilin Synthesis in Brown and Beige Fat Mitochondria is Essential for Systemic Energy Homeostasis. *Cell Metabolism* 28(1):159-174. DOI: 10.1016/j.cmet.2018.05.003.
18. **Lynes MD**, Shamsi F, Sustarsic EG, Leiria LO, Wang CH, Su SC, Huang TL, Gao F, Narain NR, Chen EY, Cypess AM, Schulz TJ, Gerhart-Hines Z, Kiebish MA, Tseng YH. 2018. Cold-Activated Lipid Dynamics in Adipose Tissue Highlights a Role for Cardiopilin in Thermogenic Metabolism. *Cell Reports* 24(3):781-790. DOI: 10.1016/j.celrep.2018.06.073.
19. Takahashi H, Alves CRR, Stanford KI, Middelbeek RJW, Nigro P, Ryan RE, Xue R, Sakaguchi M, **Lynes MD**, So K, Mul JD, Lee MY, Balan E, Pan H, Dreyfuss JM, Hirshman MF, Azhar M, Hannukainen JC, Pedersen BK, Kahn CR, Tseng YH, Goodyear LJ. 2019. TGF- β 2 is an exercise-induced adipokine that regulates glucose and fatty acid metabolism. *Nature Metabolism* 1:291-303. DOI: 10.1038/s42255-018-0030-7.
20. Leiria LO, Wang CH, **Lynes MD**, Yang K, Shamsi F, Sato M, Sugimoto S, Chen EY, Bussberg V, Narain NR, Sansbury BE, Darcy J, Huang TL, Kodani SD, Sakaguchi M, Rocha AL, Schulz TJ, Bartelt A, Hotamisligil GS, Hirshman MF, van Leyen K, Goodyear LJ, Blüher M, Cypess AM, Kiebish MA, Spite M, Tseng YH. 2019. 12-lipoxygenase regulates cold adaptation and glucose metabolism by producing the omega-3 lipid 12-HEPE from brown fat. *Cell Metabolism* S1550-4131(19): 30374-2. DOI: 10.1016/j.cmet.2019.07.001.
21. Sato M, Tsuji T, Yang K, Ren X, Dreyfuss J, Huang TL, Wang CH, Shamsi F, Leiria LO, **Lynes MD**, Yau KW, Tseng YH. 2020. Cell-autonomous light sensitivity via Opsin3 regulates fuel utilization in brown adipocytes. *PLOS Biology* 18(2):e3000630. DOI: 10.1371/journal.pbio.3000630.
22. Shamsi F, Xue R, Huang TL, Lundh M, Liu Y, Leiria LO, **Lynes MD**, Kempf E, Wang CH, Sugimoto S, Nigro P, Landgraf K, Schulz T, Li Y, Emanuelli B, Kothakota S, Williams LT, Jessen N, Pedersen SB, Böttcher Y, Blüher M, Körner A, Goodyear LJ, Mohammadi M, Kahn CR, Tseng YH. 2020. FGF6 and FGF9 regulate UCP1 expression independent of brown adipogenesis. *Nature Communications* 11(1):1421. DOI: 10.1038/s41467-020-15055-9.
23. Darcy J, Fang Y, McFadden S, **Lynes MD**, Leiria LO, Dreyfuss JM, Bussberg V, Tolstikov V, Greenwood B, Narain NR, Kiebish MA, Bartke A, Tseng YH. 2020. Integrated metabolomics reveals altered lipid metabolism in adipose tissue in a model of extreme longevity. *GeroScience*. DOI: 10.1007/s11357-020-00221-0.
24. Wang CH, Lundh M, Fu A, Kriszt R, Huang TL, **Lynes MD**, Leiria LO, Shamsi F, Darcy J, Greenwood BP, Narain NR, Kitayev A, Smith KL, Emanuelli B, Chang YT, Hagen S, Danial NN, Kiebish MA, Tseng YH. 2020. CRISPR-Engineered Human Brown-Like Adipocytes Prevent Diet-Induced Obesity and Ameliorate Metabolic Syndrome in Mice. *Science Translational Medicine* 12(558): eaaz8664. DOI: 10.1126/scitranslmed.aaz8664
25. Wolfs D, **Lynes MD**, Tseng YH, Bussberg V, Tolstikov V, Narain NR, Kiebish MA, Demerath EW, Fields DA, Isganaitis E. 2021. Brown Fat-Activating Lipokine 12,13-diHOME in Human Milk Is Associated With Infant Adiposity. *Journal of Clinical Endocrinology and Metabolism* 106(2):e943-e956. DOI: 10.1210/clinem/dgaa799.
26. Schlein C, Fischer AW, Sass F, Worthmann A, Tödter K, Jäckstein MY, Behrens J, **Lynes MD**, Kiebish M, Bussberg V, Darkwah A, Schweizer M, Bartelt A, Kubisch C, Tseng YH, Heeren J, Scheja L. 2021. Endogenous Fatty Acid Synthesis Drives Brown Adipose Tissue Involution. *Cell Reports* 34(2):108624. DOI: <https://doi.org/10.1016/j.celrep.2020.108624>
27. Shamsi F, Piper M, Ho LL, Huang LH, Gupta A, Streets A, Tseng YH*, **Lynes MD***. 2021. Vascular Smooth Muscle-Derived TRPV1-Positive Progenitors Are A New Source of Cold-Induced Thermogenic Adipocytes. *Nature Metabolism* 3(4):485-495. DOI: 10.1038/s42255-021-00373-z. ***co-corresponding author.**
28. Angueira A, Sakers AP, Holman CD, Cheng L, Arbocco M, Shamsi F, **Lynes MD**, Shrestha R, Okada C, Batmanov K, Susztak K, Tseng YH, Liaw L, Seale P. 2021. Defining the Lineage of Thermogenic Perivascular Adipose Tissue. *Nature Metabolism* 3(4):469-484. DOI: 10.1038/s42255-021-00380-0.
29. **Lynes MD***, Carlone DL, Townsend KL, Breault DT, Tseng YH*. 2022. Telomerase reverse transcriptase expression marks a population of rare adipose tissue stem cells. *Stem Cells* 40(1):102-111. DOI: <https://doi.org/10.1093/stmcls/sxab005>. ***co-corresponding author.**
30. Townsend KL, Pritchard E, Coburn JM, Kwon YM, Blasckiewicz M, **Lynes MD**, Kaplan DL, Tseng YH. 2022. Silk hydrogel-mediated delivery of bone morphogenetic protein 7 (BMP7) directly to subcutaneous white adipose tissue (scWAT) increases browning and energy expenditure. *Frontiers in Bioengineering and Biotechnology* 10:884601. DOI: 10.3389/fbioe.2022.884601.

31. Park K, Li Q, **Lynes MD**, Yokomizo H, Maddaloni E, Shinjo T, St-Louis R, Li Q, Ktagiri S, Fu J, Park H, Boumenna T, Li Q, Wu IH, Shah H, Clermont A, Tseng YH, King GL. 2022. Endothelial cells induced differentiation of perivascular progenitor cells into brown fat to reduce atherosclerosis. *Circulation Research* 131(2):168-183. DOI: 10.1161/CIRCRESAHA.121.319582.
32. Rahbani, JF, Scholtes, C, Lagarde, DM, Hussain, MF, Roesler, A, Dykstra, CB, Bunk, J, Samborska, B, O'Brien, SL, Tripp, E, Pacis, A, Angueira, AR, Johansen, OS, Cinkornpumin, J, Hossain, I, **Lynes, MD**, Zhang, Y, White, AP, Pastor, WA, Chondronikola, M, Sidossis, L, Klein, S, Kralli, A, Cypess, AM, Pedersen, SB, Jessen, N, Tseng, YH, Gerhart-Hines, Z, Seale, P, Calebiro, D, Giguère, V Kazak, L. 2022. ADRA1A-Gαq signaling potentiates adipocyte thermogenesis through CKB and TNAP. *Nature Metabolism* 4(11):1459-1473. DOI: <https://doi.org/10.1038/s42255-022-00667-w>.

Reviews, commentaries and chapters

1. **Lynes MD** and Widmaier EP. 2010. Involvement of CD36 and intestinal alkaline phosphatases in fatty acid transport in enterocytes, and the response to a high-fat diet. *Life Sciences* 88: 384-91. DOI: 10.1016/j.lfs.2010.12.015.
2. **Lynes MD** and Tseng YH. 2014. Unwiring the transcriptional heat circuit. *Proceedings of the National Academy of Sciences USA* 111(40):14318-14319. DOI: 10.1073/pnas.1416145111.
3. **Lynes MD** and Tseng YH. 2015. The Thermogenic Circuit: Regulators of Thermogenic Competency and Differentiation. *Genes & Diseases* 2:164-172. DOI: 10.1016/j.gendis.2015.03.001.
4. **Lynes MD** and Tseng YH. 2018. Deciphering Adipose Tissue Heterogeneity. *Annals of the New York Academy of Sciences* 1411(1):5-20. DOI: 10.1111/nyas.13398.
5. **Lynes MD**, Kodani SK and Tseng YH. 2019. Thermogenic Lipokines. *Endocrinology* 160(10):2314-2325. DOI: 10.1210/en.2019-00337.
6. **Lynes MD** and Tseng YH. 2020. Lipid Biomarkers for Brown fat Burning. *Journal of Clinical Endocrinology and Metabolism* 105(8):dgaa339. DOI: 10.1210/clinem/dgaa339.
7. **Lynes MD** and Tseng YH. 2023. Chapter 7: Bioenergetics and Obesity. *Handbook of Obesity*, 5th edition accepted manuscript.

Preprints

1. Wibowo MC, Yang Z, Chavkin TA, Nguyen B, Pham LD, Huang TL, **Lynes MD**, Tseng YH, Kostic AD. 2022. The impact of multigenerational high-fat diet feeding on the gut microbiome and host metabolism. *Biorxiv*. DOI: <https://doi.org/10.1101/2022.02.01.478488>.
2. Jensen GS, Beaulieu AN, Curtis CD, Passarelli J, Blaszkiewicz M, Thomas S, Morin T, Willows JW, Greco CW, Brennan CJ, Aniapam C, Caron L, Alves MJ, **Lynes MD**, Carlone DL, Breault DT, Townsend KL. 2023. Telomerase reverse transcriptase (TERT)-expressing cells mark a novel stem cell population in the adult mouse brain. *Biorxiv*. DOI: <https://doi.org/10.1101/2023.02.09.527879>
3. Tsuji T, Tolstikov V, Zhang Y, Huang TL, Halpin M, Narain NR, Yau KW, **Lynes MD**, Kiebish MA, Tseng YH. 2023. A novel light-responsive adipose-hypothalamus axis in metabolic regulation. SSRN DOI: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4487680

Patents

U.S. Patent 16/532,114 “Methods and compositions for treating metabolic disorders.” Yu-Hua Tseng and Matthew D. Lynes (Joslin Diabetes Center/Harvard University).

U.S. Patent 62/961,327 “Methods for treating type 2 diabetes, hepatitis and/or inflammatory liver disease.” Michael A. Lynes, (University of Connecticut), Matthew D. Lynes and Yu-Hua Tseng (Joslin Diabetes Center/Harvard University).

U.S. Provisional Patent “Methods and compositions for promoting thermogenic potential.” Yu-Hua Tseng and Matthew D. Lynes (Joslin Diabetes Center/Harvard University).