

Michael F. Coleman PhD

2100 MHRC, Department of Nutrition, University of North Carolina at Chapel Hill, 135 Dauer Dr., Chapel Hill, NC 27599 • Phone: (919) 9850347 • E-Mail: mcoleman@unc.edu

Education

- 2017** **PhD** University College Cork, School of Biochemistry and Cell Biology, Cork, Ireland
Biochemistry. Advisor Rosemary O'Connor PhD

Thesis: "Pyrimidine nucleotide carrier 1 in mitochondrial homeostasis and cancer"
- 2012** **BSc with honors** Cork Institute of Technology and University College Cork, Cork, Ireland
Biomedical science.
- 2010** **BSc** Cork Institute of Technology, Cork, Ireland
Biomedical science

Professional Experience

Research Assistant Professor, Department of Nutrition, University of North Carolina, Chapel Hill, NC
July 2022-Present

Postdoctoral Research Associate, Department of Nutrition, University of North Carolina, Chapel Hill, NC
July 2017-June 2022
Advisor: Stephen D. Hursting, PhD, MPH

Graduate Research Assistant, *School of Biochemistry and Cell Biology*, University College Cork, Ireland
2010-2012
Advisor: Rosemary O'Connor, PhD

Awards and Memberships

Invited Presentations

2023 Invited oral presentation at MD Anderson Department of Pediatrics, USA

2022 Invited oral presentation American Association for Cancer Research conference on the science of cancer health disparities in racial/ethnic minorities and the medically underserved, USA

2019 Invited oral presentation American Institute for Cancer Research Conference, USA

Awards

2022 Transdisciplinary Research on Energetics and Cancer (TREC), Training Fellowship, Yale University, USA

2021 Speaker's prize, oral presentation FASEB, USA

2018 Best poster, North Carolina Research Campus Annual Symposium, USA

2016 Speaker's prize, Irish Association for Epithelial Biology, Ireland

2012 PhD Scholarship, Irish Cancer Society, Ireland

2012 President's prize for undergraduate research excellence, Academy of Medical Laboratory Sciences, Ireland

2010 Undergraduate Research Experience and Knowledge Award, undergraduate research scholarship, University College Cork, Ireland

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Memberships

2019-Present American Association of Cancer Research

2020 American Society for Nutrition

2020-Present Scientific Reports ad hoc reviewer

2020-Present Nutrients ad hoc reviewer

2020-Present Cancers ad hoc reviewer

Teaching and Invited Guest Lectures

Courses

NUTR845 (Nutritional metabolism): I co-teach this upper-level graduate student course with Dr. Sandra Mooney, focused on formulating and testing hypotheses related to nutritional biochemistry using cell, molecular biology, and/or in vivo approaches.

Invited Guest Lectures

2023 “Metabolism and Cancer”

NUTR600 Human metabolism: macronutrients (undergraduate and graduate).

2023 “Nutrition and Cancer”

NUTR240 Introduction to human nutrition: macronutrients (undergraduate).

Mentorship

Graduate Students

2023 – present **Malian, Hannah.** PhD, Nutrition (Hursting). Committee Member, “Regulation of B7H3 Targeting CAR T Cell Therapies Efficacy by Obesity.”

2023 – present **McDonell, Shannon.** MS, Nutrition (Hursting). Committee Member, “Sulindac Reverses Obesity-Driven Tumor Growth via Restoration of Antitumor Immunity”.

2023 – present **Bathon, Brooke.** PhD, Nutrition (Shaikh). Committee Member. Title TBD

2023 – present **Zhou, Jiaya.** PhD, Nutrition (Maeda). Comprehensive exam committee.

BSPH Honors Thesis students

2023 – present **Oh, Hannah.** BSPH Independent Study Advisor, “Regulation of B7H3 by Obesity-Associated Cytokine Signals.”

2021 – present **Attaar, Numair.** BSPH Independent Study Advisor, “PI3K Dependent Induction of PDL1 Following Suppression of Pyruvate Carboxylase.”

2022 – present **Lamba, Sajan.** BSPH Independent Study Advisor (co-taught with Dr. J. Poulton Dept. Cell Biology and Physiology).

Other mentorship

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I have acted as a primary mentor for a total of 19 students spread across PhD (6), MS (5), and BS/BSPH (8). In this role, I oversee experimental design, execution, and synthesis of the experimental/scientific work and assist with other training milestones such as presentations, thesis proposals, thesis writing and thesis defense preparation. I have acted as a secondary mentor to 7 additional BS/BSPH students. I reviewed experimental designs as needed and provided feedback on milestones/research products.

Publications

**shared authorship*

1. Glenny E.M., Ho A.N., Kiesel V.A., Chen F., Gates C.E., Paules E.M., Xu R., Holt C.A., **Coleman M.F.**, Hursting S.D. Tirzepatide attenuates mammary tumor progression in diet-induced obese mice. [bioRxiv. 2024](#)
2. Camp, K.*, **Coleman, M.F.***, McFarlane, T.L., Doerstling, S.D., Khatib, S.A., Rezeli, E.T., Lewis, A.G., Pfeil, A.J., Smith, L.A., Bowers, L.W., Fouladi, F., Gong, W., Glenny, E.M., Parker, J.S., Milne, G.L., Carroll, I.M., Fodor, A.A., Seeley, R.J., Hursting, S.D. Calorie restriction outperforms bariatric surgery in a murine model of obesity and triple-negative breast cancer. [JCI Insights. 2023](#).
3. Hunt E.G., Hurst K.E., Riesenber B.P., Kennedy A.S., Gandy E.J., Andrews A.M., Del Mar Alicea Pauneto C., Ball L.E., Wallace E.D., Gao P., Meier J., Serody J.J., **Coleman M.F.**, Thaxton J.E. Acetyl-CoA carboxylase obstructs CD8(+) T cell lipid utilization in the tumor microenvironment. [Cell Metab. 2024](#)
4. Cozzo A.J., **Coleman M.F.**, Hursting S.D. You complete me: tumor cell-myeloid cell nuclear fusion as a facilitator of organ-specific metastasis. [Front Oncol. 2023](#)
5. Bustamante-Marin, X., Devlin, K.L., McDonell, S.B., Dave, O., Merlino, J.L., Grindstaff, E.J., Ho, A.N., Rezeli, E.T., **Coleman, M.F.**, Hursting, S.D. Regulation of IGF1R by MicroRNA-15b Contributes to the Anticancer Effects of Calorie Restriction in a Murine C3-TAg Model of Triple-Negative Breast Cancer. [Cancers. 2023](#).
6. Kalam, F., James, D., Li, Y.R., **Coleman, M.F.**, Kiesel, V.A., Cespedes Feliciano, E.M., Hursting, S.D., Sears, D.D., Kleckner, A.S. Intermittent Fasting Interventions to Leverage Metabolic and Circadian Mechanisms for Cancer Treatment and Supportive Care Outcomes. [JNCI Monographs. 2023](#).
7. Kung, C-P, Skiba, M.B., Crosby, E.J., Gorzelitz, J., Kennedy, M.A., Kerr, B.A., Li, Y.R., Nash, S., Potiaumpai, M., Kleckner, A.S., James, D.L., **Coleman, M.F.**, Fairman, C.M., Galván, G.C., Garcia, D.O., Gordon, M.J., His, M., Hornbuckle, L.M., Kim, S-Y, Kim, T-H, Kumar, A., Mahé, M., McDonnell, K.K., Moore, J., Oh, S., Sun, X., Irwin, M.L. Key Takeaways for knowledge expansion of early career scientists conducting transdisciplinary research in energetics and cancer (TREC): A Report from the TREC Training Workshop 2022. [JNCI Monographs. 2023](#).
8. Smith, L.A., Craven, D.M., Rainey, M.A., Cozzo, A.J., Carson, M.S., Glenny, E.M., Sheth, N., McDonell, S.B., Rezeli, E.T., Montgomery, S.A., Bowers, L.W., **Coleman, M.F.**, Hursting, S.D. Separate and combined effects of advanced age and obesity on mammary adipose inflammation, immunosuppression and tumor progression in mouse models of triple negative breast cancer. [Front Oncol. 2023](#).
9. Stroud, A.M., **Coleman, M.F.** Bariatric Surgery in the Prevention of Obesity-Associated Cancers: Mechanistic Implications. [Surgery for Obesity and Related Diseases. 2023](#).

10. **Coleman, M.F.***, Kulkoyluoglu Cotul*, E., Pfeil, A.J., Devericks, E.N., Chen, H., Kiesel, V.A., Safdar, M.H., Teegarden, D., Hursting, S.D., Wendt, M.K. Hypoxia-mediated suppression of pyruvate carboxylase drives tumor microenvironment immunosuppression. *bioRxiv*. 2022.
11. Devericks, E.N., Carson, M.S., McCullough, L.E., **Coleman, M.F.**, Hursting, S.D. The obesity-breast cancer link: a multidisciplinary perspective. *Cancer and Metastasis Reviews*. 2022.
12. Orenduff, M.C., **Coleman, M.F.**, Glenny, E.M., Huffman, K.M., Rezeli, E.T., Bareja, A., Pieper, C.F., Kraus, V.B., Hursting, S.D. Differential effects of calorie restriction and rapamycin on age-related molecular and functional changes in skeletal muscle. *Experimental Gerontology*. 2022.
13. Bowers, L.W., Doerstling, S.S., Shamsunder, M.G., Lineberger, C.G., Rossi, E.L., Montgomery, S.A., **Coleman, M.F.**, Gong, W., Parker, J.S., Howell, A., Harvie, M., Hursting, S.D. Reversing the genomic, epigenetic and triple negative breast cancer-enhancing effects of obesity. *Cancer Prev Res (Phila)*. 2022.
14. Bowers L.W., Glenny E.M., Punjala A., Lanman N.A., Goldbaum A., Himbert C., Montgomery S.A., Yang P., Roper J., Ulrich C.M., Dannenberg A.J., **Coleman M.F.**, Hursting S.D. Weight loss and/or sulindac mitigate obesity-associated transcriptome, microbiome, and protumor effects in a murine model of colon cancer. *Cancer Prev Res (Phila)*. 2022.
15. **Coleman, M.F.**, Liu, K.A., Pfeil, A.J., Etigunta, S.E., Bowers, L.W., Lashinger, L.M., Cui, Z., Hursting, S.D. β -hydroxy- β -methylbutyrate supplementation inhibits pancreatic tumor growth and preserves muscle mass in obese mice. *Cancers*. 2021.
16. Hufnagel S., Xu H., **Coleman M.F.**, Valdes S.A., Liu K.A., Hursting S.D., Cui Z. 4-(N)-Docosahexaenoyl 2', 2'-difluorodeoxycytidine induces immunogenic cell death in colon and pancreatic carcinoma models as a single agent. *Cancer Chemother Pharmacol*. 2021.
17. Stalneck, C.A., Grover, K.R., Edwards, A.C., **Coleman, M.F.**, Yang, R., Papke, B., Goodwin, C.M., Pierobon, M., Petricoin E.M. III, Gautam, P., Wennerber K., Cox, A.D., Der, C.J. Hursting, S.D., Bryant, K.L. Concurrent inhibition of IGF1R and ERK increases pancreatic cancer vulnerability to autophagy inhibition. *Cancer Research*. 2021.
18. Glenny, E.M., **Coleman, M.F.**, Giles, E.D., Wellberg, E.A., Hursting, S.D. Designing Relevant Preclinical Rodent Models for Studying Links Between Nutrition, Obesity, Metabolism, and Cancer. *Annual Review of Nutrition*. 2021.
19. Kiesel, V.A., Sheeley, M.P., **Coleman, M.F.**, Cotul, E.K., Donkin, S.S., Hursting, S.D., Wendt, M.K., Teegarden, D. Pyruvate carboxylase and cancer progression. *Cancer and Metabolism*. 2021.
20. **Coleman, M.F.**, O'Flanagan, C.H., Pfeil, A.J., Chen, X., Etigunta, S.E., Tsai, Y.H., Parker, J.S., Ashkavand, Z., Sumner, S., Krupenko, S.A., Hursting, S.D. Metabolic Response of Triple-Negative Breast Cancer to Folate Restriction. *Nutrients*. 2021.
21. Kok, D.E., **Coleman, M.F.**, O'Flanagan, C.H., Ashkavand, Z., Hursting, S.D., Krupenko, S.A. Effects of folic acid restriction on transcriptomic profiles in murine models of triple-negative breast cancer cell lines. *Biochimie*. 2020.
22. **Coleman, M.F.**, Cozzo, A.J., Pfeil, A.J., Etigunta, S.E., Hursting, S.D. Cell intrinsic and systemic metabolism in tumor immunity and immunotherapy. *Cancers*. 2020.

23. Lyons, A., **Coleman, M.F.**, Riis, S., Favre, C., O'Flanagan, C. H., Zhdanov, A. V., Papkovsky, D. B., Hursting, S. D., O'Connor, R. Insulin-like growth factor-1 signaling is essential for mitochondrial biogenesis and mitophagy in cancer cells. *The Journal of Biological Chemistry*. 2017.
24. Stanicka, J., Rieger, L., O'Shea, S., Cox, O., **Coleman, M.F.**, O'Flanagan, C., Addario, B., McCabe, N., Kennedy, R., O'Connor, R. FES-related tyrosine kinase activates the insulin-like growth factor-1 receptor at sites of cell adhesion. *Oncogene*. 2018.

Other Work (Commentaries and Conference Abstracts)

1. Glenny, EM, Ho, AN, Kiesel, VA, Chen, F, Gates, CE, Paules, EM, Xu, R, Holt, AC, **Coleman, MF**, Hursting, SD. Tirzepatide mitigates obesity-associated metabolic dysregulation and tumor progression in a mouse model of triple-negative breast cancer. *Cancer Research (supplement) 2024*
2. **Coleman, MF**, Cotul-Kulkoyluoglu, E, Pfeil, AJ, Ho, AN, Devericks, EN, Safdar, MH, Chen, H, Attaar, N, Kiesel, VA, Teegarden, D. Pyruvate carboxylase regulates tumor progression through central carbon metabolism and immunosuppression. *Cancer Research (supplement) 2024*
3. Andolino, C, Buhman, KK, **Coleman, MF**, Hursting, SD, Layosa, M, Wendt, MK, Teegarden, D. Proteomic analysis of cytoplasmic lipid droplets and whole cell lysates reveal ferroptosis regulation by fatty acid synthase-derived lipid droplets in metastatic breast cancer. *Cancer Research (supplement) 2024*
4. **Coleman, MF**, Glenny, EM, McFarlane, TL, Malian, HM, Gates, CE, Chen, F, Ho, AN, Kiesel, VA, Hursting, SD. Tirzepatide treatment restores antitumor immunity in a model of obesity-driven cancer. *Cancer Research (supplement) 2024*
5. Stalneck, C.A., **Coleman, M.F.**, Bryant, K.L. Susceptibility to autophagy inhibition is enhanced by dual IGF1R and MAPK/ERK inhibition in pancreatic cancer. *Autophagy*. 2022.
6. **Coleman, M.F.**, Pfeil, A.J., Kiesel, V., Etigunta, S.K., Wendt, M.K., Teegarden, D., Hursting, S.D., Mammary tumor microenvironment reprogramming in response to pyruvate carboxylase modulation. *Cancer Research (supplement) 2021*.
7. **Coleman, M.F.**, Liu, K.A., Etigunta, S.K., Pfeil, A.J., Tang, X., Fabela, S., Lashinger, L.M., Cui, Z.g, Hursting, S.D., β Hydroxy β Methylbutyrate synergizes with cytotoxic chemotherapy and immunotherapy in a mouse model of pancreatic cancer. *Cancer Research (supplement) 2021*.
8. Bustamante-Marin, X.M., Devlin, K.L., Dave, O., Merlino, J.L., McDonell, S.B., **Coleman, M.F.**, Hursting, S.D., Anticancer effects of calorie restriction in a murine C3-TAg model of triple-negative breast cancer: the role of miR-15b. *Cancer Research (supplement) 2021*.
9. McFarlane, T.L., Camp, K.K., Glenny, E.M., Rezeli, E., **Coleman, M.F.**, Hursting, Stephen D, Metaboendocrine and inflammatory correlates of tumor growth following caloric restriction and vertical sleeve gastrectomy in a mouse model of breast cancer. *Cancer Research (supplement) 2021*.
10. Craven, D.M., Smith, L.A., **Coleman, M.F.**, Glenny, E.M., Hursting, S.D., Intermittent calorie restriction reverses the adverse effects of obesity and advanced age on tumor growth in a mouse model of breast cancer. *Cancer Research (supplement) 2021*.

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11. Camp, K.K., Rossi, E., McFarlane, T.L., Doerstling, S., Khatib, S., Glenny, E.M., **Coleman, M.F.**, Bowers, L.W., Rezeli, E., Seeley, R.J., Hursting, S.D., Calorie restriction reverses the tumorigenic effects of obesity to a greater extent than bariatric surgery in a murine model of breast cancer. *Cancer Research (supplement)* 2021.
12. Eisenbeis, L.K., McDonell, S.B., Smith, L.A., Cozzo, A.J., **Coleman, M.F.**, Hursting, S.D., The role of obesity-associated adipose tissue inflammation in breast cancer metastasis. *Cancer Research (supplement)* 2020.
13. VerHague, M., Albright, J., Favela, S., Barron, K., **Coleman, M.F.**, Meyer, K., French, J.E., Hursting, S.D., Diet-induced obesity and caloric restriction weight loss in Diversity Outbred (DO) mice: An experimental preclinical translational model for the investigation of pathways for prevention of obesity and cancer. *Cancer Research (supplement)* 2020.
14. Riis, S., **Coleman, M.F.**, Hursting, S.D., O'Connor, R., Insulin-like growth factor-1 signaling promotes mitochondrial turnover and protection in cancer cells *Cancer Research (supplement)* 2019.
15. Cozzo, A.J., Coleman, M.F., O'Flanagan, C.H., Pearce, J.B., Rainey, M.A., Hursting, S.D., Separate and combined effects of metabolic reprogramming interventions, autophagy inhibition, and carboplatin on murine triple-negative breast cancer cells. *Cancer Research (supplement)* 2019.
16. Chen, X., O'Flanagan, C.H., **Coleman, M.F.**, Der, C.J., Hursting, S.D., Separate and combined effects of caloric restriction mimetics and autophagy inhibition on KRAS-driven pancreatic adenocarcinoma. *Cancer Research (supplement)* 2018.
17. Lyons, A., **Coleman, M.F.**, O'Connor, R., Favre, C., IGF-1 and mitochondrial signaling in cancer cell phenotype and invasiveness. *Molecular Biology of the Cell* 2015.
18. Tresse, E., Cox, O.T., Edmunds, S.J., **Coleman, M.F.**, O'Connor, R., PDLIM2 is required for macrophage subset differentiation with implications for cytokine production in tumor microenvironment. *Molecular Biology of the Cell* 2014.

Funding (Current)

NORC Pilot and Feasibility \$40,000/year Coleman (PI) 4/1/24-3/31/25

Defining role of pyruvate carboxylase expression in breast cancer glucose and glutamine metabolism

Using in vitro models of cancer cell metabolism we will delineate how suppression of PC remodels metabolism and identify actionable targets for intervention. Effort 1.2 calendar.

Funding (pending)

Gilead Research Scholars \$80,000/year Coleman (PI) 1/1/24-12/31/24

Incretin-based therapy to promote antitumor immunity in obesity-driven triple-negative breast cancer

Establish how incretin-based therapy can restore antitumor immunity in animal models of obesity-driven TNBC using in vivo and in vitro assays of antigen specific tumor control. Effort 1.2 calendar.

NIH/NCI: CA232589 \$499,900/year Teegarden (mPI) Coleman (co-I) 02/1/24-01/31/29

Obesity, metabolism and breast cancer metastasis

Define the steps of breast cancer metastasis that functionally require elevated PC expression and establish the role of leptin in obesity-associated PC expression and metastatic progression. Effort: 1.2 calendar.