

# Matthew A. Cottam, Ph.D.

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## Education

### Vanderbilt University

Nashville, TN

PH.D. IN MOLECULAR PHYSIOLOGY AND BIOPHYSICS

2016 - 2022

- Advisor: Dr. Alyssa Hasty

### Wake Forest University

Winston-Salem, NC

BS CHEMISTRY

2012 - 2016

- Undergraduate Research Advisor: Dr. Michael Gross

## Experience

- 2023- **Staff Scientist**, Department of Surgical Sciences, Division of Surgical Oncology and Endocrine Surgery, Vanderbilt University Medical Center
- 2022-2023 **Bioinformatics Analyst**, Creative Data Solutions, Vanderbilt Center for Stem Cell Research, Vanderbilt University
- 2016-2022 **Doctoral Candidate**, Department of Molecular Physiology and Biophysics, Vanderbilt University
- 2015 **Summer Research Fellow**, Department of Chemistry, Wake Forest University
- 2014-2016 **Undergraduate Research Assistant**, Department of Chemistry, Wake Forest University
- 2014 **Summer Research Student**, Department of Urology, Vanderbilt University
- 2012-2014 **Undergraduate Research Assistant**, Department of Biology, Wake Forest University
- 2013 **Summer Research Student**, Department of Biomaterials, Wake Forest Institute for Regenerative Medicine

## Publications

### PUBLISHED

- Marathe SJ, Grey EW, Bohm MS, Joseph SC, Ramesh AV, **Cottam MA**, Idrees K, Wellen KE, Hasty AH, Rathmell JC, Makowski L. 2025. Incretin Triplet Agonist Retatrutide (LY3437943) Alleviates Obesity-Associated Cancer Progression. *NPJ Metab Health Dis*.
- Garcia JN, **Cottam MA**, Rodriguez AS, Agha AFH, Winn NC, Hasty AH. 2025. Interrupting T Cell Memory Ameliorates Exaggerated Metabolic Response to Weight Cycling. *bioRxiv (Under review at Diabetes)*
- Pierro EW, **Cottam MA**, An H, Lehmann BD, Pietenpol JA, Wellen KE, Makowski L, Rathmell JC, Fingleton B, Hasty AH. 2025. Comparison of Lean, Obese, and Weight Loss Models Reveals TREM2 Deficiency Attenuates Breast Cancer Growth Uniquely in Lean Mice and Alters Clonal T Cell Populations. *Cancer Res*.
- Arner EN, Jennings EQ, Crooks DR, Ricketts CJ, Wolf MM, **Cottam MA**, Fisher-Gupta EL, Lang M, Maio N, Shibata Y, Krystofiak ES, Vlach LM, Hatem Z, Blatt AM, Heintzman DR, Sewell AE, Hathaway ES, Steiner KK, Ye X, Schaefer S, Bacigalupa ZA, Linehan WM, Beckermann KE, Mason FM, Idrees K, Rathmell WK, Rathmell JC. 2025. Impaired Oxidative Phosphorylation Drives Primary Tumor Escape and Metastasis. *bioRxiv. (Under review at Science)*
- Dos Santos C, Cambraia A, Shrestha S, Cutler M, **Cottam M**, Perkins G, Lev-Ram V, Roy B, Acree C, Kim KY, Deerinck T, Dean D, Cartiailler JP, MacDonald PE, Hetzer M, Ellisman M, Arrojo E, Drigo R. 2024. Calorie Restriction Increases Insulin Sensitivity to Promote Beta Cell Homeostasis and Longevity in Mice. *Nat Commun*.
- Cox OH, Gianonni-Guzmán MA, Cartiailler JP, **Cottam MA**, McMahon DG. 2024. Transcriptomic Plasticity of the Circadian Clock in Response to Photoperiod: A Study in Male Melatonin-Competent Mice. *J Biol Rhythms*.
- Bennett NE, Beadle EP, Parker DV, Coe EJ, **Cottam MA**, Baum JE, Miller JS, Serrenho JA, Rhoades JA. 2024. Gli2 Overexpression Alters the Differentiation Status of Dedifferentiated Liposarcoma Cells and Results in an Immunosuppressive Myeloid Phenotype in Orthotopic Tumors. *bioRxiv*.
- Pinette JA, Myers JW, Park WY, Bryant HG, Eddie AM, Wilson GA, Montufar C, Shaikh Z, Vue Z, Nunn ER, Bessho R, **Cottam MA**, Haase VH, Hinton AO, Spinelli JB, Cartiailler JP, Zaganjor E. 2024. Disruption of nucleotide biosynthesis reprograms mitochondrial metabolism to inhibit adipogenesis. *J Lipid Res*.

- Bader JE, Wolf MM, Lupica-Tondo GL, Madden MZ, Reinfeld BI, Arner EN, Hathaway ES, Steiner KK, Needle GA, Hatem Z, Landis MD, Faneuff EE, Blackman A, Wolf EM, **Cottam MA**, Ye X, Bates ME, Smart K, Wang W, Pinheiro LV, Christofides A, Smith D, Boussiotis VA, Haake SM, Beckermann KE, Wellen KE, Reinhart-King CA, Serezani CH, Lee CH, Aubrey C, Chen H, Rathmell WK, Hasty AH, Rathmell JC. 2024. PD-1 is induced on tumor-associated macrophages in obesity to directly restrain anti-tumor immunity. *Nature*
- Lodge M, Scheidemantle G, Adams VR, **Cottam MA**, Richard D, Breuer D, Thompson P, Shrestha K, Liu X, Kennedy A. 2024. Fructose regulates the pentose phosphate pathway and induces an inflammatory and resolution phenotype in Kupffer cells. *Sci Rep*.
- Osipovich AB, Zhou FY, Chong JJ, Trinh LT, **Cottam MA**, Shrestha S, Cartailier JP, Magnuson MA. 2023. Deletion of Ascl1 in pancreatic  $\beta$ -cells improves insulin secretion, promotes parasympathetic innervation, and attenuates dedifferentiation during metabolic stress. *Mol Metab*.
- Caslin HL, **Cottam MA**, Betjemann AM, Mashayekhi M, Silver HJ, Hasty AH. 2023. Single cell RNA-sequencing suggests a novel lipid associated mast cell population following weight cycling. *bioRxiv*.
- Smart CD, Fehrenbach DJ, Wassenaar JW, Agrawal V, Fortune NL, Dixon DD, **Cottam MA**, Hasty AH, Hemnes AR, Doran AC, Gupta DK, Madhur MS. 2023. Immune profiling of murine cardiac leukocytes identified Trem2 as a novel mediator of hypertensive heart failure. *Cardiovascular Research*
- Caslin HL, **Cottam MA**, Pinon JM, Boney LY, Hasty AH. 2023. Weight cycling induces innate immune memory in adipose tissue macrophages. *Front Immunol*.
- Winn NC, **Cottam MA**, Bhanot M, Caslin HL, Garcia JN, Arrojo E Drigo R, Hasty AH. 2023. Weight cycling impairs pancreatic insulin secretion but does not perturb whole-body insulin action in mice with diet-induced obesity. *Diabetes*.
- Cottam MA**, Winn NC, Caslin HL, Hasty AH. 2022. Multiomics reveals persistence of obesity-associated immune cell phenotypes in adipose tissue during weight loss and weight regain in mice. *Nat Comm*.
- Patil P, Russo KA, McCune JT, Pollins AC, **Cottam MA**, Dollinger BR, Colazo JM, Yu F, Martin JR, Gupta MK, Cardwell NL, Davison JM, Thompson CM, Brabul A, Hasty AH, Guelcher SA, Duvall CL. 2022. ROS-Degradable Polythioketal Urethane Foam Dressings to Promote Porcine Skin Wound Repair. *Sci Transl Med*. 14(641):eabm6586
- Winn NC, Wolf EM, **Cottam MA**, Bhanot M, Hasty AH. 2021. Myeloid-specific deletion of ferroportin impairs macrophage bioenergetics but is disconnected from systemic insulin action in adult mice. *Am J Physiol Endocrinol Metab*. 1;321(3):E376-E39
- Winn NC, **Cottam MA**, Wasserman DH, Hasty AH. 2021. Exercise and Adipose Tissue Immunity: Outrunning Inflammation. *Obesity* (Silver Spring). 29(5):790-801
- Jackson MA, Patel SS, Yu F, **Cottam MA**, Glass EB, Hoogenboezem EN, Fletcher RB, Dollinger BR, Patil P, Liu DD, Kelly IB, Bedingfield SK, King AR, Miles RE, Hasty AM, Giorgio TD, Duvall CL. 2021. Kupffer cell release of platelet activating factor drives dose limiting toxicities of nucleic acid nanocarriers. *Biomaterials*. 268:120528
- McDonnell WJ, Koethe JR, Mallal SA, Pilkinton MA, Kirabo A, Ameka MK, **Cottam MA**, Hasty AH, Kennedy AJ. 2018. High CD8 T-Cell Receptor Clonality and Altered CDR3 Properties Are Associated With Elevated Isoleuglandins in Adipose Tissue During Diet-Induced Obesity. *Diabetes*. 67(11):2361-2376
- Cottam MA**, Itani HA, Beasley AA 4th, Hasty AH. 2018. Links between Immunologic Memory and Metabolic Cycling. *J Immunol*. 200(11):3681-3689
- Peterson KR, **Cottam MA**, Kennedy AJ, Hasty AH. 2018. Macrophage-Targeted Therapeutics for Metabolic Disease. *Trends Pharmacol Sci*. 39(6):536-546
- Muhoza SP, **Cottam MA**, Gross MD. 2017. Temperature Fabrication of Nanostructured Ytria-Stabilized-Zirconia (YSZ) Scaffolds by In Situ Carbon Templating Xerogels. *J Vis Exp*. (122):55500
- Cottam MA**, Muhoza SP, Gross MD. 2016. Preserving Nanomorphology in YSZ Scaffolds at High Temperatures via textitIn Situ Carbon Templating of Hybrid Materials. *J. Amer. Ceram. Soc*. 99(8):2625–2631

## IN PREPARATION/REVIEW

- Siddiqui MT, **Cottam MA**, Mirza MB, Keeli LB, Kristen CK, Washington K, Idrees, K. 2025. Effect of chemotherapy on passenger mutations in metastatic colorectal cancer. *Under review at Molecular Oncology*
- Cottam MA**, Mirza MB, Arner EN, Siddiqui MT, Marincola Smith P, Piscombe C, Revetta F, Hatem Z, Tasneem N, Cameron A, Beckermann KE, Edwards J, Rathmell JC, Lau KS, Washington MK, Jamieson NB, Raoof M, Idrees K. 2025. Regulatory

Macrophages Contribute to Tumor Cell Plasticity in Colorectal Cancer Metastases. *In revision.*

**Cottam MA**, Schleh M, Garcia JN, Winn NC, Hasty AH, Caslin HL. 2025. Weight loss enriches adipose tissue for granzyme K producing clonal CD8+ T cells that induce inflammation in bystander cells during weight regain. *In preparation*

Bhanot M, **Cottam MA**, Winn NC, Hasty AH. Empagliflozin treatment during weight loss does not improve post-weight regain glucose homeostasis in mice. *In preparation*

## Awards, Fellowships, & Grants

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<b>Ruth L. Kirschstein National Research Service Award</b> , NIH/NIDDK 5F31DK123881	2021-2023
<b>Vanderbilt Diabetes Scholar</b> , Vanderbilt Diabetes Research and Training Center	2021-2022
<b>Dean's Award for Exceptional Achievement</b> , Vanderbilt University	2019-2021
<b>Symposia Poster Award</b> , Vanderbilt Program in Molecular Medicine	2019
<b>Multidisciplinary Training in Molecular Endocrinology</b> , NIH/NIDDK T32DK007563	2017-2019
<b>Graduate Student Travel Award</b> , Vanderbilt University	2017
<b>Grant Backerman Undergraduate Student Award</b> , American Institute of Chemists	2016
<b>Summer Research Fellowship</b> , Wake Forest University	2015
<b>Summer Research Scholar</b> , Vanderbilt University	2014
<b>Summer Research Scholar</b> , Wake Forest Institute for Regenerative Medicine	2013
<b>Undergraduate Scholar</b> , Wake Forest University	2012-2016

## Presentations

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**Cottam, MA**, Mirza MB, Arner EN, Siddiqui M, Liscombe C, Hatem Z, Beckermann KE, Idrees K. 2024. Regulatory macrophages contribute to tumor cell plasticity in colorectal cancer metastases. Biocentury Grand Rounds, Nashville, TN.

**Cottam, MA**, Mirza MB, Arner EN, Hatem Z, Beckermann KE, Idrees K. 2024. Single-cell transcriptomics of colorectal cancer metastases identifies enrichment for a therapeutically targetable population of TREM2+ macrophages in peritoneal metastases. Immunology 2024, Chicago, IL.

**Cottam, MA**. 2021. Clonal expansion of exhausted CD8+ T cells in weight loss and weight cycling. Departmental seminar: Molecular Physiology and Biophysics, Nashville, TN.

**Cottam, MA**. 2020. Alterations in systemic glucose homeostasis following weight cycling. Departmental seminar: Molecular Physiology and Biophysics, Nashville, TN.

**Cottam, MA**. 2019. CD8+ Memory T Cells in Weight Cycling.. Departmental seminar: Molecular Physiology and Biophysics, Nashville, TN.

**Cottam, MA**, Kennedy AJ, Hasty AH. 2019. Adipose Tissue CD4+ and CD8+ Memory T cells are Retained with Weight Loss and CD8+ Memory T Cells Expand During Weight Regain. Poster presentation: Southeastern Immunology Symposium, Emory University, Atlanta, GA.

**Cottam, MA**, Kennedy AJ, Hasty AH. 2019. Adipose Tissue CD4+ and CD8+ Memory T cells are Retained with Weight Loss and CD8+ Memory T Cells Expand During Weight Regain. Poster presentation: Keystone Symposia: Immunometabolism, Metaflammation and Metabolic Disorders, Vancouver, British Columbia, Canada.

**Cottam, MA**, Kennedy AJ, Hasty AH. 2018. Adipose Tissue CD8+ Memory T Cells Expand During Weight Regain. Poster presentation: Vanderbilt Diabetes Day, Nashville, TN.

**Cottam, MA**, Jang C, Buchanan, J. 2015. Novel Processing of Porous Ceramic Nanocomposites for Fuel Cell Electrodes. Poster Presentation: International Symposium on Clusters and Nanomaterials, abstract, Richmond, VA.

**Cottam, MA**, Jang Cm Buchanan, J. 2015. Novel Processing of Porous Ceramic Nanocomposites for Fuel Cell Electrodes. Poster Presentation: State of North Carolina Undergraduate Research and Creativity Symposium, Highpoint, NC.

## Teaching Experience

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**Introduction to R for Bulk RNA-seq Analysis**, Short Course Instructor  
**Introduction to Clinical and Translational Research**, Graduate Teaching Assistant,  
Vanderbilt University

*Spring 2021*

*Spring 2018*

## Mentoring

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**Melanie Aldridge**, Graduate Research Assistant  
**Marium Siddiqui**, Research Assistant I  
**Muhammad Shameer**, Undergraduate Student  
**Bilal Mirza Muhammad**, Postdoctoral Fellow  
**Omar Shaikh**, Undergraduate Student  
**Julianne Burkett**, Rotation Student  
**Brittney Covington**, Rotation Student  
**Oykü Sensoy**, Rotation Student  
**Noyna Fabre**, Summer Undergraduate Student  
**Adam Beasley**, Summer Undergraduate Student

*2025-Current*

*2024-Current*

*2023-Current*

*2024-2025*

*2020-2021*

*Fall 2021*

*Fall 2019*

*Spring 2019*

*Summer 2018*

*Summer 2017*

## Outreach & Professional Development

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### SERVICE AND OUTREACH

**Nature Publishing Group**, Reviewer, Nature  
**Edge for Scholars**, Discussion Panelist, Vanderbilt University, Nashville, TN  
**Science Fair**, Volunteer Judge, Pope John Paull II High School, Henderson, TN  
**Molecular Physiology and Biophysics Graduate Student Association**, Committee Member  
**Student Representative**, Vanderbilt Program in Molecular Medicine

*2025*

*Summer 2022*

*Spring 2021*

*2017-2020*

*2018-2020*

### DEVELOPMENT

**Regression and Modeling in R**, Vanderbilt Center for Quantitive Sciences  
**Big Data in Biomedical Research**, Vanderbilt Center for Quantitive Sciences

*Summer 2021*

*Summer 2019*