R. MICHAEL GOWER, Principal Investigator

Associate Professor
Department of Biomedical Engineering
Department of Chemical Engineering
University of South Carolina

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EDUCATION

Ph.D., Biomedical Engineering, University of California, Davis CA, June 2010.
Dissertation: *Monocyte Priming During Dyslipidemia: Elevated beta2-integrin CD11c/CD18 Orchestrates Enhanced Adhesion to VCAM-1.*
Advisor: Professor Scott I. Simon, Ph.D.

B.S., Chemical Engineering, Colorado School of Mines, Golden CO, May 2004.

PROFESSIONAL EXPERIENCE

Duration	Position	Institution
2025 – Present	Associate Professor	Biomedical Engineering Department, University of South Carolina, Columbia SC
2024 – Present	Biomedical Engineer	VA Medical Center, Columbia SC
2023 – 2025	Associate Professor	Chemical Engineering Department, University of South Carolina, Columbia SC
2022 – 2024	WOC	VA Medical Center, Columbia SC
2020 – 2022	Research Health Scientist	VA Medical Center, Columbia SC
2014 – 2025	Faculty	Biomedical Engineering Program, University of South Carolina, Columbia SC
2014 – 2023	Assistant Professor	Chemical Engineering Department, University of South Carolina, Columbia SC
2011 – 2014	Postdoctoral Researcher Advisor: Lonnie Shea	Chemical and Biological Engineering Department, Northwestern University, Evanston IL
2010 – 2011	Postdoctoral Researcher Advisor: Scott Simon	Biomedical Engineering Department, University of California, Davis CA

HONORS AND AWARDS

Honor/Award	Bestowed By	Year
NSF CAREER Award	NSF-CBET	2022
Pearce Faculty Fellow	University of South Carolina, Honors College	2022
Mentee, PROPEL Research Mentorship Program	University of South Carolina, Vice President for Research Office	2021
Mentee, Training in Grantsmanship for Rehabilitation Research (TIGRR)	TIGRR Review Committee	2021
ABME Associate Editor Award	Annals of Biomedical Engineering Journal	2019
Young Investigator Travel Award	National IDeA Symposium of Biomedical Research Excellence	2016
Postdoc Presentation Award	Northwestern Postdoctoral Forum	2013
IBIS Travel Award	Northwestern University, Chicago IL	2012
Distinguished Presentation Award	University of California Bioengineering Symposium	2009
T32 Basic and Translational Cardiovascular Science Fellowship	University of California, Davis	2008
I2CAM Travel Award	University of California, Davis	2007

HHMI Med into Grad Initiative Fellowship	University of California, Davis	2006
President's Scholarship	Colorado School of Mines, Golden CO	2000

PUBLICATIONS

1. Cheung C, Searcy R, Atube K, Colonna N, Krusen K, Coppage K, Holly K, Pratz P, Fournier J, Sikirzhytski V, Smuder A, Gower RM. Local injection of particles for retinoic acid drug delivery improves muscle structure and modulates inflammation in mice recovering from cast immobilization. *American Journal of Physiology-Cell Physiology.* **In Press.**
2. Dhar R, Dos Passos RR, **Gower RM**, Jain A, Evans C. Towards Targeting of Inflammasome Signaling in Venous Thrombosis. *J Thromb Haemost*. Sep 12:S1538-7836(25)00557-4. (**2025**).
3. Cheung CV, Atube KJ, Colonna NA, Carter GJ, Marchena T, McCarthy S, Krusen KE, McCain RS, Frizzell N, **Gower RM**. A microparticle delivery system for extended release of all-trans retinoic acid and its impact on macrophage insulin-like growth factor 1 release and myotube formation. *Int J Pharm.* Dec 5;666:124821. (**2024**).
4. Isely, C., Atube, K. J., Cheung, C. V., Steege, C. F., Pellechia, P. J. & **Gower, R. M.** Surface Functionalization of Polymer Particles for Cell Targeting by Modifying Emulsifier Chemistry. *ACS Appl Polym Mater* 4, 2269–2282 (**2022**).
5. Spetz, M. R., Isely, C. & **Gower, R. M.** Effect of fabrication parameters on morphology and drug loading of polymer particles for rosiglitazone delivery. *Journal of Drug Delivery Science and Technology* 65, 102672 (**2021**).
6. Murphy, K. P., Hendley, M. A., Patterson, A. T., Hall, H. E., Carter, G. J., Isely, C. & **Gower, R. M.** Modulation of adipocyte size and fat pad weight via resveratrol releasing scaffolds implanted into the epididymal adipose tissue. *J Biomed Mater Res A* 109, 766–778 (**2021**).
7. Isely, C., Stevens, A. C., Tate, G. L., Monnier, J. R. & **Gower, R. M.** Fabrication of biodegradable particles with tunable morphologies by the addition of resveratrol to oil in water emulsions. *Int J Pharm* 590, 119917 (**2020**).
8. Hendley, M. A., Isely, C., Murphy, K. P., Hall, H. E., Annamalai, P. & **Gower, R. M.** Scaffold Implant Into the Epididymal Adipose Tissue Protects Mice From High Fat Diet Induced Ectopic Lipid Accumulation and Hyperinsulinemia. *Front Bioeng Biotechnol* 8, 562 (**2020**).
9. Hendley, M. A., Murphy, K. P., Isely, C., Struckman, H. L., Annamalai, P. & **Gower, R. M.** The host response to poly(lactide-co-glycolide) scaffolds protects mice from diet induced obesity and glucose intolerance. *Biomaterials* 217, 119281 (**2019**).
10. Isely, C., Hendley, M. A., Murphy, K. P., Kader, S., Annamalai, P., Jabbari, E. & **Gower, R. M.** Development of microparticles for controlled release of resveratrol to adipose tissue and the impact of drug loading on particle morphology and drug release. *Int J Pharm* 568, 118469 (**2019**).
11. Yanez, M., Jhanji, M., Murphy, K., **Gower, R. M.**, Sajish, M. & Jabbarzadeh, E. Nicotinamide Augments the Anti-Inflammatory Properties of Resveratrol through PARP1 Activation. *Sci. Rep.* 9, 10219 (**2019**).
12. Murphy, K. P., Hendley, M. A., Isely, C., Annamalai, P., Peña, E. & **Gower, R. M.** Resveratrol Delivery from Porous Poly(lactide- co-glycolide) Scaffolds Promotes an Anti-Inflammatory Environment within Visceral Adipose Tissue. *ACS Applied Materials & Interfaces* 10, 43363–43374 (**2018**).
13. Liu, J. M. H., Zhang, J., Zhang, X., Hlavaty, K. A., Ricci, C. F., Leonard, J. N., Shea, L. D. & **Gower, R. M.** Transforming growth factor-beta 1 delivery from microporous scaffolds decreases inflammation post-implant and enhances function of transplanted islets. *Biomaterials* 80, 11–19 (**2016**).
14. Azarin, S. M., Yi, J., **Gower, R. M.**, Aguado, B. A., Sullivan, M. E., Goodman, A. G., Jiang, E. J., Rao, S. S., Ren, Y., Tucker, S. L., Backman, V., Jeruss, J. S. & Shea, L. D. In vivo capture and label-free detection of early metastatic cells. *Nat Commun* 6, 8094 (**2015**).

15. Boehler, R. M., Kuo, R., Shin, S., Goodman, A. G., Pilecki, M. A., **Gower, R. M.**, Leonard, J. N. & Shea, L. D. Lentivirus delivery of IL-10 to promote and sustain macrophage polarization towards an anti-inflammatory phenotype. *Biotechnol. Bioeng.* 111, 1210–1221 (**2014**).
16. **Gower, R. M.**, Boehler, R. M., Azarin, S. M., Ricci, C. F., Leonard, J. N. & Shea, L. D. Modulation of leukocyte infiltration and phenotype in microporous tissue engineering scaffolds via vector induced IL-10 expression. *Biomaterials* 35, 2024–2031 (**2014**).
17. Foster, G. A., **Gower, R. M.**, Stanhope, K. L., Havel, P. J., Simon, S. I. & Armstrong, E. J. On-chip phenotypic analysis of inflammatory monocytes in atherogenesis and myocardial infarction. *Proc Natl Acad Sci USA* 110, 13944–13949 (2013).
18. Boehler, R. M., Shin, S., Fast, A. G., **Gower, R. M.** & Shea, L. D. A PLG/HAp composite scaffold for lentivirus delivery. *Biomaterials* 34, 5431–5438 (**2013**).
19. Graham, J. G., Zhang, X., Goodman, A., Pothoven, K., Houlihan, J., Wang, S., **Gower, R. M.**, Luo, X. & Shea, L. D. PLG scaffold delivered antigen-specific regulatory T cells induce systemic tolerance in autoimmune diabetes. *Tissue Eng Part A* 19, 1465–1475 (**2013**).
20. **Gower, R. M.** & Shea, L. D. Biomaterial Scaffolds for Controlled, Localized Gene Delivery of Regenerative Factors. *Adv Wound Care* 2, 100–106 (**2013**).
21. Seidlits, S. K., **Gower, R. M.**, Shepard, J. A. & Shea, L. D. Hydrogels for lentiviral gene delivery. *Expert Opin Drug Deliv* 10, 499–509 (**2013**).
22. **Gower, R. M.**, Wu, H., Foster, G. A., Devaraj, S., Jialal, I., Ballantyne, C. M., Knowlton, A. A. & Simon, S. I. CD11c/CD18 expression is upregulated on blood monocytes during hypertriglyceridemia and enhances adhesion to vascular cell adhesion molecule-1. *Arterioscler. Thromb. Vasc. Biol.* 31, 160–166 (**2011**).
23. Glaser, D. E., **Gower, R. M.**, Lauer, N. E., Tam, K., Blancas, A. A., Shih, A. J., Simon, S. I. & McCloskey, K. E. Functional characterization of embryonic stem cell-derived endothelial cells. *J. Vasc. Res.* 48, 415–428 (**2011**).
24. Phillipson, M., Heit, B., Parsons, S. A., Petri, B., Mullaly, S. C., Colarusso, P., **Gower, R. M.**, Neely, G., Simon, S. I. & Kubes, P. Vav1 is essential for mechanotactic crawling and migration of neutrophils out of the inflamed microvasculature. *J Immunol* 182, 6870–6878 (**2009**).
25. Wu, H., **Gower, R. M.**, Wang, H., Perrard, X.-Y. D., Ma, R., Bullard, D. C., Burns, A. R., Paul, A., Smith, C. W., Simon, S. I. & Ballantyne, C. M. Functional role of CD11c+ monocytes in atherogenesis associated with hypercholesterolemia. *Circulation* 119, 2708–2717 (**2009**).
26. Tsou, J. K., **Gower, R. M.**, Ting, H. J., Schaff, U. Y., Insana, M. F., Passerini, A. G. & Simon, S. I. Spatial regulation of inflammation by human aortic endothelial cells in a linear gradient of shear stress. *Microcirculation* 15, 311–323 (**2008**).

BOOK CHAPTERS

1. **Gower RM**, Shea LD. Biomaterial Scaffolds for Controlled, Localized Gene Delivery of Regenerative Factors. Wound Healing Society Yearbook (WHSYB)-Advances in Wound Care, vol 3. **2011.**
2. **Gower RM** and Simon SI. Vascular Mimetic Microfluidic Systems for the Study of Endothelial Activation and Leukocyte Recruitment in Models of Atherogenesis. In: *Hemodynamics and Mechanobiology of the Endothelium,* edited by Hsiai TK, Blackman B, and Jo H. World Scientific, pp313-329, **2010**.

PATENTS and INVENTION DISCLOSURES

1. **Gower RM** et al. “Poly(D,L-Lactide-co-glycolide)-retinoic acid microparticle composition for treatment muscle atrophy.” Patent Application Filed, August 16, 2024.
2. **Gower RM** et al. “Functionalized Polyvinyl Alcohol and Products Formed Therewith.” Patent Application Filed, August 20, 2020

3. **Gower RM** et al. “Method for Tuning Topology of Polymer Particles.” Patent Application Filed, August 20, 2020.
4. **Gower RM** et al. “Multi-Chamber Pellet Die System.” Patent No. US 10,807,339 B2, October 20, 2020.
5. **Gower RM** et al. “Drug Releasing Polymer Implants for the Treatment of Metabolic Disorders.” Patent No. US 10,092,508 B2, October 9, 2018.
6. Shea LD, Azarin SM, **Gower RM**, and Jeruss JJ. “Synthetic Scaffolds for Metastasis Detection.” US Patent Application No. 61/700703, Filed September 13, 2012. Licensed to Pioneer Pioneer Biosolutions Inc.

PRESENTATIONS

Seminars

1. University of South Carolina Biochemistry Divisional Seminar, Columbia, SC, November 1, **2023**.
2. Advances in Immunoengineering: Fundamentals and Cutting Edge Advances 2023 Workshop and Course. John Hopkins University, Conducted via Zoom, January 10, **2023**.
3. Department of Chemical and Biomolecular Engineering, Seminar Series, University of Tennessee, Knoxville, TN, **03/2022.**
4. Center for Exercise Science Seminar Series, University of Florida, Gainesville FL, **02/2021**.
5. Cain Department of Chemical Engineering Seminar Series, Louisiana State University, Baton Rouge LA, **10/2018.**
6. Department of Exercise Science Seminar Series, University of South Carolina, Columbia, SC, **12/2017.**
7. Department of Chemical and Biological Engineering Seminar Series, University of Alabama, Tuscaloosa, AL, **09/2017.**
8. Department of Biomedical Engineering Alumni Seminar Series, University of California, Davis CA, **05/2017.**
9. Department of Chemistry and Biochemistry, Biochemistry Divisional Seminar Series, University of South Carolina, Columbia, SC, **10/2016.**
10. Department of Regenerative Medicine and Cell Biology Seminar Series, Medical University of South Carolina, Charleston SC, **05/2015**.
11. Yonsei University Chemical and Biomolecular Engineering and Northwestern University Chemical and Biological Engineering Joint Workshop, Northwestern University, Evanston IL, **02/2013.**
12. David Jeffrey & Benjamin Alan Gelber Lecture Series, Section of Leukocyte Biology, Baylor School of Medicine, Houston TX, **05/2008**.

Invited Presentations

1. *Nanomedicines for muscle atrophy and traumatic brain injury.* The Columbia and Charleston VA Healthcare System Research Week Symposium, Charleston SC, **June 26, 2025.**
2. *Modulating biology with materials.* Combined Pharmacy and BME Research Retreat, Columbia, SC, August 17, **2023**.
3. *Addressing skeletal muscle atrophy with localized delivery of retinoic acid*. Columbia VA Health Care System Grand Rounds, Columbia, SC, July 27, **2023**.
4. *Visualizing Macrophage-Biomaterial Interactions at the IRF.* USC Research Cores Fair, Columbia, SC, January 5, **2023**.
5. *Targeting Macrophages for Muscle.* National VA Research Week Symposium, Ralph H. Johnson VA Health Care System, Charleston, SC, May 18, **2022**.

6. *Bioinspired Materials for Engineering Macrophage Function.* Stimulus Research Program (SRP) Session B, 2021 SC EPSCoR State Conference, July 23, **2021**.
7. *Trojan Horses for Muscle Growth after Atrophy.* National VA Research Week, Columbia VA, Columbia, SC, May 18, **2021**.
8. *Bioinspired Materials for Engineering Macrophage Function.* "Innovations in Tissue Engineering and Regenerative Medicine" session of the 2020 South Carolina EPSCoR Conference, Columbia SC, **2020**. (canceled due to COVID)
9. *Biomaterials for the Treatment of Metabolic Disease.* Carolina Cardiovascular Conference, Columbia SC, **2018.**
10. *Adipose Tissue Engineering: A Therapeutic Strategy for Metabolic Disease.* University of South Carolina IRF Research Symposium, Columbia SC, **2017.**
11. *Adipose Tissue Engineering: Strategies for Obesity and Metabolic Disorders.* Southeastern Regional Meeting of the American Chemical Society, Columbia SC, **2016.**

Conference Oral Presentations

1. Ariail E, **Gower RM**. *Development of Phosphatidylserine-Presenting Particles to Target Macrophages in Muscle Regeneration.* Columbia VA Health Care Research Week, Columbia, SC, May **2022**.
2. Atube K, **Gower RM**. *Phosphatidylserine-Presenting Particles for Targeting and Engineering Macrophage Function*. Columbia VA Health Care Research Week, Columbia, SC, May **2022**.
3. Cheung C, **Gower RM**. *ATRA-Loaded PLG Microparticles to Direct Macrophage Regenerative Function*. Columbia VA Health Care Research Week, Columbia, SC, May **2022**.
4. Marchena T, **Gower RM**. *Development of an In Vitro Model of Muscle Atrophy for Screening Small Molecule Therapeutics.* Columbia VA Health Care Research Week, Columbia, SC, May **2022**.
5. Atube K, Isely C, Cheung C, **Gower RM**. *Development of Phosphatidylserine Presenting Particles for Targeting Macrophages in Muscle Regeneration.* American Institute for Chemical Engineers Annual Meeting, Boston, MA, **2021.**
6. Cheung C, Carter C, **Gower RM**. *ATRA-Loaded PLG Microparticles to Direct Macrophage Regenerative Function*. American Institute for Chemical Engineers Annual Meeting, Boston, MA, **2021.**
7. Isely C, Atube K, Cheung C, **Gower RM**. *Surface Functionalization of Polymer Particles for Cell Targeting By Modifying Emulsifier Chemistry*. American Institute for Chemical Engineers Annual Meeting, Boston, MA, **2021.**
8. Atube K, **Gower RM**. *Development of Phosphatidylserine Presenting Particles for Targeting Macrophages in Tissue Regeneration*. Society for Biomaterials Annual Meeting, **2021**.
9. Cheung C, Carter G, **Gower RM**. *ATRA-loaded PLG microparticles to direct macrophage regenerative function.* Society for Biomaterials Annual Meeting, **2021**.
10. Isely C, **Gower RM.** Fabrication of Biocompatible Particles with Tunable Shapes and Surfaces by the Addition of Resveratrol to Oil in Water Emulsions. American Institute for Chemical Engineers Virtual Meeting, **2020**.
11. Murphy KP, Patterson AT, **Gower RM.** Modulation of Adipocyte Size and Fat Pad Weight Via Resveratrol Releasing Scaffolds Implanted into Epididymal Adipose Tissue. American Institute for Chemical Engineers Virtual Meeting, **2020.**
12. Murphy KP, Hendley MA, Isely C, **Gower RM.** Resveratrol Loaded PLG Scaffolds Prevent Accumulation of Epididymal Adipose Tissue after High Fat Diet Challenge. American Institute for Chemical Engineers Annual Meeting, Orlando, FL **2019.**
13. Hendley MA, Murphy KP, Isely C, Annamalai P, **Gower RM.** Treating Obesity and Glucose Intolerance through Polymer Scaffold Delivery of Resveratrol to the Adipose Tissue. American Institute for Chemical Engineers Annual Meeting, Orlando, FL **2019.**

14. Murphy KP and **Gower RM**. Resveratrol Delivery from Porous Poly(lactide-co-glycolide) Scaffolds Promotes an Anti-inflammatory Environment within Visceral Adipose Tissue. Society for Biomaterials Annual Meeting, Seattle WA, **2019**.
15. Hendley MA and **Gower RM**. Polymer Implant Establishes Novel Microenvironments within Adipose Tissue That Correlate with Enhanced Glucose Metabolism and Protection from Diet Induced Obesity. American Institute for Chemical Engineers Meeting, Pittsburgh, PA, **2018**.
16. Murphy KP and **Gower RM**. Defining the Mechanisms of Immune Resolution after Biomaterial Implant into Adipose Tissue. American Institute for Chemical Engineers Meeting, Pittsburgh, PA, **2018**.
17. Hendley MA and **Gower RM**. Resveratrol Scaffolds Implanted into Fat Protect Mice from Glucose Intolerance Caused by A High Fat Diet. Biomedical Engineering Society Annual Meeting, Atlanta, GA, **2018**.
18. Murphy KP and **Gower RM**. Modulation of Leukocyte Infiltration into Biomaterial Scaffolds Engineered to Release Anti-Inflammatory Small Molecules. Society for Biomaterials Annual Meeting, Atlanta, GA, **2018**.
19. Hendley M and **Gower RM**. Resveratrol Releasing Scaffolds Protect Mice Against Diet Induced Obesity and Glucose Intolerance. American Institute for Chemical Engineers Meeting, Minneapolis MN, **2017**.
20. Isley C and **Gower RM**. Microparticles for the Delivery of Anti-Diabetic Drugs to the Adipose Tissue. American Institute for Chemical Engineers Meeting, Minneapolis MN, **2017**.
21. Murphy K and **Gower RM**. Modulating the Immune Environment within Adipose Tissue with Polymer Scaffolds. American Institute for Chemical Engineers Meeting, Minneapolis MN, **2017**.
22. **Gower RM**. Adipose Tissue Engineering: A Therapeutic Strategy for Aging. The South Carolina Clinical and Translational Research Institute (SCTR) and MUSC Center on Aging Research Retreat, Charleston SC, **2017**.
23. Murphy K and **Gower RM**. Modulation of Leukocyte Infiltration into Biomaterial Scaffolds Engineered to Release Anti-Inflammatory Small Molecules. PMSE Biomaterial Science and Translational Medicine Symposium, 254th American Chemical Society Meeting, Washington DC, **2017**.
24. Hendley M and **Gower RM**. Poly(lactide-co-glycolide) scaffolds protect mice against diet induced obesity and glucose intolerance PMSE Biomaterial Science and Translational Medicine Symposium, 254th American Chemical Society Meeting, Washington DC, **2017**.
25. **Gower RM**. Adipose Tissue Engineering: A therapeutic Strategy for Metabolic Disease. The Center for Epigenetic Regulation of Inflammation and The Center for Dietary Supplements and Inflammation External Advisory Meeting, Columbia SC, **2017**.
26. Murphy K, Zhang Y, Pena M, **Gower RM**. Chemokine Releasing Polymer Implants to Direct Immune Cell Migration in the Setting of Colon Cancer. American Institute for Chemical Engineers Meeting, San Francisco CA, **2016**.
27. Gower RM. Resveratrol Implants for the Treatment of Obesity and Insulin Resistance. FASEB Research Conference: Immunological Aspects of Obesity, Big Sky MT, **2016**
28. Murphy K, Zhang Y, Pena M, **Gower RM**. Chemokine Releasing Polymer Implants to Direct Immune Cell Migration in the Setting of Colon Cancer. American Institute for Chemical Engineers Meeting, San Francisco CA, **2016**.
29. **Gower RM**, Hendley MA, Resveratrol Scaffolds Promote Lipid Metabolism in Adipose Tissue. National IDeA Symposium of Biomedical Research Excellence, Washington DC, **2016**.
30. Hendley MA, **Gower RM**. Resveratrol Releasing Scaffolds for Adipose Tissue Engineering. Institute for Biological Engineering Annual Meeting, Greenville SC, **2016**.
31. Murphy KP, Zhang Y, Peña M, Gower RM. Tissue-Engineering Scaffolds for the Prevention of Metastatic Colorectal Cancer. Grad Student Day. University of South Carolina, Columbia. **2016**.

32. **Gower RM**, Zhang J, Liu JM, Zhang X, Shea LD. Scaffolds Engineered to Release TGF-β1 Improve Islet Graft Function. Society for Biomaterials Annual Meeting, Charlotte NC, **2015**.
33. **Gower RM**, Zhang X, Zhang J, Liu J, Ricci CF, Shea LD. Immunomodulatory Scaffolds for Enhanced Cell Transplant. Biomedical Engineering Society Meeting, San Antonio TX, **2014**.
34. **Gower RM**, Shea LD. Biomaterial Scaffolds for Local Immunomodulation. American Institute for Chemical Engineers Meeting. San Francisco CA, **2013**.
35. **Gower RM**, Shea LD. Gene-Releasing Scaffolds for Immunomodulation. Biomedical Engineering Society Meeting, Seattle WA, **2013**.
36. **Gower RM**, Shea LD. Gene Releasing Scaffolds for Local Immunomodulation and Enhanced Cell Transplant. Biomedical Engineering Society Meeting, Atlanta GA, **2012**.
37. **Gower RM**, Simon SI. CD11c/CD18 expression is increased on blood monocytes during hypertriglyceridemia and enhances adhesion to VCAM-1. 12th Biennial Meeting of the International Society for Applied Cardiovascular Biology, Boston MA, **2010**.
38. **Gower RM**, Simon SI. CD11c/CD18 expression is increased on blood monocytes during hypertriglyceridemia and enhances adhesion to VCAM-1. 16th International Vascular Biology Meeting, Los Angeles CA, **2010**.
39. **Gower RM**, Simon SI. Adhesion molecules and monocyte recruitment in atherogenesis. 10th Annual University of California System-wide Bioengineering Symposium, University of California, Merced CA, **2009**.
40. **Gower RM**, Simon SI.Targeting molecules in atherosclerosis: A functional role for CD11c in monocyte recruitment. Annual Biomedical Engineering Society Meeting, Saint Louis MO, **2008**.
41. **Gower RM**, Simon SI. Spatial Regulation of Inflammation by Human Aortic Endothelial Cells in a Linear Gradient of Shear Stress. Annual Experimental Biology Meeting, Biomedical Engineering Society Symposium: Mechano-Sensing at the Vessel Wall in Regulation of Atherogenesis, San Diego CA, **2008**.

Conference Poster Presentations

1. Cheung C, **Gower RM**. Particle-based retinoic acid drug delivery accentuates myotube formation when cultured with macrophages and accelerates muscle recovery in mice with muscle atrophy. 6th Annual Drexel Immune Modulation and Engineering Symposium, Philadelphia, PA, **2024.**
2. Joe D, Mayson T, Colonna N, **Gower RM**. *Developing a mouse model for repetitive, mild traumatic brain injury.* Annual Biomedical Conference for Minoritized Scientists , Pittsburgh, PA, **2024**.
3. Cheung C, **Gower RM**. Retinoid acid particle-based delivery accelerates muscle recovery after atrophy. SCBio Annual Conference. Greenville, SC, **2024.**
4. Cheung C, Krusen K, Holly K, Ward Pratz P, **Gower RM**. *Retinoic acid drug delivery accelerates muscle recovery in mice with muscle atrophy.* Biomedical Engineering Society Annual Conference, Baltimore, MD, **2024.**
5. Rucker C, Atube K, **Gower RM**. *Comparing the Use of Brain-derived and Synthetic Phosphatidylserine in Lipid-polymer Hybrid Particles for Modulating Macrophage Inflammation*. Biomedical Engineering Society Annual Meeting, Baltimore, MD, **2024**.
6. Cheung C, Krusen K, Holly K, Ward Pratz P, Gower RM. *PLG microparticles encapsulating retinoic acid accelerates muscle recovery in mice after hindlimb casting-induced muscle atrophy.* Society for Biomaterials Regional Conference, Atlanta, GA, **2024**.
7. Rucker C, Atube K, **Gower RM**. *Comparing the Use of Brain-derived and Synthetic Phosphatidylserine in Lipid-polymer Hybrid Particles for Modulating Macrophage Inflammation*. Society for Biomaterials Southeast Regional Symposium, Atlanta, GA, **2024**.

8. Cheung C, Krusen K, Holly K, Ward Pratz P, **Gower RM**. *PLG microparticles encapsulating retinoic acid accelerates muscle recovery in mice after hindlimb casting-induced muscle atrophy*. Columbia Veterans Affairs Health Care System 2024 Research Week, Columbia, SC, **2024.**
9. Rucker C, Atube K, **Gower RM**. *Comparing the Use of Brain-derived and Synthetic Phosphatidylserine in Lipid-polymer Hybrid Particles for Modulating Macrophage Inflammation*. Columbia VA Health Care System Research Week, Columbia, SC, **2024**.
10. Rucker C, Atube K, Gower RM. *Comparing the Use of Brain-derived and Synthetic Phosphatidylserine in Lipid-polymer Hybrid Particles for Modulating Macrophage Inflammation*. Discover USC, Columbia, SC, **2024**.
11. Cheung C, **Gower RM**. *Retinoid acid particle-based delivery accelerates muscle recovery after atrophy*. SCBio Annual Conference, Columbia, SC, **2024**.
12. Cheung C, **Gower RM**. *Particle-based delivery of retinoic acid accelerates muscle recovery after atrophy*. Columbia Veterans Affairs Health Care System 2023 Research Week, Columbia, SC, **2023**.
13. Colonna N, **Gower RM**. *Designing a Mucoadhesive Lipid-Polymer Nanoparticle for Use in Nose-to-Brain of Pharmaceutical Agents*. Columbia VA Health Care System Research Week, Columbia, SC, **2023**.
14. Rucker C, Atube K, Cheung C, Colanna N, **Gower RM**. *Apoptotic-Inspired Particles Target and Modulate Macrophage Inflammation.* Columbia Veterans Association Health Care Research Week, Columbia, SC, **2023**.
15. Cheung C, **Gower RM**. Particle-based delivery of retinoic acid accelerates muscle recovery after atrophy. Discover USC, Columbia, SC, **2023.**
16. Colonna N, **Gower RM**. *Designing a Mucoadhesive Lipid-Polymer Nanoparticle for Use in Nose-to-Brain of Pharmaceutical Agents*. Discover USC, Columbia, SC, **2023**.
17. Rucker C, Atube K, Cheung C, Colanna N, **Gower RM**. *Apoptotic-Inspired Particles Target and Modulate Macrophage Inflammation*. Discover USC, Columbia, SC, **2023**.
18. Cheung C, Atube K, Marchena T, **Gower RM**. *ATRA-PLG Microparticles to Direct Macrophage Regenerative Function and Myotube Formation*. Inaugural Research Cores Fair, Columbia, SC, **2023**
19. Ariail E, **Gower RM.** *Development of Phosphatidylserine-Presenting Particles to Target Macrophages in Muscle Regeneration.* National VA Research Week Symposium, Dorn VA, Columbia SC, **2022.**
20. Atube K, **Gower RM.** *Development of Phosphatidylserine-Presenting Particles for Targeting Macrophages*. National VA Research Week Symposium, Dorn VA, Columbia SC, **2022.**
21. Candice C, **Gower RM.** *ATRA-loaded PLG microparticles to direct macrophage regenerative function*. National VA Research Week Symposium, Dorn VA, Columbia SC, **2022.**
22. Marchena T, **Gower RM.** *Development of an in vitro muscle atrophy model to screen for small molecule therapeutics.* National VA Research Week Symposium, Dorn VA, Columbia SC, **2022.**
23. Ariail E, **Gower RM.** *Development of Phosphatidylserine-Presenting Particles to Target Macrophages in Muscle Regeneration.* Discover UofSC, Columbia SC, **2022.**
24. Atube K, **Gower RM.** *Development of Phosphatidylserine-Presenting Particles for Targeting Macrophages*. Discover UofSC, Columbia SC, **2022.**
25. Candice C, **Gower RM.** *ATRA-loaded PLG microparticles to direct macrophage regenerative function*. Discover UofSC, Columbia SC, **2022.**
26. Marchena T, **Gower RM.** *Development of an in vitro muscle atrophy model to screen for small molecule therapeutics.* Discover UofSC, Columbia SC, **2022.**
27. Wheeler S, **Gower RM.** *Development of mucoadhesive nanoparticles for delivery of all-trans retinoic acid.* Discover UofSC, Columbia SC, **2022.**

28. Atube K, **Gower RM.** *Development of Phosphatidylserine Presenting Particles for Targeting Macrophages in Tissue Regeneration*. Discover UofSC, Columbia SC, **2021.**
29. Cheung C, **Gower RM.** *ATRA-loaded PLG microparticles to direct macrophage regenerative function.* Discover UofSC, Columbia SC, **2021**.
30. Hall H, **Gower RM**. *Resveratrol Releasing Scaffolds and Healthy Dietary Changes as a Treatment Strategy for Type 2 Diabetes.* Discover UofSC, Columbia SC, **2021**.
31. Carter G, **Gower RM**. *Investigating the Effects of Nanoparticle Delivery to Myoblasts on Differentiation into Myotubes*. Discover UofSC, Columbia SC, **2021**.
32. Hall HE, Hendley MA, **Gower RM.** Resveratrol Releasing Scaffolds Combined with Healthy Dietary Changes as a Treatment Strategy for Obesity. Biomedical Engineering Society Virtual Meeting, **2020**.
33. Isely C, **Gower RM.** Controlling Morphology of Biodegradable Polymer Particles with Bioactive Small Molecules and Its Application in Modulating Adipose Tissue Function. American Institute for Chemical Engineers Annual Meeting, Orlando, FL **2019**.
34. Isely C, Spetz M, **Gower RM.** *The Effect of Dispersed-Phase Solvent and Extraction Volume on Rosiglitazone Encapsulation in PLG Particles.* American Institute for Chemical Engineers Annual Meeting, Orlando, FL **2019**.
35. Hendley MA, Murphy KP, Isely C, Annamalai P, **Gower RM.** *Reversing Weight Gain and Glucose Intolerance Caused by High Fat Diet Feeding Through Polymer Scaffold Delivery of Resveratrol to the Adipose Tissue.* Biomedical Engineering Society Annual Meeting, Philadelphia, PA **2019**.
36. Isely C, Spetz M, Hendley M, Murphy K, **Gower RM.** Exploring the Effects of Emulsion Parameters on PLG Microparticles for Small-Molecule Delivery. Biomedical Engineering Society Annual Meeting, Philadelphia, PA **2019.**
37. Isely C and **Gower RM.** *Development of microparticles for controlled release of resveratrol to adipose tissue and the impact of drug loading on particle morphology and drug release.* Discover USC, Columbia, SC. **2019.**
38. Murphy K and **Gower RM.** *Defining the Immune Response to Resveratrol Releasing Polymer Scaffolds Implanted in Adipose Tissue.* Discover USC, Columbia, SC. **2019.**
39. Caughman AM and **Gower RM.** *Utilizing Microparticles to Induce Skeletal Muscle Hypertrophy.* Discover USC, Columbia, SC. **2019.**
40. Spetz MR and Gower RM. *Investigating the effect of PLG microparticles on endocrine function of adipose tissue.* Discover USC, Columbia, SC. **2019.**
41. Isely C and **Gower RM**. Evaluation of Microparticles Designed to Modify Adipocyte Endocrine Function. American Institute for Chemical Engineers Meeting, Pittsburgh, PA, **2018**.
42. Hendley MA and **Gower RM**. Resveratrol Loaded Scaffolds Protect Mice Against Diet Induced Obesity and Glucose Intolerance. American Institute for Chemical Engineers Meeting, Pittsburgh, PA, **2018**.
43. Murphy KP and **Gower RM**. Defining the Immune Response to Resveratrol Releasing Polymer Scaffolds Implanted in Adipose Tissue. Biomedical Engineering Society Annual Meeting, Atlanta, GA, **2018**.
44. Isely C and b. Exploring the Effects of Fabrication Parameters on PLG Particles for Small Molecule Delivery. Biomedical Engineering Society Annual Meeting, Atlanta, GA, **2018**.
45. Hendley MA and **Gower RM**. Polymer Scaffolds Protect Mice Against Diet Induced Obesity and Glucose Intolerance. Society for Biomaterials Annual Meeting, Atlanta, GA, **2018**.
46. **Gower RM**. Adipose Tissue Engineering: Strategies for Modulating Metabolism. 2nd Annual Southeast Cancer Immunology, Immunotherapy, and Inflammation Research Retreat, Georgia Cancer Center, Augusta GA, **2017**.

47. Isley C and **Gower RM**. Biodegradable Microparticles for the Delivery of Exercise Mimetics to Adipose Tissue. PMSE Biomaterial Science and Translational Medicine Symposium, 254th American Chemical Society Meeting, Washington DC, **2017**.
48. Bonhomme, K and **Gower RM**. Effects of Biomaterial Scaffolds on Lipolysis and Glucose Uptake in Adipocytes. The Obesity Society Annual Meeting, Washington DC, **2017**.
49. Hendley MA and **Gower RM**. Resveratrol Releasing Scaffolds to Promote Lipid Metabolism in Adipose Tissue. Biomedical Engineering Society Meeting, Minneapolis MN, **2016**.
50. **Gower RM**. Microporous polymer scaffolds that control innate immunity for enhanced islet transplant. World Biomaterials Congress, Montreal, Quebec, **2016**.
51. Struckman H, Olgivie R, and **Gower RM**. Characterization of the Immune Environment within Tissue Engineering Scaffolds. Institute for Biological Engineering Annual Meeting, Greenville SC, **2016**.
52. Pond K, Kiaris H, and **Gower RM**. CCL8-loaded Implants for the Study and Treatment of Colon Cancer. Institute for Biological Engineering Annual Meeting, Greenville SC, **2016**.
53. Marker S, Hendley M, and **Gower RM**. Polymer Scaffolds for Adipose Tissue Engineering. Institute for Biological Engineering Annual Meeting, Greenville SC, **2016**.
54. Struckman H and **Gower RM**. Immunomodulatory Scaffolds for Treatment of Colon Cancer. Discovery Day. University of South Carolina, Columbia. **2015**.

TEACHING EXPERIENCE

Course	Terms	Students
BMEN 271 Introduction to Biomaterials (Honors)	Fall 2018 – Present	69
BMEN 547 Immunoengineering	Spring 2015 – Present	156
BMEN 321 Biomonitoring & Electrophysiology	Fall 2014 – Fall 2017	221

STUDENTS MENTORED

Doctoral Students

Name	Program	Degree Awarded	Placement
Nicholas Colonna	BMEN	In Progress	
Kidochukwu Atube	ECHE	12/2024	Foghorn Therapeutics
Candice Cheung	BMEN	12/2024	Postdoc, Georgia Tech
Christopher Isely	ECHE	05/2021	WuXi AppTec, St. Paul MN
Kendall Murphy	ECHE	05/2020	Postdoc, U of Cincinnati
Michael Hendley	BMEN	12/2019	KBI Biopharma

Undergraduate Students

Name	Program	Duration	Placement
Murphy Jones	BMEN	08/2022 – Present	
VaCarie Burgess	VA-REU	06/2022 – Present	
Miranda Copenhaver	BMEN-REU	05/2022 – Present	
Kate Coppage	BARSC-MD	05/2022 – Present	
Caroline Rucker	BMEN	01/2022 – Present	
Sadie Lofton	BMEN	01/2022 – Present	
Tristan Marchena	BMEN	03/2021 – 05/2022	UPenn, PhD BioE
Christine Steege	ECHE	01/2021 – 05/2021	BS student at Univ of South Carolina
Samantha McCarthy	BMEN	11/2020 – 12/2021	BS student at Univ of South Carolina
Emily Ariail	BMEN	09/2020 – 05/2022	John Hopkins, PhD BME

Griffin Carter	BMEN	01/2020 – 05/2021	Georgia Tech, MS Robotics
Alexandra Stevens	BMEN	08/2019 – 05/2021	Children's Hospital Philadelphia
Hayley Hall	BMEN	01/2019 – 05/2021	Penn State, PhD Biomed Eng
Alexandra Patterson	ECHE	01/2019 – 05/2020	Georgia Tech, PhD Chem Eng
Madeline Spetz	BMEN	01/2018 – 05/2019	Vanderbilt, PhD Biomed Eng
Alexander Caughman	BMEN	08/2017 – 05/2019	MUSC, Research Assistant
Shrusti Patel	BMEN	05/2017 – 05/2018	Vanderbilt, PhD Biomed Eng
Milaan Shah	BMEN	01/2016 – 05/2018	Univ of SC, Med School
Kristina Pond	BMEN	01/2016 – 12/2016	Univ of Kentucky, Med School
Felicia Canipe	BMEN	08/2015 – 06/2016	Georgia Tech, MS program
Mary Margavio	BMEN	08/2015 – 06/2016	Senior consultant at Clarion.
Juline Deppen	BMEN	08/2015 – 06/2016	Georgia Tech, PhD Biomed Eng
Ludjelie Manigat	BMEN	05/2015 – 08/2015	Penn State, Medical School
Heather Struckman	BMEN	01/2015 – 07/2018	Ohio State, PhD Biomed Eng
Skyler Marker	ECHE	01/2015 – 12/2016	Process engineer at Barnwell
Chris Haycook	BMEN	10/2014 – 06/2016	Vanderbilt, PhD Biomed Eng
Jesse Zhang	ECHE	03/2013 – 12/2014	Scientist at Fluent BioSciences
Eric Jiang	ECHE	03/2012 – 07/2014	Consultant at Beghou
Christine Ricci	ECHE	01/2012 – 05/2013	Senior scientist at FUJIFILM
Shreya Rajan	ECHE	01/2012 – 05/2013	Project manager at ZS Associates
Kayan Tam	BMEN	01/2006 – 06/2011	Postdoc at Rockefeller University

ACADEMIC SERVICE

Professional Community

1. Session Chair Area 15D/E, 2022 AIChE Annual Meeting
2. Session Chair Area 8B, 2022 AIChE Annual Meeting
3. Programing Chair Area 15D/E, 2021 AIChE Annual Meeting
4. Session Chair Area 8B, 2021 AIChE Annual Meeting
5. Associate Editor, Annals of Biomedical Engineering, 01/2015 – 07/2021
6. Grant Reviewer, 2021 NASA ROSES Space Biology Inflammation Panel
7. Programming Vice Chair 15D/E, 2020 AIChE Annual Meeting
8. Session Chair Area 8B, 2020 AIChE Annual Meeting
9. Grant Reviewer, 2020 NASA Space Biology Immune Panel
10. Session Chair Area 8B, 2019 AIChE Annual Meeting
11. Session Chair, 2019 BMES Annual Meeting
12. Abstract Reviewer, 2019 BMES Annual Meeting
13. Abstract Reviewer, 2018 SFB Annual Meeting
14. Session Chair Area 8B, 2018 AIChE Annual Meeting
15. Session Chair, 2018 BMES Annual Meeting
16. Abstract Reviewer, 2018 BMES Annual Meeting
17. Abstract Reviewer, 2017 SFB Annual Meeting
18. Session Chair Area 8B, 2017 AIChE Annual Meeting
19. Session Chair Area 8B, 2016 AIChE Annual Meeting
20. Session Chair Area 8B, 2015 AIChE Annual Meeting

21. Session Chair, 2015 BMES Annual Meeting
22. Abstract Reviewer, 2015 BMES Annual Meeting

University of South Carolina

1. Faculty Mentor, Top Scholar Program (Ainsley Reed), 08/2023 – 05/2024
2. Faculty Mentor, Top Scholar Program (Joshua Campbell), 08/2022 – 05/2023
3. Member, VA IACUC, 04/2022 – Present
4. Faculty Mentor, McNair Scholars Program (Christine Steege), 08/2020 – 05/2021
5. Member, IACUC, 08/2015 – 08/2018
6. Faculty Mentor, McNair Scholars Program (Milaan Shah), 08/2015 – 05/2016
7. Faculty Senator, 08/2015 – 05/2018
8. Faculty Advisor, BMES Student Chapter, 04/2015 – present

ACTIVE FUNDING

3. Award: Merit (1I01RX004564)
Agency: VA RR&D
Amount: $1,029,753
Period: 05/2024 to 04/2028
PI: Michael Gower
Co-PI: None
Title: Macrophage targeted microparticles for the regeneration of atrophied muscle

2. Award: SPiRE (1I21RX004645)
Agency: VA RR&D
Amount: $229,848
Period: 04/2024 to 03/2026
PI: Michael Gower
Co-PI: None
Title: Improving cognition in the chronic phase of traumatic brain injury with nanoparticles for nose-to-brain drug delivery

1. Award: CAREER
Agency: NSF
Amount: $500,000
Period: 08/2022 to 07/2027
PI: Michael Gower
Co-PI: None
Title: CAREER: Biomaterial Implants to Control Adipose Tissue Function

COMPLETED FUNDING

6. Award: BRAVE Funding
Agency: VA Technology Transfer Program (TPP)
Amount: $100,000
Period: 10/2023 to 09/2024
PI: Michael Gower
Co-PI: None
Title: Furthering development and commercialization potential of ATRA-PLG for muscle

wasting by establishing efficacy in obesity

5. Award: SPIRE
Agency: VA RR&D
Amount: $257,838
Period: 01/2020 to 09/2022
PI: Michael Gower
Co-PI: None
Title: Biomaterial Implants for the Treatment of Disuse Muscle Atrophy

4. Award: Pilot Project
Agency: SC NASA EPSCoR
Amount: $25,000
Period: June 1, 2018 to May 31, 2019
PI: Michael Gower
Co-PI: None
Title: Implants for the Prevention and Treatment of Microgravity Induced Muscle Atrophy

3. Award: Pilot Project - P20 GM103641
Agency: NIH NIGMS COBRE - Center for Inflammation and Dietary Supplements
Amount: $205,500
Period: June 1, 2016 to May 31, 2018
PI: Michael Gower
Co-PI: None
Title: Resveratrol Scaffolds for the Treatment of Obesity and Insulin Resistance

2. Award: Pilot Project - P20 GM103641
Agency: NIH NIGMS COBRE - Center for Inflammation and Dietary Supplements
Amount: $205,500
Period: June 1, 2014 to May 31, 2016
PI: Michael Gower
Co-PI: None
Title: Materials for Engineering Thermogenic Adipose Tissue

1. Award: ASPIRE III Infrastructure Award
Agency: University of South Carolina Office of the Vice President for Research
Amount: $100,000
Period: May 16, 2015 to August 15, 2016
PI: Michael Gower
Co-PI: Marj Peña (Dept. of Biological Sciences, U of SC)
Title: Proposal for an In Vivo Animal Imager