

Maude Cuchiara
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EDUCATION

- PhD – Bioengineering**, *Thesis: Biomimetic PEG Hydrogels for ex vivo Hematopoietic Stem Cell Expansion*
Rice University; Houston, TX 2011
- BS - Biomedical Engineering**, *Concentration: Tissue Engineering and Biomaterials*
North Carolina State University; Raleigh, NC 2006
- BA - Spanish Language and Literature**
North Carolina State University; Raleigh, NC 2006

RESEARCH EXPERIENCE

Research Associate Professor

Department of Materials Science and Engineering; North Carolina State University, Raleigh, NC 2019-Present

- Conduct research focused on stakeholder perceptions of emerging technologies (e.g., nanotechnology) and impacts on policy and regulation
- Lead Research Experience for Teachers program focused on nanotechnology (10 educators annually)
- Establish annual recruitment strategy and plan and execute graduate student recruitment events as a member of the Graduate Recruitment Committee
- Author and support new proposals to strengthen and support the department's education, outreach, and workforce development efforts

Managing Director, Science and Technologies for Phosphorus Sustainability (STEPS) Center

North Carolina State University, Raleigh, NC 2021-Present

- Create processes and tools to integrate >200 STEPS students, post-docs, faculty, and staff
- Supervise two staff members and undergraduate workers in the Center's headquarters office at NC State
- Organize and lead external partnership efforts to fund new research directions, support students, and solicit expert feedback on current research portfolio
- Manage STEPS Enhancement Fund by guiding fundraising efforts and prioritizing areas of investment
- Represent and advocate for STEPS internally (e.g., university industry liaisons group) and externally (e.g., NSF)
- Support and advance educational programs (e.g., Research Experience for Undergraduates, Convergence Classroom)
- Participate in research projects focused on studying the effectiveness of convergence research resources and tools and development of evaluation metrics for convergence

Associate Director, Research Triangle Nanotechnology Network (RTNN)

North Carolina State University, Department of Materials Science and Engineering; Raleigh, NC 2019-2021

- Authored and supported new proposals securing NSF RET site (2019) and REU (2021) awards
- Nucleated new partnerships to connect nanotechnology facilities to the community (e.g. 4H, Girl Scouts, museums, libraries)
- Communicated RTNN news, information, and events to internal and external stakeholders through a variety of platforms (>3,000 people)
- Executed RTNN workshops, conferences, and outreach activities (>4,000 annual participants)
- Developed new methods to measure the impact of RTNN academically, geographically, and economically
- Served on 3 NNCI working groups (K-12 Education and Outreach, Workforce Development, Online Technical Learning) to develop and disseminate best practices and coordinate network-wide efforts

Manager, Research Triangle Nanotechnology Network (RTNN)

North Carolina State University, Department of Materials Science and Engineering; Raleigh, NC

2016-2019

- Facilitated client interactions with RTNN
- Planned and implemented >50 RTNN workshops, conferences, and outreach activities
- Organized and executed 2018 NNCI REU Convocation held at NC State (>65 participants)
- Generated RTNN reports and presentations for NSF reporting and dissemination to stakeholders
- Coordinated development of *Nanotechnology, A Maker's Course*, a Massive Open Online Course (MOOC) housed on Coursera, across 3 universities (>68,000 enrolled to date)

Research Scientist and Lab Manager, West Laboratory for Biofunctional Materials

Duke University, Department of Biomedical Engineering; Durham, NC

2012-2016

Rice University, Department of Bioengineering; Houston, TX

2011-2012

- Advised and supported 15-20 undergraduate and graduate student and postdoctoral fellow research projects
- Coordinated all laboratory purchasing with >50 vendors and managed monthly supply budget of \$15,000
- Maintained scientific and administrative online resources including calendar, equipment schedules, websites, waste management, and inventories
- Served as liaison between laboratory and multiple Duke offices: Cell Culture Facility, Procurement, Safety, Accounts Payable, IT, Facilities Management
- Prepared and reviewed safety documents, protocols, scientific manuscripts, and grant proposals

Graduate Research, NSF Graduate Fellow, West Laboratory for Biofunctional Materials

Rice University, Department of Bioengineering; Houston, TX

2006- 2011

- Designed complex biomaterial system to recapitulate the hematopoietic stem cell (HSC) niche *in vitro* using a bioactive poly(ethylene) glycol hydrogel scaffold
- Collaborated with interdisciplinary, multi-institutional team in an effort to generate *ex vivo* bone

Research Assistant, Gould Laboratory

North Carolina State University, Department of Entomology; Raleigh, NC

2002-2006

- Examined genetic variations between two strains of moths: *Heliothis verescens* and *Heliothis subflexa*

Research Assistant, Boyan Laboratory

Georgia Institute of Technology, Department of Bioengineering; Atlanta, GA

2005

- Determined effects of TP508, a synthetic thrombin peptide, on chondrocyte apoptosis and nitric oxide production

Research Assistant, West Laboratory for Biofunctional Materials

Rice University, Department of Bioengineering; Houston, TX

2004

- Established and published innovative patterning protocols for polymer hydrogels
- Created a novel system to study interactions between lymphocytes and bioactive polymer hydrogels during flow

SCIENCE AND TECHNOLOGY POLICY EXPERIENCE

Baker Institute Scholar

James A. Baker III Institute for Public Policy, Science and Technology Policy Program; Houston, TX

2012-Present

- Author peer-reviewed publications addressing policy and ethical concerns in science and technology
- Research the effects of scientific policy and judicial decisions on research, commercialization, and society

Post-Doctoral Research Associate

James A. Baker III Institute for Public Policy, Science and Technology Policy Program; Houston, TX

2011-2012

- Composed policy reports analyzing current scientific issues and proposing recommendations for future policies

- Organized events to engage and educate local scientists, policymakers, and the community in regards to current scientific and ethical topics

Graduate Intern

James A. Baker III Institute for Public Policy, Science and Technology Policy Program; Houston, TX 2009-2011

- Developed stem cell policy recommendations for the state of Texas
- Published reports evaluating federal and state stem cell research policies

Policy Intern

National Science Foundation, Biomedical Engineering Program; Arlington, VA 2009

- Determined and analyzed multidisciplinary research trends in the biomedical engineering program
- Presented recommendations for promoting multidisciplinary research to program officers

TEACHING EXPERIENCE

Mentor to High School, Undergraduate, and Graduate Students

Rice University; Houston, TX and Duke University; Durham, NC 2007-2016

- Taught lab techniques and scientific principles to high school, undergraduate, and graduate students
- Assisted students in the development of novel research projects

Instructor, ME 221: Structure and Properties of Solids

Duke University; Department of Mechanical Engineering and Materials Science, Durham, NC 2015

- Researched and prepared all course materials including lecture notes, homework sets, and classroom demonstrations
- Supplied an environment in and outside the classroom that supported the development of all students

Instructor, BMME 510: Biomaterials

University of North Carolina at Chapel Hill; Department of Biomedical Engineering, Chapel Hill, NC 2013-2014

- Developed and presented new course content for senior level undergraduate and graduate students
- Organized and evaluated class materials for ABET accreditation of undergraduate program

Guest Lecturer, BIOE 202: Advances in Bioengineering

Rice University, Department of Bioengineering; Houston, TX 2008-2011

- Debated ethics of current stem cell research and therapy

Guest Lecturer, BIOE 576: Foundations of Biotechnology

Rice University, Department of Bioengineering; Houston, TX 2009-2010

- Led discussions on basic cell culture principles and applications in biomedical research

Teaching Assistant, BIOE 370: Biomaterials

Rice University, Department of Bioengineering; Houston, TX 2007

- Taught weekly course review sessions and advised students on how to approach problem sets

Teaching Assistant, BIOE 342: Laboratory in Tissue Culture Techniques

Rice University, Department of Bioengineering; Houston, TX 2007

- Guided students in experimental design and helped them critically evaluate their results

RESEARCH PUBLICATIONS

- Horgan, Madison D., Christopher L. Cummings, Jennifer Kuzma, Michael Dahlstrom, Ilaria Cimadori, **Maude Cuchiara**, Colin Larter, Nick Loschin, and Khara Grieger. "Beyond the Hype: Stakeholder Perceptions of Nanotechnology and Genetic Engineering for Sustainable Food Production." *Sustainability*. 2025, 17 (15).

- Jones, M. Gail, Julianna Nieuwsma, Kathleen Bordewieck, Gina Childers, Steve McDonald, Kimberly Bourne, **Maude Cuchiara**, Anna-Maria Marshall, Brooke K. Mayer, Christine Ogilvie Hendren, and John Classen. “Wicked Problems: Graduate Students’ Experiences in A Convergent Research Environment.” *Res Sci Educ.* 2025.
- Deviney, Alison V., Jehangir Bhadha, Lucas Crane, **Maude Cuchiara**, Shwetha Delanthamajalu, Luciano Gatiboni, Sandra M Guzman, Christine Ogilvie Hendren, Anna-Maria Marshall, Elise Morrison, Natalie G Nelson, Jay Rickabaugh, Rosangela Sozzani, Paul Westerhoff, and Jacob L Jones. “Triple Bottom Line Scenario Sites: A Method for Integrating Diverse Disciplines in Convergent Research.” *Sustainability.* 2024; 16 (23).
- Jones, Jacob L., David M. Berube, **Maude Cuchiara**, Khara Grieger, Elaine A Cohen Hubal, Sarah J Karikó, Phillip Strader, and Yves Theriault. “Positioning nanotechnology to address climate change.” *Environment Systems and Decisions.* 2024.
- Merck, Ashton, Khara Grieger, **Maude Cuchiara**, and Jennifer Kuzma. “What Role Does Regulation Play in Responsible Innovation of Nanotechnology in Food and Agriculture? Insights and Framings from US Stakeholders.” *Bull Sci Technol Soc.* 2022; 42 (3).
- Ruzante, Juliana. Susan Mayer, Ellen Thomas Shumaker, Sidney Holt, Adam Kokotovich, **Maude Cuchiara**, Andrew R Binder, Jennifer Kuzma, and Khara Grieger. “Eliciting stakeholder perceptions using a novel online engagement platform.” *RTI Press Publication.* 2022; No. OP-0071-2201.
- Nelson, Natalie G, **Maude L Cuchiara**, Christine Ogilvie Hendren, Jacob L Jones, Anna-Maria Marshall. “Hazardous spills at retired fertilizer manufacturing plants will continue to occur in the absence of scientific innovation and regulatory enforcement.” *Environ Sci Technol.* 2021; 55 (24): 16267-16269.
- Grieger, Khara D., Ashton W. Merck, **Maude Cuchiara**, Andrew R. Binder, Adam Kokotovich, Christopher L. Cummings, and Jennifer Kuzma. “Responsible Innovation of nano-agrifoods: Insights and views from U.S. stakeholders.” *NanoImpact.* 2021, 24: 100365.
- Grieger, Khara, Nathan Bossa, James Levis, Kerstin von Borries, Phillip Strader, **Maude Cuchiara**, Christine Hendren, Steffen Hansen, and Jacob Jones. “Application and testing of risk screening tools for nanomaterial risk analysis.” *Environ Sci: Nano.* 2018; 5 (8):1844-1858.
- Alvarez-Urena, Pedro, Eleanor Davis, Corinne Sonnet, Gabrielle Henslee, Zbigniew Gugala, Edward V. Strecker, Laura J. Linscheid, **Maude Cuchiara**, Jennifer West, Alan Davis, and Elizabeth Olmsted-Davis. “Encapsulation of adenovirus BMP2-transduced cells with PEGDA hydrogels allows bone formation in the presence of immune response.” *Tissue Eng Part A.* 2017; 5-6: 177-184.
- **Cuchiara, Maude L.**, Suleyman Coskun, Omar A. Banda, Kelsey L. Horter, Karen K. Hirschi, and Jennifer L. West. “Bioactive poly(ethylene glycol) hydrogels to recapitulate the HSC niche and facilitate HSC expansion in culture.” *Biotechnol Bioeng.* 2015.
- Zhang, Xing, Bin Xu, Daniel Puperi, Aline Yonezawa, Yan Wu, Hubert Tseng, **Maude Cuchiara**, Jennifer West, and Kathryn Jane Grande-Allen. “Integrating valve-inspired design features into poly(ethylene glycol) hydrogel scaffolds for heart valve tissue engineering.” *Acta Biomater.* 2015; 14: 11-21.
- Tseng, Hubert, Daniel S. Puperi, Eric J. Kim, Salma Ayoub, Jay Shah, **Maude L. Cuchiara**, Jennifer L. West, and K. Jane Grande-Allen. “Anisotropic poly(ethylene glycol)/polycaprolactone (PEG/PCL) hydrogel-fiber composites for heart valve tissue engineering.” *Tissue Eng Part A.* 2014; 19-20: 2634-35.
- Ali, Saniya, **Maude L. Cuchiara**, and Jennifer L. West. “Micropatterning of Poly(ethylene glycol) Diacrylate Hydrogels.” *Micropatterning in Cell Biology Part C.* 2014; 121: 105 - 119.
- **Cuchiara, Maude L.**, Omar A. Banda, Kelsey L. Horter, and Jennifer L. West. “Covalent immobilization of SCF and SDF1 α for *in vitro* culture of hematopoietic progenitor cells.” *Acta Biomater.* 2013 Dec; 9 (12):9258-69.
- **Cuchiara, Maude L.***, Hubert Tseng*, Durst, Christopher A., Michael P. Cuchiara, Jennifer L. West, and K. Jane Grande-Allen. “Fabrication and mechanical evaluation of anatomically-inspired quasilaminate hydrogel.” *Ann Biomed Eng.* 2012 Oct; 41 (2): 398-407. * denotes co-first author
- Stephens-Altus Jean S., Pamela Sundelacruz, **Maude L. Rowland**, and Jennifer L. West. “Development of bioactive photocrosslinkable fibrous hydrogels.” *J Biomed Mater Res A.* 2011 Aug; 98(2):167-76.
- Taite, Lakeshia J., **Maude L. Rowland**, Katie A. Ruffino, Brian R. Smith, Michael B. Lawrence, and Jennifer L. West. “Bioactive hydrogel substrates: probing leukocyte receptor-ligand interactions in parallel plate flow chamber studies.” *Ann Biomed Eng.* 2006 Nov; 34 (11): 1705-11.

- Hahn, Mariah S., Lakeshia J. Taite, James J. Moon, **Maude L. Rowland**, Katie Ruffino, and Jennifer L. West. “Photolithographic patterning of polyethylene glycol hydrogels” *Biomaterials*. 2006 Apr; 27 (12): 2519-24.

POLICY PUBLICATIONS

- **Cuchiara, Maude L.**, Jackie K. Olive, and Kirstin R.W. Matthews. “Regulating the Therapeutic Translation of Regenerative Medicine.” *Expert Opin Biol Ther*. 2015 Sept.
- Matthews, Kirstin R.W. and **Maude L. Cuchiara**. “US National Football League athletes seeking unproven stem cell treatments.” *Stem Cells and Development*. 2014 Dec; Suppl 1: 60-4.
- Matthews, Kirstin R.W. and **Maude L. Cuchiara**. “Gene Patents, Patenting Life, and the Impact of Court Rulings on US Stem Cell Patents and Research” *Regen Med*. 2014 Mar; 9 (2): 191-200.
- **Cuchiara, Maude L.**, James Lawford Davies, and Kirstin R.W. Matthews. “Defining “Research” in the US and EU: Contrast of *Sherley v. Sebelius* and *Brüstle v. Greenpeace* Rulings.” *Stem Cell Rev*. 2013 Dec; 9 (6):743-51.
- Matthews, Kirstin R.W., **Maude R. Cuchiara**, Jingyuan Luo, Abdelali Haoudi, and Ayman Bassil. “Highlights and Recommendations from the 2012 Qatar Foundation–Baker Institute Event ‘Qatar International Conference on Stem Cell Science and Policy.’” *Baker Institute Policy Report*. 2013 Feb; 56.
- Matthews, Kirstin R.W., **Maude L. Rowland**. “Global Update USA.” *Regen Med*. 2012 Nov; 7 (6): 126-129.
- Matthews, Kirstin R.W., **Maude L. Rowland**, Jingyuan Luo, and Monica Matsumoto. “Stem Cell Research in the Courts: *Sherley v. Sebelius*.” *Baker Institute Policy Report*. 2012 Jan; 50.
- Matthews, Kirstin R.W. and **Maude L. Rowland**. “Stem Cell Policy in the Obama Age: UK and US Perspectives.” *Regen Med*. 2011 Jan; 6 (1): 125-32.
- Matthews, Kirstin R.W. and **Maude L. Rowland**. “Stem Cells and Biomedical Research in Texas.” Baker Institute for Public Policy. 2011 Jan.
- Matthews, Kirstin R.W. and **Maude L. Rowland**. “Stem Cell Policy in the Obama Age: Texas, U.S., and U.K. Perspectives.” Baker Institute for Public Policy. 2010 Mar.

RESEARCH PRESENTATIONS

- **Rowland, Maude L.**, Suleyman Coskun, Kelsey L. Horter, Omar A. Banda, Karen K. Hirschi, Jennifer L. West. “Bioactive Poly(ethylene glycol) Hydrogel Wells Support the Expansion of Murine Hematopoietic Stem Cell Populations.” Poster Presentation. *2012 ISSCR Conference*: Yokohama, Japan.
- **Rowland, Maude L.**, Omar Banda, Suleyman Coskun, Karen K. Hirschi, and Jennifer L. West. “Development of Bioactive Poly(ethylene glycol) (PEG) Hydrogels to Promote Expansion of Hematopoietic Stem Cells and Maintain their Potency.” Poster Presentation. *2011 National SFB Conference*: Orlando, Florida.
- **Rowland, Maude L.**, Suleyman Coskun, Karen K. Hirschi, and Jennifer L. West. “Bioactive PEG Hydrogels Promote the Expansion of Hematopoietic Progenitor Cells while Maintaining their Potency.” Poster Presentation. *2010 National BMES Conference*: Austin, Texas.
- **Rowland, Maude L.**, Suleyman Coskun, Karen K. Hirschi, and Jennifer L. West. “Bioactive PEG Hydrogels Promote the Expansion of Hematopoietic Progenitor Cells.” Poster Presentation. *2010 National SFB Conference*: Seattle, Washington.
- **Rowland, Maude L.**, Jean S. Altus, and Jennifer L. West. “Adhesion to bioactive poly(ethylene) glycol (PEG) hydrogels promotes expansion of hematopoietic progenitor cells.” Poster Presentation. *Keystone Symposia: Stem Cell Differentiation and Dedifferentiation*, February 2010: Keystone, Colorado.
- **Rowland, Maude L.**, Jean S. Altus, and Jennifer L. West. “Development of Bioactive PEG Hydrogels for the Expansion of Hematopoietic Stem Cells.” Poster Presentation. *2009 National BMES Conference*: Pittsburgh, Pennsylvania.
- **Rowland, Maude L.**, Jean S. Altus, and Jennifer L. West. “Bioactive hydrogels for the development of a hematopoietic stem cell niche.” Poster Presentation. *2009 National SFB Conference*: San Antonio, Texas.

- **Rowland, Maude L.**, Jean S. Altus, and Jennifer L. West. “Bioactive hydrogels for the development of a hematopoietic stem cell niche.” Poster Presentation. *2008 National BMES Conference*: St. Louis, Missouri.
- **Rowland, Maude L.**, Katie A. Ruffino, Lakeshia J. Taite, Michael B. Lawrence, and Jennifer L. West. “Cell adhesion under shear on bioactive PEG-copolymer hydrogels” Poster Presentation. *2004 National BMES Conference*: Philadelphia, Pennsylvania.

POLICY PRESENTATIONS

- Matthews, Kirstin R.W. and **Maude L. Cuchiara**. “How Should the NFL Tackle Unproven Stem Cell Treatments?” Poster Presentation. *ISSCR 2014*: Vancouver, Canada.
- Matthews, Kirstin R.W. and **Maude L. Cuchiara**. “AMP v. Myriad Genetics: Gene Patents, Patenting Life, and the Impact on U.S. Stem Cell Research.” Poster Presentation. *ISSCR 2013*: Boston, MA.
- Matthews, Kirstin R.W., **Maude L. Rowland**, and Ayman Bassil. “Highlights and Themes From the Qatar International Conference on Stem Cell Science and Policy.” Poster Presentation. *ISSCR 2012*: Yokohama, Japan.
- Matthews, Kirstin R.W. and **Maude L. Rowland**. “Defining Research in the U.S. and EU: Contrast of *Sherley v. Sebelius* and *Brüstle v. Greenpeace* Rulings.” Poster Presentation. *2012 ISSCR Conference*: Yokohama, Japan.
- **Maude L. Rowland**. “STEM Education, A Role for Scientists and Engineers.” Oral Presentation. *2011 Future of Houston’s Children Conference*: Houston, Texas.

HONORS AND ACTIVITIES

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| • NC State Access, Belonging, and Practice (ABC) Community of Practice | 2023-present |
| • Materials Science and Engineering, Recruitment Committee | 2021-present |
| • NC State Faculty LEAD Program | 2024-2025 |
| • NC State Provost’s Faculty Fellow | 2023-2024 |
| • NC State University Library Committee | 2021-2024 |
| • NC State’s Office for Institutional Equity and Diversity (OIED) Inclusive Excellence Certificate | 2023 |
| • NC State’s OIED JEDI (Justice, Equity, Diversity and Inclusion) Strategic Practice Certificate | 2022 |
| • NNCI Workforce Development Working Group | 2016-2021 |
| • NNCI Online Technical Learning Working Group | 2016-2021 |
| • NNCI K-12 and Community College Working Group | 2016-2021 |
| • NC State Outstanding Extension and Engagement Award | 2020 |
| • Duke Science Quad Community Watch Committee | 2013-2016 |
| • Duke Green Labs Committee | 2014-2016 |
| • Judge, Rice Undergraduate Research Symposium | 2009-2012 |
| • Robert Lowry Patten Award for Graduate Student Association (GSA) service | 2010 |
| • Head Coach, Rice Women’s Club Soccer Team | 2007-2010 |
| • Rice GSA Intramural Sports Representative | 2007-2010 |
| • Rice Bioengineering GSA Social Chair | 2007-2008, 2009-2010 |
| • Rice GSA Bike Team Captain | 2008-2010 |
| • NSF Graduate Research Fellowship | 2006-2009 |
| • Rice University Bike Safety Committee | 2008-2009 |
| • SEEK (Student Engineers Educating Kids) Volunteer | 2007-2009 |
| • Rice Bioengineering Teaching Assistant of the Year | 2006-2007 |
| • Summa Cum Laude, Valedictorian | 2006 |

- NC State University Honors Program 2001-2006
- NC State University Scholars Program 2001-2006
- NC State Benjamin Franklin Scholar 2001-2006
- NC State Biomedical Engineering Society (BMES) Rita Schaffer Undergraduate Award 2006
- NC State University BME Humanities Award 2006
- NC State University Women's Club Soccer 2002-2006
 - President 2004-2006
 - Treasurer 2003-2004
- NC State University Student BMES Chapter 2002-2006
 - Vice-President 2005-2006
 - Treasurer 2004-2005
- Phi Beta Kappa Honor Society
- Phi Kappa Phi Honor Society