

Leila S. Saleh, Ph.D.

Assistant Teaching Professor, University of Colorado Boulder
Paul M. Rady Department of Mechanical Engineering

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Education

Doctor of Philosophy, Chemical and Biological Engineering University of Colorado Boulder, College of Engineering and Applied Science	Aug 2020
Master of Science, Chemical and Biological Engineering University of Colorado Boulder, College of Engineering and Applied Science	Dec 2017
Bachelor of Science (with Honors), Chemical Engineering The University of Texas at Austin, Cockrell School of Engineering	May 2015

Teaching Experience

Assistant Teaching Professor, Paul M. Rady Department of Engineering <i>University of Colorado Boulder</i>	8/25 - present
<ul style="list-style-type: none">Materials Science (MCEN 2024) – F25<ul style="list-style-type: none">Average instructor score: 4.67 ± 0.14 / 5.00Chemistry for Energy & Materials (MCEN 1024) – SP26 (current)First Year Engineering Projects (GEEN1400) – SP26 (current)	
Lecturer, Paul M. Rady Department of Mechanical Engineering <i>University of Colorado Boulder</i>	1/24 - 8/25
<ul style="list-style-type: none">Chemistry for Energy and Materials (MCEN 1024) – SP24, F24<ul style="list-style-type: none">Average instructor score: 4.52 ± 0.31 / 5.00Materials Science (MCEN2024) – SP24, Su25, SP25, Su25<ul style="list-style-type: none">Average instructor score: 4.63 ± 0.19 / 5.00First Year Engineering Projects (GEEN 1400) – SP25<ul style="list-style-type: none">Average instructor score: 4.80 ± 0.11 / 5.00	
Guest Lecturer, Materials Science and Engineering Department <i>Missouri University of Science and Technology</i>	10/20, 10/22
<ul style="list-style-type: none">Tissue Engineering (MS&E 5210)	
Instructor, Science Discovery High School Academy and Research Programs <i>University of Colorado Boulder</i>	6/19 – 7/19
<ul style="list-style-type: none">Medical Science and Research Academy	
Teaching Fellow, Chemical and Biological Engineering Department <i>University of Colorado Boulder</i>	1/19 – 5/19
<ul style="list-style-type: none">Biomaterials (CHEN 4805): Instructor effectiveness = 5.31 ± 0.84 / 6.00	
Advanced Teaching Assistant, Chemical and Biological Engineering Department <i>University of Colorado Boulder</i>	1/18 – 5/18
<ul style="list-style-type: none">Biomaterials (CHEN 4805): TA effectiveness = 5.82 ± 0.61 / 6.00	
Teaching Assistant, Chemical and Biological Engineering Department <i>University of Colorado Boulder</i>	8/15 – 12/15
<ul style="list-style-type: none">Chemical Process Synthesis (CHEN 4520)	

Research Experience

Postdoctoral Research Scholar, Washington University in St. Louis School of Medicine Department of Orthopaedic Surgery, Center for Regenerative Medicine <i>Advisor: Farshid Guilak, Ph.D.</i>	9/20 – 1/24
Graduate Research Assistant, University of Colorado Boulder Chemical and Biological Engineering Department <i>Advisor: Stephanie J. Bryant, Ph.D.</i>	1/16 – 8/20

Thesis: Understanding and regulating the foreign body response to poly(ethylene glycol) hydrogels for tissue engineering

Undergraduate Research Assistant, The University of Texas at Austin

6/13 – 5/15

Center for Petroleum and Geosystems Engineering

Advisor: Quoc P. Nguyen, Ph.D.

Undergraduate Research Assistant, University of Massachusetts Amherst

6/14 – 8/14

Polymer Science and Engineering Department, NSF REU

Advisor: Maria Santore, Ph.D.

Undergraduate Research Assistant, The University of Texas at Austin

1/13 – 6/13

Department of Civil, Architectural, and Environmental Engineering

Advisor: Kerry A. Kinney, Ph.D.

Mentorship Experience

University of Colorado Boulder

Graduate Thesis Committees:

- Kayla Rasavanh: Mechanical Engineering 2025 - current

Washington University in St. Louis School of Medicine

Postdoctoral Mentor:

- Lauryn Braxton: Biomedical Engineering, *Ph.D. Expected 2026* 2022-2024
- Haleigh Pine: Biomedical Engineering, *B.S. 2022, Current M.D. Trainee (University of Michigan)* 2021-2023

Graduate Mentor, Undergraduate Senior Thesis in Chemical and Biological Engineering

2016-2018

University of Colorado Boulder

- AY 16-17: Andrew Frederickson, "Regulation of macrophage fusion *in vitro*"
- AY 17-18: Casey Vanderheyden, "*In vitro* mitigation of macrophage fusion"
- AY 17-18: Kianna Nguyen, "Effects of extracellular superoxide dismutase redistribution on the foreign body response"

Publications

1. **L.S. Saleh**, L. Braxton, E.C. Erlich, R.S. Czepielewski, H. Pine, K.H. Collins, K.L. Lenz, L.E. Springer, C.T.N. Pham, G.J. Randolph, F. Guilak, "Poly(ethylene glycol) Hydrogels as a Platform for Self-Regulating Anti-Cytokine Therapy in A Model of Inflammatory Arthritis," *in preparation, expected submission 2026*
2. E.C. Erlich, Q.A. Alayo, A. Kim, J. Han, R. L. Mintz, C.G. Huckstep, H.S. Ruiz, R.L. Field, T.J. Duning, **L. S. Saleh**, M.H. Hoofnagle, A.V. Tumanov, F. Guilak, J.R. Brestoff, R.S. Czepielewski, G.J. Randolph. "Distinct Roles for B cell-derived LT α 3 and LT α 1 β 2 in TNF-Mediated Ileitis," *Nature Immunology* (2025), doi: 10.1038/s41590-025-02263-y
3. B.J. Thompson, **L.S. Saleh**, E.L. Carillion, S. Alper, S.J. Bryant. "Damage Associated Molecular Patterns (DAMPs) Mediate the Foreign Body Response to Poly(ethylene glycol) Diacrylate Hydrogels via Toll like Receptors," *ACS Biomaterials Science & Engineering* (2025), doi: 10.1021/acsbiomaterials.4c01984
4. K.H. Collins, L. Pferdehirt, **L.S. Saleh**, A. Savadipour, L.E. Springer, K.L. Lenz, D.M. Thompson, Jr., C.T.N. Pham, F. Guilak. "Hydrogel encapsulation of genome-engineered stem cells for long-term self-regulating anti-cytokine therapy," *Gels* (2023), doi: 10.3390/gels9020169
5. **L.S. Saleh**, L.D. Amer, B. Thompson, T. Danhorn, J. Knapp, S.L. Gibbings, S. Thomas, B. O'Connor, W. Janssen, S. Alper, S.J. Bryant. "Mapping macrophage polarization and origin during the progression of the foreign body response to a poly(ethylene glycol) hydrogel implant," *Advanced Healthcare Materials* (2022) doi: 10.1002/adhm.202102209
6. **L.S. Saleh**, C. Vanderheyden, A. Frederickson, S.J. Bryant. "Prostaglandin E2 (PGE2) and its receptor EP2 modulate macrophage activation and fusion *in vitro*," *ACS Biomaterials Science and Engineering Special Issue* (2020) doi: 10.1021/acsbiomaterials.9b01180
7. D.F. Marruecos, **L.S. Saleh**, H.H. Kim, S. J. Bryant, D.K. Schwartz, J.L. Kaar. "Stabilization of fibronectin by random copolymer brushes inhibits macrophage activation," *ACS Applied Bio Materials* (2019) doi: 10.1021/acsbm.9b00815

8. L.D. Amer*, **L.S. Saleh***, C. Walker, S. Thomas, W.J. Janssen, S. Alper, S.J. Bryant. "Inflammation via myeloid differentiation primary response gene 88 signaling mediates the fibrotic response to implantable synthetic poly(ethylene glycol) hydrogels," *Acta Biomaterialia* (2019), doi: 10.1016/j.actbio.2019.09.043
*denotes equal contribution
9. **L.S. Saleh**, M. Carles-Carner, S.J. Bryant. "The in vitro effects of macrophages on the osteogenic capabilities of MC3T3-E1 cells encapsulated in a biomimetic poly(ethylene glycol) hydrogel," *Acta Biomaterialia* (2018) doi: 10.1016/j.actbio.2018.02.026
10. M. Carles-Carner, **L.S. Saleh**, S.J. Bryant. "The effects of hydroxyapatite nanoparticles embedded in a MMP-sensitive photoclickable PEG hydrogel on encapsulated MC3T3-E1 pre-osteoblasts," *Biomedical Materials* (2018) doi: 10.1088/1748-605X/aabb31
11. **L.S. Saleh**, S.J. Bryant. "The host response in tissue engineering: crosstalk between immune cells and cell-laden scaffolds," *Current Opinion in Biomedical Engineering* (2018), doi: 10.1016/j.cobme.2018.03.006
12. L.E. Jansen, L.D. Amer, E. Y-T. Chen, T.V. Nguyen, **L.S. Saleh**, W. Lui, S.J. Bryant, S.R. Peyton. "Zwitterionic hydrogels resist foreign body response in a stiffness dependent manner," *Biomacromolecules* (2018) doi: 10.1021/acs.biomac.8b00444
13. **L.S. Saleh**, S.J. Bryant. "In vitro and in vivo models for assessing the host response to biomaterials," *Drug Discovery Today: Disease Models* (2018), doi: 10.1016/j.ddmod.2018.04.002

Conference Presentations

Poster, Biomedical Engineering Society Annual Meeting	<i>Seattle, Washington</i>	10/23
L.S. Saleh , E. Erlich, R. Sanguinetti Czsepielewski, H. Pine, L. Braxton, K.H. Collins, K.L. Lenz, L.E. Springer, C.T.N. Pham, G.J. Randolph, F. Guilak. "PEG hydrogels as a platform for self-regulating anti-cytokine therapy in a model of rheumatoid arthritis"		
Poster, Orthopedic Research Society Annual Meeting	<i>Dallas, Texas</i>	2/23
L.S. Saleh , E. Erlich, R. Sanguinetti Czsepielewski, K.H. Collins, K.L. Lenz, L.E. Springer, C.T.N. Pham, G.J. Randolph, F. Guilak. "Self-regulating anti-cytokine hydrogel implants for the treatment of a novel model of TNF-mediated rheumatoid arthritis"		
Poster, Orthopedic Research Society Annual Meeting	<i>Dallas, Texas</i>	2/23
K.H. Collins, R.J. Nims, L. Pferdehirt, L.S. Saleh , A. Savadipour, L.E. Springer, K.L. Lenz, D.M. Thompson, Jr., C.T.N. Pham, F. Guilak. "Hydrogel encapsulation of genome-engineered stem cells as injectable self-regulating anti-cytokine therapy"		
Poster, Musculoskeletal Biology and Regeneration Meeting	<i>St. Louis, Missouri</i>	5/22
L.S. Saleh , E. Erlich, R. Sanguinetti Czsepielewski, H. Pine, K.H. Collins, K.L. Lenz, L.E. Springer, C.T.N. Pham, G.J. Randolph, F. Guilak. "Self-regulating anti-cytokine hydrogel implants for the treatment of rheumatoid arthritis"		
Oral Presentation (virtual), World Biomaterials Congress	<i>Glasgow, Scotland</i>	12/20
L.S. Saleh , S.L. Gibbings, W.J. Janssen, S. Alper, S.J. Bryant. "Macrophage origin impacts the foreign body response to poly(ethylene glycol) hydrogels"		
Oral Presentation, Society for Biomaterials Annual Meeting	<i>Seattle, Washington</i>	4/19
L.S. Saleh , D.F. Marruecos, S. Thomas, W. Janssen, S. Alper, D.K. Schwartz, J.L. Kaar, S.J. Bryant. "The role of toll-like receptors 2 and 4 in the foreign body response to poly(ethylene glycol) hydrogels."		
Oral Presentation, Society for Biomaterials Annual Meeting	<i>Atlanta, Georgia</i>	4/18
L.S. Saleh , M. Carles-Carner, C. Vanderheyden, A. Frederickson, S.J. Bryant. "Understanding the role of macrophages in the FBR-mediated reduction of osteogenic capabilities of MC3T3-E1 cells encapsulated in a biomimetic poly(ethylene glycol) hydrogel."		
Oral Presentation, Student Annual Research Symposium	<i>Boulder, Colorado</i>	12/17
L.S. Saleh , M. Carles-Carner, C. Vanderheyden, A. Frederickson, S.J. Bryant. "The role of macrophages in the FBR-mediated reduction of osteogenic capabilities of cells encapsulated in a biomimetic poly(ethylene glycol) hydrogel."		
Poster, Orthopedic Research Society Annual Meeting	<i>San Diego, California</i>	3/17
L.S. Saleh , M. Carles-Carner, L.D. Amer, S.J. Bryant. "The foreign body response to cell-laden MMP-sensitive poly(ethylene glycol) hydrogels for bone tissue engineering."		

Service: Professional Societies and Campus Organizations

Internal Service:

CU Mechanical Engineering Undergraduate Committee (2024-present)

- Faculty Advisor, Undergraduate Student Advisory Board
- Faculty Advisor, Chemistry for Mechanical Engineers Tutoring Initiative

Graduate Teaching Assistant Lunch & Learn Presenter (F24, SP25, F25)

Graduate Teaching Assistant Orientation & Training Presenter (F24)

Chair, CHBE Graduate Leadership Council: *Recruitment Committee* (2016-2020)

Chair, CHBE Graduate Leadership Council: *Diversity & Inclusion Committee* (2018-2020)

Graduate Student Advisory Board, *College of Engineering & Applied Science* (2018-2019)

External Service:

Reviewer, *Nature Communications* (2026)

Reviewer, *Papers & Abstracts*, American Society for Engineering Education (2024-present)

Society Membership:

Member, American Society for Engineering Education (2021 – present)

Member, Society for Biomaterials (2015 – present)

Member, Orthopaedic Research Society (2015 – present)

Member, American Institute of Chemical Engineers (2011-2017)

Selected Outreach & Development Activities

Online Teaching Academy Microcredential – Learning Design Group	<i>Boulder, Colorado</i>	2025
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Four-week training program focused on increasing the skills and knowledge of faculty who teach online or hybrid remote/online to improve student success

Center for Teaching and Learning Professional Development & STEM Pedagogy Workshops	<i>St. Louis, Missouri</i>	2020 - 2024
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Addressing Diversity and Inclusion in Academia, Teaching Students to Read and Critically Evaluate Scientific Literature, Engaging in Equity Pedagogy in STEM Classrooms, Introduction to Pedagogical Scholarship, Inclusive Research Mentoring, Incorporating Active Learning in STEM Lectures, Increasing Student Participation

Aspire – NSF NGSS Chemistry Item	<i>Boulder, Colorado</i>	2018 - 2020
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Item panelist: Served as a chemistry expert for the development of an assessment within the College of Education for 10th grade chemistry students in Colorado around the NSF Next Generation Science Standards

Student Engineers Educating Kids (SEEK)	<i>Austin, Texas</i>	2012 - 2015
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SEEK is a mentoring program for elementary and middle school students through The University of Texas at Austin partnered with Communitates in Schools (CIS), a nationwide dropout prevention program working within the public school system.

- *Mentor* (2012-2013): Administered weekly hands-on STEM demonstrations at Dobie Middle School in the classroom with a single student or small group
- *Program Officer* (2013-2014): Organized and led 12 mentors at Garcia Middle School
- *Vice President of Mentoring* (2014-2015): Oversaw 200 volunteers and mentors, organized and selected STEM projects for the year, and trained mentors in effective teaching skills appropriate to the grade level of the students

Selected Accomplishments & Honors

Nominee, John and Mercedes Peebles Innovation in Education Award, 2025

Outstanding Poster Award (Postdoctoral Fellow), Musculoskeletal Biology and Regeneration Meeting, 2022

Immunobiology of Rheumatic Diseases NIH T32 Postdoctoral Trainee, 2022-2023

Metabolic Skeletal Disorders NIH T32 Postdoctoral Trainee, 2020-2022

Center of Regenerative Medicine Distinguished Postdoctoral Trainee, 2020-2021

American Institute of Chemists Graduate Student Award, 2020

ACTIVE Faculty Development and Leadership Intensive, 2019

American Institute of Chemists Graduate Student Faculty Leadership Award, 2019

Recognition of Graduate Students Service to the Department for Improving the Department Community, 2017

Recognition of Graduate Students Service to the Department – Recruiting, 2017

Department of Education Graduate Assistantships in Areas of National Need (GAANN) Program:

Biomaterials, 2016 – 2019; Soft Materials, 2019 – 2020