

Marian H. Hettiaratchi, Ph.D.

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EDUCATION

Georgia Institute of Technology & Emory University 2011 – 2016
Ph.D., Biomedical Engineering

University of Calgary 2006 – 2011
B.Sc., Chemical Engineering with Biomedical Specialization (Internship Program, With Distinction)

WORK EXPERIENCE

Assistant Professor Starting Jan. 2020
Knight Campus for Accelerating Scientific Impact, University of Oregon
Affiliate Appointment – Department of Biomedical Engineering, Oregon Health & Science University

Post-Doctoral Fellow Jan. 2017 – Oct. 2019
Department of Chemical Engineering & Applied Chemistry, University of Toronto
Advisor: Molly Shoichet, Ph.D.
Collaborators: Brian Shoichet, Ph.D. (UCSF), Matthew O'Meara, Ph.D. (University of Michigan), Benjamin Hackel, Ph.D. (University of Minnesota), Michael Fehlings, M.D., Ph.D (Krembil Research Institute)

Doctoral Candidate Aug. 2011 – Dec. 2016
Department of Biomedical Engineering, Georgia Institute of Technology & Emory University
Advisors: Todd McDevitt, Ph.D., and Robert Guldberg, Ph.D.
Collaborators: Andrés García, Ph.D., Susan Thomas, Ph.D., Ronghu Wu, Ph.D., Johnna Temenoff, Ph.D.

Undergraduate Researcher (Part-time) May 2008 – Aug. 2009, Sept. 2010 – May 2011
Pharmaceutical Production Research Facility, University of Calgary

Internship Student Sept. 2009 – Aug. 2010
Syncrude Research Centre, Syncrude Canada Ltd.

PUBLICATIONS

Google Scholar Profile: <https://scholar.google.ca/citations?user=v2uIR-MAAAAJ&hl=en>

1. **Hettiaratchi, M.H.**, Krishnan, L., Rouse, T., Chou, C., McDevitt, T.C., Guldberg, R.E. (2019) *Heparin-Mediated Delivery of Bone Morphogenetic Protein-2 (BMP-2) Improves Spatial Localization of Bone Regeneration*. Science Advances In press.
2. **Hettiaratchi, M.H.**, Shoichet, M.S. (2019) *Modulated Protein Delivery to Engineer Tissue Repair*. Tissue Engineering: Part A 23(13-14): 925-930.
3. **Hettiaratchi, M.H.**, O'Meara, M.J., Teal, C.J., Payne, S.L., Pickering, A.J., Shoichet, M.S. (2019) *Local Delivery of Stabilized Chondroitinase ABC Degrades Chondroitin Sulfate Proteoglycans in Stroke-Injured Rat Brains*. Journal of Controlled Release 297: 14-25.
4. Nori, S., Khazaei, M., Ahuja, C.S., Ahlfors, J.E., Yokota, K., Liu, Y., Wang, J., Shibata, S., Chio, J., **Hettiaratchi, M.H.**, Fuehrmann, T., Shoichet, M.S., Fehlings, M.G. (2018) *Human Oligodendrogenic Neural Progenitor Cells Delivered with Chondroitinase ABC Facilitate Functional Repair of Chronic Spinal Cord Injury*. Stem Cell Reports 11(6): 1433-1448.

5. **Hettiaratchi, M.H.***, Schudel, A.*, Rouse, T., Garcia, A.J., Thomas, S.N., Guldborg, R.E., McDevitt, T.C. (2018) *A Rapid Method for Determining Protein Diffusion Through Hydrogels for Regenerative Medicine Applications*. APL Bioengineering 2: 026110. *Equal contribution.
6. Rinker, T.E., Philbrick, B.B., **Hettiaratchi, M.H.**, Smalley, D., McDevitt, T.C., Temenoff, J.S. (2018) *Microparticle-Mediated Sequestration of Cell-Secreted Proteins to Modulate Chondrocytic Differentiation*. Acta Biomaterialia 68: 125-136.
7. **Hettiaratchi, M.H.**, Fuehrmann, T., Shoichet, M.S. (2017) *Recent Advances in Regenerative Medicine Approaches for Spinal Cord Injury*. Current Opinion in Biomedical Engineering 4: 40-49.
8. **Hettiaratchi, M.H.**, Rouse, T., Chou, C., Krishnan, L., Stevens, H.Y., Li, M.T.A., McDevitt, T.C., Guldborg, R.E. (2017) *Enhanced In Vivo Retention of Low Dose BMP-2 Via Heparin Microparticle Delivery Does Not Accelerate Bone Healing in a Critically Sized Femoral Defect*. Acta Biomaterialia 59: 23-31.
9. **Hettiaratchi, M.H.**, Chou, C., Servies, N., Smeekens, J.M., Cheng, A., Esancy, C., Wu, R., McDevitt, T.C., Guldborg, R.E., Krishnan, L. (2017) *Competitive Protein Binding Influences Heparin-Based Modulation of Spatial Growth Factor Delivery for Bone Regeneration*. Tissue Engineering: Part A 23(13-14): 683-695.
10. Zimmermann, J.A., **Hettiaratchi, M.H.**, McDevitt, T.C. (2017) *Enhanced Immunosuppression of T Cells by Sustained Presentation of Bioactive Interferon- γ Within Three-Dimensional Mesenchymal Stem Cell Constructs*. Stem Cells Translational Medicine 6(1): 223-237.
 - Altmetric Score (517) within the top 1% of 8 million articles ranked for online attention and impact.
 - Press release: "How to Engineer a Stronger Immune System"
<https://gladstone.org/about-us/news/how-engineer-stronger-immune-system>
11. **Hettiaratchi, M.H.**, Guldborg, R.E., McDevitt, T.C. (2016) *Biomaterial Strategies for Controlling Stem Cell Fate Via Morphogen Sequestration*. Journal of Materials Chemistry B 4(20): 3464-81.
12. **Hettiaratchi, M.H.**, Miller, T., Temenoff, J.S., Guldborg, R.E., McDevitt, T.C. (2014) *Heparin Microparticle Effects on Presentation and Bioactivity of Bone Morphogenetic Protein-2*. Biomaterials 35(25): 7228-38.
 - Altmetric Score (113) within the top 5% of 8 million articles ranked for online attention and impact.
 - Press release: "Engineering a Better Way to Rebuild Bone Inside the Body"
<http://www.news.gatech.edu/2014/05/29/engineering-better-way-rebuild-bone-inside-body>

ADDITIONAL MANUSCRIPTS SUBMITTED OR IN PREPARATION

13. **Hettiaratchi, M.H.***, O'Meara, M.J.*, O'Meara, T.R., Pickering, A.J., Letko-Khait, N., Shoichet, M.S. *Computational Redesign of Chondroitinase ABC Improves Efficacy and Stability*. Submitted.
14. Delplace, V.*, Pickering, A.J.*, **Hettiaratchi, M.H.**, Zhao, S., Shoichet, M.S. *Inverse Electron Demand Diels-Alder Methylcellulose Hydrogels Enable Co-Delivery of Chondroitinase ABC and Neural Stem Cells*. In preparation.

RESEARCH FUNDING

Natural Sciences and Engineering Research Council (NSERC) Post-Doctoral Fellowship Government of Canada (\$45,000 per year)	2018 – 2020
Philanthropic Educational Organization (PEO) Scholar Award PEO Sisterhood (\$15,000)	2014 – 2015
NSERC Post-Graduate Scholarship – Doctoral Level (PGS-D3) Government of Canada (\$21,000 per year)	2012 – 2015

AWARDS AND HONOURS

Travel Award Medicine by Design – Canada First Research Excellence Fund	2019
Second Place in 3 Minute Thesis Competition Georgia Institute of Technology (\$1500) Video available at: https://www.youtube.com/watch?v=dr3VA3CfCTo&t=54s	2015
Interdisciplinary “Above and Beyond” Leadership Award Georgia Institute of Technology	2014
Travel Award Tissue Engineering and Regenerative Medicine International Society (TERMIS)	2014
Outstanding Poster Award Georgia Tech Biomaterials Day	2014
APEGA Gold Medical for Chemical Engineering Association of Professional Engineers and Geoscientists of Alberta (APEGA)	2011
Edward Wichert Undergraduate Scholarship University of Calgary (\$5000)	2009 – 2010
Schulich Academic Excellence Scholarship University of Calgary (\$30,000)	2006 – 2009
Louise McKinney Scholarship Government of Alberta (\$2500 per year)	2007, 2008, 2009
Governor General’s Bronze Academic Award Government of Canada	2006

PRESENTATIONS

INVITED PRESENTATIONS

1. **Biomedical Engineering Seminar Series, University of Calgary** Calgary, AB, 2019
2. **Chemistry & Chemical Biology Seminar Series, McMaster University** Hamilton, ON, 2019
3. **Biomedical Engineering Seminar Series, University of British Columbia** Vancouver, BC, 2019
4. **Biomedical Engineering Seminar Series, University of Michigan** Ann Arbor, MI, 2019
5. **Chemical Engineering Seminar Series, University of Maryland Baltimore County** Baltimore, MD, 2019
6. **Knight Campus Seminar Series, University of Oregon** Eugene, OR, 2018
7. **Seminar for the Foundation for Student Science and Technology (FSST)** Toronto, ON, 2018
8. **Distinguished Young Scholars Seminar Series, University of Washington** Seattle, WA, 2017

9. **Philanthropic Educational Organization (PEO) Georgia State Convention** Atlanta, GA, 2016

ORAL PRESENTATIONS

10. **Oregon Bioengineering Symposium** Corvallis, OR, 2019
Affinity-based Delivery of Stabilized Chondroitinase ABC for Central Nervous System Repair
11. **Biomedical Engineering Society** Atlanta, GA, 2018
Affinity-based Delivery of Stabilized Chondroitinase ABC for Central Nervous System Repair
12. **World Biomaterials Congress** Montreal, QC, 2016
Heparin Microparticles Loaded with Bone Morphogenetic Protein-2
Induce Bone Regeneration in a Rat Femoral Defect Model
13. **Orthopedic Research Society** Orlando, FL, 2016
Controlled Heparin Microparticle Deposition on Polycaprolactone
Nanofiber Meshes for Spatial Control of Bone Regeneration
14. **Orthopedic Research Society** Las Vegas, NV, 2015
Development of Heparin Microparticles for Enhanced Delivery of BMP-2
15. **Tissue Engineering Regenerative Medicine International Society** Washington, DC, 2014
Heparin Microparticle Delivery of BMP-2 for Bone Regeneration
16. **Georgia Tech Biomaterials Day** Atlanta, GA, 2014
Heparin Microparticle Delivery of BMP-2 for Bone Regeneration
17. **Tissue Engineering Regenerative Medicine International Society** Atlanta, GA, 2013
Controlled Presentation of Bioactive BMP-2 via Heparin Methacrylamide Microparticles

POSTER PRESENTATIONS

18. **Gordon Research Conference on Biomaterials & Tissue Engineering** Barcelona, Spain, 2019
Affinity-based Delivery of Thermo-stabilized Chondroitinase ABC for Stroke repair
19. **Canadian Biomaterials Society** Victoria, BC, 2018
Affinity-based Delivery of Chondroitinase ABC for Tissue Repair after Spinal Cord Injuries
20. **Tissue Engineering Regenerative Medicine International Society** Boston, MA, 2015
Functionalized Electrospun Membrane for Spatial Control of Bone Regeneration
21. **Tissue Engineering Regenerative Medicine International Society** Boston, MA, 2015
BMP-2-Loaded Heparin Microparticles Facilitate Functional Bone Formation in Large Defects
22. **Hilton Head Workshop on Regenerative Medicine** Hilton Head, SC, 2014
Heparin Microparticles Enhance Bioactivity of Osteogenic Growth Factors
23. **Hilton Head Workshop on Regenerative Medicine** Hilton Head, SC, 2013
Development of Heparin Microparticles to Sequester and Release Bioactive Growth Factors

TEACHING AND MENTORING EXPERIENCE

Research Mentor

Jan. 2013 – Present

McDevitt, Guldberg, and Shoichet Laboratories

- Supervised 5 students conducting independent research and assisted in obtaining their funding.
 - Andrew Pickering (2018-2019): NSERC Undergraduate Student Research Award
 - Nikhil Gupte (2014-2016): President's Undergraduate Research Award

- Catherine Chou (2013-2015): Petit Undergraduate Research Scholar Program
- Nick Servies (2014-2015): President's Undergraduate Research Award
- Camden Esancy (2013-2014): Petit Undergraduate Research Scholar Program

Cybermentor Sept. 2010 – Present
 Cybermentor Program

- Encourage girls in Grades 6-12 to pursue careers in science and engineering by broadening their knowledge of career opportunities and serving as a positive female role model in STEM.

Instructor Sept. 2017 – Dec. 2017
 University of Toronto

- Taught Oral Presentation Skills for Non-Native English Speakers (2 lecture hours/week).
- Provided feedback for students writing research proposals for NSERC scholarships (3 contact hours/week).

Calculus Tutor Aug. 2014 – Dec. 2015
 Georgia Tech Athletic Association (GTAA)

- Conducted weekly one-on-one and group tutoring sessions for students (3 contact hours/week).

Teaching Assistant Aug. 2012 – May 2013
 Georgia Institute of Technology

- Led tutorials for ~50 students for Conservation Principles in Biomedical Engineering (2 contact hours/week).

SERVICE AND LEADERSHIP EXPERIENCE

Ad Hoc Peer Reviewer 2017 – Present
 Biomaterials, Tissue Engineering: Parts A, B, C

Scholar Awards Committee Oct. 2018 – Oct. 2019
 Chapter R Ontario, Philanthropic Educational Organization (PEO)

Poster Judge May 2017, May 2018, May 2019
 Institute of Biomaterials and Biomedical Engineering (IBBME) Annual Research Conference (iARC)

Volunteer Aug. 2017
 IBBME Biomedical Engineering and Me (iBEAM) Program

- Led students in Grades 7-9 in hands-on biomaterials experiments.

Participant – Graduate Leadership Program Sept. 2014 – May. 2015
 Georgia Institute of Technology

Chair Jul. 2013 – Jul. 2015
 Bioengineering & Bioscience Unified Graduate Students (BBUGS)

- Managed an annual budget of ~\$5000 and 7 BBUGS committees that organized over 50 social events, outreach activities, and educational seminars for 200 students each year.

Participant – Stem Cell Biomanufacturing IGERT Program Aug. 2011 – Aug. 2013
 Georgia Institute of Technology

Project Leader/Mentor Aug. 2011 – Dec. 2015
 BBUGS Education and Outreach Committee

- Delivered lectures and developed demos and science projects on stem cells and biotechnology.
- Led a bimonthly science club to provide hands-on science mentorship to 30-50 high school students from BEST Academy and Coretta Scott King High School in Atlanta.

Engineering Representative

Sept. 2008 – Apr. 2009, Sept. 2010 – Apr. 2011

Women in Science and Engineering (WISE) Club

- Organized events to promote diversity in Schulich School of Engineering and expose women to STEM.

PROFESSIONAL MEMBERSHIPS

Biomedical Engineering Society	2018 – Present
Canadian Biomaterials Society	2018 – Present
Tissue Engineering Regenerative Medicine International Society	2013 – Present
Orthopedic Research Society	2015 – 2017
Engineer-in-Training, Association of Professional Engineers & Geoscientists of Alberta	2011 – 2016