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 Jan. 2020 – Present
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=v2ulR-MAAAAJ&hl=en

1. **Hettiaratchi, M.H.***, O'Meara, M.J.*, O'Meara, T. R., Pickering, A.J., Letko-Khait, N., Shoichet, M.S. (2020) *Re-engineering Biocatalysts: Computational Redesign of Chondroitinase ABC Improves Efficacy and Stability.* Science Advances *Accepted.* *Equal Contribution.

2. Subbiah, R., Cheng, A., Ruehle, M.A., **Hettiaratchi, M.H.**, Bertassoni, L.E., Guldberg, R.E. (2020) *Effects of Controlled Dual Growth Factor Delivery on Bone Regeneration Following Composite Bone-Muscle Injury.* bioRxiv. https://doi.org/10.1101/2020.03.25.008813.

3. Delplace, V.*, Pickering, A.J.*, **Hettiaratchi, M.H.**, Zhao, S., Kivijärvi, T., Shoichet, M.S. (2020) *Inverse Electron Demand Diels-Alder Methylcellulose Hydrogels Enable Co-Delivery of Chondroitinase ABC and Neural Progenitor Cells.* Biomacromolecules 21(6): 2421-2431. *Equal Contribution.

4. **Hettiaratchi, M.H.**, Krishnan, L., Rouse, T., Chou, C., McDevitt, T.C., Guldberg, R.E. (2020) *Heparin-Mediated Delivery of Bone Morphogenetic Protein-2 (BMP-2) Improves Spatial Localization of Bone Regeneration.* Science Advances 6(1): eaay1240.
    - Altmetric Score (73) within the top 5% of 8 million articles ranked for online attention and impact.

- Press release: "Oregon Scientist Shows Possible Path to Improved Bone Repair Procedures" https://www.eurekalert.org/pub_releases/2020-01/uoo-oss123019.php

5. **Hettiaratchi, M.H.**, Shoichet, M.S. (2019) *Modulated Protein Delivery to Engineer Tissue Repair*. Tissue Engineering: Part A 23(13-14): 925-930.

6. **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.

7. 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.

8. **Hettiaratchi, M.H.***, Schudel, A.*, Rouse, T., Garcia, A.J., Thomas, S.N., Guldberg, 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.

9. 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.

10. **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.

11. **Hettiaratchi, M.H.**, Rouse, T., Chou, C., Krishnan, L., Stevens, H.Y., Li, M.T.A., McDevitt, T.C., Guldberg, 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.

12. **Hettiaratchi, M.H.**, Chou, C., Servies, N., Smeekens, J.M., Cheng, A., Esancy, C., Wu, R., McDevitt, T.C., Guldberg, 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.

13. 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

14. **Hettiaratchi, M.H.**, Guldberg, 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.

15. **Hettiaratchi, M.H.**, Miller, T., Temenoff, J.S., Guldberg, 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

RESEARCH FUNDING

Collins Medical Trust Grant 2020 – 2021
Collins Medical Trust ($30,000)

UO-OHSU Collaborative Seed Grant 2020 – 2021
University of Oregon and Oregon Health & Science University, Co-PI: Luiz Bertassoni ($50,000)

Natural Sciences and Engineering Research Council (NSERC) Post-Doctoral Fellowship 2018 – 2020
Government of Canada ($45,000 per year)

Philanthropic Educational Organization (PEO) Scholar Award 2014 – 2015
PEO Sisterhood ($15,000)

NSERC Post-Graduate Scholarship – Doctoral Level (PGS-D3) 2012 – 2015
Government of Canada ($21,000 per year)

NSERC Post-Graduate Scholarship – Master's Level (PGS-M) 2011 – 2012
Government of Canada ($17,500)

AWARDS AND HONORS

Travel Award 2019
Medicine by Design – Canada First Research Excellence Fund

Second Place in 3 Minute Thesis Competition 2015
Georgia Institute of Technology ($1500)
Video available at: https://www.youtube.com/watch?v=dr3VA3CfCTo&t=54s

Interdisciplinary "Above and Beyond" Leadership Award 2014
Georgia Institute of Technology

Travel Award 2014
Tissue Engineering and Regenerative Medicine International Society (TERMIS)

Outstanding Poster Award 2014
Georgia Tech Biomaterials Day

APEGA Gold Medical for Chemical Engineering 2011
Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Edward Wichert Undergraduate Scholarship 2009 – 2010
University of Calgary ($5000)

Schulich Academic Excellence Scholarship 2006 – 2009
University of Calgary ($30,000)

Louise McKinney Scholarship 2007, 2008, 2009
Government of Alberta ($2500 per year)

Governor General's Bronze Academic Award 2006
Government of Canada

PRESENTATIONS

INVITED PRESENTATIONS

1. **Regenerative Bioscience Center, University of Georgia** Virtual Seminar, 2020

Cell-Instructive Biomaterials for Bone Tissue Engineering

2. **Biomedical Engineering Seminar Series, University of Calgary** Calgary, AB, 2019
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
3. **Chemistry & Chemical Biology Seminar Series, McMaster University** Hamilton, ON, 2019
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
4. **Biomedical Engineering Seminar Series, University of British Columbia** Vancouver, BC, 2019
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
5. **Biomedical Engineering Seminar Series, University of Michigan** Ann Arbor, MI, 2019
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
6. **Chemical Engineering Seminar Series, University of Maryland Baltimore County** Baltimore, MD, 2019
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
7. **Knight Campus Seminar Series, University of Oregon** Eugene, OR, 2018
   Rational Design of Affinity-Controlled Protein Delivery for Tissue Repair
8. **Seminar for the Foundation for Student Science and Technology (FSST)** Toronto, ON, 2018
   How to Be Successful in STEM
9. **Distinguished Young Scholars Seminar Series, University of Washington** Seattle, WA, 2017
   Bioinspired Drug Delivery Strategies for Treating Bone Defects and Spinal Cord Injuries
10. **Philanthropic Educational Organization (PEO) Georgia State Convention** Atlanta, GA, 2016
    PEO Scholar Award Presentation

ORAL PRESENTATIONS

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

POSTER PRESENTATIONS

19. **Gordon Research Conference on Biomaterials & Tissue Engineering** Barcelona, Spain, 2019

Affinity-based Delivery of Thermo-stabilized Chondroitinase ABC for Stroke Repair

20. **Canadian Biomaterials Society** Victoria, BC, 2018
Affinity-based Delivery of Chondroitinase ABC for Tissue Repair after Spinal Cord Injuries

21. **Tissue Engineering Regenerative Medicine International Society** Boston, MA, 2015
Functionalized Electrospun Membrane for Spatial Control of Bone Regeneration

22. **Tissue Engineering Regenerative Medicine International Society** Boston, MA, 2015
BMP-2-Loaded Heparin Microparticles Facilitate Functional Bone Formation in Large Defects

23. **Hilton Head Workshop on Regenerative Medicine** Hilton Head, SC, 2014
Heparin Microparticles Enhance Bioactivity of Osteogenic Growth Factors

24. **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

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.

Research Mentor Jan. 2013 – Jun. 2019
McDevitt, Guldberg, and Shoichet Laboratories
- Supervised 5 students conducting independent research and assisted in obtaining their funding.

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, Science Advances,
Advanced Functional Materials, Annals of Biomedical Engineering

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