Date Prepared: February 22, 2022

Name: Jonathan Hoggatt

Employer: Moderna Therapeutics

Position: Director of Hematology

Office Address: 200 Tech Square, 6th Floor, Cambridge, MA 02139

Education:

08/2001-05/2005	Bachelor of Science	Pharmacy	Purdue University
08/2005-05/2006	Master of Science	Biology	IUPUI
08/2006-05/2010	Doctor of Philosophy	Hematology (LM Pelus - advisor)	Indiana University School of Medicine

Postdoctoral Training:

05/2010-05/2011	Post-Doctoral Fellow	Hematology (LM Pelus)	Indiana University School of Medicine
06/2011-06/2015	Post-Doctoral Fellow	Stem Cell Biology (DT Scadden)	Harvard University / MGH

Faculty Academic Appointments:

09/2014-05/2016	Instructor in Medicine	Harvard Medical School
05/2016-	Assistant Professor of Medicine	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

06/2015-	Assistant in Immunology	Massachusetts General Hospital

Other Professional Positions

2010-2014	Consultant	Fate Therapeutics
2013-2014	Consultant	GlaxoSmithKline
08/2015-	Affiliate Faculty Member	Harvard University / SCRB
08/2015-	Principal Faculty Member	Harvard Stem Cell Institute
11/2016-	Scientific Founder	Magenta Therapeutics

Committee Service:

Local

2012 - 2015	Summer Internship Admissions Committee	Harvard Stem Cell Institute
2015 - present	Institutional Animal Care and Use Committee	MGH
2017, '18, '19, '20	HSCI Annual Retreat Faculty Co-Chair	Harvard Stem Cell Institute

National

2013 - present American Society of Hematology Government Affairs Committee

2013 - present American Society of Hematology Communications Committee

2017 The Hematologist Chief Editor Search Committee

2017 - present American Society of Hematology Media Experts Subcommittee
- Gene therapy spokesperson for the society

Professional Societies:

2011 - 2013 American Association for the Advancement of Science Member

2011 - present Society for Hematology and Stem Cells (ISEH) Active Member

2011 - present American Society of Hematology Active Member

2011	Inaugural Member Advocacy Leadership Institute
2012	Ad-hoc member of Government Affairs Committee
2012	"Fly-in Day" Capitol Hill Visit for ASH advocacy
2013	Advocacy Leadership Institute
2013-present	Member of the Government Affairs Committee
2013-present	Member of the Communications Committee
2015, 2017	Annual meeting Abstract Reviewer
2018	Annual meeting coordinating session reviewer

2013 - present International Society for Stem Cell Research (ISSCR) Member

2021- American Society of Gene and Cell Therapy Member

Grant Review Activities:

2016 New York State Stem Cell Science

2018 Ontario Institute of Regenerative Medicine

Editorial Activities:

Ad hoc Reviewer

Biology of Blood and Marrow Transplantation
Blood
Blood Advances
Cell
Cell Stem Cell
Cells
Cytotherapy
Experimental Hematology
F1000
Journal of Clinical Investigation
Journal of Leukocyte Biology
Nature
Pharmacology and Toxicology
Stem Cells
Stem Cell Reports
Stem Cells Translational Medicine
Transplant Immunology

Other editorial roles:

2014	Editorial review for Elsevier Book "Stem Cell Niche: Biology and Engineering"
2015 - 2018	Contributing Editor for *The Hematologist*
2017 - present	Editorial Board, Stem Cell Reviews and Reports
2019	Associate Editor, StemJournal

Honors and Prizes:

2001	Eli Lilly Pharmacy Scholarship
2001-2002	Health Sciences Freshman Scholar – Given to only 15 incoming freshman to support undergraduate research
2002-2004	Angelo J. Carnaghi Pharmacy Scholarship
2002	EMV Outstanding Leader Award – One of only 4 Sophomore leaders chosen as the most outstanding at Purdue University
2003	Betty M. Nelson Skilled Leader Award – Given to the most outstanding Junior leader at Purdue University
2004	Academic All Big Ten in Cross Country
2005	Merck Award Winner
2010	Sigma Xi Graduate Student Research First Place Award Winner
2010	Indiana University Cancer Research Day Award Winner
2011	Winter Eicosanoid Conference Most Outstanding Poster Award Winner

2011	Esther L. Kinsley Ph.D. Dissertation Award Award given to the single most outstanding dissertation at Indiana University, across all disciplines, and the highest honor bestowed for graduate research.
2013	Thomas T. Hoopes Prize Mentor Award (Frankie Wong – student mentee)
2016	Thomas T. Hoopes Prize Mentor Award (Hannah Rasmussen – student mentee)
2017	Research Rumble Champion Award for best speaker as part of the Cambridge Science Festival and sponsored by MGH and Brigham and Women's.
2018	Massachusetts General Hospital Nominee for PEW Scholar Award
2019	American Society of Hematology Scholar Award

Report of Funded and Unfunded Projects

2020-2021	"Prevention of hair loss and graying after DNA damage" Harvard Stem Cell Institute ($50,000)
2019 - 2021	"Hematopoietic Stem Cell Transplant - Defining the Rules of Competition and Playing Musical Chairs" American Society of Hematology Scholar Award ($150,000)
2019 - 2024	"Enhancing Bone Marrow Transplantation with Highly Engraftable Hematopoietic Stem Cells" NHLBI – R01HL144752 ($2,241,103) The goal of this project is to determine the molecular and functional features of a newly identified highly engraftable hematopoietic stem cell (heHSC), to determine what makes that HSC population better in bone marrow transplant.
2019	"Evaluation of GRO-B in Animal Models" Sponsored Research Agreement – Magenta Therapeutics ($85,648)
2013 - 2018	"Macrophage Regulation of the Hematopoietic Stem Cell Niche" NIH Career Development Grant K99/R00 HL119559 ($936,216) PI – Impact Score of 10 These studies will define the regulatory role of a novel cellular target, macrophages, and explore several clinically translatable strategies to improve hematopoietic stem cell harvest and transplantation using currently FDA approved compounds.

2013 - 2016 "Non-Steroidal anti-inflammatory drug (meloxicam) to mobilize hematopoietic stem cells" – Principle Investigator Bimal Dey, MD
LLS Translational Research Program 2013D00119
Scientific Researcher – Co-writer of award and creator of concept
Goal of the project is to explore in a Phase II randomized, placebo-controlled trial the ability of Meloxicam to enhance hematopoietic mobilization. Trial is currently being conducted at Massachusetts General Hospital.

Report of Local Teaching and Training

Teaching of Students in Courses

2008 IUPUI Microbiology and Immunology (MICR J210) Laboratory Portion
Lecturer
~30 Students
12, 2-hour laboratories and 3 class-wide study sections

2012 Harvard University, Freshman Seminar 26v: Blood from Gory to Glory
Invited Lecturer: "Hematologic Techniques in the Mouse Model"
~12 students
30 minute lecture, 1 hour laboratory

2013 Harvard University, Molecular Immunology (SCRB 178)
"In vivo imaging of T_{reg} Cells"
~16 students, 1 hour lecture

2013 Harvard University, Freshman Seminar 26v: Blood from Gory to Glory
10 students
Developed and taught three, 1 hour laboratory sessions

2014 Scadden Lab Summer Internship Director
Coordinated and taught a 10 week seminar series for 6 interns, ending with an abstract and oral presentation session. Taught topics ranging from RCR, abstract writing, presentation skills, career choices, and met one-on-one with each intern throughout the summer.

2014 Harvard University, Freshman Seminar 26v: Blood from Gory to Glory
10 students
Developed and taught three, 1 hour laboratory sessions and two, one hour lectures.

2015 Massachusetts General Hospital Summer Internship
Invited Lecturer: "Ethical Questions in Stem Cell Research"
10 students, 1 hour lecture

2015 Harvard University, Freshman Seminar 26v: Blood from Gory to Glory
10 students
Developed and taught three, 1 hour laboratory sessions and a one hour lecture.

2016 Harvard University, Immunology: New Tracks and Greatest Hits (SCRB 178)
16 students

8 hours a week, 12 weeks
Created a new course at Harvard University in 2016 focusing on current immunology literature as well as "classic" immunology papers. Developed the entire curriculum and teach twice a week for 1.5 hours each session, as well as meet individually with students on a weekly basis.

2016 Harvard University, Freshman Seminar 26v: Blood from Gory to Glory
10 students
Developed and taught three, 1 hour laboratory sessions and a one hour lecture.

2017 Harvard University, Immunology: New Tracks and Greatest Hits (SCRB 178)
16 students
8 hours a week, 12 weeks
Second year of my course at Harvard University focusing on current immunology literature as well as "classic" immunology papers. Developed a brand new curriculum for this year and teach twice a week for 1.5 hours each session, as well as meet individually with students on a weekly basis.

2018 Harvard University, Immunology: New Tracks and Greatest Hits (SCRB 178)
16 students
8 hours a week, 12 weeks
Third year of my course at Harvard University focusing on current immunology literature as well as "classic" immunology papers. Developed a brand new curriculum for this year and teach twice a week for 1.5 hours each session, as well as meet individually with students on a weekly basis.

2019 Harvard University, Immunology: New Tracks and Greatest Hits (SCRB 178)
16 students
8 hours a week, 12 weeks
Fourth year of my course at Harvard University focusing on current immunology literature as well as "classic" immunology papers. Developed a brand new curriculum for this year and teach twice a week for 1.5 hours each session, as well as meet individually with students on a weekly basis.

2020 Harvard University, Immunology: New Tracks and Greatest Hits (SCRB 178)
16 students
8 hours a week, 12 weeks
Fifth year of my course at Harvard University focusing on current immunology literature as well as "classic" immunology papers. Developed a brand new curriculum for this year and teach twice a week for 1.5 hours each session, as well as meet individually with students on a weekly basis. Adapted course for COVID.

2022 Harvard Medical School, AISC 602 – Regenerative Biomedicine
23 medical students
Guest lecture on mRNA and regenerative medicine drug development.

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2014 Navigating the K Award Process at Harvard: Best Practices and Strategies for Success
~70 attendees 12/15/14
Created and helped coordinate a K99 writing seminar for post-doctoral fellows including content advice, responding to review, an insider's guide to the review process, and working with OSP.

2015 Massachusetts General Hospital Postdoc Association Annual Meeting
~80 attendees 01/21/15
Invited speaker and presented on best practices for K99 grant writing. Concluded the talk with an open panel discussion and Q&A.

2015 Boston Children's Hospital Postdoctoral Association
~70 attendees 09/09/15
Invited speaker and presented on best practices for faculty job searches including application preparation, job talk, chalk talk, preparing the research plan, etc.

Laboratory and Other Research Supervisory and Training Responsibilities

2012 - 2015	Recruitment, hiring, training and supervision of laboratory technician/lab manager.	Daily mentoring for 32 months

Formally Supervised Trainees

2012 - 2013 Harvard University Introduction to Research (SCRB 91r)
Mentored a Harvard undergraduate during junior year (Frankie Wong), summer HSCI internship and through senior thesis project. The mentee was awarded the Thomas T. Hoopes Prize for his dissertation and was a co-author on a publication in *Nature*. Mentored him through admissions process for medical school and he is now a resident at Brigham and Women's Hospital.

2012 - 2015 Trained Tiffany Tate, a lab technician and subsequent lab manager for the Scadden lab whom I recruited and hired. Co-wrote several publications with her, and mentored and counseled her through the graduate school application process. She is now pursuing a PhD in stem cell biology at Columbia University.

2013 - 2016 Harvard University Introduction to Research (SCRB 91r), PRIZE and HSCI Internship
Have mentored a Harvard University student (Hannah Rasmussen) since freshman year on undergraduate research. Mentored one-on-one for the summer as part of the PRIZE award internship, and counseled and mentored student on application for HSCI internship, which she successfully acquired and completed in my lab this summer. She was the recipient of the American Society of Hematology Outstanding Abstract Achievement Award as the top undergraduate submission, and the first student from Harvard to achieve that prestigious award. Mentored through admissions process for medical school, where she was admitted to Stanford University School of Medicine in the Fall of 2016.

2015- present Formal mentorship of post-doctoral fellow, Bin Kuan Chou, PhD. Activities include project and research design mentorship, grant writing, manuscript preparation, and career development.

2016 Formal mentorship of Elizabeth Han, a first-year medical student from Tufts Medical School during a summer internship.

2019- 2021 Formal mentorship of SCRB Harvard University undergraduate, Sana Shareef. Including development of an independent research project and collaboration.

2020-present Formal mentorship of Aurelia Bleinroth a masters student from Germany.

Local Invited Presentations

No presentations below were sponsored by outside entities

2013 Dana Farber / Harvard Cancer Center – Bone Marrow Transplant Grand Rounds
"Stem and progenitor mobilization with non-steroidal anti-inflammatory drugs"

2013 Boston Children's Hospital – Stem Cell Transplant Program
"Niche Regulation of Hematopoietic Stem and Progenitor Cell Trafficking"

2014 Dana Farber Cancer Institute – Hematologic Malignancies
"Niche Regulation of Hematopoietic Stem and Progenitor Cell Trafficking"

2014 Massachusetts General Hospital – Transplantation Biology Resource Center
"Macrophage Regulation of The Stem Cell Niche and Tissue Regeneration"

2015 Massachusetts General Hospital – Center for Transplantation Sciences
"In Pursuit of an Ultra-Potent Hematopoietic Stem Cell"

2016 Massachusetts General Hospital – Cancer Center Retreat
"Rapid Hematopoietic Stem Cell Mobilization"

2017 Brigham and Women's Hospital – Center for Comparative Medicine
"Effective PowerPoint Presentations"

2017 Cambridge Public Library – Research Rumble (Sponsored by MGH and Brigham)
"Drive-thru Stem Cells"

2018 Harvard Medical School – Transfusion Medicine Grand Rounds
"Drive Thru Hematopoietic Stem Cells"

2018 Dana Farber Cancer Institute - Division of Hematology/Oncology
"Drive Thru Stem Cells"

2018 Brigham and Women's Hospital – Clinical Pathology Conference
"Bone Marrow Transplantation – The Forgotten Group"

2019 Harvard Stem Cell Institute
"How to Craft and Deliver an Effective Science Presentation"

2019 Dana Farber Cancer Institute – Cancer Immunology and Virology
"Bone Marrow Transplant – The Forgotten Group"

2019 Harvard Undergraduate Interdisciplinary Immunology Club
"Stem cells and immunology"

2020 Blood and Bone Seminar
"Bone marrow transplant"

2020 MGH Cancer Center Hem/Onc Science Mondays
"Bone Marrow Transplant – The Forgotten Group"

Report of Regional, National and International Invited Teaching and Presentations

National

2012 Winter Eicosanoid Conference – Baltimore, MD
"Non-steroidal anti-inflammatory drugs attenuate the hematopoietic niche and enhance stem cell mobilization"

2012 Nature Medicine – Podcast
"Blood cell boost"

2013 American Society of Hematology Advocacy Leadership Institute – Washington, DC.
"Effective Hematology Advocacy"

2015 *The Scientist* Magazine – Webinar
"Therapeutically Targeting the Hematopoietic Stem Cell Niche"
(webinar sponsored by Baker Ruskinn, Bio-techne, Gilson)

2015 American Society of Hematology Annual Meeting – Orlando, FL
Hematopoiesis and Stem Cells: Hematopoietic Stem Cell Niche
Session Chair

2017 St. Jude Children's Hospital – Department of Hematology
"Improving hematopoietic stem cell collection"

2017 The Hematologist - Podcast
"Farming hematopoietic stem cells"
Discussion with Harvard Medical School Dean George Daley

2017 American Society of Hematology Annual Meeting – Atlanta, GA
Experimental Transplantation: Basic Biology, Pre-Clinical Models: T cell regeneration and donor graft effects on HCT
Session Chair

2018 American Society of Hematology Annual Meeting – San Diego, CA
Experimental Transplantation: Basic Biology, Pre-Clinical Models: Hematopoietic Stem Cells and Alternate GVHD Tissues
Session Chair

2019 Fred Hutchinson Cancer Center – Clinical Research Division
"Drive Thru Stem Cells"

2019 Indiana University School of Medicine – Melvin and Bren Simon Cancer Center
"Drive Thru Stem Cells"

2021 International Society for Stem Cell Research – Career Panel Discussion

2021 International Society of Experimental Hematology – New Investigators Career Session

2022 Cincinnati Children's Hospital – Academic to Industry Career Transitions

Report of Clinical Activities and Innovations

Clinical Innovations

PGE_2 Enhanced HSC	Work from the Zon Laboratory from Boston Children's reignited interest in regulation of hematopoiesis by prostaglandin E_2 (PGE_2). My work identified key mechanisms mediating enhancement of stem cells, and in collaboration with Fate Therapeutics, developed formulation changes and release assays to advance the therapy for cord blood transplantation. Published a Phase 1b study and further clinical trials within the HMS system, and outside: NCT01527838, NCT02354443, NCT02354417, NCT01627314.
CD26 Inhibited Niche	In collaboration with Hal Broxmeyer of Indiana University we discovered that inhibition of CD26 results in enhanced potency of many hematopoietic growth factors, and defined for the first time the effects of enzymatic n-terminal cleavage on complex receptor formation and signaling. Clinical trials exploring the role of treating a patient with CD26 inhibitors to enhance stem cell engraftment were performed at Indiana: NCT00862719, NCT01720264.
NSAID Mobilization	Developed a novel mobilization regimen to enhance hematopoietic stem and progenitor yield using non-steroidal anti-inflammatory drugs in combination with Neupogen. Successfully co-wrote a Leukemia and Lymphoma Society grant with Bimal Dey of Massachusetts General Hospital to fund a Phase 2, randomized, placebo-controlled study at MGH NCT02003625, and work resulted in an independent clinical trial ongoing at Indiana University NCT02078102. Recently, this clinical innovation was applied by an independent group in Switzerland and shown to be efficacious (Bone Marrow Transplant. 2018 Feb;53(2):175-179.)
GRO-β Mobilization	The standard of care for clinical mobilization is a multiday regimen of G-CSF, followed by one or more sessions of apheresis. A single day process with high quality yields would truly transform this process. I developed a rapid mobilization regimen using a combination of GRO-β + AMD3100 which results in high levels of stem cell mobilization within an hour of injection. This innovation has resulted in licensed intellectual property, the formation of Magenta Therapeutics, and several Phase 1 and 2 clinical trials NCT03932864, NCT04762875, NCT04552743.

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Report of Technological and Other Scientific Innovations

Patents

1. US Patent 9,107,909 (awarded on 08/18/2015) titled "Materials and Methods to Enhance Hematopoietic Stem Cells Engraftment Procedures" (PCT application nationalized in AU, CA, CN, EP, JP, and ZA). http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO1&Sect2=HITOFF&d=PALL&p=1&u=%2Fnetahtml%2FPTO%2Fsrchnum.htm&r=1&f=G&l=50&s1=9107909.PN.&OS=PN/9107909&RS=PN/9107909

   While in the Pelus lab, we developed methods to enhance hematopoietic stem cell engraftment using eicosanoid molecules. **This patent has been commercially licensed** and ongoing clinical trials both at HMS affiliated hospitals and elsewhere are ongoing.

2. International Patent Application No. PCT/US2010/056744 (filed 11/15/2010 by Indiana University) titled "Methods to Enhance Delivery and Engraftment of Stem Cells Including the Identification of Specific Prostaglandin E2 Receptors" (nationalized in EP, JP and US). https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2011060381&recNum=298&docAn=US2010056744&queryString=PKC&maxRec=6204
   An expansion of the issued patent (9,107,909). Here, we identified the specific prostaglandin receptors responsible for enhancing stem cell engraftment. This technology allows for specific small molecule targeting and potentially more efficacious treatment. **This patent application has been commercially licensed.**

3. International Patent Application No. PCT/US2011/059619 (filed 11/07/2011 by Indiana University) titled "Materials and Methods for Treating Radiation Poisoning." http://patentimages.storage.googleapis.com/pdfs/US20140017339.pdf

   While in the Pelus laboratory, we developed methods to mitigate the effects of radiation exposure in the event of a mass casualty radiation event (dirty bomb, Fukushima, etc.) These methods are currently being explored in the Pelus lab with DOD and NIH funding.

4. International Patent Application No. PCT/US2011/059622 (filed 11/07/2011 by Indiana University) titled "Materials and Methods for Mobilizing Cells Including CD34+, Hematopoietic Colony Forming, and Endothelial Colony Forming Cells." https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2012061822&recNum=72&docAn=US2011059622&queryString=(TYK*%20or%20JAK*%20or%20JANUS*)%20AND%20((IC/A61K)%20OR%20(IC/C07D))&maxRec=11015

   Endothelial colony forming cells have the capacity to form *de novo* blood vessels in xenotransplantation models and are a potential cellular therapy. This technology describes a method to enhance the mobilization of these cells from the bone marrow to the peripheral blood, where they can be easily harvested for therapeutic potential.

5. US Patent Application No. 61/828,568 (filed 02/28/2013 by Harvard University) titled "Methods and Compositions for Mobilizing Stem Cells."
https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2014134539

   We developed novel methods to enhance the mobilization of stem and progenitor cells from the bone marrow into the blood, using a rapid mobilization strategy. This has the potential to replace the current standard of care, G-CSF. **This patent application has been commercially licensed.**

6. US Patent Application No. 62/464,333 (filed 02/27/2017 by Harvard University) titled "Highly Engraftable Hematopoietic Stem Cells."

   This patent application from Harvard University describes a novel subset of hematopoietic stem cells with enhanced engraftment properties during transplantation. The application includes both a novel method for acquiring the stem cells, as well as molecular and functional characterization of the unique subset. **This patent application has been commercially licensed.**

7. US Patent Application PCT/US16/60829 (filed 11/07/2016) titled "Enhancement of stem cell engraftment with Oncostatin M."

   Currently, there are no great therapeutics to enhance hematopoietic engraftment that can be given to the individual receiving a bone marrow transplant. This patent application describes a novel therapeutic strategy with Oncostatin M to improve bone marrow transplantation.

8. US Patent 10,213,460 (awarded 02/26/2019) titled "Materials and Methods to Enhance Hematopoietic Stem Cells Engraftment Procedures".

   We developed a method to enhance hematopoietic stem cell mobilization with the use of non-steroidal anti-inflammatory drugs. This patent covers these, and related inventions for mobilization and **has been commercially licensed.**
   http://patft.uspto.gov/netacgi/nph-Parser?Sect1=PTO2&Sect2=HITOFF&p=1&u=%2Fnetahtml%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&co1=AND&d=PTXT&s1=10,213,460.PN.&OS=PN/10,213,460&RS=PN/10,213,460

Report of Scholarship

Research investigations

1. **Hoggatt J**, Singh P, Sampath J, Pelus LM. "Prostaglandin E_2 enhances hematopoietic stem cell homing, survival, and proliferation". Blood 2009;113(22):5444-55.

2. Hoggatt A, **Hoggatt J**, Pelus LM. "A spoonful of sugar helps the medicine go down: A novel technique to improve oral gavage in mice". J Am Assoc Lab Anim Sci. 2010;49(3):329-34.

3. **Hoggatt J**, Pelus LM. "Eicosanoid regulation of hematopoiesis and hematopoietic stem and progenitor trafficking." Leukemia 2010;24(12):1993-2002.

4. Pelus LM, **Hoggatt J**, Singh P. "Pulse exposure of hematopoietic grafts to Prostaglandin E_2 *in vitro* facilitates their engraftment and recovery." Cell Proliferation. 2011;44 Suppl 1:22-9.

5. Singh P, **Hoggatt J**, Hu P, Speth JM, Fukuda S, Breyer RM, Pelus LM. "Blockade of prostaglandin E_2 signaling through EP1 and EP3 receptors attenuates Flt3L-dependent dendritic cell development from hematopoietic progenitors". Blood 2012;119(7):1671-82.

6. Singh P, Hu P, **Hoggatt J**, Moh A, Pelus LM. "Expansion of bone marrow neutrophils following G-CSF administration in mice results in osteolineage cell apoptosis and mobilization of hematopoietic stem and progenitor cells". Leukemia 2012;26(11):2375-83.

7. Broxmeyer HE*, **Hoggatt J***, O'Leary HA, Mantel C, Chitteti BR, Cooper S, Messina-Graham S, Hangoc G, Farag S, Rohrabaugh SL, Ou X, Speth JM, Pelus LM, Srour EF, Campbell TB. "CD26/Dipeptidylpeptidase IV Negatively Regulates Colony Stimulating Factor Activity and Stress Hematopoiesis". Nature Medicine 2012, Dec;18(12):1786-9.

   ***co-first authors**

   Featured interview on Nature Medicine Podcast, December 2012, "Blood Cell Boost", http://www.nature.com/nm/podcast/index-2012-12-06.html

   Comment in: Enhancing hematopoietic growth factor performance. Nat Med. 2012 Dec;18(12):1740-1.

8. **Hoggatt J**, Singh P, Stilger KN, Plett PA, Sampson CH, Chua HL, Orschell CM, Pelus LM. "Recovery from hematopoietic injury by modulating prostaglandin E(2) signaling post-irradiation." Blood Cells Molecule and Diseases 2013;50(3):147-53.

9. **Hoggatt J**, Mohammad KS, Singh P, Hoggatt AF, Chitteti BR, Speth JM, Hu P, Poteat BA, Stilger KN, Ferraro F, Silberstein L, Wong FK, Farag SS, Czader M, Milne GL, Breyer RM, Serezani CH, Scadden DT, Guise T, Srour EF, Pelus, LM. "Differential Stem and Progenitor Cell Trafficking by Prostaglandin E_2". Nature 2013, Mar 21;495(7441):365-9.

    Featured Interview on the HSCI Science Update, May 2013, "Aspirin-like Drugs Enhance Bone Marrow Transplants", http://www.hsci.harvard.edu/newsroom/aspirin-drugs-enhance-bone-marrow-transplants

    Comment in: Stem cells: Painkillers caught in blood-cell trafficking. Nature. 2013 Mar 21;495(7441):317-8

    Comment in: Blood disorders: Boosting the stem cell harvest. Nat Rev Drug Discov. 2013 May;12(5):344-5.

10. Zhao W, Breese E, Bowers A, **Hoggatt J**, Pelus LM, Broxmeyer HE, Goebl M, Harrington MA. "SIMPL Enhancement of Tumor Necrosis Factor-α Dependent p65-MED1 Complex Formation is Required for Mammalian Hematopoietic Stem and Progenitor Cell Function." PLoS One 2013;8(4):e61123.

11. Cutler C, Multani P, Robbins D, Kim HT, Le T, **Hoggatt J**, Pelus LM, Desponst C, Chen Y, Rezner B, Armand P, Koreth J, Glotzbecker B, Ho VT, Alyea E, Isom M, Kao G, Armant M, Silberstein L, Hu P, Soiffer RJ, Scadden DT, Ritz J, Goessling W, North TE, Mendlein J, Ballen K, Zon LI, Antin JH, and Shoemaker DD. "Prostaglandin-Modulated Umbilical Cord Blood Hematopoietic Stem Cell Transplantation." Blood 2013;122(17):3074-3081.
12. **Hoggatt J**, Mohammad KS, Singh P, Pelus LM. "Prostaglandin E_2 Enhances Long-term Repopulation but Does Not Permanently Alter Inherent Stem Cell Competitiveness." Blood 2013;122(17):2997-3000.

13. Speth JM, **Hoggatt J**, Singh P, Pelus LM. "Pharmacologic Increase in HIF1α Enhances Hematopoietic Stem and Progenitor Homing and Engraftment." Blood, 2014:123(2):203-207.

14. Fukuda S, **Hoggatt J**, Singh P, Abe M, Speth JM, Hu P, Conway EM, Nucifora G, Yamaguchi S, Pelus LM. "Survivin modulates genes with divergent molecular functions and regulates proliferation of hematopoietic stem cells through Evi-1." Leukemia, 2015 Feb;29(2):433-40.

15. **Hoggatt J**[*+], Hoggatt AF[*], Tate TA, Fortman J, Pelus LM[+]. "Bleeding the Laboratory Mouse: Not All Methods are Equal." Experimental Hematology, 2016: Feb;44(2):132-137.

    *** co-first authors, + co-corresponding authors**

16. Palchaudhuri R, Saez B, **Hoggatt J**, Schajnovitz A, Sykes DB, Tate TA, Czechowicz A, Kfoury Y, Ruchika F, Rossi DJ, Verdine GL, Mansour MK, Scadden DT. "Non-genotoxic conditioning for hematopoietic stem cell transplantation using a hematopoietic cell-specific internalizing immunotoxin." Nature Biotechnology, 2016 Jul;34(7):738-745.
17. Silberstein L, Goncalves KA, Kharchenko PV, Turcotte R, Kfoury Y, Mercier F, Baryawno N, Severe N, Bachand J, Spencer JA, Papazian A, Lee D, Chitteti BR, Srour EF, **Hoggatt J**, Tate T, Lo Celso C, Ono N, Nutt S, Heino J, Sipilä K, Shioda T, Osawa M, Lin CP, Hu GF, Scadden DT. "Proximity-based differential single-cell analysis of the niche to identify stem/progenitor cell regulators." Cell Stem Cell, 2016; Oct 6;19(4):530-543.

18. Singh P, **Hoggatt J**, Mohammad KS, Kamocka MM, Saunders MR, Hu P, Speth J, Carlesso N, Guise TA, Pelus LM. "Neuropeptide-Y regulates a vascular gateway for hematopoietic stem/progenitor cells." Journal of Clinical Investigation, 2017; Dec 1;127(12):4527-4540.

19. **Hoggatt J***, Singh P, Tate TA, Chou BK, Datari SR, Fukuda S, Liu L, Kharchenko PV, Schajnovitz A, Baryawno N, Mercier FE, Boyer J, Gardner J, Morrow DM, Scadden DT, Pelus LM. "Rapid mobilization reveals a highly engraftable hematopoietic stem cell." Cell, 2018; Jan11;172(1-2):191-204.

    *** lead corresponding author**

    Featured in the NIH Director's Blog December 12, 2017, "Helping People in Need of a Stem Cell Transplant." https://directorsblog.nih.gov/2017/12/12/helping-people-in-need-of-a-stem-cell-transplant/

20. Czechowicz A, Palchaudhuri R, Scheck A, Hu Y, **Hoggatt J**, Saez B, Pang WW, Mansour MK,Tate TA, Chan YY, Walck E, Wernig G, Shizuru JA, Winau F, Scadden DT, Rossi DJ. "Selective hematopoietic stem cell ablation using CD117-antibody-drug-conjugates enables safe and effective transplantation with immunity preservation." Nature Communications, 2019; Feb6;10(1):617-628.

21. Patterson AM, Liu L, Sampson CH, Plett PA, Li H, Singh P, Mohammad KS, **Hoggatt J**, Capitano ML, Orschell CM, Pelus LM. "A Single Radioprotective Dose of Prostaglandin E_2 Blocks Irradiation-Induced Apoptotic Signaling and Early Cycling of Hematopoietic Stem Cells." Stem Cell Reports, 2020; Jul 17:S2213-6711(20)30247-2.

22. Mendez-Gonzalez JB and **Hoggatt J**. "Hematopoietic Stem Cell Mobilization: Current Collection Approaches, Stem Cell Heterogeneity, and a Proposed New Method for Stem Cell Transplant Conditioning." Stem Cell Reviews and Reports, 2021; Dec;17(6):1939-1953.

Other peer-reviewed publications

1. Pelus LM, **Hoggatt J**, Singh P, Sampath J. "Hematopoietic Agents." Burger's Medicinal Chemistry, Drug Discovery and Development. Seventh Edition, 2010:567-608.

2. **Hoggatt J**, Pelus LM. "Mobilization of Hematopoietic Stem Cells From the Bone Marrow Niche to the Blood Compartment." Stem Cell Research and Therapy. 2011 Mar 14;2(2):13.

3. **Hoggatt J**, Pelus LM. "Many mechanisms mediating mobilization: an alliterative review." Current Opinion in Hematology. 2011 Jul 18(4):231-8.

4. Pelus LM, **Hoggatt J**. "Pleiotropic effects of prostaglandin E_2 in hematopoiesis; prostaglandin E_2 and other eicosanoids enhance hematopoietic stem and progenitor function." Prostaglandins and Other Lipid Mediators. 2011;96(1-4):3-9.

5. Pelus LM, Speth J, **Hoggatt J**. "Prostaglandin E_2 and other eicosanoid based strategies to enhance umbilical cord blood stem cell engraftment." Cord Blood Biology, Transplantation, Banking and Regulation. AABB 2011.

6. **Hoggatt J**, Pelus LM. "Hematopoietic Stem Cell Mobilization with Agents Other than G-CSF." Methods in Molecular Biology 2012;904:49-67.

7. **Hoggatt J**, Scadden DT. "The Stem Cell Niche: Tissue Physiology at a Single Cell Level." Journal of Clinical Investigation 2012;122(9):3029-34.
8. Park D*, **Hoggatt J***, Ferraro F*, Scadden DT. "The Skeletal Stem Cell." Osteoporosis, 4th edition, 2013, Chapter 7, 127-147.
   ***co-first authors**
9. **Hoggatt J**, Pelus LM. "Hematopoiesis." Brenner's Encyclopedia of Genetics, 2nd Edition, 2013; 418-421.

10. **Hoggatt J*,** Speth JM and Pelus LM*. "Sowing the seeds of a fruitful harvest: hematopoietic stem cell mobilization." Stem Cells, 2013;31(12)2599-2606.
    ***co-corresponding authors**

11. **Hoggatt J***, Pelus LM*. "How beneficial is the use of NSAIDs in stem-cell transplantation?" Expert Opinion on Pharmacotherapy, 2013;14(18):2453-2456.
    ***co-corresponding authors**

12. **Hoggatt J*** and Pelus LM*. "New G-CSF Agonists for Neutropenia Therapy." Expert Opinion On Investigational Drugs, September 27, 2014;23(1):21-35.
    ***co-corresponding authors**

13. **Hoggatt J***, Tate TA and Pelus LM*. "Hematopoietic Stem and Progenitor Cell Mobilization in Mice." 3rd Edition Hematopoietic Stem Cell Protocols, Methods in Molecular Medicine, Humana Press, 2014;1185:43-64.
    ***co-corresponding authors**

14. **Hoggatt J***, Tate TA and Pelus LM*. "Role of Lipegfilgrastim in the Management of Chemotherapy Induced Neutropenia." International Journal of Nanomedicine, 2015;10:2647-52.
    ***co-corresponding authors**
15. **Hoggatt J**, Kfoury Y and Scadden DT. "Hematopoietic Stem Cell Niche in Health and Disease." Annual Review of Pathology, 2016;11:555-581.
16. **Hoggatt J** and Scadden DT. "Structure and Function of the Bone Marrow Hematopoietic Niche." Encyclopedia of Immunobiology, 2016; Volume 3:400-406.

Non-peer reviewed scientific or medical publications/materials in print or other media

1. **Hoggatt J.** "Stem Cell Barcoding: Is it time to change our definition of a hematopoietic stem cell?" The Hematologist, Jan-Feb 2015 Issue.
2. **Hoggatt J.** "Ebola Infection in Mice." The Hematologist, May-Jun 2015 Issue.
3. **Hoggatt J.** "Designer Babies?" The Hematologist, Jul-Aug 2015 Issue.
4. Rasmussen HK, **Hoggatt J.** "Hematopoietic Stem Cells Should Hold Their Breath." The Hematologist, Sep-Oct 2015 Issue.
5. **Hoggatt J.** "Anti-CD47 Therapy is More Than a Dinner Bell." The Hematologist, Nov-Dec 2015 Issue.

6. **Hoggatt J**. "Therapeutically Enhancing Stem Cell Engraftment." The Hematologist, Jan-Feb 2016 Issue.
7. **Hoggatt J.** "A Clearer View of HSCs." The Hematologist, Mar-Apr 2016 Issue.
8. **Hoggatt J**. "Jedi T Cells." The Hematologist, Jul-Aug 2016 Issue.
9. **Hoggatt J.** "Gene Therapy for 'Bubble Boy' Disease." **Cell**, 2016; Jul 14;166(2):263.
10. Chou BK, **Hoggatt J.** "Strength in Numbers." The Hematologist, Sep-Oct 2016 Issue.
11. **Hoggatt J.** "A SWAT Team for Stem Cell Transplantation." The Hematologist Nov-Dec 2016 Issue.
12. **Hoggatt J.** "Novel Insights into Mitochondrial Regulation of Hematopoiesis." The Hematologist Jan-Feb 2017 Issue.
13. **Hoggatt J.** "Learning to Count Beyond Four." The Hematologist Mar-Apr 2017 Issue.
15. **Hoggatt J.** "Seeing the Future." The Hematologist May-Jun 2017 Issue.
16. **Hoggatt J.** "Cellular Heterogeneity Based on Microniches." The Hematologist Jul-Aug 2017 Issue.
17. Mercier F, Rhee C, **Hoggatt J.** "Farming Hematopoietic Stem Cells." The Hematologist Sep-Oct 2017 Issue.
18. **Hoggatt J.** "Successes in Gene Therapy: 2017." The Hematologist Jan-Feb 2018 Issue.

Thesis

Hoggatt J. Eicosanoid Regulation of Hematopoietic Stem and Progenitor Cell Function [dissertation]. Indianapolis (IN): Indiana University; 2010.

- Esther L. Kinsley Award Winner

Abstracts, Poster Presentations Presented at Professional Meetings (last 3 years)

1. Falahee PC, Goncalves KA, Hyzy SL, Proctor JL, **Hoggatt J,** Morrow DM, Cooke MP. The combination of GROβ and AMD3100 leads to rapid and robust mobilization of hematopoietic stem cells in nonhuman primates. [abstract] Blood 2017;130:1920.
2. Dipersio JF, **Hoggatt J**, Devine SM, Blernat L, Howell H, Schmelmer V, Neale JR, Boitano AE, Cooke MP, Goncalves KA, Raffel GD, Falahee PC, Morrow DM, Davis JC. Rapid and robust mobilization of CD34+ HSCs without G-CSF following administration of MGTA-145 alone or in combination with plerixafor. [abstract] Blood 2019;134:1961.
3. Dipersio JF, Devine SM, **Hoggatt J**, Scadden DT, Howell H, Schmelmer V, Neale J, Boitano AE, Cooke MP, Goncalves KA, Raffel GD, Savage W, Falahee PC, Morrow DM, Davis JC. Phase 1 Clinical Study of MGTA-145 in combination with plerixafor shows rapid single-day mobilization and collection of CD34+ HSCs without G-CSf. [oral abstract] American Society of Transplantation and Cellular Therapy Meeting 2020.

Narrative Report:

I am greatly interested in translational medicine and have directed my investigations towards advancing bench research to bedside therapies. I am currently the Director of Hematology at Moderna Therapeutics where I am building a team to use nucleic acid technology to treat blood diseases. My academic research has focused on investigating the regulation of hematopoietic stem and progenitor cells, with a particular emphasis on facilitating hematopoietic transplantation, and on the role of myeloid cells (neutrophils and macrophages) in regulation of tissue homeostasis. I defined a role for prostaglandin E_2 on regulation of hematopoietic stem cell homing, survival and proliferation; work that was published as a two separate first authors papers in *Blood*. Much of this work has resulted in several licensed patent applications and 4 clinical trials: NCT01527838, NCT02354443, NCT02354417, NCT01627314.

My research discovered a novel role for non-steroidal anti-inflammatory drugs (NSAIDs) or other eicosanoid-regulating molecules in hematopoietic stem and progenitor retention in the bone marrow. These investigations were published as first author papers in *Nature*, and in *Leukemia*, and have led to clinical trials at MGH (NCT02003625), Indiana University (NCT02078102), and was recently independently validated in a clinical study (Bone Marrow Transplant. 2018 Feb;53(2):175-179.)

While investigating the micro-environmental role in regulation of hematopoiesis in a collaborative project with Hal Broxmeyer, we discovered a novel role for growth factor processing, mediated by CD26 that uniquely regulates receptor complex signaling and hematopoietic progenitor function. This work was published as a co-first author paper in *Nature Medicine* and is being explored clinically (NCT00862719, NCT01720264).

Most recently, my laboratory in collaboration with Louis Pelus of Indiana University and David Scadden of MGH, has developed a new, rapid mobilization regimen with the combination of GROβ and AMD3100. This work resulted in licensed patent applications, the creation of Magenta Therapeutics, of which I am a Scientific Founder, was recently published as a first, and lead corresponding author paper in *Cell*, and recently entered Phase 2 clinical trials NCT04762875, NCT04552743.

I am committed to education of the next generation of scientists and clinicians and have a number of teaching and mentoring endeavors. I directly mentor Harvard undergraduates through thesis projects, where they have received the Thomas T. Hoopes Prize for their work. I created a seminar for post-doctoral fellows on NIH grant writing, and have been invited to several other career mentoring sessions. In 2016, I created a new course at Harvard University titled “Immunology: New Tracks and Greatest Hits – SCRB 178). The entire curriculum was created de novo, and this course currently has 16 students.

Outside of the laboratory I have served as both a Police Commissioner, and as a City Councilman for West Lafayette, Indiana. As a police commissioner I dealt with hiring/firing, promotion/demotion and discipline issues for a force of 48 uniformed officers. While serving as a City Councilor, I represented >29,000 residents and authored numerous local ordinances governing city operations and resident health and safety, and I was responsible for the fiscal body review and establishment of the city operational budget. In one case, I have used my scientific expertise in cannabinoid biology to author legislation limiting access to synthetic cannabinoid drugs that was adopted by my community, and surrounding communities used the language to enact their own ordinances. I have serve on the Government Affairs Committee at the American Society of Hematology to continue to educate elected officials on health and science issues. I also serve on the Communications Committee of ASH and as a spokesperson for the organization on gene therapy.