

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Education and Certifications

Carroll College – Helena, MT

- Bachelor of Arts (B.A.) Biochemistry & Molecular Biology *May 2021*
 - Minor in Psychology

Research Experience

Oregon State University-Oregon Health & Sciences University College of Pharmacy – Portland, OR

- Faculty Research Assistant: Gaurav Sahay *July 2021 – current*
 - Continuing to uncover the potential of novel lipid-based nanoparticles to deliver mRNA for adjuvant therapeutic treatment of human cancers.

Oregon Health & Sciences University – Portland, OR

- Cell Developmental and Cancer Biology Department (CDCB) Intern: Gaurav Sahay lab *June – July 2021*
 - Formulated lipid-based nanoparticles and exploration into enhanced mRNA delivery utilizing combination adjuvant cancer therapies.
- Cell Developmental and Cancer Biology Department (CDCB) Intern: Georgiana Purdy lab *June – August 2020*
 - Assigned to the Purdy lab that explored techniques studying Mycobacterium tuberculosis and the host macrophage; canceled due to SARS-CoV-2 pandemic.
- Cell Developmental and Cancer Biology Department (CDCB) Intern: Gaurav Sahay lab *June – August 2019*
 - Explored a novel gene therapeutic through nanoparticle mRNA delivery and electrophysiological functional assays for Cystic Fibrosis.

Carroll College – Helena, MT

- CH-485 Independent Research: 120 hours, David M. Hitt lab *August 2020 – May 2021*
 - Explored organic synthesis of Structure-Activity Relationship (SAR) for novel Oxadiazole class of antibiotics to combat Methicillin-resistant *Staphylococcus aureus* (MRSA).
- CH-390 Physical Chemistry Lab: 60 hours, John Rowley lab *August 2020 – May 2021*
 - Extracted novel lipids and oils for biodiesel from algae biomass in aims of utilizing inexpensive resources available to rural Montana farmers.
 - Developed photo responsive phospholipid vesicles to encapsulate pharmaceutically relevant compounds for effective site-specific drug delivery.
 - Quantified of the activation energy of a non-enzyme catalyzed reaction.
- CH-485 Independent Research: 20 hours, David M. Hitt lab *January 2020 – May 2020*
 - Synthesis of potential antibiotic derivatives of Berkeleylactone A that may possess resistance against strains of Methicillin-resistant *Staphylococcus aureus* (MRSA).
- BI-485 Independent Research: 48 hours, Alyssa Hahn lab *August – December 2019*
 - Undergraduate researcher performing metabolite extractions to study and analyze for potential biomarkers for Osteoarthritis.
- CH-302L Organic Chemistry Lab: 60 hours, David M. Hitt lab *Spring 2019*
 - Conducted a Suzuki Reaction to generate an organic product that may store solar energy in its bonds.

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Presentations/Publications/Featured Works

- **Michael I. Henderson**, Yulia Eygeris, Madeleine Landry, Jeonghwan Kim, Conroy Sun, Gaurav Sahay
[Poster] Don't Shoot the Messenger: Combining mRNA Cancer Nanomedicines with Radiation Therapy.
CDCB Research Internship Poster Symposium, Knight Cancer Research Building – Portland, OR *August 2021*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Eygeris Y.; Sahay G.
[Oral Presentation] Engineered mutant α -ENaC subunit mRNA delivered by lipid nanoparticles reduces amiloride currents in cystic fibrosis-based cell and mice models.
https://apps.cur.org/ncur2021/search/Display_NCUR.aspx?id=111816
National Council on Undergraduate Research (NCUR) – Virtual Conference *April 2021*
- **Henderson M.**; Hewes P.
[Oral Presentation] Studies Towards the Synthesis of Novel Oxadiazole Derivatives for Antibiotic Screening Against *Escherichia coli*, *Staphylococcus aureus*, and *Pseudomonas aeruginosa*.
<https://scholars.carroll.edu/handle/20.500.12647/10380>
Student Undergraduate Research Festival (SURF) – Digital Conference *April 2021*
- Butler S.; **Henderson M.**; Zwiack A.
[Oral Presentation] Liposomes vs Lipid Nanoparticle (LNP) Antibiotic Entrapment Efficiency Utilizing Fluorescein Dye. <https://scholars.carroll.edu/handle/20.500.12647/10438>
Student Undergraduate Research Festival (SURF) – Digital Conference *April 2021*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Sahay G.
[Oral Presentation] Engineered mutant α -ENaC subunit mRNA delivered by lipid nanoparticles reduces amiloride currents in cystic fibrosis-based cell and mice models. <https://scholars.carroll.edu/handle/20.500.12647/10437>
Student Undergraduate Research Festival (SURF) – Digital Conference *April 2021*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Eygeris Y.; Sahay G.
[Paper Publication] Engineered mutant α -ENaC subunit mRNA delivered by lipid nanoparticles reduces amiloride currents in cystic fibrosis-based cell and mice models.
American Association for the Advancement of Science (AAAS) – Science Advances Journals *November 2020*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Eygeris Y.; Sahay G.
[Virtual Poster Gallery] Engineered α -ENaC mutant subunit mRNA delivered by lipid nanoparticles reduces amiloride currents in Cystic Fibrosis-based cell and mice models
North American Cystic Fibrosis Conference (NACFC) – Digital Conference *October 2020*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Sahay G.
[Poster] Hijacking ENaC: An innovative gene therapy-based approach to treat cystic fibrosis.
Oregon Bioengineering Symposium – Corvallis, OR *November 2019*
- Mukherjee A.; MacDonald K.; Kim J.; **Henderson M.**; Sahay G.
[Poster] Hijacking ENaC: An innovative gene therapy-based approach to treat cystic fibrosis.
OHSU Gene Therapy Symposium – Portland, OR *October 2019*

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Presentations/Publications/Featured Works, continued

- Ou, C.; **Henderson, M.**; Mukherjee, A.; Sahay G.
[Poster] Determining the Efficacy of Combination Treatment of Nanoparticle Delivered CFTR with Ivacaftor on Cystic Fibrosis Bronchial Epithelial Cells.
Research Internship Poster Symposium, Knight Cancer Research Building – Portland, OR *August 2019*
- **Michael Henderson**; Anindit Mukherjee; Gaurav Sahay
[Poster] Hijacking ENaC: An innovative gene therapy-based approach to treat cystic fibrosis.
Research Internship Poster Symposium, Knight Cancer Research Building – Portland, OR *August 2019*
- Fonte, M.; **Henderson, M.**; Hitt, D. M.; Rowley, J.
[Poster] Synthesis of 2-(4-ethoxycarbonylphenyl) thiophene and 5,5'-(4-ethoxycarbonylphenyl)- 2,2'-bithiophene: Case Study of a Derivative Synthesis Project to Support a Hammett Analysis of an Electrochemical Oxidative Dimerization.
Montana Section of the American Chemical Society Spring Meeting – Helena, MT *April 2019*

Clinical Experience

Shodair Children's Hospital – Helena, MT

- Mental Health Technician *January 2020 – May 2021*
 - Weekly tended to adolescents struggling with depression, substance abuse, and a variety of mental illnesses. Lead group activities by actively contributing in patient safety and treatment plans.

St. Peter's Health Hospital – Helena, MT

- Patient Service Technician *January 2020 – May 2021*
 - Efficiently met the nutritional needs of up to 36 hospital patients daily on the medical floor.

Medical/Surgical Shadowing – Eugene, OR

- Dr. John Fitzharris, M.D. (medical oncologist): 6.5 hours *December 2019*
- Dr. Daniel Fitzpatrick, M.D. (orthopedic surgeon): 17.5 hours *December 2019*
- Dr. Katelyn Clark, M.D. (general surgeon): 3.5 hours *December 2019*
- Dr. Michael Koester, M.D. (physiatrist): 4 hours *December 2019*
- Dr. Elaine Skalabrin, M.D. (neurointensivist): 8 hours *December 2019*
- Dr. Charles Zachem, D.O. (nephrologist): 8 hours *January 2019*
- Dr. Travis Littman, M.D. (general/trauma/critical care surgeon): 8 hours *August 2018*
- Dr. Neil Roundy, M.D. (neurosurgeon): 3 hours *August 2016*
- Dr. Christine Kollmorgen, M.D. (general/breast/endocrine surgeon): 8 hours *August 2016*

Oregon Health & Science University (OHSU) Research Shadowing – Portland, OR

December 2018 – January 2019

- Sudarshan Anand, Ph.D. (microRNA, cancer, cell engineering): 5 hours
- Cristina Espinosa-Diez, Ph.D. (microRNAs in endothelial stress responses): 15 hours
- Dr. Matthew Dietz, D.O (pediatric hematology & oncology fellow): 5 hours

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Clinical Experience, continued

HELPS INTERNATIONAL/Community Mission – Santa Cruz Del Quiche, Guatemala *February – March 2018 and 2020*

- Sterile Processing/Surgical-Clinical Shadowing: 20 hours
- Outreach Clinic: 8 hours
- Post-Op Ward: 57 hours

St. Peter's Health Emergency Medical Technician Shadowing – Helena, MT: 10 hours

March 2017

Professional Experience

Helena Food Share – Helena, MT

- Pantry Assistant *April 2020 – May 2021*
 - Efficiently utilized team communication to distribute food and quality service to those in need within the greater Helena community.

Oregon Health and Sciences University – Portland, OR

- Laboratory Mentor *June – August 2019*
 - Advised a high school Continuing Umbrella of Research Education (CURE) award-winning intern to acquire the skillset(s) of tissue culture, SDS-PAGE western blot, electrophysiological assays when studying cystic fibrosis.

Carroll College – Helena, MT

- Laboratory Teaching Assistant *January – May 2019*
 - Organized slides, facilitated educational activities, and aided in instruction for 27 undergraduate students that took Biological Principles II Lab.

Northwest Surgical Specialist, LLP – Springfield, OR

- Patient Educational Video Creator *June 2018 – August 2018*
 - Created two sets of six educational videos covering pre, operative, and post care for Colorectal and Esophageal Surgery Pathway Patients.
- Summer Intern and Medical Data Entry *June 2016 – August 2016*
 - Processed crucial data into American College of Surgeons Specific and Mastery of Breast Surgery Registries for enhancement of future patient outcomes.

Leadership Experience

Carroll College – Helena, MT

- Pre-Medical Club (PMC) Sergeant at Arms *August 2020 – May 2021*
 - Elected the Sergeant at Arms, I partnered with fellow officers to reconstruct interactive club meetings and help members find local clinical work. Together, we established a mentoring program for the success of future club leadership. In mentoring future officers, I helped acquire \$282 for club t-shirts and organized informative mindfulness tips.
- ASCC representative for Carroll College Photography Club *October 2018*
 - Organized the creation and funding of Carroll College Photography Club.

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Volunteer Services/Community Services

- Helena Food Share – Helena, MT *October 2019 – April 2020*
- Efficiently distributed, restocked shelves with food, and ensured a positive environment through conversation with the Helena community members in need.
- Habitat for Humanity ReStore – Helena, MT *October 2019 – February 2020*
- Effectively disinfected, priced, and organized furniture from in-house donations.
- Positive Community Kitchen – Eugene, OR *March 2016 – (seasonal)*
- Prepared nourishing meals for community members fighting life-threatening illnesses.
- Oregon Cancer Foundation – Eugene, OR *May 2019*
- Organized and captured photographs at “Neighbors Helping Neighbors with Cancer Fundraising Event” for future fundraiser awareness.
- Volunteer in Medicine – Springfield, OR *June – July 2018*
- Eligibility Screener and Pharmacy Front Window Assistant: 85+ hours
 - Provided insurance screenings for eligibility, scheduled appointments, and aided the pharmacist.
- HELPS INTERNATIONAL – Santa Cruz Del Quiche, Guatemala *February – March 2018 and 2020*
- Diligently sterilized hundreds of medical instruments to ensure proper surgical protocol.
 - Generated quality videos and photography to promote future medical missions.
 - Provided excellent patient care in the post-op ward for Guatemalan’s that underwent surgical operations.
 - Showcased medical mission photographs at Wayne Lyman Morse United States Federal Courthouse to promote local awareness of ongoing efforts by women in healthcare.
- Arthritis Foundation Walk – Eugene, OR *July 2012 and 2013*
- Photographed and helped organize event walk by distributing logistical and directional signs.

Professional Photography

- Freelance Photography *December 2017 - current*
- nCAMP gear [LINK](#)
 - Standard Knight Adventure Goods [LINK](#)
 - Old Trapper Beef Jerky [LINK](#)
 - Featured photograph by Michael Henderson at Oregon Subaru Club [LINK](#) *April 2018*
 - Featured photographs by Michael Henderson celebrating Montana Day [LINK](#) *April 2018*
 - Featured photographs by Michael Henderson, Update: Santa Cruz Del Quiche! [LINK](#) *April 2018*
 - Team Photo-Videographer, Guatemala Medical/Community Development Mission, Cascade Medical Team/HELPS INTERNATIONAL *February – March 2018*
 - Displayed Landscape Photography at Department of Gynecological Oncology, Willamette Valley Cancer Institute – Eugene, Oregon *August – December 2017*
 - Photographer for Oregon Cancer Alliance at American Cancer Society Relay for Life – Eugene, Oregon *July 2017*

Michael Ian Henderson

90970 Ridgeview Road

Eugene, Oregon 97408

Phone: 503-915-2838

Email: mihenderson@carroll.edu

www.michaelihenderson.com

Skills

Software

- Bioinformatics:
 - BLAST sequence alignment/RASMOL
- ImageJ
- GraphPad Prism
- Slack
- MSOffice
- Adobe PS, LR, Premiere Pro, Illustrator

Separation

- Diff. centrifugation/subcellular fractionation
- Gel filtration chromatography
- Ion exchange chromatography
- Dialysis

Protein

- Western blot
- SDS-PAGE protein electrophoresis
- Protein purification
- Bradford protein assay
- Bicinchoninic acid assay

DNA/mRNA

- Transfection assays
- PCR
- Restriction enzyme analysis of DNA
- Agarose gels

Synthetic Chemistry

- Fabrication of lipid vesicles
- Formulation of lipid nanoparticles
- Reflux-condensation
- TLC/Flash column chromatography

Functional Assays

- Dynamic Light Scattering (DLS)
- RNA encapsulation measurements (Ribogreen)
- Drug toxicity screening
- Spectrophotometry
- Enzyme kinetic analysis (Michaelis-Menten)
- Laurdan hydration assay
- Enzyme-linked immunosorbent assay (ELISA)

Cell Culture

- Cancer cells (Hela, 4T1, CT26, HCT116)
- Immune cells (JE6, J774)
- Endothelial cells (CFBE, F508)