

CURRICULUM VITAE

Nathaniel Alling Hathaway, Ph.D.

A) PERSONAL INFORMATION

Division of Chemical Biology and Medicinal Chemistry
UNC Eshelman School of Pharmacy
3209 Marsico Hall Campus Box # 7363
125 Mason Farm Road
UNC-Chapel Hill, NC 27599-7363

Phone: 919.445.9327
Email: Hathaway@unc.edu
Web: <https://pharmacy.unc.edu/nate-hathaway-lab/>

B) EDUCATION

2007 Doctor of Philosophy (PH.D.) in Cell and Developmental Biology,
Biological and Biomedical Sciences program at Harvard Medical School
Harvard University, Cambridge, MA

2001 Bachelor of Sciences (B.S.) in Biology,
Case Western Reserve University, Cleveland, OH

2001 Bachelor of Arts (B.A.) in Chemistry and Philosophy,
Case Western Reserve University, Cleveland, OH

C) PROFESSIONAL EXPERIENCE

01/2021-current **Director**, The UNC CRISPR Screening Facility. The University of North Carolina at Chapel Hill, Chapel Hill, NC

12/2019-current **Associate Professor**, with tenure, Division of Chemical Biology and Medicinal Chemistry, UNC Eshelman School of Pharmacy, The University of North Carolina at Chapel Hill, Chapel Hill, NC

07/2013-11/2019 **Assistant Professor**, Division of Chemical Biology and Medicinal Chemistry, UNC Eshelman School of Pharmacy, The University of North Carolina at Chapel Hill, Chapel Hill, NC

02/2008-06/2013 **Post-doctoral Fellow**, HHMI & Department of Developmental Biology, Stanford Medical School, Palo Alto, CA

D) HONORS AND AWARDS

2021 Instructor worthy of recognition, UNC Eshelman School of Pharmacy (also 2020)
2020 The Mark Foundation for Cancer Research ASPIRE Award (with Courtney Hodges)
2018 CBMC Teaching Recognition Recipient (also, 2016, 2017)
2017 IBM Junior Faculty Development Award
2016 AACP - New Investigator Award Recipient
2001 Undergraduate degree with distinction *magna cum laude*
2000 Michelson-Morley Research Competition 1st Place

E) BIBLIOGRAPHY & PRODUCTS OF SCHOLARSHIP

REFEREED PAPERS

Publications: 32 total publications

* denotes equal contribution, # denotes corresponding authorship.

1. Wistner SC, MacDonald IA, Stanley KA, **Hathaway NA#**. Characterization of Hepatoma-Derived Growth Factor-Related Protein 2 Interactions with Heterochromatin. *Cells*. 2023 Jan 14;12(2):325.
2. A simulation model of heterochromatin formation at submolecular detail. Williams MR, Xiaokang Y, **Hathaway NA#**, Kireev D#. *iScience*. 2022 Jun 14;25(7):104590
3. Lu D, Foley CA, Birla SV, Hepperla AJ, Simon JM, James LI, **Hathaway NA#**. Bioorthogonal Chemical Epigenetic Modifiers Enable Dose-Dependent CRISPR Targeted Gene Activation in Mammalian Cells. *ACS Synth Biol*. 2022 Apr 15;11(4):1397-1407.
4. Waybright JM, Clinkscales SE, Barnash KD, Budziszewski GR, Rectenwald JM, Chiarella AM, Norris-Drouin JL, Cholensky SH, Pearce KH, Herring LE, McGinty RK, **Hathaway NA**, James LI. A Peptidomimetic Ligand Targeting the Chromodomain of MPP8 Reveals HRP2's Association with the HUSH Complex. *ACS Chem Biol*. 2021 Aug 20.
5. Feng W, Simpson DA, Cho JE, Carvajal-Garcia J, Smith CM, Headley KM, **Hathaway N**, Ramsden DA, Gupta GP. Marker-free quantification of repair pathway utilization at Cas9-induced double-strand breaks. *Nucleic Acids Res*. 2021 May 21;49(9):5095-5105
6. Ni K, Ren J, Xu X, He Y, Finney R, Braun SMG, **Hathaway NA**, Crabtree GR, Muegge K. LSH mediates gene repression through macroH2A deposition. *Nat Commun*. 2020 Nov 6;11(1):5647.
7. Skrajna A, Goldfarb D, Kedziora KM, Cousins EM, Grant GD, Spangler CJ, Barbour EH, Yan X, **Hathaway NA**, Brown NG, Cook JG, Major MB, McGinty RK. Comprehensive nucleosome interactome screen establishes fundamental principles of nucleosome binding. *Nucleic Acids Res*. 2020 Sep 25;48(17):9415-9432
8. Chiarella AM*, Lu D*, **Hathaway NA#**. Epigenetic Control of a Local Chromatin Landscape. *Int J Mol Sci*. 2020 Jan 31;21(3): E943.
9. Chiarella AM, Butler KV, Gryder BE, Lu D, Wang TA, Yu X, Pomella S, Khan J, Jin J#, **Hathaway NA#**. Dose-dependent activation of gene expression is achieved using CRISPR and small molecules that recruit endogenous chromatin machinery. *Nat Biotechnol*. 2020 Jan;38(1):50-55.
10. Gryder BE, Pomella S, Sayers C, Wu XS, Song Y, Chiarella AM, Bagchi S, Chou HC, Sinniah R, Walton A, Wen X, Rota R, **Hathaway NA**, Zhao K, Chen J, Vakoc CR, Shern JF, Stanton BZ, Khan J. Histone hyperacetylation disrupts core gene regulatory architecture in rhabdomyosarcoma. 2019 *Nat Genet.*, 2019, *Nat Genet*. 2019 Dec;51(12):1714-1722.
11. Madigan VJ, Yuziuk JA, Chiarella AM, Tyson TO, Meganck RM, Tse LV, **Hathaway NA**, Asokan A. Ring finger protein 121 is a potent regulator of adeno-associated viral genome transcription. *PLoS Pathog*. 2019 Aug 6;15(8):e1007988.

12. Vignaux PV, Bregio C, **Hathaway NA#**. Contribution of promoter DNA sequence to heterochromatin formation velocity and memory of gene repression in mouse embryo fibroblasts. *PLoS One*. 2019 Jul 3;14(7):e0217699.
13. Headley KM, Kedziora KM, Alejo A, Lai EZX, Purvis JE, **Hathaway NA#**. Chemical Screen for Epigenetic Barriers to Single Allele Activation. *Stem Cell Res*. 2019 Jul;38:101470.
14. MacDonald IA, Butler KV, Herring LE, Clinkscales SE, Yelagandula R, Stecher K, Bell O, Graves LM, Jin J, **Hathaway NA#**. Pathway-Based High-Throughput Chemical Screen Identifies Compounds that Decouple Heterochromatin Transformations. *SLAS Discov*. 2019, May 30:2472555219849838.
15. Khodaverdian V, Tapadar S*, MacDonald IA*, Xu Y, Ho P, Sanghani BA, Fan Y, **Hathaway NA#**, Oyelere AK#. Deferiprone: Pan-selective Histone Lysine Demethylase Inhibition Activity and Structure Activity Relationship Study. *Sci Rep*. 2019 Mar 18;9(1):4802.
16. Chory EJ, Calarco JP, **Hathaway NA**, Bell O, Neel DS, Crabtree GR. Nucleosome turnover regulates histone methylation patterns over the genome. *Mol Cell*. 2019 Jan 3;73(1):61-72.
17. Chiarella AM, Wang TA, Butler, KV, Jin J, **Hathaway NA#**. Chemical Epigenetic Modifiers (CEM)s repress gene transcription by re-directing cellular machinery. *J Vis Exp*. 2018 Sep 20;(139).
18. Chiarella AM*, Quimby AL*, Mehrab-Mohseni M, Velasco B, Kasoji SK, Davis IJ, Dayton PA, **Hathaway NA#**, and Pattenden SG#. Cavitation enhancement increases the efficiency and consistency of chromatin fragmentation from fixed cells for downstream quantitative applications. *Biochemistry*. 2018 May 15;57(19):2756-2761.
19. Butler KV*, Chiarella AM*, Jin J#, **Hathaway NA#**. Targeted Gene Repression Using Novel Bifunctional Molecules to Harness Endogenous Histone Deacetylation Activity. *ACS Synth Biol*. 2018 Jan 19;7(1):38-45.
20. Ren J, **Hathaway NA**, Crabtree GR, Muegge K. Tethering of Lsh at the Oct4 locus promotes gene repression associated with epigenetic changes. *Epigenetics*. 2018;13(2):173-181.
21. Butler KV, MacDonald IA, **Hathaway NA**, Jin J. Report and Application of a Tool Compound Data Set. *J Chem Inf Model*. 2017 Nov 27;57(11):2699-2706.
22. McLaughlin JE, Khanova J, Persky A, **Hathaway N**, and Cox W. Design, Implementation, and Outcomes of a Three-week Pharmacy Bridging Course. *American Journal of Pharmaceutical Education*. *Am J Pharm Educ*. 2017;81(7), Article 6313.
23. MacDonald IA, **Hathaway NA#**. Epigenetic Roots of Immunologic Disease and New Methods for Examining Chromatin Regulatory Pathways. *Immunol Cell Biol*. 2015 Mar;93(3):261-70.
24. **Hathaway NA***, Bell O*, Hodges C, Miller EL, Neel DS, Crabtree GR. Dynamics and Memory of Heterochromatin in Living Cells. *Cell*. 2012 Jun 22;149(7):1447-60.
25. Dimova N, **Hathaway NA**, Lee BH, Kirkpatrick DS, Berkowitz ML, Gygi SP, Finley D, King RW. APC/C-mediated multiple monoubiquitylation provides an alternative degradation signal for cyclin B1. *Nat Cell Biol*. 2012 Jan 29;14(2):168-76.

26. Zeng X, Sigoillot F, Gaur S, Choi S, Pfaff KL, Oh DC, **Hathaway N**, Dimova N, Cuny GD, King RW. Pharmacologic inhibition of the anaphase-promoting complex induces a spindle checkpoint-dependent mitotic arrest in the absence of spindle damage. *Cancer Cell*. 2010 Oct 19;18(4):382-95.
27. Kleijnen MF, Roelofs J, Park S, **Hathaway NA**, Glickman M, King RW, Finley D. Stability of the proteasome can be regulated allosterically through engagement of its proteolytic active sites. *Nat Struct Mol Biol*. 2007 Dec;14(12):1180-8.
28. Crosas B, Hanna J, Kirkpatrick DS, Zhang DP, Tone Y, **Hathaway NA**, Buecker C, Leggett DS, Schmidt M, King RW, Gygi SP, Finley D. Ubiquitin chains are remodeled at the proteasome by opposing ubiquitin ligase and deubiquitinating activities. *Cell*. 2006 Dec 29;127(7):1401-13.
29. Hanna J, **Hathaway NA**, Tone Y, Crosas B, Elsasser S, Kirkpatrick DS, Leggett DS, Gygi SP, King RW, Finley D. Deubiquitinating enzyme Ubp6 functions noncatalytically to delay proteasomal degradation. *Cell*. 2006 Oct 6;127(1):99-111.
30. Kirkpatrick DS*, **Hathaway NA***, Hanna J, Elsasser S, Rush J, Finley D, King RW, Gygi SP. Quantitative analysis of in vitro ubiquitinated cyclin B1 reveals complex chain topology. *Nat Cell Biol*. 2006 Jul;8(7):700-10.
31. **Hathaway NA**, King RW. Dissecting cell biology with chemical scalpels. *Curr Opin Cell Biol*. 2005 Feb;17(1):12-9.
32. Bardeesy N, Sinha M, Hezel AF, Signoretti S, **Hathaway NA**, Sharpless NE, Loda M, Carrasco DR, DePinho RA. Loss of the Lkb1 tumour suppressor provokes intestinal polyposis but resistance to transformation. *Nature*. 2002 Sep 12;419(6903):162-7.

PATENTS AND LICENSED TECHNOLOGIES

5 total; 3 resulting from work associated with UNC research

1. Bioorthogonal Chemical Epigenetic Modifiers. Hathaway, James, Lu, Foley, Wasserman. 2022. Provisional Patent Filed.
2. Use of Chemical Epigenetic Modifiers to Modulate Gene Expression from Vectors. **Hathaway**, Hirsch, Umana, Song. 2021. PCT Filed.
3. Bifunctional Chemical Epigenetic Modifiers and Methods of Use. **Hathaway**, Jin, Butler, Chiarella. 2018 Full Patent Filed. Epigenos Bioscience, Inc. founded by Dr. Hathaway to commercialize this technology.
4. Heterochromatin Gene Repression Inhibitors. **Hathaway**, Jin, MacDonald, Butler. 2018 Full Patent Filed. License optioned.
5. Assays of Chromatin Mediated Transcription Modulation and Compositions Used Therein. Bell, Crabtree, **Hathaway**. 2013 Provisional Patent Filed.
6. Methods and Compositions for Enhancing Proteasome Activity. Finley, Hanna, **Hathaway**, King, Lee. US Patent 9,201,073, issued 2015. Commercially Licensed.

INVITED ORAL PRESENTATIONS

1. TBA, Miller Symposium at University of California, Davis, April 14 2023.
2. Chemically Controlling Chromatin, Case Western Reserve University, Cleveland, Department of Chemistry, November 3, 2022
3. UNC CRISPR Screening Facility, McAllister Heart Institute Retreat, UNC, Chapel Hill October 14, 2022
4. Chemically Controlling Chromatin, 2nd Induced Proximity-Based Drug Discovery Summit, Boston, May 10, 2022
5. Chemically Controlling Chromatin, North Carolina A&T State University, Biology Department November 22, 2021, Greensboro, NC
6. Site-Specific Chemical Activation of Chromatin, Mini-Symposium with Howard University College of Pharmacy, November 18, 2021
7. Precision Control of Transcription with Bifunctional Molecules, Induced Proximity Strategies for Cancer Therapeutics, The Mark Foundation for Cancer Research, New York, NY January 8, 2020
8. Chemically Controlling Chromatin, Syngenta, RTP Plant Expression Community Seminar Series, October 15, 2019, RTP, NC
9. Chemically Activating Chromatin, EpiBio 2019, September 12-14, 2019, Barcelona, Spain
10. Precision Control of Transcription with Bifunctional Molecules, 3rd annual Drugging Transcription conference. April 25, 2019. Cambridge, MA.
11. Precision Epigenetic Therapeutics for Cancer, Innovators Road Show, April 16-17, 2019. Boston, MA.
12. Precision Epigenetic Therapeutics for Cancer, 2019 Annual Innovation Showcase. April 11, 2019, Chapel Hill, NC.
13. Drug Discovery Techniques. Carolina Cancer Nanotechnology Training Program (CCNTP) at UNC. April 15, 2019. Chapel Hill, NC.
14. New chemically driven strategies to understand and control the mammalian epigenome. University of Georgia, Department of Cellular Biology. November 13, 2018. Athens, GA.
15. Chemical manipulation of the epigenome to understand and potentially treat human disease. Endocrine Research Conference, UNC. June 28, 2018. Chapel Hill, NC.
16. Combining chemistry and protein engineering to control epigenetic gene regulation in mammalian cells. National Institute of Environmental Health Sciences, Annual Trainee Symposium EPA/NIEHS campus, Keynote speaker. June 1, 2018. Research Triangle Park, NC.

17. Pathway Based Chemical Screen Identifies New Components of Epigenetic Gene Repression as Potential New Cancer Therapeutics. The American Society for Pharmacology and Experimental Therapeutics (ASPET). April 22, 2018. San Diego, CA.
18. New chemically driven strategies for understanding and controlling epigenetic processes in mammalian cells. The Scripps Research Institute, Chemistry Department. April 20, 2018. La Jolla, CA.
19. New chemically driven strategies for understanding, inhibiting, and controlling epigenetic processes in mammalian cells. Purdue, Department of Medicinal Chemistry and Molecular Pharmacology. March 22, 2018. West Lafayette, IN.
20. New chemically driven strategies for understanding and controlling epigenetic processes in mammalian cells. University of New Mexico, Chemistry and Chemical Biology. March 9, 2018. Albuquerque, NM.
21. New Bifunctional Molecules Capture Chromatin Regulatory Machines to Control Gene Expression. AIChE International Conference on Epigenetics and Bioengineering in Miami. Dec 13-15, 2017. Miami, FL.
22. Chemical Facilitated *Oct4* Reactivation & Chemical Epigenetic Modifiers, two emerging stories. Carolina Chromatin Consortium, UNC. November 2, 2017. Chapel Hill, NC.
23. Pathway based high throughput chemical screen identifies new molecular components of heterochromatin. Southeastern Chemical Biology Symposium at University of Georgia. April 14, 2017. Athens, GA.
24. Discovery of novel heterochromatin inhibitors using high-throughput flow cytometry as a primary screen. Birmingham Flow Cytometry Meeting. March 25, 2016. Birmingham, AL.
25. Exploring the Mechanics of Heterochromatin Regulation with New Chemical Tools. Lineberger Comprehensive Cancer Retreat. September 1, 2015. Chapel Hill, NC.
26. Examining Complex Mechanisms of Epigenetic Transformations in Living Cells. 38th Lineberger Cancer Center Symposium. April 21, 2014. Chapel Hill, NC.
27. Unraveling Complex Chromatin Transformations with Chemical Tools. Lineberger Comprehensive Cancer Center Molecular Therapeutics Retreat. November 20, 2013. Chapel Hill, NC.
28. Controlling Chromatin Structure and Function with a Chemically-Mediated Approach. UNC Molecular and Cellular Biophysics Program Seminar. October 7, 2013. Chapel Hill, NC.
29. Chemically-Mediated Control of Heterochromatin in Living Cells. Indiana University, Bloomington. Department of Biology. November 15, 2013. Bloomington, IN.
30. Role of ubiquitin chain linkage in Cyclin B1 degradation. CSHL The Ubiquitin Family Meeting. April 25-29, 2007. Cold Spring Harbor, NY.
31. Quantitative Analysis of Multiubiquitin Chains Synthesized by the Anaphase-Promoting Complex. CSHL The Ubiquitin Family Meeting. April 27-May 1, 2005. Cold Spring Harbor, NY.

F) TEACHING ACTIVITIES

LECTURES

Year	Course Name	Course No.	Lectures	Enrolled	Course Type	Evaluation
2014 S	Pharmaceutical Biochemistry II	PHCY 422	4	161	Professional	3.68/5
2014 S	Biochem. Found. Chem. Bio.	CBMC 804	2	9	Graduate	4.29/5
2015 S	Pharmaceutical Biochemistry II	PHCY 422	4	152	Professional	3.47/5
2015 S	Biochem. Found. Chem. Bio.	CBMC 804	2	8	Graduate	4.52/5
2015 F	Grad. Genetics Seminar Course	GENT 703	16	39	Graduate	n/a
2015 F	BBSP First Year Group	BBSP 902	9	16	Graduate	n/a
2015 S	BBSP First Year Group	BBSP 902	9	16	Graduate	n/a
2015 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	151	Professional	3.50/5
2016 S	Biochem. Found. Chem. Bio.	CBMC 804	2	7	Graduate	4.03/5
2016 F	BBSP First Year Group	BBSP 902	9	16	Graduate	n/a
2016 S	BBSP First Year Group	BBSP 902	9	16	Graduate	n/a
2016 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	143	Professional	4.21/5
2016 F	Pharmacy (PIPS)	PHCY 621	8	15	Professional	3.80/5
2017 S	Biochem. Found. Chem. Bio.	CBMC 804	2	6	Graduate	4.60/5
2017 F	BBSP First Year Group	BBSP 902	9	18	Graduate	n/a
2017 S	BBSP First Year Group	BBSP 902	9	18	Graduate	n/a
2017 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	154	Professional	4.50/5
2017 F	Pharmacy (PIPS)	PHCY 621	8	10	Professional	3.89/5
2018 F	BBSP First Year Group	BBSP 902	9	15	Graduate	n/a
2018 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	145	Professional	4.59/5
2018 F	Adv. Chromatin and Epigenetics	BIOC 702	1	22	Graduate	n/a
2018 S	Biochem. Found. Chem. Bio.	CBMC 804	2	10	Graduate	4.80/5
2019 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	159	Professional	4.48/5
2019 F	Adv. Chromatin and Epigenetics	BIOC 702	1	18	Graduate	n/a
2019 S	Biochem. Found. Chem. Bio.	CBMC 804	2	8	Graduate	4.82
2020 S	Adv. CRISPR-Cas9 Engineering	GNET 760	1	15	Graduate	4.54
2020 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	124	Professional	4.44
2021 S	Adv. CRISPR-Cas9 Engineering	GNET 760	1	16	Graduate	n/a
2021 S	Biochem. Found. Chem. Bio.	CBMC 804	2	8	Graduate	4.33
2021 F	Phcy. Bridge Course: Biochem.	PHCY 500	4	144	Professional	4.38
2022 S	Biochem. Found. Chem. Bio.	CBMC 804	2	9	Graduate	4.60
2022 F	Adv. CRISPR-Cas9 Engineering	GNET 760	1	7	Graduate	n/a
2022 S	Phcy. Bridge Course: Biochem.	PHCY 500	4	139	Professional	4.59
2022 F	Biotechnology	BMME 485	1	10	Undergrad	n/a

CURRENT GRADUATE STUDENTS

Sara Wasserman, Pharmaceutical Sciences Graduate Program (CBMC), 2019-present
B.S. Chemistry, UNC Asheville

Jessica Umana, Pharmaceutical Sciences Graduate Program (CBMC), 2019-present
B.S. Biochemistry, Converse College

Sara Clinkscales, Pharmaceutical Sciences Graduate Program (CBMC), 2018-present
B.S. Biology, College of Charleston

Xiaokang (Steve) Yan, Pharmaceutical Sciences Graduate Program (CBMC), 2017-present
B.S. Cell Biology and Genetics, Univ. Maryland College Park

CURRENT POSTDOCTORAL SCHOLARS

Travis Nelson, PhD 2020-present

PhD Department of Chemistry, University of Nebraska-Lincoln

CURRENT UNDERGRADUATE STUDENTS

Mary Huang, 2021-present

Arushi Goel, 2021-present

Casey Lepley, 2021-present

Nicole Pereira 2021-present

FORMER GRADUATE STUDENTS

Dongbo Lu, Pharmaceutical Sciences Graduate Program (CBMC), 2018-2022

Thesis title: Development and Optimization of Chemical Epigenetic Modifiers

Current position: Postdoctoral Fellow, UNC, Gupta lab

Anna Chiarella, PhD in Genetics and Molecular Biology. 2015-2018

Thesis title: Novel Bifunctional Molecules Redirect Chromatin-Modifying Machinery to Study and Control Gene Expression

Current position: Postdoctoral Fellow, Columbia University, Rustgi lab

Patricia Vignaux, PhD in Genetics and Molecular Biology. 2014-2019

Thesis title: A Modular Chromatin in vivo Assay Reveals the Influence of Promoter Structure on Heterochromatin Memory

Current position: Postdoctoral Fellow, Collaborations Pharmaceuticals, Inc.

Kathryn Headley, Genetics and Molecular Biology Graduate Program, 2015-2019

Thesis title: Chemical Screen for Epigenetic Barriers to Single Allele Activation of Oct4

Current position: Postdoctoral Fellow, NIEHS, Wade lab

FORMER POSTDOCTORAL SCHOLARS

Ian MacDonald, PhD 2013-2018

Current position: Scientist, Precision BioSciences, Inc.

FORMER VISITING SCHOLARS

Ali Al Sibahi, University College London School of Pharmacy, Fall 2018

Current position: MPharm program at UCL

FORMER RESEARCH TECHNICIANS

Sophie Troyer, 2020-2021

Current Position: MD, PhD Program University of Rochester School of Medicine

FORMER UNDERGRADUATE STUDENTS

Ameriks Barboza, 2021-2022

Current Position: Applying to medical school.

Shama Birla, 2018-2021

Current Position: John Hopkins University Masters Program

Guido Chiriboga, 2018-2021
Current Position: applying to medical school

Karly Stanley, 2018-2021
Current Position: University of Utah, PhD Program

Glory Dan-Dukor, 2019-2020
Current position: UNC BBSP, PhD Program

Celyn Bregio, 2018-2019
Current position: University of Chicago Medical School

Aidin Alejo, 2017-2018
Current position: NIEHS Postbac program, Fessler lab

Ellie Lai, Summer 2018
Current position: Case Western Reserve University Undergraduate Studies

Bryan Obika, Summer 2017
Current position: UNC Undergraduate Studies

April Wang, 2016-2019
Current position: UNC Undergraduate Studies

Austin Sun, 2015-2016
Current position: University of Washington, PhD program

FORMER HIGH SCHOOL STUDENTS

Kristina Cala, Topsail High School, Summer 2018
Current position: Topsail High School, Class of 2019

Ben Wu, Trinity High School, Summer and Fall 2016
Current position: Emory University Undergraduate Studies

AWARDS WON BY STUDENTS IN HATHAWAY LAB

Chemical Biology Interface NIH T-32 (J. Umana)
Translational Medicine NIH T-32 (S. Wasserman)
NIH Training Supplement 2yr (J. Umana)
UNC ImPACT Internship (P. Vignaux)
NSF Graduate Research Fellowships Program (K. Headley)
Eshelman Institute for Innovation Student Award (A. Chiarella)
GMB NIH T-32 (A. Chiarella)
MiBio NIH T-32 (K. Headley)
NC TraCS Award (A. Chiarella)
Keystone Meeting Travel Award (A. Chiarella)
SMART Fellowship (A. Wang, B. Obika, A. Alejo, and C. Bergio)
ABRCMS presentation award (A. Wang)
SURE Fellowship (E. Lai)

G) GRANTS

CURRENT GRANT SUPPORT

Total Current & Completed Grant Support in Direct Funding = \$ 5,034,570

Source of Support: NIH/NIGMS R01GM118653
Principal Investigator: N. Hathaway
Total Direct Funding: \$1,050,000
Total Period of Support: 07/01/2017-06/30/2023
Percent Effort: 25%
Project Title: Mechanism of HP1-mediated Heterochromatin Assembly and Durability in Live Cells.

Source of Support: NIH/NIGMS R01GM132299
Principal Investigator: D. Kireev and N. Hathaway (Multi-PI)
Total Direct Funding: \$800,000
Total Period of Support: 12/01/2019 – 11/31/2023
Percent Effort: 15%
Project Title: Experimental and computational insights into the dynamics of heterochromatinization.

Source of Support: NIH/NIGMS R41GM146326
Principal Investigator: N. Hathaway
Total Direct Funding: \$350,000
Total Period of Support: 09/16/2021 – 09/15/2023
Percent Effort: 8%
Project Title: Site-specific epigenetic activation of TP53 to improve cancer therapy

Source of Support: NIH/NEI R41EY033603
Principal Investigator: M. Hirsch (Hathaway, Co-I)
Total Direct Funding: \$150,000
Total Period of Support: 02/09/2022-01/31/2024
Percent Effort: 10%
Project Title: Novel platform for optimizing AAV transgene expression to improve efficacy of ocular gene therapies

Source of Support: NIH/NIAID R21AI164214
Principal Investigator: M. Hirsch and N. Hathaway (Multi-PI)
Total Direct Funding: \$ 297,992
Total Period of Support: 02/09/2022-01/31/2024
Percent Effort: 12.5%
Project Title: Chemically regulating AAV transgene expression with endogenous gene activators

Source of Support: NIH/NCI R01CA252720
Principal Investigator: Oyelere (Hathaway, Co-PI)
Total Direct Funding: \$ 157,628
Total Period of Support: 03/01/2021-02/28/2026
Percent Effort: 4%
Project Title: Reposition and Optimization of Deferiprone for Breast Cancer Therapy

COMPLETED GRANT SUPPORT

Source of Support: The Mark Foundation for Cancer Research
Principal Investigator: C. Hodges and N. Hathaway (Multi-PI)
Total Direct Funding: \$115,000 (sub award to UNC)
Total Period of Support: 10/01/2020-03/31/2022
Percent Effort: 12%
Project Title: Expanding bifunctional molecules to restore function after SWI/SNF loss

Source of Support: NIH/NCATS R41TR003245
Principal Investigator: N. Hathaway
Total Direct Funding: \$ 251,236
Total Period of Support: 04/01/2020 – 03/01/2022
Percent Effort: 8%
Project Title: Chemically controlling chromatin to treat Friedreich's Ataxia

Source of Support: Eshelman Institute for Innovation
Principal Investigator: D. Crona
Role: Co-I (N. Hathaway)
Total Direct Funding: \$250,000
Total Period of Support: 07/01/2019-12/30/2021
Percent Effort: 3%
Project Title: Chemically catalyzed epigenetic gene regulation in prostate cancer

Source of Support: NIH/NIGMS (R01GM118653-03S1)
Principal Investigator: N. Hathaway
Total Direct Funding: \$102,806
Total Period of Support: 12/01/2018-11/30/2021
Percent Effort: n/a
Project Title: Research Supplements to Promote Diversity in Health Related Research Program

Source of Support: Eshelman Institute for Innovation
Principal Investigator: N. Hathaway
Total Direct Funding: \$50,000
Total Period of Support: 07/01/2020-06/30/2021
Percent Effort: 3%
Project Title: Novel Bioorthogonal Chemical Epigenetic Modifier Development

Source of Support: NSF CBET 2040094
Principal Investigator: N. Hathaway
Total Direct Funding: \$22,455
Total Period of Support: 09/01/2020-8/31/2021
Percent Effort: 0%
Project Title: 4th International Conference on Epigenetics and Bioengineering (EpiBio)

Source of Support: North Carolina Biotechnology Center Biotechnology Meeting Grant
Principal Investigator: N. Hathaway
Total Direct Funding: \$5,000
Total Period of Support: 10/09/2020-10/11/2020

Percent Effort: 0%
Project Title: 4th International Conference on Epigenetics and Bioengineering (EpiBio)

Source of Support: Eshelman Institute for Innovation
Principal Investigator: L. James
Role: Co-I (N. Hathaway)
Total Direct Funding: \$200,000
Total Period of Support: 07/01/2018-06/30/2020
Percent Effort: 3%
Project Title: Transforming CRISPR-Cas9 Genome-Editing Efficiency with 53BP1 Chemical Probes.

Source of Support: NIH/NIGMS (R01GM118653-02S1)
Principal Investigator: N. Hathaway
Total Direct Funding: \$30,000
Total Period of Support: 07/01/2018-06/30/2019
Percent Effort: n/a
Project Title: Administrative Supplement to Purchase a Liquid Chromatography/Mass Selective Detector

Source of Support: Eshelman Institute for Innovation
Principal Investigator: N. Hathaway
Total Direct Funding: \$280,000
Total Period of Support: 07/01/2017-06/30/2019
Percent Effort: 10%
Project Title: Center for Allele Specific Regulation (CASR)

Source of Support: Eshelman Institute for Innovation
Principal Investigator: D. Kireev
Role: CO-I (N. Hathaway)
Total Direct Funding: \$198,784
Total Period of Support: 07/01/2017-06/30/2018
Percent Effort: 10%
Project Title: Cracking the Key to Pluripotency through Molecular Biosystems Computing.

Source of Support: Eshelman Institute for Innovation
Principal Investigator: N. Hathaway
Total Direct Funding: \$200,000
Total Period of Support: 06/01/2016-05/31/2018
Percent Effort: 12.5%
Project Title: Development of Chemical Heterochromatin Inhibitors as Novel Epigenetic Cancer Therapies.

Source of Support: IBM Junior Faculty Development Award
Principal Investigator: N. Hathaway
Total Direct Funding: \$7,500
Total Period of Support: 01/01/2017-12/31/2017
Percent Effort: n/a
Project Title: Live Cell Imaging Platform to Examine Dynamic Epigenetic Mechanics

Source of Support: North Carolina Biotechnology Center
Principal Investigator: N. Fisher
Role: Supporting Investigator (N. Hathaway)
Total Direct Funding: \$106,169.00
Total Period of Support: 3/28/2017
Percent Effort: n/a
Project Title: Attune NxT 4-laser acoustic focusing flow cytometer with Autosampler

Source of Support: The American Association of Colleges of Pharmacy
Principal Investigator: N. Hathaway
Total Direct Funding: \$10,000
Total Period of Support: 01/01/2016-12/31/2016
Percent Effort: n/a
Project Title: Development of novel inhibitors of mammalian heterochromatin gene repression.

Source of Support: North Carolina Biotechnology Center
Principal Investigator: K. Pearce
Role: Supporting Investigator (N. Hathaway)
Total Direct Funding: \$200,000
Total Period of Support: 03/25/2016
Percent Effort: n/a
Project Title: High Content Cell Imager for Enabling Cellular and Phenotypic Assay Drug Discovery Screens.

Source of Support: North Carolina Biotechnology Center
Principal Investigator: N. Fisher
Role: Supporting Investigator (N. Hathaway)
Total Direct Funding: \$200,000
Total Period of Support: 03/24/2015
Percent Effort: n/a
Project Title: Intellicyt iQue Screener.

H) PROFESSIONAL SERVICE

PROFESSIONAL SERVICE TO THE DISCIPLINE

Grant Review:

Review for a panel of the French National Research Agency (ANR) (2020)
Service to Human Frontier Science Program Research Grant Review (2020)
Service to NSF Panel (2018-2019)
Service to NSF Panel (2016-2017)
Service to AACP Panel (2019)

Journal Review:

Ad hoc reviewer- ACS Combinatorial Science, ACS Synthetic Biology, Anti-Inflammatory & Anti-Allergy Agents in Medicinal Chemistry, Biology Methods & Protocols, Bioconjugate Chemistry, Bioorganic Chemistry, Communications Biology, Current Stem Cell Research & Therapy, Epigenetics, Journal of Theoretical Biology, Molecular Cell, International Journal of Molecular Sciences, Nature Communications, Nature Structural & Molecular Biology, PNAS, Scientific Reports, Stem Cell Research, The CRISPR Journal, The Journal of Clinical Investigation, Yale J Biol Med.

Journal Advisory Board:
Advisory Board for The Harvard Undergraduate Research Journal (2008)

Editorial Board Member:
PLOS ONE (2018-current)
Epigenetics Communications (2020-current)

Meeting Organization:
Organizing Committee for 5th International Conference on Epigenetics and Bioengineering in Raleigh, NC (EpiBio 2021)

Organizing Chair for 4th International Conference on Epigenetics and Bioengineering in Raleigh, NC (EpiBio 2020)

Organizing Committee for 3rd International Conference on Epigenetics and Bioengineering in Barcelona, Spain (EpiBio 2019)

Organizing Committee for 2nd International Conference on Epigenetics and Bioengineering at the University of California, San Francisco (EpiBio 2018)

Professional Memberships:
American Association of Colleges of Pharmacy (2015-present)
Society for Biological Engineering (American Institute of Chemical Engineers, 2018- present)
American Society for Biochemistry and Molecular Biology (2017- present)

UNIVERSITY SERVICE

School of Pharmacy and Chemical Biology and Medicinal Chemistry Committees

2019-present CBMC Administrative Leadership team member
2019-present Graduate Education Committee (GEC) member
2019 Search Committee for Assistant Director of Curricular and Student Affairs
2019-present Divisional Director of Graduate Admissions, Pharmaceutical Sciences
2018-2019 ACPE School Accreditation Standards Team Reviewer
2016, 2018 Young Innovators Program (YIP)
2015-2016 Development team for Pharmacy Innovation and Problem Solving (PIPS) course
2015-present Chemical Biology and Medicinal Chemistry (CBMC) Admissions Committee
2014-2015 Co-Course Developer, Biochemistry Module for Pharmacy Bridging Course
2014 Search Committee for Professor in Chemical Biology and Medicinal Chemistry
2014 Search Committee for Assistant Professor in Chemical Biology and Medicinal Chemistry
2014-present Eshelman School of Pharmacy Multiple Mini Interviewer
2013-present Chemical Biology and Medicinal Chemistry Faculty Recruitment Ambassador

Institutional for University of North Carolina at Chapel Hill

2018-present Individual Development Plan (IDP) coordinator for MiBio
2016 Participated in Faculty Mentoring Workshop for Biomedical Researchers
2016 UNC Genetics Scientific Retreat Asheville, session chair
2016-present Primary Faculty UNC Program in Translational Medicine (T-32 Pending)
2015-present Steering Committee for MiBio Graduate Training Program (Ongoing T-32)
2015-2021 BBSP Program First Year Groups Mentor
2014-present MD-PhD Candidate Interviewer
2014-2022 Biological and Biomedical Sciences Program (BBSP) Admissions Committee
2013-present Participant in Carolina Chromatin Consortium (C3) Group

Ph.D. Thesis Committees (29 total)

Gabrielle Quickstad (Shpargel and Magnuson Group, Genetics and Molecular Biology, 2022)
Michelle Thomas (Pattenden Group, Chemical Biology and Medicinal Chemistry, 2021)
Caroline Fraser (Davis Group, Genetics and Molecular Biology, 2021)
Anthony Sanchez (Margolis Group, Chemical Biology and Medicinal Chemistry, 2020)
Yani Zhao (McGinty Group, Chemical Biology and Medicinal Chemistry, 2020)
Jie Li (Wang Group, Genetics and Molecular Biology, 2020)
Yi-En Liao (Liu Group, Chemical Biology and Medicinal Chemistry, 2020, chair)
Kenneth Guzman (James Group, Chemical Biology and Medicinal Chemistry, 2020, chair)
Kaitlyn Maffuid (Carter Group, Pharmacotherapy and Experimental Therapeutics, 2019)
Matt Bowler (Bowers Group, Chemical Biology and Medicinal Chemistry, 2019, chair)
Isabelle Engelberg (Frye Group, Chemical Biology and Medicinal Chemistry, 2019)
Hannah Wiedner (Giudice Group, Genetics and Molecular Biology, 2019)
Caroline Foley (Frye & James Group, Chemistry Department, 2018)
Megan Justice (Downen Group, Biology Department, 2018)
Nolan Brown (Brustad Group, Chemistry Department, 2018)
Spencer Nystrom (McKay Group, Genetics and Molecular Biology, 2017)
Tamara Vital (Davis Group, Genetics and Molecular Biology, 2017, chair)
Katelyn Arnold (Liu Group, Chemical Biology and Medicinal Chemistry, 2017, chair)
Michelle O'Connor (Sheikh Group, Genetics and Molecular Biology, 2016, chair)
Kelsey Lamb (Frye Group, Chemical Biology and Medicinal Chemistry, 2016, chair)
Jon Bogart (Bowers Group, Chemical Biology and Medicinal Chemistry, 2016)
Aminah Wali (Davis Group, Genetics and Molecular Biology, 2016)
Katie Bolling (Matera & Strahl Groups, Biology & Biochemistry and Biophysics, 2015, chair)
Philip Coryell (Purvis Group, Genetics and Molecular Biology, 2015)
Chris Holmquist (Marzluff Group, Chemical Biology and Medicinal Chemistry, 2015)
David Lee (Calabrese Group, Pharmacology, 2015)
Junghyun Lee (Frye Group, Chemical Biology and Medicinal Chemistry, 2015)
Doan On (Wang Group, Biochemistry and Biophysics, 2014)
Kim Barnash (Frye Group, Chemical Biology and Medicinal Chemistry, 2014)