

CURRICULUM VITAE
SARAH J HAINER, Ph.D.

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CURRENT POSITION

2018 – present **Assistant Professor**
Department of Biological Sciences, University of Pittsburgh

2021 – present **Member**
University of Pittsburgh Medical Center Hillman Cancer Center

EDUCATION

2012 **Ph.D., Molecular, Cell, and Developmental Biology** University of Pittsburgh.
Department of Biological Sciences

2007 **B.S., Molecular Biology** University of Pittsburgh.
Department of Biological Sciences

PREVIOUS POSITIONS

Sept. 2012 – **Postdoctoral Research Scholar**
Dec. 2017 Advisor: Dr. Thomas G. Fazio. Department of Molecular, Cell, and Cancer Biology,
University of Massachusetts Medical School.
The Role of esBAF in Regulating ncRNA mediated Gene Expression in ES cells.

Aug. 2007 – **Doctoral Student**
Aug. 2012 Advisor: Dr. Joseph Martens. Department of Biological Sciences, University of
Pittsburgh. *The Contribution of Chromatin and Chromatin Associated Factors to
Transcription Regulation in Saccharomyces cerevisiae*

Sept. 2004 – **Undergraduate Researcher**
Aug. 2007 Advisor: Dr. Jeffrey Lawrence. Department of Biological Sciences, University of
Pittsburgh. *The Influence of Protozoan Predation on Antigenic Diversity in Salmonella
enterica*

ACTIVE GRANTS

	<u>Years</u>	<u>Total Direct Costs</u>
Research Grant. “Investigating the role of overlapping dinucleosomes in gene regulation.” University of Pittsburgh Central Research Development Fund. Role: PI	2019 – 2021	\$18,000
R35GM133732, Research Grant. “Chromatin-mediated mechanisms of transcription regulation in ES cells.” National Institute of General Medicine, NIH, R35. Role: PI	2019 – 2024	\$1,250,000
Research Grant. “Role of FBXO24 mediated ubiquitination of FoxP1 protein in the pathogenesis and treatment of COPD” NIH, R01. Role: col	2020 – 2024	\$7,200

Research Grant. “Imaging nanoscale chromatin folding in early carcinogenesis”. National Cancer Institute, NIH, R01. Role: col	2020 – 2023	\$136,626
Research Grant. “Determining gene expression control during neural differentiation through coupled protein localization and RNA-seq in single cells” University of Pittsburgh Momentum Funds Role: PI	2021 – 2023	\$18,000

PREVIOUSLY FUNDED GRANTS

	<u>Years</u>	<u>Total Direct Costs</u>
Research Grant. “Determining the Role of the Essential Elongation Factor Spt16 in Embryonic Stem Cell Pluripotency”. Samuel and Emma Winters Foundation, Pittsburgh, PA. Role: PI	2018 – 2019	\$10,600
CDP-8895-16, Special Fellow. “Role of Nucleosome Remodeling Factors in Regulating ncRNA Expression”. Leukemia and Lymphoma Society, Career Development Grant. Role: PI.	2016 – 2019	\$185,715
New Investigator Award. “Building a network of ncRNA regulation”. Charles E. Kaufman Foundation. Role: PI	2018 – 2020	\$136,364
Research Grant. “Mechanosensitive orchestration of transcriptional program of MKL coupling to selective autophage-driven regulation of cell migration”. University of Pittsburgh Collaborative Fund. Role: co-PI	2019 – 2020	\$10,000
Research Grant. “Determining BAF complex function during neural development.” Whitehall Foundation. Role: PI	2019 – 2020	\$68,825

SUBMITTED/PENDING GRANTS

	<u>Years</u>	<u>Total Direct Costs</u>
Research Grant. “Using nanobodies to increase the sensitivity and resolution of chromatin profiling through uliCUT&RUN”. National Cancer Institute, NIH R21. Role: PI	2021 – 2024	\$200,000
Research Grant. “The prognostic significance and mechanistic determination of chromatin remodeling biomarkers in non-functional pancreatic neuroendocrine tumor” National Cancer Institute, NIH R01. Role: col	2021 – 2026	\$170,000
Research Grant. “Co-regulation of alternative lengthening of telomeres and chromatin dynamics in ATRX-DAXX deficient cancer cells” National Cancer Institute, NIH R01. Role: col	2021 – 2026	\$170,176

AWARDS AND FELLOWSHIPS

	<u>Year(s)</u>
University nominee for Pew Biomedical Scholar	2020
University nominee for Johnson&Johnson WiSTEM²D Scholars Award	2020
“Most Valuable Professor” , Awarded by University of Pittsburgh Women’s Diving Team	2020
University nominee for Edward Mallinckrodt, Jr Foundation Scholar Program	2019
University nominee for Johnson&Johnson WiSTEM²D Scholars Award	2019
University nominee for Packard Fellowships for Science and Engineering	2019
Nominee for Arnold and Mabel Beckman Foundation Young Investigator Award	2018
Leukemia and Lymphoma Special Fellow , Postdoctoral Fellowship/Transition Award	2016 – 2019
Leukemia and Lymphoma Fellow , Postdoctoral Fellowship Award	2013 – 2016
Postdoctoral Training Program Fellowship (T32) , Postdoctoral Fellowship at the University of Massachusetts Medical School	2012 – 2013
Andrew P. Mellon Predoctoral Fellowship , Mellon Foundation	2011 – 2012

Mary P. Edmonds Graduate Student Award , University of Pittsburgh, Department of Biological Sciences	2011
Outstanding Presentation Award , University of Pittsburgh, Dietrich School of Arts and Sciences	2011
Honorable Mention for Poster and Poster Presentation , Pennsylvania State University Summer Symposium on Chromatin and Epigenetics	2011
Pisum Prize Poster Award . University of Pittsburgh, Department of Biological Sciences	2010
Samuel D. Colella Award for Undergraduate Research . University of Pittsburgh, Department of Biological Sciences	2006

PUBLICATIONS

- BJ Patty and **SJ Hainer**. Transcription factor chromatin profiling genome-wide using uliCUT&RUN in single cells and individual blastocysts. *Nature Protocols*; In Press
- BJ Patty and **SJ Hainer**. Non-Coding RNAs and Nucleosome Remodeling Complexes: An Intricate Regulatory Relationship. *Biology*. 2020 August 6; 9(8): 213.
- K Troy, Y Liu*, **SJ Hainer***. PathSTORM: a road to early cancer detection. *Molecular & Cellular Oncology* 2020; 7:5
*denotes co-corresponding authors
- SJ Hainer*** and CD Kaplan*. Specialized RSC: substrate specificities for a conserved chromatin remodeler. *BioEssays*. 2020 July; 42(7):e2000002
*denotes co-corresponding authors
- J Xu, H Ma, H Ma, W Jiang, M Duan, S Zhao, C Gao, E-R Hahm, **SM Lardo**, **K Troy**, M Sun, R Pai, DB Stolz, S Singh, RE Brand, DJ Hartman, J Hu, **SJ Hainer***, Y Liu*. Super-resolution imaging reveals the evolution of higher-order chromatin folding in early carcinogenesis. *Nature Communications*, 2020 April 20; 11(1): 1899
*denotes co-corresponding authors
- NA Fraunhofer, N Agarwal, K Takeishi, A Ostrowska, AC l'Hortet, J Guzman-Lepe, K Morita, **K Troy**, WM Mars, S Paranjpe, GK Michalopoulos, A Bell, **SJ Hainer**, IJ Fox, A Soto-Gutierrez Cellular location of HNF4a is linked with terminal liver failure in humans. *Hepatology Communications*, 2020 April 21; 4(6):859-875
- DC Klein and **SJ Hainer**. Chromatin Regulation and Dynamics in Stem Cells. *Current Topics in Developmental Biology*, 2020;138:1-71
- DC Klein and **SJ Hainer**. Genomic Methods in Profiling DNA Accessibility and Factor Localization. *Chromosome Res*, 2020 Mar; 28 (1): 69-85
- C Tavera-Montanez*, **SJ Hainer***, D Cangussu, SJV Gordon, Y Xiao, P Reyes-Gutierrez, AN Imbalzano, JG Navea, TG Fazzio, T Padilla-Benavides. The classic metal-sensing transcription factor MTF1 promotes myogenesis in response to copper. *FASEB J*. 2019 Dec; 33(12):14556-14574
*denotes co-first authors
- SJ Hainer***, A Boskovic, KN McCannell, OJ Rando, TG Fazzio*. Profiling of pluripotency factors in individual stem cells and early embryos. *Cell*. 2019 May 16; 177(5):1319-1329
*denotes co-corresponding authors

SJ Hainer* and TG Fazio*. "High Resolution Chromatin Profiling using CUT&RUN". Current Protocols Molecular Biology. 2019 April;126(1):e85

*denotes co-corresponding authors

Publications Prior to University of Pittsburgh Appointment:

- D Acharya, **SJ Hainer**, Y Yoon, F Wang, I Bach, JA Rivera-Perez, TG Fazio. KAT-independent gene regulation by Tip60 promotes ESC self-renewal but not pluripotency. Cell Reports. 2017 19: 671-679
- SJ Hainer**, KN McCannell, J Yu, L Ee, LJ Zhu, OJ Rando, TG Fazio. DNA methylation directs genomic localization of Mbd2 and Mbd3 in ES cells. Elife. 2016 Nov 16;5.
- SJ Hainer** and JA Martens. Regulation of chaperone binding and nucleosome dynamics by key residues within the globular domain of histone H3. Epigenetics & Chromatin. 2016 Apr 30;9:17.
- SJ Hainer** and TG Fazio. Regulation of Nucleosome Architecture and Factor Binding Revealed by Nuclease Footprinting of the ESC Genome. Cell Reports. 2015 Oct 6;13(1):61-9
- SJ Hainer**, W Gu, BR Carone, BL Landry, OJ Rando, CC Mello, TG Fazio. Suppression of pervasive noncoding transcription in embryonic stem cells by esBAF. Genes & Dev. 2015 Feb 15;29(4): 362-378
- PB Chen, LJ Zhu, **SJ Hainer**, KN McCannell, TG Fazio. Unbiased chromatin accessibility profiling by RED-seq uncovers unique features of nucleosome variants in vivo. BMC Genomics. 2014 15:1104
- BR Carone, JH Hung, **SJ Hainer**, MT Chou, DM Carone, Z Weng, TG Fazio, OJ Rando. High-resolution mapping of chromatin packaging in mouse embryonic stem cells and sperm. Dev Cell. 2014 Jul 14: 11-22
- SJ Hainer**, BA Charsar, SB Cohen, JA Martens. Identification of mutant versions of the Spt16 histone chaperone that are defective for transcription-coupled nucleosome occupancy in *Saccharomyces cerevisiae*. G3 (Bethesda). 2012 May 2:555-567
- JA Pruneski, **SJ Hainer**, KO Petrov, JA Martens. The Paf1 complex represses *SER3* transcription in *Saccharomyces cerevisiae* by facilitating intergenic transcription-dependent nucleosome occupancy of the *SER3* promoter. Eukaryotic Cell. 2011 Oct;10(10):1283-94
- SJ Hainer** and JA Martens. Identification of histone mutations that are required for transcription-coupled nucleosome occupancy. Mol Cell Biol. 2011 Sep;31(17):3557-68
- SJ Hainer** and JA Martens. Transcription of ncDNA across regulatory sequences: many roads lead to local gene regulation. Transcription. 2011 May/June 2(3):120-123
- SJ Hainer**, JA Pruneski, RD Mitchell, R Monteverde, JA Martens. Intergenic transcription causes repression by directing nucleosome assembly. Genes & Dev. 2011 Jan 1;25(1):29-40

POPULAR PRESS

Profiling of pluripotency factors in individual stem cells and early embryos **F1000 prime**, January 20, 2020
<https://f1000.com/prime/735454597?key=6BinNspQcDOrOS>

"**uliCUT&RUN maps protein binding on chromatin in single cells and single embryos**", EurekAlert!. April 8, 2019. https://eurekalert.org/pub_releases/2019-04/uop-ump040819.php

INVITED PRESENTATIONS

University of Oregon. To be given May 2021

Wesleyan University. March 2021

Indiana University School of Medicine. February 2021

Hillman Cancer Center, University of Pittsburgh. February 2021

Fragile Nucleosome Virtual Seminar Series. October 2020

Duquesne University. October 2020

Indiana University, Bloomington. To be given September 2020 **cancelled due to COVID-19*

Cold Spring Harbor Laboratories Course on Chromatin, Epigenetics, and Transcription, Guest lecture. To be given July 2020 **cancelled due to COVID-19*

Keystone Symposia: Gene Regulation from Mechanism to Disease. January 2020
Human Genetics Department, University of Pittsburgh. November 2019
Michigan State University. October 2019
Cold Spring Harbor Laboratories Meeting Mechanisms of Eukaryotic Transcription, August 2019
Penn State Molecular Biology Symposium on Chromatin and Epigenetic Regulation of Transcription, July 2019
Pittsburgh Local Nucleic Acids Meeting, Carnegie Mellon University. May 2019
The Epigenome Across the Lifespan, University of Pittsburgh. May 2019
University of the Sciences in Philadelphia. April 2019
Computational and Systems Biology Department, University of Pittsburgh. January 2019
Lynch Syndrome Focus Group, University of Pittsburgh. January 2019
School of Engineering/Biological Sciences collaborative symposium, University of Pittsburgh. Dec 2018
School of Medicine/Biological Sciences collaborative symposium, University of Pittsburgh. May 2018
Pittsburgh Area Chromatin Symposium, University of Pittsburgh. May 2018
Magee-Womens Research Institute, University of Pittsburgh. March 2018

CONFERENCE POSTER PRESENTATIONS

Keystone Symposia: Gene Regulation from Mechanism to Disease, Denver, CO, USA. January 2020
Keystone Symposia: Gene Control in Development Disease, British Columbia, Canada. March 2018
Cold Spring Harbor Laboratories Systems Biology Conference, New York, USA. March 2018

PROFESSIONAL SERVICE

Editorial Board(s), Guest Editorships, Advisory Boards

Editorial Advisory Board, *Chromosome Research* 2018 – current
Early Career Reviewer, *eLife* 2018 – 2019

Grant Reviews:

NIH NCI Review Panel ZCA TCRB-J(J1), Nov 2020
MRC, 2020 (1)

Manuscript Reviews:

Journal of Cell Biology, 2021 (1); Cell Reports, 2021 (1); eLife, 2021 (1); Nucleic Acids Research, 2020 (1);
Genome Research, 2020 (1); Nature Reviews Methods Primer, 2020 (1); Chromosome Research, 2020 (1);
PLoS Genetics, 2020 (1); Cell Reports, 2020 (1); Trends in Biochemical Sciences, 2020 (1); Genetics, 2020
(1); Nature Communications, 2020 (2); Nature Structure Molecular Biology, 2020 (1); BMC Genomics, 2020
(1); Nature, 2019 (1); Nucleic Acids Research, 2019 (2); WIREs System Biology and Medicine, 2019 (1);
Nature Communications, 2019 (1); PLoS Biology, 2019 (1)

UNDERGRADUATE-LEVEL TEACHING SINCE APPOINTMENT

Instructor: Department of Biological Sciences Genomics (BIOSC1275), University of Pittsburgh, January 2021-April 2021.

Instructor: Department of Biological Sciences Genomics (BIOSC1275), University of Pittsburgh, January 2020-April 2020.

GRADUATE-LEVEL TEACHING SINCE APPOINTMENT

Guest Lecturer: Department of Biological Sciences Graduate Genomic Course, University of Pittsburgh, February 25, 2021. "Genome-wide epigenetic profiling methods". 1 Lecture, 1 hour.

Guest Lecturer: Department of Biological Sciences Graduate Seminar Course, University of Pittsburgh, November 16, 2020. "Bias in academic science". 1 Lecture, 1 hour.

Guest Lecturer: Department of Biological Sciences Graduate Genomic Course, University of Pittsburgh, October 1, 2018. "Genome-wide epigenetic profiling methods". 1 Lecture, 2 hours.

TEACHING PRIOR TO APPOINTMENT

Teaching Assistant, Department of Biological Sciences, University of Pittsburgh.
Introduction to Biology Laboratory II. Summer 2012. Duties: Lab setup and instruction

Teaching Assistant, Department of Biological Sciences, University of Pittsburgh.
Introduction to Biology Laboratory I. Summer 2012. Duties: Lab setup and instruction

Teaching Assistant, Department of Biological Sciences, University of Pittsburgh.
Virology Laboratory. Fall 2010. Duties: Lab setup and instruction

LAB PERSONNEL AND ACTIVITIES

Current Personnel	Position	Start Date
Jasmine Dioguardi	Human Genetics Masters Student	March 2021
Braulio Bonilla	Postdoctoral Researcher	January 2021
Emily Brown	Research Specialist II	August 2020
Cailin Jordan	Undergraduate Researcher	May 2019
Sarah Tripplehorn	MCDB PhD Student (Joint with K. Arndt)	April 2019
Benjamin Patty	MCDB PhD Student	April 2019
Santana Lardo	Research Specialist II	June 2018
David Klein	MCDB PhD Student	February 2018

Previous Personnel	Position	Dates	Subsequent positions (most recent listed last)
Charles Agbavor	Rotation Student	October 2020 – February 2021	PhD in L. Cahoon Lab
Rody Kingston	Rotation Student	August 2020 – October 2020	
Lisa Coe	Undergraduate Researcher	January 2018 – August 2020	Research Tech
Dominic Hendrickson	Undergraduate Researcher	February 2018 – August 2020	MA at Pitt Public Health
Christine Troy	Research Specialist II	April 2018 – August 2020	PhD at UC MERCED
Kayla Komondor	Rotation Student	February 2020 – April 2020	PhD in A. Carlson Lab
Sanchirmaa Namjilsuren	Rotation Student	February 2020 – April 2020	PhD in K. Arndt Lab
Mitchell Lesko	Rotation Student	August 2019 – November 2019	PhD in J. Durrant/A. O'Donnell Labs
Alex Francette	Rotation Student	February 2019 – April 2019	PhD in K. Arndt Lab
Shunran Zhang	Rotation Student	November 2018 – February 2019	Exited Program
Caleb Kim	Undergraduate Researcher	February 2018 – July 2018	Undergraduate student

Student Research Fellowships	Name/Position	Year(s)
T32 Training Program	Sarah Tripplehorn, Graduate Student	2020 – 2021
National Science Foundation (NSF) GRFP	Ben Patty, Graduate Student	2020 – 2023
Norman H. Horowitz Fellowship	Cailin Jordan, Undergraduate	2019 – 2020
HHMI Summer Research Fellowship. Department of Biological Sciences, University of Pittsburgh.	Cailin Jordan, Undergraduate	Summer, 2019
HHMI Summer Research Fellowship. Department of Biological Sciences, University of Pittsburgh.	Lisa Coe, Undergraduate	Summer, 2018

SERVICE:

Workshops, Panels, and Events (organized and given):

Inclusion in Academic Science, eLife Wednesday ECR series, February 2021

Speaker

Women in Science Day Panel, Department of Biological Sciences, University of Pittsburgh, February 2021

Organized event

How to interview for graduate school, Department of Biological Sciences, University of Pittsburgh, January 2021

Organized event with Jessica Wandelt

Attendance to ABRCMS, Department of Biological Sciences, University of Pittsburgh, November 2020

Organized and lead Departmental attendance

Bias and Inclusion in Academic Science, RNA Rustbelt Meeting Diversity Panel, October 2020

Speaker

Inclusion in Academic Science, Donders Research Institute Radboud University, Netherlands, September 2020

Speaker

Departmental Book Club: Superior, Department of Biological Sciences, University of Pittsburgh August 2020

Developed and co-led event (with Jahree Sosa)

Inclusion in Academic Science, University of Pittsburgh Diversity Forum, July 2020

Speaker

Women in Science Day Celebration, Department of Biological Sciences, University of Pittsburgh, February 2020

Organized event

University committees:

Committee	Role	Academic Year(s)
Integrative Systems Biology Graduate Recruiting Committee	Member	2020 – 2021
Integrative Systems Biology Graduate Recruiting Committee	Member	2019 – 2020

Departmental committees:

Committee	Role	Academic Year(s)
Committee on Diversity, Inclusion, and Equity	Member	2020 – 2021

Graduate Fellowship Committee	Member	2020 – 2021
Committee Diversity Initiatives	Member	2019 – 2020
Graduate Fellowship Committee	Member	2019 – 2020
HHMI Oversight Committee	Member	2018 – 2019

Dissertation committees (University of Pittsburgh Department of Biological Sciences):

Student	Role	Purpose	P.I.	Program	Dates
Etan Dieppa	Member	HMB Committee	n/a	HMB	Fall 2020 – Spring 2021
Leah Cabo	Member	Comps/Thesis	Boyle	MCDB	Fall 2020 – Present
Karen Peralta Martinez	Chair	Comps/Thesis	Kohl	MCDB	Fall 2020 – Present
Shenyu Shu	Member	Comps/Thesis	Gao	ISB	Spring 2020 – Present
Yunye Zhu	Chair	PhD Thesis	Kaplan	MCDB	Spring 2019 – Present
Alex Francette	Member	Comps/Thesis	Arndt	MCDB	Fall 2019 – Present
Payal Arora	Member	Comps/Thesis	Kaplan	MCDB	Fall 2019 – Present
Madeline Torres	Member	HMB committee	n/a	HMB	Fall 2019 – Spring 2020

External Dissertation committees:

Student	Role	Purpose	P.I.	Program	Date
Jasmina Al-Mousawi	External Examiner	Masters Thesis	Josh Brickman	Univ of Copenhagen	Fall 2020

Diversity Initiatives:

Intersectionality Initiative Lead, Early Career Group eLife Community Ambassador April 2019 – June 2020

Blog for inclusion in science: <https://eclife.org/intersectionality-what-it-means/>

Guidelines for inclusive practices: <https://osf.io/muk7v/>

Template for lab document: <https://osf.io/2xn6z/>

Slides and script for inclusion in academic science:

https://figshare.com/articles/presentation/Intersectionality_In_Science_pptx/12616712/2

Article on Fair Funding: <https://doi.org/10.38126/JSPG180105>

Blog discussing women in science: <https://eclife.org/invisible-woman/>

Article on writing supportive and effective reference letters: <http://doi.org/10.1111/febs.15757>

Article on effectively navigating mentee/mentor relationship: <http://doi.org/10.1111/febs.15823>

Professional Development (attended):

Ethical Use of Power, University of Pittsburgh, To attend June 2021

Solving Problems and Ethical Dilemmas, University of Pittsburgh, To attend May 2021

Silence (Not Golden): Dissent and Consensus in the Workplace, University of Pittsburgh, To attend May 2021

Principles and Practices of Servant Leadership, University of Pittsburgh, To attend April 2021

Understanding Russia, University of Pittsburgh, To attend April 2021

Understanding Korea, University of Pittsburgh, October 2020

Developmental Model of Intercultural Sensitivity and the IDI Assessment Tool, University of Pittsburgh, June 2020

Understanding India, University of Pittsburgh, May 2020

Veterans on Campus: Understanding Resources and Opportunity, University of Pittsburgh, May 2020

Supporting Trans and Non-Binary Community Members, University of Pittsburgh, April 2020

Religion Diversity: Challenging Assumptions to Advance Inclusion, University of Pittsburgh, December 2019

Microaggression: Recognizing and Challenging a Subtle Form of Bias, University of Pittsburgh, May 2019

Different Like You: Recognizing Stereotypes and Removing Barriers, University of Pittsburgh, December 2018
Workplace Bullying: Understanding a Barrier to Equal Opportunity, University of Pittsburgh, November 2018
Preventing Sexual Misconduct, University of Pittsburgh, November 2018
Gender Theory, Gender Diversity, and Trans-Inclusive Spaces, University of Pittsburgh, November 2018
Intercultural Competency: Beyond the Basics, University of Pittsburgh, November 2018
Baby Boomers to Millennials: Respect and Productivity in the Workplace, University of Pittsburgh, October 2018
Fostering a Diverse and Inclusive Environment: The Why and How, University of Pittsburgh, October 2018