Alexander J. Federation

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EDUCATION

Harvard University
Cambridge, MA
Ph.D. Chemical Biology, 2015
Certificate in Human Biology and Translational Medicine

University of Rochester
Rochester, NY
B.S. Chemistry, B.S. Cell & Developmental Biology, 2011
Magna Cum Laude

RESEARCH EXPERIENCE

Postdoctoral Fellow
Altius Institute for Biomedical Research, University of Washington
Seattle, WA
2016-present
Advisors: John Stamatoyannopoulos, Michael MacCoss

Graduate Student
Dana Farber Cancer Institute
Boston, MA
2011-2015
Advisor: James Bradner
Thesis: Development of chemical and computational tools to study transcriptional regulation

Undergraduate Student
University of Rochester
Rochester, NY
2008-2011
Advisor: Bradley Nilsson
Thesis: Peptide-based antagonists of amyloid-β aggregation

Summer Research Fellow
Johns Hopkins University
Baltimore, MD
2009
Advisor: Kalina Hristova
Project: Development of antagonists for the FGFR family

PUBLICATIONS

*denotes co-authorship

19. **Federation AJ***, Polaski DR*, Lin CL, Ott CJ, Fan A, Bradner JE. Identification of central transcription factors in gene regulatory networks assembled from super enhancer linkage networks. *BioArxiv.*

18. Tatetsu H, Armant M, Wang F, Gao C, Ueno C, **Federation AJ**, Qi J, Bradner JE, Tenen D, Chai L. Maintenance and enhancement of human PBSC engraftment after ex vivo culture via an HDACi/SALL4 axis. *In Review.*

17. **Federation AJ**, Searle B, Howard N, Kutavyn T, MacCoss MA, Stam JA. Quantification of nuclear proteome dynamics with label-free chromatin fractionation. *BioArxiv.*

16. Zhang Y, **Federation AJ**, Kim S, Lun M, O'Keefe J, Brown J, and Steinhauser M. Adipocyte progenitor quiescence is regulated by a transcriptional network that includes Nr4a1. *Accepted*

15. Ott CJ*, **Federation AJ***, Kasar S, Kiltgaard JL, Lenci R, Fernandez SM, Souza A, Freedman ML, Brown JR, Bradner JE. Enhancer architecture and essential core regulatory circuitry of chronic lymphocytic leukemia. *Cancer Cell,* In press (2018).

14. Feldman ZB, Doherty SP, Reyes JM, Rahl PB, Lin CY, Sheng Q, Duan Q, **Federation AJ**, Kung AL, Haldar SM, Young RA, Plutzky J, Bradner JE, Brown J. BET bromodomain proteins regulate enhancer function during adipogenesis. *PNAS,* In press (2018).

13. Mack SC, Pajtler KW, Chavez L, Okonechnikov K, Bertrand KC , Wang X, Erkek S, **Federation A**, Song A, Lee C, Wang X, McDonald L, Morrow JJ, Saiakhova A, Sin-Chan P, Wu Q, Michaelraj AK, Miller TE, Hubert CG, Ryzhova M, Garzia L, Donovan L, Dombrowski S, Factor DC, Luu B, Valentim CLL, Gimple RC, Morton A, Kim L, Prager BC, Lee JJY, Wu X, Zuccaro J, Thompson Y, Holgado BL, Reimand J, Ke SQ, Tropper A, Lai S, Vijayarajah S, Doan S, Mahadev V, Miñan AF, Gröbner SN, Lienhard M, Zapatka M, Huang Z, Aldape KD, Carcaboso AM, Houghton PJ, Keir ST, Milde T, Witt H, Li Y, Li CJ, Bian XW, Jones DTW, Scott I, Singh SK, Huang A, Dirks PB, Bouffe P, Bradner JE, Ramaswamy V, Jabado N, Rutka JT, Paul Northcott PA, Lupien M, Lichter P, Korshunov A, Scacheri PC, Pfister SM, Kool M, Taylor MD, Rich JN. Therapeutic targeting of ependymoma as informed by oncogenic enhancer profiling. *Nature,* 553, 101–105 (2017).

12. Cheng J, Park D, Berrios C, White E, Arora R, Yoon R, Branigan T, Xiao T, Westerling T, **Federation A**, Zeid R, Strober B, Swanson S, Florens L, Bradner J, Brown M, Howley P, Padi M, Washburn M, DeCaprio JA. Merkel cell polyomavirus recruits MYCL to the EP400 complex to promote oncogenesis. *PLOS Pathogens,* 13(10): e1006668 (2017).

11. Zhang H, Qi J, Reyes JM, Li L, Rao PK, Li F, Lin CY, Perry JA, Lawlor MA, **Federation AJ**, De Raedt T, Li YY, Liu Y, Duarte MA, Zhang Y, Herter-Sprie GS, Kikuchi E, Carretero J, Perou CM, Reibel JB, Paulk J, Bronson RT, Watanabe H, Fillmore CM, Kim CF, Hammerman PS, Brown M, Cichowski K, Long H, Bradner JE, Wong KK. Oncogenic deregulation of EZH2 as an opportunity for targeted therapy in lung cancer. *Cancer Discovery,* Sep;6(9):1006-21 (2016).

10. Bandopadhayay P, Ramkissoon LA, Jain P, Bergthold G, Wala J, Zeid R, Schumacher SE, Urbanski L, O'Rourke R, Gibson WJ, Pelton K, Ramkissoon SH, Han HJ, Zhu Y, Choudhari N,

Silva A, Boucher K, Henn RE, Kang YJ, Knoff D, Paolella BR, Gladden-Young A, Varlet P, Pages M, Horowitz PM, **Federation AJ**, Malkin H, Tracy AA, Sara Seepo3, Matthew Ducar10,16, Paul Van Hummelen16, Santi, Buccoliero AM, Scagnet M, Bowers DC, Giannini C, Puget S, Hawkins C, Tabori U, Klekner A, Bognar L, Burger PC, Eberhart C, Rodriguez FJ, Hill DA, Mueller S, Haas-Kogan DA, Phillips JJ, Santagata S, Stiles CD, Bradner JE, Jabado N, Goren A, Grill J, Ligon AH, Goumnerova L, Waanders AJ, Storm PB, Kieran MW, Ligon KL, Beroukhim R, Resnick AC. MYB-QKI rearrangements in angiocentric glioma drive tumorigenicity through a tripartite mechanism. *Nature Genetics*, 48, 3, 273-82 (2016).

9. Lin CY, Erkek S, Kawauchi D, **Federation AJ**, Zeid R, Zapatka M, Worst B, Warnatz HJ, Waszak S, Jones DTW, Kool M, Hovestadt V, Buchhalter I, Sieber L, Johann P, Risch T, Amstislavskiy V, Yaspo ML, Lehrach H, Ryzhova M, Korshunov A, Elis R, Lichter P, Korbel JO, Pfister SM, Bradner JE, Northcott PA. Medulloblastoma Regulatory Circuitries Reveal Subgroup-Specific Cellular Origins. *Nature*, 530, 7588, 57-62 (2016).

8. St Andre V*, **Federation AJ***, Lin CL, Abraham BJ, Fan A, Lee TI, Bradner JE, Young RA. Core Transcriptional Circuitries of Human Cells. *Genome Research*, 26, 3, 385-96 (2016).

7. Pefanis E, Wang, J, Rothschild G, Lim J, Kazadi D, Sun J, **Federation AJ**, Chao J, Elliott O, Liu ZP, Economides AN, Bradner JE, Rabadan R, Basu U. RNA Exosome-Regulated Long Non-Coding RNA Transcription Controls Super- Enhancer Activity. *Cell*, 161, 774-489 (2015).

6. Yi JS*, **Federation AJ***, Qi J*, Dhe-Paganon S, Hadler M, Xu X, St Pierre R, Varca A, Wu L, Marineau JJ, Smith WB, Souza A, Chory EJ, Armstrong SA, Bradner JE. Structure-Guided DOT1L Probe Optimization by Label-Free Ligand Displacement. *ACS Chem Bio*, 10, 667-674 (2015).

5. Meng F*, Du Z*, **Federation AJ***, Jiazhi H, Meyers RM, Wasserman CR, Neuberg D, Bradner JE, Liu XS, Alt FW. Convergent Sense/Antisense Transcription at Intragenic Super-Enhancers Targets AID-initiated Genomic Instability. *Cell*, 159, 1538-1548 (2014),

4. Brown JD, Lin CY,Duan Q ,Griffin G, **Federation AJ**, Paranal RM, Bair S, Newton G,Lichtman A, Kung A, Yang T, Wang H, Luscinskas FW, Croce K, Bradner JE, Plutzky J. NF-κB Directs Dynamic Super Enhancer Formation in Inflammation and Atherogenesis. *Molecular Cell*, 52, 219-231 (2014).

3. **Federation AJ**, Bradner JE, Meissner A. The Use of Small Molecules in Somatic-Cell Reprogramming. *Trends in cell biology*, 24, 179-87 (2014).

2. Yu W, Chory EJ, Wernimont AK, Tempel W, Scopton A, **Federation AJ**, Marineau JJ, Qi J, Barsyte-Lovejoy D, Yi J, Marcellus R, Iacob RE, Engen JR, Griffin C, Aman A, Wienholds E, Li F, Pineda J, Estiu G, Shatseva T, Hajian T, Al- Awar R, Dick JE, Vedadi M, Brown PJ, Arrowsmith CH, Bradner JE, Schapira M. Catalytic Site Remodeling of the DOT1L Methyltransferase by Selective Inhibitors. *Nature Communications*, 3, 1288 (2012).

1. Bowerman CJ, Liyanage W, **Federation AJ**, Nilsson BL. Tuning β-sheet Peptide Self-Assembly and Hydrogelation Behavior by Modification of Sequence Hydrophobicity and Aromaticity. *Biomacromolecules*, 12, 2735-2745 (2011).

PATENTS

4. **Federation AJ**, MacCoss MJ, Stamatoyannopoulos JA. Isolation and characterization of the nuclear proteome. *Pending.*

3. Bradner JE, Qi J, **Federation AJ**, Jacobson ZE, Varca AC. Small molecule chromobox inhibitors. *PCT/US2017/053229.*

2. Bradner JE, Qi J, **Federation AJ**. DOT1L Probes. *PCT/US2014/048375.*

1. Chai L, Tatetsu H, Tenen DG, Bradner JE, **Federation AJ**. Compositions and Methods for Ex-Vivo Expansion of Human Hematopoietic Stem/Progenitor Cells. *PCT/US2015/022557.*

FUNDING

2017-2019	American Cancer Society Postdoctoral Fellowship
2016-2018	Altius Fellowship
2013-2015	National Institutes of Health R21 (PI: James Bradner)
2011-2015	National Science Foundation Graduate Research Fellowship
2011-2015	Harvard University Ashford Interdisciplinary Research Fellowship
2010-2011	DeKiewiet Fellowship for Undergraduate Research
2009	NSF Research Experience for Undergraduates, Johns Hopkins University
2008	NSF Research Experience for Undergraduates, University of Rochester

AWARDS AND HONORS

2011	American Chemical Society Award for Excellence in Chemistry
2011	Phi Beta Kappa
2010	University of Rochester Award for Athletic and Academic Achievement
2009-2010	University Athletic Association All-Academic Team
2008	Merck Index Excellence in Organic Chemistry Award
2007	University of Rochester Bausch and Lomb Scientific Achievement Award

COMPUTATIONAL EXPERIENCE

Languages: Python, R, Bash
Modeling: PyMol, Coot, Schrodinger Suite
Online Learning: Machine Learning Certificate, University of Washington

TEACHING

Bioinformatics Techniques for Epigenomics Data
Instructor, 2015

Drug Development, from Concept to Commercialization
Course Director, 2012-2014

Modern Approaches in Drug Discovery
Teaching Fellow, 2013

Principles of Drug Action in Man
Teaching Fellow, 2013

Organic Chemistry I
Teaching Assistant, 2010-2011

Organic Chemistry II
Teaching Assistant, 2010-2011

Cell Biology
Teaching Assistant, 2011

Honors Introductory Biology
Teaching Assistant, 2009-2010

OUTREACH

Journal of Emerging Investigators
Editor, 2012-2015
A journal for young scientists to share their original work in a peer reviewed setting and learn about the scientific publication process

University of Rochester High School Summer Research Experience
Founder and Director, 2008-2011
A summer program designed to give local high school students, typically unrepresented in the sciences, a paid summer internship to do research in a field of interest. A collaboration between the University of Rochester and the Rochester City Schools.

MENTORING EXPERIENCE

Date	Mentee	Current Position
2018-present	Natalie Perez	Undergraduate Intern, *Altius Institute*
2016-2018	Nicholas Howard	Research Associate, *Altius Institute*
2016-present	Tanya Kutyavin	Research Associate, *Altius Institute*
2013-2015	Zoe Jacobson	Research Associate, *Tenya Therapeutics*
2014	Daniel Kaser	Attending Physician, *Brigham and Women's*
2012-2013	Raymond Paranal	Graduate Student, *Harvard University*

INVITED TALKS

9. American Society for Mass Spectrometry Conference (2017)
8. Dana Farber Hematologic Neoplasia Immunologic Therapies Seminar (2014)
7. Dana Farber Center for Functional Cancer Epigenetics (2014)
6. Harvard Department of Systems Biology (2014)
5. Broad Institute Therapeutics Program (2014)
4. Dana Farber Department of Medical Oncology (2013)
3. Harvard Chemical Biology Program (2013)
2. Leder Human Biology Program (2013)
1. HHMI Translational Research Retreat (2013)

POSTER PRESENTATIONS

19. Keystone Conference on Gene Control (2019)
18. Cold Spring Harbor Meeting on Systems Biology (2018)
17. American Society for Mass Spectrometry Conference (2017)
16. Keystone Meeting on Rare Diseases (2017)
15. GlaxoSmithKline Postdoctoral Retreat (2016)
14. Epigenomics Conference (2016)
13. Keystone Meeting in Epigenetics and Cancer (2015)
12. HHMI Translational Research Retreat (2014)
11. Leder Human Biology Symposium (2014)
10. Harvard Chemical Biology Retreat (2013)
9. Keystone Meeting in Epigenetics and Cancer (2013)
8. Leder Human Biology Symposium (2012)
7. Smith Family Foundation Research Awards (2012)
6. American Chemical Society Research Symposium (2011)
5. University of Rochester Research Exposition (2010)
4. Johns Hopkins Medical School Research Exposition (2009)
3. University of Rochester Research Exposition (2008)
2. University of Rochester Department of Chemistry (2008)
1. Naval Research Symposium (2007)