

Robert K. Bradley, Ph.D.

Fred Hutchinson Cancer Research Center
1100 Fairview Avenue North
Mailstop: M1-B514
Seattle, WA 98109-1024

(206) 667-5662
rbradley@fredhutch.org
<http://bradleybiology.org/>

EDUCATION

University of California, Berkeley 2008
Ph.D. in Biophysics

Princeton University 2004
A.B. in Physics with Highest Honors

PROFESSIONAL EXPERIENCE

Associate Member, Fred Hutchinson Cancer Research Center 2015 – present
Assistant Member, Fred Hutchinson Cancer Research Center 2011 – 2015
Computational Biology Program, Public Health Sciences Division
Basic Sciences Division

Postdoctoral Fellow, Massachusetts Institute of Technology 2009 – 2011
Department of Biology

Postdoctoral Associate, University of California, Berkeley 2008 – 2009
Department of Molecular & Cellular Biology and Department of Mathematics

HONORS AND AWARDS

Leukemia & Lymphoma Society Scholar 2017 – 2022

Fred Hutchinson President's Young Investigator Award 2016

Ellison Medical Foundation New Scholar 2013 – 2017

Damon Runyon Cancer Research Foundation Dale F. Frey Scientist 2012 – 2014

Damon Runyon Cancer Research Foundation Postdoctoral Fellow 2009 – 2011

NSF Graduate Research Fellow 2005 – 2008

ITO Foundation Fellow 2004 – 2005

Highest Honors, Princeton University 2004

Kusaka Memorial Prize in Theoretical Physics, Princeton University 2004

Kusaka Memorial Prize in Physics, Princeton University 2003

PUBLICATIONS (reverse chronological order)

1. Fei DL, Zhen T, Durham B, Ferrarone J, Zhang T, Garrett L, Yoshimi A, Abdel-Wahab O, **Bradley RK**, Liu P, and Varmus H (2018). Impaired hematopoiesis and leukemia development in mice with a conditional knock-in allele of a mutant splicing factor gene *U2af1*. PNAS doi:10.1073/pnas.1812669115.
2. Lee SC*, North K*, Kim E*, Jang E, Obeng E, Lu SX, Liu B, Inoue D, Yoshimi A, Ki M, Yeo M, Zhang XJ, Kim MK, Cho H, Chung YR, Taylor J, Durham BH, Kim YJ, Pastore A, Monette S, Palacino J, Seiler M, Buonamici S, Smith PG, Ebert BL, **Bradley RK**[†], Abdel-Wahab[†] (2018). Synthetic lethal and convergent biological effects of cancer-associated spliceosomal gene mutations. *Cancer Cell* 34:225-241. *co-first authors; [†]co-corresponding authors
3. Chang C-J, Kotini AG, Olszewska M, Georgomanoli M, Teruya-Feldstein J, Sperber H, Sanchez R, DeVita R, Martins TJ, Abdel-Wahab O, **Bradley RK**, Papapetrou EP (2018). Dissecting the contributions of cooperating gene mutations to cancer phenotypes and drug responses with patient-derived iPSCs. *Stem Cell Reports* 10:1610-1624.
4. Pineda JMB, **Bradley RK** (2018). Most human introns are recognized via multiple and tissue-specific branchpoints. *Genes & Development* 32:577-591.
5. Jagannathan S, **Bradley RK** (2017). Congenital myotonic dystrophy—an RNA-mediated disease across a developmental continuum. *Genes & Development* 31:1067-1068.
6. Feng Q, Jagannathan S, **Bradley RK** (2017). The RNA surveillance factor UPF1 represses myogenesis via its E3 ubiquitin ligase activity. *Molecular Cell* 67:239-251.
7. Fei DL[†], Motowski H, Chatrikhi R, Prasad S, Yu J, Gao S, Kielkopf CL[†], **Bradley RK**[†], Varmus H[†] (2016). Wild-type U2AF1 antagonizes the splicing program characteristic of U2AF1-mutant tumors and is required for cell survival. *PLoS Genetics* 12:e1006384. [†]co-corresponding authors
8. Uo T, Dvinge H, Sprenger CC, **Bradley RK**, Nelson PS, Plymate SR (2016). Systematic and functional characterization of novel androgen receptor variants arising from alternative splicing in the ligand-binding domain. *Oncogene* 36:1440-1450.
9. Jagannathan S, **Bradley RK** (2016). Translational plasticity facilitates the accumulation of nonsense genetic variants in the human population. *Genome Research* 26:1639-1650.
10. Jagannathan S*, Shadle S*, Resnick R, Snider L, Tawil RN, van der Maarel SM, **Bradley RK**[†], Tapscott SJ[†] (2016). Model systems of DUX4 expression recapitulate the transcriptional profile of FSHD cells. *Human Molecular Genetics* 25:4419-4431. *co-first authors; [†]co-corresponding authors
11. Dvinge H*, Kim E*, Abdel-Wahab O[†], **Bradley RK**[†] (2016) RNA splicing factors as oncoproteins and tumour suppressors. *Nature Reviews Cancer* 16:413-430. *co-first authors; [†]co-corresponding authors
12. Lee SC*, Dvinge H*, Kim E, Cho H, Micol JB, Chung YR, Durham BH, Yoshimi A, Kim YJ, Thomas M, Lobry C, Chen CW, Pastore A, Taylor J, Wang X, Krivtsov A, Armstrong SA, Palacino J, Buonamici S, Smith PG, **Bradley RK**[†], Abdel-Wahab O[†] (2016) Modulation of splicing catalysis for therapeutic targeting of leukemia with mutations in genes encoding spliceosomal proteins. *Nature Medicine* 22:672-678. *co-first authors; [†]co-corresponding authors

Robert K. Bradley, Ph.D.

Perspective article in Cancer Discovery. Recommended by the Faculty of 1000.

13. Inoue D, **Bradley RK**, Abdel-Wahab O (2016) Spliceosomal gene mutations in myelodysplasia: molecular links to clonal abnormalities of hematopoiesis. *Genes & Development* 30:989-1001.
14. The Cancer Genome Atlas Research Network (2015) The molecular taxonomy of primary prostate cancer. *Cell* 163:1011-1025.
15. Hickey TE, Irvine CM, Dvinge H, Tarulli GA, Hanson AR, Ryan NK, Pickering MA, Birrell SN, Hu DG, Mackenzie PI, Russell R, Caldas C, Raj GV, Dehm SM, Plymate SR, **Bradley RK**, Tilley WD, Selth LA (2015) Expression of androgen receptor splice variants in clinical breast cancers. *Oncotarget* 6:44728-44744.
16. Robinson D, Van Allen EM, et al (2015) Integrative clinical genomics of advanced prostate cancer. *Cell* 161:1215-1228.
17. Kim E*, Ilagan JO*, Liang Y*, Daubner GM*, Lee SC-W, Ramakrishnan A, Li Y, Chung YR, Micol J-B, Murphy M, Cho H, Kim M-K, Zebari AS, Aumann S, Park CY, Buonamici S, Smith PG, Deeg HJ, Lobry C, Aifantis I, Modis Y, Allain FH-T, Halene S, **Bradley RK**[†], Abdel-Wahab O[†] (2015) *SRSF2* mutations contribute to myelodysplasia through mutant-specific effects on exon recognition. *Cancer Cell* 27:617-630.
*co-first authors; [†]co-corresponding authors
Perspective articles in Nature Reviews Cancer and Cancer Cell.
18. Dvinge H, **Bradley RK** (2015) Widespread intron retention diversifies most cancer transcriptomes. *Genome Medicine* 7:45.
19. Feng Q, Snider L, Jagannathan S, Tawil R, van der Maarel SM, Tapscott SJ[†], **Bradley RK**[†] (2015) A feedback loop between nonsense-mediated decay and the retrogene *DUX4* in facioscapulohumeral muscular dystrophy. *eLife* 4:e04996. [†]co-corresponding authors
Recommended by the Faculty of 1000.
20. Ilagan JO*, Ramakrishnan A*, Hayes B, Murphy ME, Zebari AS, Bradley P, **Bradley RK** (2015) *U2AF1* mutations alter splice site recognition in hematological malignancies. *Genome Research* 25:14-26. *co-first authors
21. Dvinge H, Ries RE, Ilagan JO, Stirewalt DL, Meshinchi S, **Bradley RK** (2014) Sample processing obscures cancer-specific alterations in leukemic transcriptomes. *PNAS* 111:16802-16807.
Recommended by the Faculty of 1000.
22. Hubert CG*, **Bradley RK***, Ding Y, Toledo CM, Herman J, Skutt-Kakaria K, Girard EJ, Davison J, Berndt J, Corrin P, Hardcastle J, Basom R, Delrow JJ, Webb T, Pollard SM, Lee J, Olson JM, Paddison PJ (2013) Genome-wide RNAi screens in human brain tumor isolates reveal a novel viability requirement for PHF5A. *Genes & Development* 27:1032-1045. *co-first authors
Perspective article in Cancer Discovery.
23. Klattenhoff C, Scheuermann JC, Surface LE, **Bradley RK**, Fields PA, Steinhauser ML, Ding H, Butty VL, Torrey L, Haas S, Abo R, Tabebordbar M, Lee RT, Burge CB, Boyer LA (2013) *Braveheart*, a long non-coding RNA required for cardiovascular lineage commitment. *Cell* 152:570-583.
Recommended by the Faculty of 1000. Perspective articles in EMBO Journal and Circulation Research.
24. Xi Z, Yuguo W, **Bradley RK**, Sugumaran M, Marx CJ, Rest JS, Davis CC (2013) Massive mitochondrial gene transfer in a parasitic flowering plant. *PLoS Genetics* 9:e1003265.

25. Xi Z, **Bradley RK**, Wurdack KJ, Wong KM, Sugumaran M, Bomblies K, Rest JS, Davis CC (2012) Horizontal transfer of expressed genes in a parasitic flowering plant. *BMC Genomics* 13:227.
Covered by The Economist and Scientific American.
26. Satija R, **Bradley RK** (2012) The TAGteam motif facilitates binding of 21 sequence-specific transcription factors in the *Drosophila* embryo. *Genome Research* 22:656-665.
27. **Bradley RK**, Merkin JM, Lambert N, Burge CB (2012) Alternative splicing of RNA triplets is often regulated and accelerates proteome evolution. *PLoS Biology* 10:e1001229.
Perspective article in Genome Biology.
28. **Bradley RK***, Li XY*, Trapnell C, Davidson S, Pachter L, Chu HC, Tonkin LA, Biggin MD, Eisen MB (2010) Binding site turnover produces pervasive quantitative changes in transcription factor binding between closely related *Drosophila* species. *PLoS Biology* 8:e1000343. *co-first authors
Perspective article in PLoS Biology.
29. **Bradley RK**, Holmes I (2009) Evolutionary triplet models of structured RNA. *PLoS Computational Biology* 5:e1000483.
30. **Bradley RK**, Roberts A, Smoot M, Juvekar S, Do J, Dewey C, Holmes I, Pachter L (2009) Fast Statistical Alignment. *PLoS Computational Biology* 5:e1000392.
31. **Bradley RK**, Uzilov AV, Skinner ME, Bendana YR, Barquist L, Holmes I (2009) Evolutionary modeling and prediction of non-coding RNAs in *Drosophila*. *PLoS One* 4:e6478.
32. Varadarajan A, **Bradley RK**, Holmes I (2008) Tools for simulating evolution of aligned genomic regions with integrated parameter estimation. *Genome Biology* 9:R147.
33. **Bradley RK**, Pachter L, Holmes I (2008) Specific alignment of structured RNA: stochastic grammars and sequence annealing. *Bioinformatics* 24:2677-2683.
34. *Drosophila* 12 Genomes Consortium (2007) Evolution of genes and genomes on the *Drosophila* phylogeny. *Nature* 450:203-218.
35. **Bradley RK**, Holmes I (2007) Transducers: an emerging probabilistic framework for modeling indels on trees. *Bioinformatics* 23:3258-3262.
36. Klosterman PS, Uzilov AV, Bendana YR, **Bradley RK**, Chao S, Kosiol C, Goldman N, Holmes I (2006) Xrate: a fast prototyping, training and annotation tool for phylo-grammars. *BMC Bioinformatics*. 7:428.
37. Gubser SS, **Bradley RK** (2005) Degenerate eigenvalues for Hamiltonians with no obvious symmetries. *Adv. Theor. Math. Physics* 9:593-602.

Robert K. Bradley, Ph.D.

SPONSORED RESEARCH SUPPORT: ACTIVE

| | |
|--|---|
| R01 HL128239 (PI: Bradley; co-PI: Abdel-Wahab) NIH/NHLBI Genetic and molecular basis for <i>SRSF2</i> mutations in myelodysplasia Role: Principal Investigator | 08/01/2015 – 05/31/2020 \$510,415 |
| P01 NS069539 (PI: Tapscott) NIH/NINDS The Pathogenesis of Facioscapulohumeral Muscular Dystrophy Role: Project PI Project 2: Repeat derepression and RNA-mediated toxicity in FSHD | 10/01/2015 – 09/30/2020 \$819,958 \$179,499 |
| R01 DK103854 (PI: Bradley) NIH/NIDDK <i>U2AF1</i> mutations in myelodysplastic syndromes: from mechanism to therapy Role: Principal Investigator | 12/01/2015 – 11/30/2019 \$233,067 |
| Leukemia & Lymphoma Society Scholar Award (PI: Bradley) Leukemia & Lymphoma Society The biological and therapeutic consequences of <i>SF3B1</i> mutations in myelodysplastic syndromes Role: Principal Investigator | 07/01/2017 – 06/30/2022 \$104,762 |
| Discovery Research Grant (PI: Bradley) Evans Foundation Leveraging the minor spliceosome to understand and treat myelodysplastic syndromes Role: Principal Investigator | 09/01/2018 – 08/31/2020 \$181,818 |

INVITED SEMINARS/PRESENTATIONS

| | |
|---|------|
| University of California, Berkeley, CA (Statistics and Genomics) | 2011 |
| University of Oregon, Eugene, OR (Institute for Molecular Biology) | 2012 |
| University of Washington, Seattle, WA (Hematology Grand Rounds) | 2013 |
| University of Washington, Seattle, WA (Hematology Joint Meeting) | 2014 |
| University of Washington, Seattle, WA (Pharmacology) | 2014 |
| Memorial Sloan Kettering Cancer Center, New York, NY | 2014 |
| New York Genome Center, New York, NY (Five Points Series) | 2015 |
| Mayo Clinic, Rochester, MN | 2015 |
| Memorial Sloan Kettering Cancer Center, New York, NY | 2015 |
| University of Rochester, Rochester, NY (Biochemistry and Biophysics) | 2015 |
| School of Medicine at Mount Sinai, New York, NY (Oncological Sciences) | 2015 |
| Albert Einstein College of Medicine, New York, NY (Developmental & Molecular Biology) | 2015 |
| American Association for Cancer Research annual conference, New Orleans, LA | 2016 |
| Evans Foundation MDS Meeting, Nashville, TN | 2016 |
| Workshop on Splicing Factor Mutations, Boston, MA | 2016 |
| University of California, Irvine, CA (Microbiology and Molecular Genetics) | 2017 |
| RNA Biology 2017, NIH (National Cancer Institute) | 2017 |
| Aplastic Anemia and MDS Foundation International Scientific Symposium, Rockville, MD | 2018 |

INSTITUTIONAL SERVICE

Co-director of the FHCRC Summer Undergraduate Research Program (SURP) 2016 – present

PhD thesis committee member

| | |
|--------------------------------------|----------------|
| Eric Alcid (Toshio Tsukiyama lab) | 2011 – 2015 |
| Chad Toledo (Patrick Paddison lab) | 2012 – 2015 |
| Siva Kasinathan (Steve Henikoff lab) | 2013 – 2017 |
| Xiaojie Qiu (Cole Trapnell lab) | 2015 – present |
| Alex Corella (Pete Nelson lab) | 2016 – present |
| April Lo (Alice Berger lab) | 2017 – present |

PhD qualifying examination

Alex Rosenberg (Georg Seelig lab, Computational & Synthetic Biology) 2012

Undergraduate interns

| | |
|--|--------------------|
| Kelsey Loy, Williams College | July – August 2012 |
| Heather Johns, Whitman College (FHCRC SURP) | June – August 2014 |
| Aidan Lopez, Cornell University (FHCRC High School internship program) | June – August 2015 |
| Alice Zhang, University of Chicago (FHCRC SURP) | June – August 2015 |
| Ayah Idris, University of Washington (Pathways to Cancer Research program) | June – August 2018 |
| Jason Dao, University of Washington (Pathways to Cancer Research program) | June – August 2018 |

High school interns

| | |
|-----------------|--------------------|
| Sean Choksi | June – August 2013 |
| Denise Engracia | June – August 2013 |
| Rohan Hassan | June – August 2014 |
| Rachel Thomson | June – August 2014 |
| Kaela Allen | June – August 2015 |

Robert K. Bradley, Ph.D.

| | |
|-------------------|--------------------|
| Gil Gunday | June – August 2015 |
| Meghan Parker | June – August 2016 |
| Thomas La Guardia | June – August 2016 |

Graduate/Medical student interviews and recruitment

| | |
|---|----------------|
| UW MCB student interviews & recruitment | 2012 – present |
| UW MSTP student interviews | 2014 – present |

Other mentoring service

| | |
|---|--------------|
| SACNAS discussion | October 2012 |
| GenOM project career lunch | July 2012 |
| FHCRC High School Internship Program talk | January 2013 |
| NWABR CURE visit | July 2013 |
| FHCRC BRI discussion group | July 2014 |

Committees

| | |
|---|----------------------|
| FHCRC Weintraub award committee | 2013, 2015 – present |
| FHCRC PHS merit review revision committee | 2013 |
| FHCRC Genomics Shared Resource advisory committee | 2014 – present |
| FHCRC Proteomics Shared Resource advisory committee | 2015 – present |
| FHCRC Ethics Education Oversight committee | 2014 – present |

Grant and fellowship reviewing

| | |
|--|------|
| FHCRC Cancer Center Support Grant Pilot Award | 2013 |
| UW Royalty Research Fund | 2013 |
| UW Cell & Molecular Biology Training Grant | 2014 |
| Evans Foundation Grant | 2016 |
| NIH Cancer Biology Special Emphasis Panel (ad hoc reviewer) | 2016 |
| NIH Cancer Molecular Pathobiology (CAMP) Study Section (ad hoc reviewer) | 2017 |