RICHARD L. FROCK, PhD
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EDUCATIONAL BACKGROUND

12/18/2009 - Ph.D. in Biochemistry, University of Washington
05/20/2001 - B.A. in Biochemistry, Vassar College

PROFESSIONAL APPOINTMENTS

01/01/2018-present	**Assistant Professor, University Tenure Line** Stanford University School of Medicine, Stanford, CA Department of Radiation Oncology, Division of Radiation and Cancer Biology **Member**, Stanford Cancer Institute (SCI), Stanford Interdisciplinary Biosciences Institute (Bio-X), Maternal and Child Health Research Institute (MCHRI), Spark Program in Translational Research.
01/01/2022-12/31/2022	**Assistant Professor,** Radiation Oncology – Radiation and Cancer Biology appointment extension
01/01/2023-12/31/2023	**Assistant Professor,** Radiation Oncology – Radiation and Cancer Biology appointment extension
02/01/2010-12/15/2017	**Research Fellow** Harvard Medical School, Department of Genetics, Boston, MA Boston Children's Hospital, Program in Cellular and Molecular Medicine, Boston, MA *Mentor: Frederick W. Alt* Research Focus: Mechanisms of DSB repair and chromosomal translocations during V(D)J and Class Switch Recombination using Linear Amplification-Mediated High-Throughput Genome-wide Translocation Sequencing (LAM-HTGTS)
10/01/2001-12/18/2009	**Predoctoral Research Associate** University of Washington, Department of Biochemistry, Seattle, WA *Mentors: Brian K. Kennedy & Steve D. Hauschka* Committee members: Richard D. Palmiter, David R. Morris, Stephen J. Tapscott, Edith H. Wang, Stephen M. Schwartz Dissertation: A Role for A-Type Nuclear Lamins in the Homeostasis of Striated Muscle and the Immune System

HONORS AND AWARDS

2024 American Cancer Society - Lisa Dean Moseley Foundation Stem Cell Consortium Member
2023 Research Scholar, American Cancer Society
2022 Best Oral Presentation, 2nd Flash Radiotherapy and Particle Therapy Conference
2022 Early Career Investigator Travel Award, Radiation Research Society
2019 V Scholar, V Foundation for Cancer Research

2019 Early Career Investigator Travel Award, Radiation Research Society
2019 Radiation Research Foundation Career Development Award
2014 Allergic and Immunologic Disease Postdoctoral National Research Service Award
2014 Boston Children's Hospital PCMM Scientific Retreat Poster Award
2011 Northwest Genomic Engineering Consortium Travel Award
2011 Immune Disease Institute Scientific Retreat Poster Award
2010 Cancer Immunology Postdoctoral National Research Service Award
2008 North American Vascular Biology Organization Vasculata Poster Award
2006 Cardiovascular and Pathology Predoctoral National Research Service Award
2006 Schultz Cancer Biology Travel Award

PUBLICATIONS

PEER-REVIEWED ORIGINAL RESEARCH PUBLICATIONS (27 total)

27. Ji L, Pu L, Wang J, Cao H, Melemenidis S, Sinha S, Guan L, Laseinde EE, von Eyben R, Richter SA, Nam J, Kong C, Casey KM, Graves EE, **Frock RL**, Le QT, Rankin EB. FTO inhibition enhances the therapeutic index of radiation therapy in head and neck cancer. *JCI Insight* 2025 Jun 9;10(11):e184968.

    *Design, supervision, and funding

26. Wang J, Sadeghi CA, Le LV, Le Bouteiller M, **Frock RL.** ATM and 53BP1 regulate alternative end joining-mediated V(D)J recombination. *Science Advances* 2024 Aug 2;10(31):eadn4682. PMC11290492. Featured by *Stanford Medicine Radiation Oncology*

25. Rangel V, Sterrenberg JN, Garawi A, Mezcord V, Folkerts ML, Caulderon SE, Garcia YE, Wang J, Soyfer EM, Eng OS, Valerin JB, Tanjasiri SP, Quintero-Rivera F, Seldin MM, Masri S, ***Frock RL**, Fleischman AG, Pannunzio NR. Increased AID Results in Mutations at the CRLF2 Locus Implicated in Latin American ALL Health Disparities. *Nature Communications* 2024 Jul 27;15(1):6331. PMC11283463.

    *Conception, design, data acquisition, data analysis and interpretation, supervision, funding, commented on manuscript and revision

24. Guan L, Viswanathan V, Jiang Y, Vijayakumar S, Cao H, Zhao J, Colburg DRC, Neuhofer P, Zhang Y, Wang J, Xu Y, Laseinde EE, Hildebrand, R, Rahman M, ***Frock RL**, Kong C, Beachy PA, Artandi S, Le QT. Tert-expressing cells contribute to salivary gland homeostasis and tissue regeneration after radiation therapy. *Genes & Development* 2024 Jul 19;38(11-12):569-582. PMC11293384.

    *Design, supervision, and funding

23. Wang J, Sadeghi CA, **Frock RL.** DNA-PKcs Suppresses Illegitimate Chromosome Rearrangements. *Nucleic Acids Research*. 2024 May 22;52(9):5048-5066. PMC11109964.

22. Wang J, Le Gall J, ***Frock RL**, Strick TR. Shifted PAMs generate DNA overhangs and enhance SpCas9 post-catalytic complex dissociation. *Nature Structural & Molecular Biology* 2023 Nov; 30(11):1707-1718. PMC10643121.

    *Design, data acquisition, data analysis and interpretation, supervision, funding, commented on manuscript

21. Barghouth PG, Melemenidis S, Montay-Gruel P, Ollivier J, Viswanathan V, Gonçalves PJ, Soto LA, Lau BC, Sadeghi C, Edlabadkar A, Zhang R, Ru N, Baulch JE, Manjappa R, Wang J, Le Bouteiller M, Surucu M, Yu A, Bush K, Skinner L, Maxim P, Loo Jr. BW, Limoli C, Vozenin M-C, **Frock RL**. FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates. *Radiotherapy and Oncology* 2023 Nov:188:109906. PMC10591966.
    Special issue on *2022 FLASH Radiotherapy and Particle Therapy Conference (FRPT)*.
    Invited for special issue on*16th International Wolfsberg Meeting on Molecular Radiation Biology*.

20. Lattanzi A, Camarena J, Lahiri P, Segal H, Srifa W, Vakulskas CA, ***Frock RL**, Kenrick J, Lee C, Talbott N, Skowronski J, Cromer MK, Charlesworth CT, Bak RO, Mantri S, Bao G, DiGiusto D,

Tisdale J, Wright JF, Bhatia N, Roncarolo MG, Dever DP, Porteus MH. Development of β-globin gene correction in human hematopoietic stem cells as a potential durable treatment for sickle cell disease. *Science Translational Medicine.* 2021 Jun 16;13(598):eabf2444. PMC8862191.

*Conception and design, data acquisition, data analysis and interpretation, supervision, funding, commented on manuscript

19. Liang Z, Kumar V, Le Bouteiller M, Zurita J, Kenrick J, Lin SG, Lou J, Hu J, Ye AY, Boboila C ♦Alt FW, ♦**Frock RL**. Ku70 suppresses alternative end-joining in G1-arrested progenitor B cells. *Proc. Natl. Acad. Sci. USA.* 2021 May 25;118 (21):e2103630118. PMC8166026.
Featured as Publication of the Week in *SCIENCE IN THE CITY*

18. Wang Q, Liu J, Janssen JM, Le Bouteiller M, ***Frock RL**, Gonçalves MAFV. Precise and broad scope genome editing based on high-specificity Cas9 nickases. *Nucleic Acids Research.* 2021 Jan 25;49(2):1173-1198. PMC7826261.

*Conception and design, data interpretation, supervision, commented on manuscript and revision

17. Chen X, Tasca F, Wang Q, Liu J, Janssen, Brescia MD, Bellin M, Szuhai K, Kenrick J, ***Frock RL**, Gonçalves MAFV. Expanding the editable genome and CRISPR-Cas9 versatility using DNA cutting-free gene targeting based on in trans paired nicking. *Nucleic Acids Research.* 2020 Jan 24;48(2):974-995. PMC6954423.

*Conception and design, data acquisition, data analysis and interpretation, supervision, commented on manuscript and revision

16. Layer JV, Cleary J, Brown AJ, Stevenson KE, Morrow SN, Scoyk AV, Blasco RB, Karaca E, Meng F, ***Frock RL**, Tivey T, Kim SS, Fuchs H, Chiarle R, Alt FW, Roberts SA, Weinstock DM, Day TA. Parp3 promotes long-range end-joining in murine cells. *Proc Natl Acad Sci U S A.* 2018 Oct 2;115(40):10076- 10081. PMC6176633.

15. Willis NA, **Frock RL**, Menghi F, Duffey EE, Panday A, Camacho V, Hasty EP, Liu ET, Alt FW, Scully R. Mechanism of tandem duplication formation in BRCA1-mutant cells. *Nature*. 2017 Nov 30;551(7682):590-595. PMC5728692.

14. Paulsen BS, Mandal PK, **Frock RL**, Boyraz B, Yadav R, Gutierrez-Martinez P, Ebina W, Fasth A, Talkowski ME, Agarwal S, Alt FW, Rossi, DJ. Ectopic expression of RAD52 and dn53BP1 improves homology-directed repair during CRISPR/Cas9-mediated genome editing. *Nature Biomedical Engineering*. 2017 Nov;1(11):878-888. PMC6918705.
Featured in *Nature Biomedical Engineering*.

13. ✦Kumar V, Alt FW, ✦**Frock RL**. PAXX and XLF DNA repair factors are functionally redundant in joining DNA breaks in a G1-arrested progenitor B-cell line. *Proc Natl Acad Sci U S A.* 2016 Sep 20;113(38):10619-24. PMC5035843.
Briefly highlighted in *Cell Reports* Facebook post 10/6/2016

12. ✦Zhao L, ✦**Frock RL**, Du Z, Hu J, Chen L, Krangel MS, Alt FW. Orientation-specific RAG activity in chromosomal loop domains contributes to Tcrd V(D)J recombination during T cell development. *Journal of Experimental Medicine*. 2016 Aug 22;213(9):1921-1936. PMC4995090.

11. Hu J, Meyers RM, Dong J, Panchakshari RA, ♦Alt FW, ♦**Frock RL**. Detecting DNA double- stranded breaks in mammalian genomes by linear amplification-mediated high-throughput genome-wide translocation sequencing. *Nature Protocols*. 2016 May;11(5):853-71. PMC4895203

10. Hu J, Zhang, Y, Zhao L, **Frock RL**, Du Z, Meyers RM, Meng FL, Schatz DG, Alt FW. Chromosomal loop domains direct the recombination of antigen receptor genes. *Cell.* 2015 Nov 5;163(4):947-59. PMC4660266
Featured in *Trends in Molecular Medicine*

9. ✦**Frock RL**, ✦Hu J, Meyers RM, Ho YJ, Kii E, Alt FW. Genome-wide detection of DNA double-

stranded breaks induced by engineered nucleases. *Nature Biotechnology*. 2015 Feb;33(2):179-86. PMC4320661
Featured in *Nature Biotechnology* and *Molecular Cell*

8. ✦**Frock RL**, ✦Chen SC, Dai DF, Pak DN, Frett E, Lau C, Brown C, Wang Y, Rabinovitch PS, Santana LS, Ladiges WC, Worman HJ, Kennedy BK. Cardiomyocyte-specific expression of lamin A improves cardiac function in *Lmna*$^{-/-}$ mice. *PLoS One.* 2012 7(8):e42918. PMC3419749.

7. ✦Chiarle R, ✦Zhang Y, ✦**Frock RL**, ✦Lewis SM, Molinie B, Ho YJ, Myers DR, Choi VW, Compagno M, Malkin DJ, Neuberg D, Monti S, Giallourakis CC, Gostissa M, Alt FW. Genome-wide Translocation Sequencing Reveals Mechanisms of Chromosome Breaks and Rearrangements in B Cells. *Cell.* 2011 Sep 30;147(1):107-19. PMC3186939
Featured in *Cell* and *Nature Reviews Genetics*

6. ✦Hale JS, ✦**Frock RL,** Mamman SA, Fink PJ, Kennedy BK. Cell-extrinsic defective lymphocyte development in *Lmna*$^{-/-}$ mice. *PLoS One.* 2010 5(4):e10127. PMC2853576.

5. **#Frock RL**, Kudlow BA, Evans AM, Jameson SA, Hauschka SD, Kennedy BK. Lamin A/C and emerin are critical for skeletal muscle satellite cell differentiation. *Genes Dev.* 2006 20(4): 486-500. PMC1369050.

4. Johnson BR, Nitta RT, **Frock RL**, Mounkes L, Barbie DA, Stewart CL, Harlow E, Kennedy BK. A-type lamins regulate retinoblastoma protein function by promoting subnuclear localization and preventing proteasomal degradation. *Proc Natl Acad Sci U S A.* 2004 101(26): 9677-9682. PMC470734.

3. Barbie DA, Kudlow BA, **Frock R**, Zhao J, Johnson BR, Dyson N, Harlow E, Kennedy BK. Nuclear reorganization of mammalian DNA synthesis prior to cell cycle exit. *Mol Cell Biol.* 2004 24(2): 595-607. PMC343811.

2. #Deng WM, Schneider M, **Frock R**, Castillejo-Lopez C, Gaman EA, Baumgartner S, Ruohola-Baker H. Dystroglycan is required for polarizing the epithelial cells and the oocyte in Drosophila. *Development.* 2003 130(1): 173-184.

1. Pfennig BW and **Frock RL**. The use of molecular modeling and VESPR theory in the undergraduate curriculum to predict the three-dimensional structure of molecules. *J Chem Ed* 1999 7: 1018- 1022.

✦Co-first author; ♦Co-corresponding author; #Journal cover

PEER-REVIEWED ARTICLES (OTHER – 2 total)

2. **Frock RL**, Sadeghi C, Meng J, Wang JL. DNA End Joining: G0-ing to the Core. *Biomolecules* 2021 Oct 9;11(10):1487. PMC8533500 (corresponding author)

1. Smith ED, Kudlow BA, **Frock RL**, Kennedy BK. A-type nuclear lamins, progerias and other degenerative disorders. *Mech Ageing Dev.* 2005 126(4): 447-460. DOI: 10.1016/j.mad.2004.10.006

BOOK CHAPTERS (1 total)

1. ✦**Frock RL**, ✦Hu J, Alt FW. Mechanisms of recurrent chromosomal translocations. In Janet Rowley, Terence Rabbitts, & Michelle LeBeau (Eds.) Chromosomal Translocations and Genome Rearrangements in Cancer. Switzerland: Springer International Publishing, 2015. Pp. 27-51. DOI: 10.1007/978-3-319-19983-2

✦Co-first author

PUBLISHED MEETING ABSTRACTS (5 total)

5. Barghouth PG, Ollivier J, Montay-Gruel P, Loo BW, Vozenin M, Limoli C, **Frock RL**. **2021**.

Ultra-high dose rate (FLASH) irradiation does not alter microhomology mediated recombination under varying oxygen tension when compared to standard clinical dose rates. *Clin Cancer Res* 27:8s PO-012. DOI: 10.1158/1557-3265.RADSCI21-PO-012

4. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. **2019** Ku70 suppresses alternative end-joining in G1-arrested progenitor B cells. *Cancer Res* 79:13s 1745. DOI: 10.1158/1538-7445.AM2019-1745

3. Vanoli F, Ito S, **Frock RL**, Alt FW, Moynahan M, Jasin M, **2017**. PARP inhibitor Olaparib induces genomic instability in normal mammalian cells. *Mol Cancer Res* 15:4s B37. DOI: 10.1158/1557-3125.DNAREPAIR16-B37

2. Mandal PK, Paulsen BS, **Frock RL**, Gutierrez-Martinez P, Ebina W, Agarwal S, Alt FW, Rossi DJ. **2016**. Transient Manipulation of DNA Damage Repair Pathway Choice Improves Homology-Directed Repair During CRISPR/Cas9-Mediated Genome Editing. *Mol Ther* 24:1s pS227 568. DOI: 10.1016/S1525-0016(16)33376-7

1. Hu J, Zhang Y, Zhao L, **Frock RL**, Du Z, Meyers RM, Meng FL, Schatz DG, Alt FW. **2016**. Topologically associated domains genome-wide restrict the off-target activity of recombination activating gene 1/2 endonuclease. *Cancer Immunol Res* 4:1s A180. DOI: 10.1158/2326-6074.CRICIMTEATIAACR15-A180

EDITORIAL SERVICE

- Associate Editor (2023-present)
  - Genome Editing in Human Health and Disease, *Frontiers in Genome Editing*
- Review Editor (2021-present)
  - Genome Editing in Blood Disorders, *Frontiers in Genome Editing*
  - Genome Organization and Dynamics, *Frontiers in Molecular Biosciences*
- Ad hoc Reviewer (2018-present):
  - *Nature Cell Biology, Nature Structural & Molecular Biology, Nucleic Acids Research, Cell Reports, Nature Protocols, Nature Communications, iScience, Cell Cycle, PLoS ONE, Trends in Cancer*
  - *Frontiers in Genetics* (Public Reviewer): Libri A, Marton T, Deriano L. The (lack of) DNA double-strand break repair pathway choice during V(D)J recombination. **2022** doi: 10.3389/fgene.2021.823943
- Review Editor, B cell Biology, *Frontiers in Immunology* (2018-present; Public Reviewer below):
  - Helen A Beilinson, Steven A Erickson, Tatyana Golovkina **2024**. The endogenous Mtv8 locus and the immunoglobulin repertoire . Front. Immunol. 15:1345467. doi: 10.3389/fimmu.2024.1345467
  - Ovejero S, Viziteu E, Dutrieux L, Devin J, Lin YL, Alaterre A, Jourdan M, Basbous J, Requirand G, Roibert N, de Boussac H, Seckinger A, Hose D, Vincent L, Herbaux C, Constantinou A, Pasero P, Moreaux J. The BLM helicase is a new therapeutic target in multiple myeloma involved in replication stress survival and drug resistance. **2022** doi: 10.3389/fimmu.2022.983181
  - Corcoran AE, Rogers CH, Mielczarek O. Dynamic 3D locus organisation and its drivers underpin immunoglobulin recombination. **2020** doi: 10.3389/fimmu.2020.633705
  - Smith AL, Scott JNF, Boyes J. The ESC: The Dangerous By-Product of V(D)J. **2020** *doi: 10.3389/fimmu.2019.01572*
  - Safonova Y and Pevzner PA. De novo inference of diversity genes and analysis of non-canonical V(DD)J recombination in immunoglobulins. **2019** *doi: 10.3389/fimmu.2019.00987*

SERVICE AS GRANT REVIEWER

04/2025-present	Term Member, DMC review committee, American Cancer Society
02/2025	Ad hoc Reviewer, DFKZ-MOST Israel-Cooperation
01/2025, 06/2024	Ad hoc Reviewer, DMC, American Cancer Society
08/2024	Ad hoc Reviewer, NASA - Oak Ridge Associated Universities
07/2023	Ad hoc Reviewer, K99/R00 - ZGM1 TWD-8(KR), NIH/NIGMS
07/2022, 05/2018	Ad hoc Reviewer, Swiss National Science Foundation
10/2021	Early Career Reviewer, Molecular Genetics B Study Section, NIH/CSR
03/2019	Ad hoc Reviewer, Israel Science Foundation

SERVICE AS INVESTIGATOR REVIEWER

04/2022	Pasteur Institute, Paris, France

PATENTS

"Methods relating to the detection of recurrent and non-specific double strand breaks in the genome" Alt FW, **Frock RL**, Hu J, Meyers RM WO2016081798, USPTO 15/527,790 Patent No.10640820 (5/5/2020).

UNIVERSITY ADMINISTRATIVE SERVICE

Stanford Cancer Institute

2024	Faculty search committee member (Sheltzer)
2025	Faculty Lead (Sheltzer) Department Appointments & Promotions

Cancer Biology Program PhD Thesis Committee

2025	Member, Aditi Gnanasekar (Mischel)
2020	Defense Chair, Tony Gao (Qi)
2019-2023	Member and Defense Chair, Maxim Markovic (Nolan)
2019	Defense Chair, Michael Debreuil (Bassik)
2019	Defense Chair, Zintis Inde (Dixon)

Cancer Biology Speaker host

2023	Agata Smogorzewska, Rockefeller University
2025	Alberto Ciccia, Columbia University

Cancer Biology Admissions

2024-2025	Committee member

Department of Radiation Oncology Radical Seminar Speaker Series

2021-present	Speaker organizer and host (in person): **2021** – Justin Leung (UAMS), Nausica Arnoult (CU-Boulder), Remi Buisson (UCI), Nick Pannunzio (UCI) **2022** – Natalie Saini (MUSC), Timothy Chan (CWRU-CCCC), Sandeep Burma (UT San Antonio) **2023** – Ionannis Verginadis (UPENN), Gargi Ghosal (UNMC), Peter Ly (UT Southwestern), Gaorav Gupta (UNC) **2024** – David Yu (Emory), Todd Aguilera (UT Southwestern), Markus Lobrich (TU-Darmstadt), Priyanka Verma (WashU), Judit Jiminez Sainz (MUSC), Robert Weiss (Cornell)

SERVICE TO PROFESSIONAL ORGANIZATIONS

MEMBERSHIPS

- Environmental Mutagenesis and Genomics Society (2024-present)

- Radiation Research Society (2019-present)
- American Association for Cancer Research (2018-present)
- American Association for the Advancement of Science (2010-present)
- Society for Developmental Biology (2009-present)
- American Society for Cell Biology (2002-present)

COMMITTEE SERVICE

- *2nd Flash Radiotherapy and Particle Therapy Conference.* **November 30-December 2, 2022**, Barcelona, Spain—FLASH Mechanisms Track Session Chair.
- *FASEB SRC: Genetic Recombination and Genome Rearrangements Conference.* **August 14-19, 2022**, Steamboat Springs, CO—Discussion Session Leader.
- *AACR Annual Meeting 2021.* **April 9-14, 2021**, Virtual— Chair, DNA Damage and Repair Section, Molecular and Cellular Biology, Genetics Subcommittee.
- *Gordon Research Conference: DNA Damage, Mutation and Cancer.* **March 1-6, 2020**, Ventura, CA—Academia Career Mentoring Dinner
- *FASEB SRC: Genetic Recombination and Genome Rearrangements Conference.* **July14-19, 2019**, Steamboat Springs, CO—Discussion Session Leader; Career Workshop Panelist
- *Northeast Regional Life Sciences Core Directors Meeting*, **October 13-15, 2016**, Boston, MA—Breakout Session Organizer for CRISPR off-targets

CERTIFICATIONS

- MCHRI Eureka Translational Medicine, **February 9-13, 2020**, Monterey, CA

PRESENTATIONS

INVITED ORAL PRESENTATIONS (National and Regional; 37 total)

1. "Parallel DNA Joint Capture Identifies Recombination and DNA Damage Response Regulators" *24th Midwest DNA Repair Symposium.* **May 17-18, 2025,** University of Michigan, Ann Arbor, MI
2. "Making Ends Meet: Repair Fate Mapping Illegitimate Recombination" University of Washington, Department of Biochemistry Seminar, **February 18, 2025**, Seattle, WA.
3. "Unraveling A-EJ and DDR Mechanisms Through V(D)J Recombination" *Gordon Research Conference: Mammalian DNA repair*, **February 2-7, 2025**, Ventura, CA.
4. "Alternative End Joining and the ATM-Initiated DNA Damage Response Suppress MH-Mediated V(D)J Recombination and Translocation" *EMGS 55th Annual Meeting*, **September 7-11, 2024**, Palm Springs, CA.
5. "Novel Regulators of DNA Repair and Recombination" American Cancer Society – Lisa Dean Moseley Foundation Cancer Stem Cell Consortium Retreat, **August 2, 2024,** UCLA Luskin Conference Center, Los Angeles, CA.
6. "ATM & 53BP1 Regulate Alternative End Joining Mediated V(D)J Recombination" *FASEB: Genetic Recombination and Genome Rearrangements.* **July 14-18, 2024**, Tucson, AZ.
7. "Molecular Archaeology: DNA Repair Fate Mapping Recombination and Rearrangements" *Social DNAing*, **June 27, 2024**, Columbia University.
8. "FLASH Radiotherapy, DNA Damage and Translocations" Johns Hopkins University, Radiation Oncology Grand Rounds – Emerging Themes of Basic Cancer Biology, **February 29, 2024,** Webinar.
9. "Molecular Archaeology: Unraveling Principles of Chromosome Translocations " University of California, Irvine, Department of Biological Chemistry BC Seminar Series, **January 10, 2024**, Irvine, CA.
10. "Novel Microhomology-mediated End Joining Mechanisms" Stanford University, School of

Medicine, Department of Radiation Oncology, Division of Cancer Biology Faculty Seminar Series, **December 5, 2023**, Stanford, CA.

11. "Compounding V(D)J Recombination Reveals Novel End Joining Functional Determinants" *45th Chromatin Chromosomes and Epigenetics Conference.* **December 7-10, 2023**, Asilomar, CA.
12. "Molecular Archaeology: Unraveling Principles of DNA End Joining" University of Arkansas Medical Sciences, Biochemistry and Molecular Biology Faculty Seminar Series, **November 16, 2022**, Webinar.
13. "FLASH Does Not Alter MH-Mediated Repair Under Varying O_2 Tension vs. CONV Dose Rates" *68th Radiation Research Society Annual Meeting.* **October 16-19, 2022**, Waikoloa Village, HI.
14. "Cutting and Pasting: DNA Repair Artistry in Non-cycling Cells" Stanford Bio-X Undergraduate Summer Research Program Faculty Talk, **July 20, 2022**, Stanford, CA.
15. "Cutting and Pasting: DNA Repair Artistry in Non-cycling Cells" University of the Pacific Biological Sciences Seminar, **April 8, 2022**, Stockton, CA.
16. "Aberrant DNA End Joining Mechanisms in Non-cycling Cells." Stanford Radiation Oncology Department Retreat, **November 18-19, 2021**, Stanford, CA.
17. "DNA End Joining in Quiescent Progenitor B Cells." University of California, Davis, Seminar in Molecular Genetics. **November 15, 2021**, Davis CA.
18. "Functional Genomics of DNA Repair Processes." 44th Annual Stanford Cancer Biology Program Scientific Conference, **November 12-13, 2021**, Woodside, CA.
19. "Identifying the Rules of Engagement: DNA End-Joining in G1/G0-Phase." Stanford Radiation Oncology Faculty Seminar Series, **February 5, 2021**, Stanford, CA.
20. "Mind the Gap: Breaking New Ground on G1-Phase End-Joining." Tulane University, Department of Biochemistry and Molecular Biology Seminar Series. **April 20, 2020**, Webinar.
21. "Repair Fate Mapping of Broken Ends in Non-Dividing Cells." *Gordon Research Conference: DNA Damage, Mutation and Cancer.* **March 1-6, 2020**, Ventura, CA.
22. "Elucidating DNA DSB Repair Pathway Choice in G1-Phase Progenitor B Cells." *65th Radiation Research Society Annual Meeting,* **November 3-6, 2019**, San Diego, CA.
23. "Elucidating Mechanisms of Chromosome Translocations and Double Strand Break Repair." 41st Annual Stanford Cancer Biology Program Scientific Conference, **September 14-15, 2018**, San Jose, CA.
24. "New Insights into Non-Homologous End-Joining Mechanisms of Recurrent DNA Double-Stranded Breaks in Progenitor B cells." *2nd Annual Genome Editing USA Congress,* **May 10-11, 2018**, Boston, MA.
25. "Assessing Endonuclease Off-Target Activity and Genome-wide Collateral Damage." *Northeast Regional Life Sciences Core Directors Meeting*, **October 13-15, 2016**, Boston, MA.
26. "Breaking Bad: Genome-wide Detection of Designer Nuclease Targeting and its Ensuing Collateral Damage." *Precision Medicine Symposia-2016 on RNAi/Genome Editing*, **May 4-5, 2016**, Burlington, MA.
27. "Breaking Bad: Genome-wide Detection of Designer Nuclease Targeting and its Ensuing Collateral Damage." *Clinical Immunology Society Annual Meeting*, **April 14-17, 2016**, Boston, MA.
28. "Genome-wide Detection of DNA Double-Stranded Breaks Induced by Engineered Nucleases." *Information Gathering Meeting on Human Editing*, **October 5, 2015**, National Academy of Sciences, Washington, D.C.

29. "Genome-wide Detection of DNA Double-stranded Breaks Induced by Engineered Nucleases." *HHMI Scientific Meeting*, **February 10-12, 2015**, Chevy Chase, MD.
30. "Genome-wide Detection of DNA Double-Stranded Breaks Induced by Engineered Nucleases." *Genome Engineering: The CRISPR/Cas Revolution*, **September 24-27, 2015**, Cold Spring Harbor, NY.
31. "Genome-wide Assessment of Custom Nuclease-mediated On and Off-target Breaks and Translocations in Human Cells." Harvard Medical School, Division of Immunology Trainee Forum, **April 11, 2014**, Boston, MA.
32. "Principles of Translocations in Human Cells Using Engineered Nucleases Targeting the RAG1 Locus." Harvard Medical School, DNA Replication and Repair Series, **August 1, 2013**, Boston, MA.
33. "Principles of Translocations in Human Cells Using Engineered Nucleases Targeting the RAG1 Locus." Boston Children's Hospital Program in Cellular and Molecular Medicine Open Forums, **March 22, 2013**, Boston, MA.
34. "Genome-wide Translocation Sequencing Reveals Mechanisms of Chromosome Breaks and Rearrangements in B cells." 4th *Annual Northwest Genome Engineering Consortium workshop on Genome Engineering*, **Nov 8, 2011**, Seattle, WA.
35. "Elucidating the Mouse B Lymphocyte Translocatome." Harvard Medical School Immune Disease Institute Open Forums, **March 18, 2011**, Boston, MA.
36. "Delayed Muscle Differentiation Kinetics in *Lmna*$^{-/-}$ Myoblasts." *3rd Seattle Muscular Dystrophy Conference,* **June 14-15, 2007**, Seattle, WA.
37. "Lamin A/C and Emerin are Critical for Normal Adult Skeletal Myogenesis." *Northwest Developmental Biology Conference,* **March 16-19, 2005**, Friday Harbor, WA.

INVITED ORAL PRESENTATIONS (International; 11 total)

1. "Parallel DNA Joint Capture Identifies Recombination and DNA End Tethering Regulators" *Fusion: 8th Nucleic Acids Conference.* **July 4-7, 2025,** Dolce CampoReal Lisboa, Portugal.
2. "Making Ends Meet: Repair Fate Mapping Illegitimate Recombination" University of Oxford, Weatherall Institute of Molecular Medicine Seminar, **April 1, 2025**, Oxford, United Kingdom.
3. "Making Ends Meet: Repair Fate Mapping Illegitimate Recombination" Simon Fraser University, Department of Molecular Biology & Biochemistry Seminar, **March 14, 2025**, Vancouver, Canada.
4. "Unraveling A-EJ and DDR Mechanisms Through V(D)J Recombination" *12th 3R+3C International Symposium*, **November 18-24, 2024**, Fukuoka, Japan
5. "ATM & 53BP1 Regulate Alternative End Joining Mediated V(D)J Recombination" *EMBO DNA Damage Response in cell physiology and diseases*, **October 14-18, 2024**, Sounio, Greece
6. "DNA-PKcs Suppresses Illegitimate Chromosome Rearrangements" *NHEJ in Health and Diseases*, **September 27-29, 2023**, IRSN, Fontenay-aux-Roses, France
7. "Molecular Archaeology: Unraveling Principles of Chromosome Translocations" Institute of Biology de l'École Normale Supérieure (IBENS), **June 20, 2023,** Paris, France
8. "FLASH Does Not Alter MH-Mediated Repair Under Varying O_2 Tension vs. CONV Dose Rates" *2nd Flash Radiotherapy and Particle Therapy Conference*, **November 30-December 2, 2022**, Barcelona, Spain.
9. "High-Throughput Methods to Study V(D)J Recombination, IgH Class Switch Recombination, Chromosomal Translocations, and DNA End-Joining" 19th International Summer School on Immunology - FEBS advanced lecture course Immune System: Genes, Receptors and Regulation,

September 23-30, 2017, Hvar Island, Croatia.

10. "Genome-wide Analysis of Designer Nuclease Targeting" 9th Stem Cell Clonality and Genome Stability Retreat, **October 17-18, 2016**, Florence, Italy.
11. "Gene Editing Tools and Assessing their Genome-wide Collateral Damage" Precision Genome Engineering Training Day, **January 27, 2016**, Ghent, Belgium.

CONFERENCE PRESENTATIONS (Poster; 16 total)

1. Wang J, Xu J, Wang M, Sadeghi C, Le Bouteiller M, Wu JC, **Frock RL.** Parallel Joint Capture Identifies Recombination and DNA Damage Response Regulators. *Stanford Drug Discovery Symposium.* **April 28-29, 2025,** Stanford, CA
2. Wang J, Xu J, Wang M, Le Bouteiller M, Wu JC, **Frock RL.** Parallel Joint Capture Identifies Recombination and DNA Damage Response Regulators. *CRISPR and Beyond: Perturbations at Scale to Understand Genomes.* **April 2-5, 2025,** Wellcome Genome Campus, UK
3. Wang J, Sadeghi CA, **Frock RL.** DNA-PKcs suppresses illegitimate chromosome rearrangements. *Gordon Research Conference: DNA Damage, Mutation and Cancer.* **March 10-15, 2024,** Ventura, CA.
4. Barghouth PG, Melemenidis S, Montay-Gruel P, Ollivier J, Viswanathan V, Gonçalves PJ, Soto LA, Lau BC, Sadeghi C, Edlabadkar A, Manjappa R, Wang J, Le Bouteiller M, Surucu M, Yu A, Bush K, Skinner L, Maxim P, Loo Jr. BW, Limoli C, Vozenin M-C, **Frock RL.** FLASH-RT does not affect chromosome translocations and junction structures beyond that of CONV-RT dose-rates. *International Wolfsberg Meeting on Molecular Radiation Biology/Oncology.* **June 17-19, 2023,** Hurdalsjøen Hotel, Norway.
5. Wang JL, Le Bouteiller M, Origel CA, Sadeghi C, Conner KA, Le L, Edlabadkar A, **Frock RL.** Compounding V(D)J recombination reveals novel end joining functional determinants. *Fusion: Balancing Genome Fidelity and Plasticity Conference.* **May 4-7, 2023,** Tulum, Mexico.
6. Wang JL, Origel C, Le Bouteiller M, Sadeghi C, Conner KA, Le L, Edlabadkar, A, **Frock RL**. Identifying DNA end-joining functional determinants in non-cycling progenitor B cells. *FASEB SCR: Genetic Recombination and Genome Rearrangements Conference.* **August 14-19, 2022,** Steamboat Springs, CO.
7. Wang JL, Sadeghi C, Xu J, Meng J, **Frock RL**. Characterizing compounds and genes in V(D)J recombination. Stanford Radiation Oncology Department Retreat **November 18-19, 2021**, Stanford, CA.
8. Wang JL, Le Bouteiller M, Origel CA, Barghouth PG, Sadeghi C, Meng J, **Frock RL**. DNA end joining in quiescent progenitor B cells. Poster. *Gordon Research Conference: Mammalian DNA Repair*, **October 31-November 5, 2021**, Ventura, CA.
9. Liang Z, Kumar V, Le Bouteiller M, Zurita J, Kenrick J, Lin SG, Lou J, Hu J, Ye AY, Boboila C, Alt FW, **Frock RL**. Ku70 suppresses alternative end joining in G1-arrested B cells. Virtual iPoster. *2021 V Scholar Summit.* **April 28-29, 2021**.
10. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *Gordon Research Conference: DNA Damage, Mutation and Cancer.* **March 1-6, 2020**, Ventura, CA.
11. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *Translational Oncology Program Annual Symposium.* **October 21, 2019**, Stanford, CA.
12. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *FASEB SRC: Genetic Recombination*

and Genome Rearrangements Conference. **July 14-19, 2019**, Steamboat Springs, CO.

13. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *Gordon Research Conference: Mammalian DNA Repair.* **February 10-15, 2019**, Ventura, CA.
14. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. Stanford Immunology Annual Scientific Conference. **November 2-4, 2018**, Pacific Grove, CA.
15. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *Genome Engineering: The CRISPR-Cas Revolution.* **August 22-25, 2018**, Cold Spring Harbor, NY.
16. **Frock RL**, Kumar V, Liang Z, Zurita J, Du Z, Lin SG, Boboila C, Alt FW. Ku70 Suppresses Alternative End-joining in G1-arrested progenitor B cells. *Gene Expression and Signaling in the Immune System.* **April 24-28, 2018**, Cold Spring Harbor, NY.

TEACHING

Fall 2021-2024	**Lecturer** Stanford University, CBIO 240: Molecular and Genetic Basis of Cancer Role: Lecture on DNA end joining mechanisms and chromosome translocations, V(D)J recombination and hematologic malignancies.
Spring 2019-2025	**Lecturer** Stanford University, RADO 202: The Basic Science of Radiation and Cancer Biology Role: Single lecture on the DNA damage response, DNA repair pathways, and Genome Instability Syndromes for medical students.
Fall 2018-2020, 2022, 2024	**Lecturer** Stanford University, CBIO 280: Cancer Biology Journal Club Role: Lecture on chromosome translocations, DNA repair outcomes and other laboratory research topics.
Fall 2018 Winter 2024	**Discussion Section Leader** Stanford University, CBIO 240: Molecular and Genetic Basis of Cancer Role: Facilitated journal club style discussions on papers related to the lecturer's weekly topic for graduate students
Sept. 2017	**Lecturer**, FEBS International Summer School on Immunology, Hvar Island, Croatia

MENTORING (PI)

Postdoctoral Fellows:

- Garima Chaturvedi (2025-present) –Postdoctoral Scholar, Stanford University, Stanford, CA
- Jinglong Wang (2020-2025) –Professor, Soochow University, Suzhou, China
- Carlos Origel (2020-2021) –Sr. Computational Scientist, Recursion, Portland, OR
- Marie Le Bouteiller (2019-2021) –Homemaker
- Paul Barghouth (2019-2021) –Researcher, Nucleix, San Diego, CA

Master/Doctoral/Medical/Veterinary Students:

- Kristin Conner (2022) – Small animal Internal Medicine Resident, University of Minnesota
- Cheyenne Sadeghi (2021-2025) – MD/PhD student, UNC, Chapel Hill, NC
- Faiza Chowdhury (2025) – MD Student, Howard University, Washington D.C.

Research Technicians/Bioinformaticians:

- Josefin Kenrick (2018-2021) –PhD student, SciLifeLab, Stockholm, Sweden
- Micah Kelly (2018-2019) –Admin. Associate, Radiation Oncology, Stanford University Stanford, CA

Undergraduate Research Students:

- Sanika Kulkarni (2025) – Undergraduate, UC Irvine
- Olivia Santos (2025) – Undergraduate, UC Berkeley
- Elvis Lang (2023) – MD student, University of Central Florida, Orlando, FL
- Darsh Vithlani (2023) – Master Student, University of Pennsylvania, Philadelphia, PA
- Anushka Edlabadkar (2022) – ACRC, Jacobs Medical Center, UC San Diego Health
- Long Le (2022) – EMT, San Francisco, CA
- Jodie Meng (2021-2022) – MD student, Vanderbilt University, Nashville, TN
- Anita Taft (2021) – Fulbright Grantee, Prospective Medical Student

High School Summer Students:

- Carrie Truong (2023-present) – Undergraduate, Harvard University, Cambridge, MA
- Finn Maniscalco (2019) –Structures Engineer, Varda, El Segundo, CA