

BIOGRAPHICAL SKETCH

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NAME: **Kekoa Taparra**

eRA COMMONS USER NAME (credential, e.g., agency login): KTAPARR1

POSITION TITLE: Resident Physician

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE	COMPLETED	FIELD OF STUDY
Fairfield University Fairfield, CT	BS	05/2012	<i>Major 1:</i> Biology (Cellular & Molecular) <i>Major 2:</i> Psychology (Behav Neurosci) <i>Minors:</i> Asian studies, Math, Philosophy
Johns Hopkins School of Medicine Baltimore, MD	PhD	05/2016	Cellular and Molecular Medicine Dept. of Radiation Oncology and Molecular Radiation Sciences
Mayo Clinic Alix School of Medicine Rochester, MN	MD	05/2020	Doctor of Medicine - Science of Health Care Delivery Certification
Gundersen Health System La Crosse, WI	Internship	06/2021	Transitional Internship
Stanford Medicine Stanford, CA	Residency	<i>present</i>	Radiation Oncology

A. Personal Statement

I am a resident physician-scientist trainee in the Department of Radiation Oncology at Stanford Medicine. I am the first known Native Hawaiian MD PhD physician scientist according to the Society for Native Hawaiian Physicians. I am a graduate of the Kamehameha Schools, a K-12 institution in Hawai'i founded by Princess Pauahi during a time when our people were approaching extinction – declining from a population of ~800,000 to 20,000 individuals. Today, Native Hawaiians experience disproportionate health care disparities (Taparra, JAMA Health Forum, 2021). Personally I have had 10 Native Hawaiian family members who have struggled with a cancer diagnoses. Thus it is not surprising that the data reveal disproportionate cancer disparities among Native Hawaiians with some of the highest morbidity and mortality compared to other racial groups (Taparra, JAMA, 2021; Taparra, JCO Oncology Practice, 2021). Nonetheless, Pacific Islander individuals are poorly represented in the medical school pipeline and the oncology workforce (Taparra, JAMA Network Open, 2021). In this context, my life's mission has been to return home to the islands to provide high quality cancer care to the communities that raised me. I completed my PhD at Johns Hopkins School of Medicine and MD at Mayo Clinic Alix School of Medicine where I gained tools to think critically as a scientist while delivering compassionate patient-centered care at the bedside. During my training, I have had the fortune to conduct research and publish in areas I am very passionate about including: Pacific Islander health disparities, access to cancer care disparities, oligometastatic prostate cancer, and the impact of cancer healthcare costs have on survival outcomes. Upon completion of my training, I hope to continue my passion of mentoring underrepresented individuals in medicine to give back and show the next generation of Pacific Islanders that we are capable of careers in medicine and the health sciences.

B. Positions, Scientific Appointments and Honors**Positions and Appointments**

- 2009 Research Associate, University of Hawai'i Mānoa Institute for Biogenesis Research, Dr. Tom Humphreys
- 2010 Research Assistant, University of Hawai'i Hilo, Life Sciences, Dr. David Montgomerie
- 2010 Research Student, Genetics, Fairfield University Department of Biology, Dr. Anita Fernandez
- 2011-2012 Research Student, Breast Cancer, Fairfield University Department of Biology, Dr. Shelley Phelan
- 2012 Millennium: The Takeda Oncology Company (Takeda Cambridge), Global Medical Affairs, Dr. Tom Giove
- 2012 Ph.D. Student Research Rotation, Breast Cancer Genetics, Dr. Sara Sukumar
- 2013 Ph.D. Student Research Rotation, Prostate Cancer Epigenetics, Dr. William Nelson
- 2013-2016 Ph.D. Graduate Student, Radiation Oncology and Molecular Radiation Sciences, Dr. Phuoc Tran (Advisor)
- 2016 Medical Student Research, Dept. of Epidemiology, Minority Health Perceptions, Dr. Alexandra Greenberg
- 2017-2020 Medical Student Research, Dept. of Radiation Oncology, Dr. Nadia Laack
- 2017-2020 Medical Student Research, Dept. of Hematology and Oncology, Dr. Stephen Ansell
- 2018-2020 Medical Student Research, Dept. of Radiation Oncology, Dr. Bradley Stish
- 2020-2021 Mayo Clinic Research Collaborator, Dept. of Radiation Oncology, Drs. Bradley Stish and Kimberly Corbin
- 2020-2021 Gundersen Health System Cancer Center Research Resident, Transitional Year Residency Program
- 2020- 'Ahahui 'O Nā Kauka (Society for Native Hawaiian Physicians)
- 2020- Resident Physician Research, Dept. of Radiation Oncology, Stanford, Mentor Dr. Quynh-Thu Le

Scientific Appointments

- 2006-2010 **United States of America Swimming: National Governing Body of Swimming in the USA**
Elected National and State Athlete Representative (2006-2008)
Convention Education Committee, Elected Athlete Representative (2008-2010)
- 2012- **American Association for Cancer Research (AACR) - Associate Member**
Associate Member Council, Elected Council Member (2015-2018)
Elected Chair, Communications Committee (2016-2017)
Co-Chair, Civic Scientist Workshop Professional Advancement Session, 2016 Annual Meeting
Co-Chair, Personalized Career Discussions Professional Advancement Session, 2016 Annual Meeting
Co-Chair, Science Policy Workshop Professional Advancement Session, 2017 Annual Meeting
National Rally for Medical Research Hill Days, Washington, D.C., AMC Representative
Chair, Personalized Career Conversations Professional Advancement Session, 2018 Annual Meeting
Radiation Science and Medicine Working Group (2016-Present)
- 2014-2016 **Johns Hopkins University Biomedical Scholars Association**
Executive Board Member
Community Service and Outreach Officer
Director of the Science, Health, and Research Partnership (SHaRP) Program
- 2014-2016 **Medical Education Resources Initiative for Teens (MERIT) Mentoring Program**
Education Curriculum Development Team
Biomedical Research Strategist for MERIT summer programs
- 2016-2018 **American Medical Association (AMA) Medical Student Section (MSS)**
Committee on Scientific Issues (AMA-MSS CSI), Member (2016-2018)
Research Policy Subcommittee (2016-2017)
AMA Interim Symposium (2017-2018)
- 2016-2020 **Mayo Clinic School of Medicine**
MCSOM Research Committee, Selected Medical Student Representative (2016-2020)
MCSOM LCME Independent Student Analysis (ISA), Task Force Member (2017-2019)
MCSOM Student Organization Funding Task Force, Chair (2018-2019)
MCSOM Medical Specialty Journal Club Program (MSJCP), Founder and Program Director (2016-2020)
- 2020- **Association of Residents in Radiation Oncology (ARRO)**
Equity and Inclusion Subcommittee (EISC), Member (2020-present)
Mentorship Program Subcommittee (2020-present)
- 2021- **Stanford Medicine**
Graduate Medical Education Department Representative (Radiation Oncology)

Honors and Awards

- 2008 USA Swimming National Scholastic All American Award
- 2011 Fairfield University *Cura Personalis* Mentor of the Year Award
- 2009-2012 Fairfield University Magis Scholar (Highest Institution Academic Scholarship)
- 2012 Asian Studies Departmental Achievement Award (Highest Department Honor)
- 2012 Biology Departmental Achievement Award (Highest Department Honor Awarded to 1 Student)
- 2012 Valedictorian/Commencement Speaker Fairfield University Class of 2012
- 2014 Cold Spring Harbor Laboratories: Models and Mechanisms of Cancer Graduate Student Travel Award
- 2014 NIH NCI F31 Predoctoral Fellowship National Research Service Award (NRSA) - F31CA189588
- 2015 Johns Hopkins Alumni Association Student Grant Awardee - Science Health and Research Partnership
- 2015 American Association for Cancer Research Minority Scholar in Cancer Research Award
- 2015 National Thermo Pierce Biotechnology Fisher Scientific Scholarship Award
- 2015 Johns Hopkins University/Hospital/Health System Martin Luther King, Jr. Award for Community Service
- 2016 1st Place Johns Hopkins Radiation Oncology and Molecular Radiation Sciences Scientific Presentation Award
- 2016 American Association for Cancer Research-Takeda Oncology Scholar in Training Award
- 2016 Johns Hopkins School of Medicine Graduate Student Association Travel Award
- 2016-2017 'Imi Na'auao Scholarship – Kamehameha Schools Merit Based Medical/Graduate School Scholarship
- 2016-2020 Mayo Clinic School of Medicine 4 Year Full Tuition Merit Scholarship Recipient (1 of 2 students)
- 2017 Mayo Clinic Division of Hematology and Division of Oncology Medical Student Research Award
- 2017 Mayo Clinic School of Medicine Ponce De Leon Scholarship & Jean M. Fox Scholarship Award
- 2017 American Society for Radiation Oncology (ASTRO) Minority Summer Fellowship Award (1 Clinical Fellow)
- 2017 American Heart Association Helen N. & Harold B. Shapira Heart Medical Scholarship (1 recipient)
- 2018 American Society of Hematology (ASH) Minority Medical Student Award Program Award
- 2018 Princess Pauahi Foundation – Kamehameha Schools c/o 1960 Scholarship and c/o 1962 Scholarship Award
- 2018 American Society of Clinical Oncology (ASCO) Conquer Cancer Foundation Medical Student Rotation Award
- 2019 National Medical Fellowships National Alumni Council Scholarship Award
- 2019 American Society of Hematology Annual Meeting Abstract Achievement Award
- 2019 Mayo Clinic Hematology/Oncology Medical Student Research Travel Award and Scholarship
- 2021 European Urology Oncology SoMe Award (Most Influential Article in Issue)
- 2021 Conquer Cancer Merit Award - ASCO Quality Care Symposium
- 2021 American Association for Cancer Research Scholar-In-Training Award
- 2021 Cures Within Reach Foundation Research Grant Award
- 2021 Tobacco Related Disease Research Program Research Grant Award

C. Contributions to Science

As the first reported Native Hawaiian MD PhD physician scientist, I have had the opportunity to engage in research focusing on Pacific Islander cancer disparities and representation in the medical pipeline. I have demonstrated that not only is the representation of Pacific Islanders in medicine significantly underrepresented compared to the proportion of the US population who identify as Pacific Islander, but these numbers are decreasing across the medicine pipeline from medical students, to residents, to academic faculty. This is important because of the disproportionate health care disparities that impact Native Hawaiians and other Pacific Islanders. My research has demonstrated that compared to other ethnic and racial categories, Native Hawaiians have a higher likelihood of developing subsequent invasive breast cancer after initially being treated for a pre-cancerous DCIS. This and other health disparities have been the recent focus of my academic work.

1. **Taparra K**, Miller RC, Deville C. Navigating Native Hawaiian and Pacific Islander Cancer Disparities from a Cultural and Historical Perspective. **Journal of Clinical Oncology - Oncology Practice** 2021 Jan 6; PMID: 33497251.
2. **Taparra K**. Pacific Islanders Searching for Inclusion in Medicine. **JAMA Health Forum** [Insights]. 2021 Feb 24. 2 (2), e210153-e210153.
3. **Taparra K**, Deville C. A Cross-Sectional Study of Pacific Islander Representation among United States Allopathic Medical Schools, Residency Programs, and Faculty Physicians. **JAMA Network Open** 2021 Sep 1. PMID: 34542620.

4. **Taparra K**, Fukui J, Killeen J, Sumida K, Loo LMW, Hernandez BY. Racial/Ethnic Disparities in rates of Invasive Secondary Breast Cancer among women with Ductal Carcinoma In Situ in Hawai'i. **JAMA Network Open** 2021 Oct 1; PMID: 34668945.
5. Jain B, Ng Kenrick, Santos PMG, **Taparra K**, Muralidhar V, Mahal BA, Vapiwala N, Trinh QD, Nguyen PL, Dee EC. Prostate Cancer Disparities in Risk Group at Presentation and Access to Treatment for Asian Americans, Native Hawaiians, and Pacific Islanders: A Study with Disaggregated Ethnic Groups. **Journal of Clinical Oncology – Oncology Practice** 2021 Oct 28; PMID: 34709962.
6. **Taparra K**, Harding M, Deville C. Healing and Health Equity for Asian American, Native Hawaiian, and Pacific Islander Populations. **JAMA** 2021 Dec 21; PMID: 34932087.

My graduate school work has contributed to the field of sugar metabolism in cancer research. At Johns Hopkins, I focused on the epithelial mesenchymal transition (EMT) process in non-small cell lung cancer (NSCLC). I found that EMT, which normally plays a key role in the metastatic potential of a cell, also reprograms sugar metabolism through the sugar metabolism O-GlcNAcylation pathway to drive tumorigenesis of NSCLC. Using a vertebrate model of NSCLC, we demonstrate that the sugar post-translational modification of O-GlcNAcylation is necessary and sufficient to overcome KRAS^{G12D} oncogene induced senescence. This provided evidence for a new avenue of targetable agents in mutant KRAS driven NSCLC.

1. **Taparra K**, Tran PT, Zachara NE. Hijacking the Hexosamine Biosynthetic Pathway to Promote EMT-Mediated Neoplastic Phenotypes. **Frontiers in Oncology** 2016 Apr 18;6(85). PMID: 2698019.
2. **Taparra K***, Wang H*, Malek R*, Barbhuiya MA, Simons BW, Ballew M, Nugent KM, Groves J, Williams JD, Shiraishi T, Verdone J, Yildirim G, Henry R, Zhang B, Wong J, Wang K, Nelkin BD, Pienta KJ, Felsher D, Zachara NE, Tran PT. O-GlcNAcylation is required for mutant KRAS-induced lung tumorigenesis. **J Clinical Investigation** 2018 Nov 1; 128(11):4924-4937. PMID: 30130254. *Authors Contributed Equally
3. Malek R, Wang H, **Taparra K**, Tran PT. Therapeutic Targeting of Epithelial Plasticity Programs: Focus on the Epithelial-Mesenchymal Transition. **Cells Tissues Organs** 2017 Feb;2(203): 114-127. PMID: 28214899.
4. Malek R, Gajula R, Williams R, Nghiem B, Simons B, Nugent K, Wang H, **Taparra K**, Lemtiri-Chlieh G, Yoon A, True L, An S, DeWeese TL, Ross AE, Schaeffer EM, Pienta KJ, Hurley PJ, Morrissey C, Tran PT. TWIST1-WDR5-Hottip regulates Hoxa9 chromatin to facilitate prostate cancer metastasis. **Cancer Research** 2017 May 8; 77(12):3181-3193. PMID: 28484075
5. [Chapter Reviewer] Freeze H, Schachter H, Kinoshita T. (2017). Chapter 45: Genetic Disorders of Glycosylation. In *Essentials of Glycobiology, Third Edition*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.

During medical school, I worked on a novel protocol to reduce treatment toxicity for one of our most vulnerable cancer patient populations: adolescents and young adults. Early-stage Hodgkin lymphoma is cured at rates of ~90% with chemotherapy and radiotherapy. Despite its efficacy, conventional RT has been associated with long-term cardiac toxicities and secondary malignancies. Therefore, advancements in RT delivery are imperative to reduce long-term cardiovascular morbidity and mortality while also maintaining survival outcomes. In this project, for which I was awarded with ASCO and ASTRO research fellowship grants, we use EKG-gated CT angiography to delineate the cardiac substructures for the use of photon and proton therapy to significantly reduce cardiac substructure radiation dose. Also relevant to the field of adolescents and young adults with cancer, in other research, I led a team that focused on cost of cancer care for this age group showing factors associated with high cost of care and how these high costs are associated with predicting poor clinical outcomes. Overall, the emphasis of this body of literature has focused on the adolescent and young adult population, which is understudied but experiences high morbidity due to long-term survival.

1. **Taparra K**, Liu H, Polley MY, Ristow K, Habermann T, Ansell S. Bleomycin Use in the Treatment of Hodgkin Lymphoma (HL): Toxicity and Outcomes in the Modern Era. **Leukemia and Lymphoma** 2019 Sep; 13:1-11. PMID: 31517559.
2. **Taparra K**, Lester SC, Hunzeker A, Funk RK, Blanchard MJ, Young P, Herrmann J, Tasson A, Leng S, Martenson JA, Whitaker TJ, Williamson E, Laack NN. Reducing Heart Dose with Protons and Cardiac

Substructure Sparing for Mediastinal Lymphoma Treatment. *International Journal of Particle Therapy* 2020 Sep 4; 4;7(1):1-12. PMID: 33094130

3. **Taparra K**, Fitzsimmons A, Frankki S, De Wall A, Chino F, Peters A. Healthcare Costs for Adolescent and Young Adults with Cancer: A Community-Based Hospital Study between 2005-2020. *Supportive Care in Cancer* 2021 Sep 26. PMID: 34564776.

D. Scholastic Performance (Undergraduate Coursework)

YEAR	SCIENCE COURSE TITLE	GRADE	YEAR	OTHER COURSE TITLE	GRADE
FAIRFIELD UNIVERSITY			FAIRFIELD UNIVERSITY		
2008	General Biology and Lab I	A	2008	Intro to CS & Programming and Lab I	A
2009	General Biology and Lab II	A	2008	Comp & Prose Lit	A
2009	General Biology and Lab III	A-	2008	Intermediate Japanese I	A
2009	General Inorganic Chemistry I	A	2008	Differential Calculus	A
2009	General Inorganic Chemistry Lab I	A	2009	Intro to CS & Programming and Lab II	A
2009	Developmental Biology	A-	2009	Data Structures and Algorithms	A-
2010	General Inorganic Chemistry II	A	2009	Introduction to Literature	A
2010	Genetics	A	2009	Intermediate Japanese II	A
2010	Biology Research Capstone I	A	2009	Integral Calculus	A
2011	Molecular Biology	A	2009	Ind Study: Japanese Translation	A
2011	Evolutionary Biology	A-	2009	Discrete Mathematics	A
2011	Mol. Mech. of Human Disease	A-	2009	Ancient/Medieval Philosophy	A
2011	Biochemistry II	B+	2010	Biological Basis of Behavior	A
2011	Biology Research Capstone II	A	2010	Hormones and Behavior	A
2011	General Physics I	A	2010	Ethics of Health Care	A
2011	General Physics I Lab	A	2010	Visual Culture Since 1400	A
2012	Cell Biology	A	2010	Imagining Shakespeare	A
2012	Biology Research Capstone III	A	2010	Digital Photography	A
2012	General Physics II	A-	2010	Human Neuropsychology	A
2012	General Physics II Lab	A	2011	Questions: Descartes to Derrida	A
UNIVERSITY OF HAWAI'I - HILO			2011	Phil of Daoism and Zen Buddhism	A
2010	Organic Chemistry I	P	2011	Statistics for Life Sciences	A
2010	Organic Chemistry I Lab	P	2011	Abnormal Psychology	A
2010	Organic Chemistry II	P	2011	Developmental Psychology	A
2010	Organic Chemistry II Lab	P	2011	Cognitive Psychology	A
JOHNS HOPKINS UNIVERSITY SOM			2012	Research Methods in Psychology	A-
2012	Introduction to the Human Body	B	2012	Spec Topics: Current Issues/Behavior	A
2012	Molecular Biology and Genomics	A	2012	Phil Biology and Evolutionary Theory	A
2012	Fundamentals of Genetics	B+	上智大学 (SOPHIA UNIVERSITY) TOKYO, JAPAN		
2012	Topics in Cellular and Molecular Med	P	2009	Japanese History: Edo & Tokyo	P
2012	CMM Research	A	2009	Survey of Japanese Religions	P
2012	CMM Research	A	UNIV. OF HAWAI'I - LEEWARD COM. COLLEGE		
2013	Cell. and Mol. Basis of Disease	A	2009	Europe & World in Transition	P
2013	Pathways and Regulation	B+	2009	Intro to Religious Studies	P
2013	Cell Structure & Dynamics	B			
2013	CMM Core Discussion	P			
2013	CMM Research	A			
2013	Phenotyping for Functional Genetics	A			