

NAME: McPherson, Marla C.
eRA COMMONS USER NAME (credential): MARLA.MCPHERSON
POSITION TITLE: Postdoctoral Researcher

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

INSTITUTION AND LOCATION	DEGREE (if applicable)	START DATE MM/YYYY	END DATE MM/YYYY	FIELD OF STUDY
University of Connecticut	BS	09/2006	05/2010	Biological Sciences
UC Davis	PHD	09/2010	12/2016	Integrative Genetics and Genomics
Stanford University	NIH training grant	03/2017	present	Immunology

A. Personal Statement

My long-term research goal is to elucidate mechanisms of virally-induced human cancer in order to identify putative therapeutic targets. I have acquired extensive training in molecular biology, genetics, virology, and immunology during my graduate training in Genetics and Genomics at UC Davis as well as my two years of postdoctoral research at the Stanford University School of Medicine. As an undergraduate, I built a strong foundation in experimental biology in the laboratory of Dr. Patrick Senatus through our studies in a neurodegenerative disease model. As a doctoral student in Dr. Mary Delany's laboratory at the University of California (UC) Davis, I investigated host-virus interactions and viral integration during key stages of avian herpesvirus infection and the impact on oncogenic T cell transformations. I discovered that viral DNA from vaccine strains routinely used in commercial settings integrate into host T cell genomes, yet do not transition into a discerned transformation-associated viral phenotype. These findings were published in *Vaccine*, where it was featured as a "highlighted article." As a graduate student, I published a total of five first-author research and review articles in peer-reviewed journals. I was also awarded several research honors and fellowships and presented at several major national and international research conferences. In addition, I served as the student chair of the Genetic and Genomics Executive Committee.

As a post-doctoral fellow, I will expand my experimental skill set to human disease. My sponsor, Dr. Olivia Martinez, is a well-recognized leader in transplant immunology and Epstein-Barr Virus (EBV) research. In addition to her excellent publication record, she has extensive experience training postdoctoral fellows and successfully guiding their projects. The proposed EBV B cell lymphoma research will provide me with new technical and scholarly training in human immunology, as well as virus and cancer research. I have already contributed to collaborative projects focused on EBV+ B lymphomas in the lab, resulting in a second-authored research publication in the *American Journal of Transplantation*. To cultivate a robust scientific community at Stanford, I volunteer as a member of the Stanford Immunology Postdoctoral Committee and as lead organizer of the annual Immunology Postdoc Symposium. Through this scientific outreach, I have gained valuable experience in management, leadership, and networking. My training plan additionally includes other activities for research career development, including high school and college student mentoring, grantsmanship, computational biology workshops/courses, and conference presentations. Recently, I presented my preliminary research findings at the Stanford Immunology Research Conference (2018) and the International Congress of The

Transplantation Society (2018). I am confident that I have the adaptability, critical thinking, and experimental acumen to conduct successful and novel postdoctoral research projects under the outstanding mentorship of Dr. Martinez. I look forward to continuing our research elucidating the genetic and immunological processes underlying virus-induced B cell transformation in human disease and cancer.

1. Sang AX, **McPherson MC**, Ivison GT, Qu X, Rigdon J, Esquivel CO, Krams SM, Martinez OM. Dual blockade of the PI3K/Akt/mTOR pathway inhibits post-transplant Epstein-Barr virus B cell lymphomas and promotes allograft survival. *Am J Transplant*. 2018 Dec; *Epub*.
1. **McPherson MC**, Cheng HH, Smith JM, Delany ME. Vaccination and disease-susceptibility genotype significantly reduces an oncogenic Gallid alphaherpesvirus 2 telomere integration phenotype in host birds. *Cytogenet Genome Res*. 2018; 156 (4): 204-214.
2. **McPherson MC**, Cheng HH, Delany ME. Marek's disease herpesvirus vaccines integrate into chicken host chromosomes yet lack a virus-host phenotype associated with oncogenic transformation. *Vaccine*. 2016; 34: 5554-61.
3. **McPherson MC**, Robinson CM, Gehlen LP, Delany ME. Comparative cytogenomics of poultry: mapping of single gene and repeat loci in the Japanese quail (*Coturnix japonica*). *Chromosome Res*. 2014; 22 (1): 71-83.

B. Positions and Honors

Positions and Employment

2009 - 2010 Clinical Academic Assistant, University of Connecticut Health Center
2010 - 2016 Graduate Student Researcher, UC Davis
2017 - Postdoctoral Researcher, Stanford University School of Medicine

Other Experience and Professional Memberships

2010 Student Intern, University of Connecticut Biological Research Collections
2011 - 2013 Recruitment Student Representative, UC Davis Integrative Genetics & Genomics Graduate Group Student Executive Committee
2013 - 2014 Chair of Avian Exhibits, UC Davis Picnic Day Animal Science Committee
2013 - 2015 Genetics Colloquium Organizing Co-Chair, UC Davis Integrative Genetics & Genomics Graduate Group Student Executive Committee
2013 - 2014 Student Chair, UC Davis Integrative Genetics & Genomics Graduate Group Student Executive Committee
2017-2018 Organizing Chair, Immunology Postdoc Symposium, Stanford Immunology Postdoctoral Committee
2017- Member, Stanford Immunology Postdoctoral Committee

Honors

2011 Hart, Cole & Goss Research Fellowship, UC Davis Animal Science Department
2012 Ed F. Olivera, Sr. Memorial Award, UC Davis Animal Science Department
UC Davis Foundation Fellowship, UC Davis College of Agricultural and Environmental Sciences
Henry A. Jastro Research Scholarship Award, UC Davis Graduate Studies
2013 Austin Eugene Lyons Fellowship in Genetics, UC Davis College of Agricultural and Environmental Sciences

2014	1st Place People's Choice Poster Award, UC Davis Interdisciplinary Graduate and Professional Student Symposium Floyd and Mary Schwall Dissertation Year Fellowship in Medical Research, UC Davis College of Agricultural and Environmental Sciences Rosenberg Graduate Researcher Award, UC Davis Animal Science Department
2015	Best Presentation in Biological Sciences, UC Davis Interdisciplinary Graduate and Professional Symposium Best Overall Research Poster, UC Davis Integrative Genetics and Genomics Annual Meeting and Colloquium
2017-2018	Immunology Training Grant Postdoctoral Fellowship, Stanford Immunology, Stanford University School of Medicine

C. Contribution to Science

1. **Undergraduate Career:** My early career focused on using molecular and systems biology within the context of neurosurgical research. I was trained in neuroscience, and behavioral and molecular biology in the laboratory of Dr. Patrick Senatus in the Department of Surgery at the UConn Health Center. We investigated the potential of deep brain stimulation in the treatment of jaw tremors in a rodent model of Parkinson's Disease. I also analyzed large datasets on human neurosurgical technique research as well as contributed to grant writing development and implementation.
 - a. Collins LE, Paul NE, Baqi Y, Müller CE, Ledgard F, Satzer D, **McPherson MC**, Rhodes C, Senatus PB, Salamone JD. Deep brain stimulation of the subthalamic nucleus effectively reverses tremulous jaw movements induced by both dopamine antagonism and cholinergic stimulation in a rodent model of Parkinsonian tremor: Interaction with the effects of adenosine A2A antagonism. 41st Annual Meeting of the Society for Neuroscience. 2011; Washington, DC.
2. **Graduate Career:** My graduate research focused on host-Marek's Disease Virus genomic interactions and patterns of virus telomeric integration that impact oncogenic T cell transformation. Furthermore, I investigated the cytogenomic characteristics of vaccine strains used to protect against virus-induced T cell tumors in Marek's disease. I published three first-author research and two review articles based on this research. My latest publication characterized the genome-level behavior of oncogenic virus strains in the infected immune cells of vaccinated and unvaccinated hosts with disease-resistant and -susceptible genotypes. My research uncovered a number of viral infection states during Marek's disease pathogenesis and virus-associated T cell oncogenesis and can serve as a guide to improving methods for novel vaccine evaluation.
 - a. **McPherson MC**, Cheng HH, Smith JM, Delany ME. Vaccination and disease-susceptibility genotype significantly reduces an oncogenic *Gallid alphaherpesvirus* 2 telomere integration phenotype in host birds. *Cytogenet Genome Res.* 2018; 156 (4): 204-214.
 - b. **McPherson MC**, Cheng HH, Delany ME. Marek's disease herpesvirus vaccines integrate into chicken host chromosomes yet lack a virus-host phenotype associated with oncogenic transformation. *Vaccine.* 2016; 34: 5554-61.
 - c. **McPherson MC**, Delany ME. Virus and host genomic, molecular, and cellular interactions during Marek's disease pathogenesis and oncogenesis (Review). *Poult Sci.* 2016; 95 (2): 412-29.
 - d. **McPherson MC**, Robinson CM, Delany ME. Host-viral genome interactions in Marek's disease (Review). *Third Report on Chicken Genes and Chromosomes. Cytogenet Genome Res.* 2015; 145: 78-179.

- e. **McPherson MC**, Robinson CM, Gehlen LP, Delany ME. Comparative cytogenomics of poultry: mapping of single gene and repeat loci in the Japanese quail (*Coturnix japonica*). *Chromosome Res.* 2014; 22 (1): 71-83.
3. **Postdoctoral Career:** As a postdoctoral fellow, my research has focused on (1) host genomic perturbations generated by EBV that may contribute to tumorigenesis in EBV+ B cell lymphomas and (2) EBV-based modulation of the host human miRNA network and its alteration of the host PI3K/Akt pathway in infected B cells. I am investigating potential mechanisms of EBV-induced B cellular proliferation and transformation. Improved understanding of the mechanisms of EBV pathogenesis will help identify new therapeutic targets for EBV-associated malignancies.
- a. Sang AX, **McPherson MC**, Ivison GT, Qu X, Rigdon J, Esquivel CO, Krams SM, Martinez OM. Dual blockade of the PI3K/Akt/mTOR pathway inhibits post-transplant Epstein-Barr virus B cell lymphomas and promotes allograft survival. *Am J Transplant.* 2018 Dec; *Epub.*
- b. **McPherson MC**, Balachandran Y, Boyd SD, Zimmermann H, Trappe RU, Esquivel CO, Krams SM, Martinez OM. Genomic Modifications Associated with Epstein Barr Virus+ Post-Transplant Lymphoproliferative Disorder. American Transplant Congress. 2018; Seattle, WA.
- c. **McPherson MC**, Balachandran Y, Boyd SD, Zimmermann H, Trappe RU, Esquivel CO, Krams SM, Martinez OM. Genomic status of the Epstein Barr Virus and Virus-Associated PI3K/Akt/mTOR Pathway Dysregulation in Post-Transplant Lymphoproliferative Disorder. 27th International Congress of The Transplantation Society. 2018; Madrid, Spain.

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/1ZeNcqrhjqgkz/bibliography/49497201/public/?sort=date&direction=ascending>

D. Additional Information: Scholastic Performance

Scholastic Performance

YEAR	COURSE TITLE	GRADE
UNIVERSITY OF CONNECTICUT (UNDERGRADUATE)		
2006	Principles of Biology I	B+
2006	Calculus I	A-
2006	Principles of Biology II	B
2007	Human Genetics	A-
2008	Evolution and Human Diversity	A
2008	Introduction to Conservation Biology	A-
2008	Animal Physiology	B+
2008	General Physics I	A-
2008	History of Science	A-
2008	Organic Chemistry I	B-
2009	Genetic Engineering and Genomics	A-
2009	General Physics II	A
2009	Concepts of Genetic Analysis	A
2009	Biology of the Vertebrates	A

YEAR	COURSE TITLE	GRADE
2009	Organic Chemistry II	A-
2009	Biochemistry	A
2009	Cell Biology	A
2010	Paleobiology	A
2010	Basic Museum Techniques	A
2010	Molecular & Genetic Approaches	A
2010	Evolutionary Biology	A
UC DAVIS (GRADUATE)		
2010	Advanced Genetic Analysis	A
2010	History of Genetics	A
2010	Molecular Genetics Laboratory	S
2011	Molecular Sequencing	A
2011	Quantitative & Population Genetics	A+
2011	Gene Therapy	A
2011	Science Communication & Writing	S
2011	Molecular Genetics	A-
2011	Genomics	B
2011	Scientific Professionalism	S
2011	Animal Genetics Seminar	A
2012	Animal Cell Culture	A

A few courses at UC Davis were graded as S (Satisfactory, B or better) or NS (Not Satisfactory).