

Kiara V. Whitley

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Curriculum Vitae

Academic Preparation and Training

June 2016-August 2022

PhD in Microbiology and Molecular Biology

Brigham Young University, *Provo, UT*

Supervised by Dr. K. Scott Weber

Graduate research: Understanding the role of the T cell co-receptor CD5

GPA: 4.0

August 2015-June 2016

MS in Microbiology and Molecular Biology (transferred to PhD)

Brigham Young University, *Provo, UT*

Supervised by Dr. K. Scott Weber

Graduate research: Isolating TKI-specific antibodies for cancer immunotherapy

September 2014-April 2015

Adjunct Professor

Brigham Young University-Idaho, *Rexburg, ID*

Bio 264 Lab – Human Anatomy and Physiology

September 2009-July 2014

B.S. in Biology, Emphasis in Human Biology

Brigham Young University-Idaho, *Rexburg, ID*

Undergraduate research: Gene therapy targeting ovarian cancer

GPA: 3.99

Professional Teaching Experience

Jan. 2021-April 2021

Jan. 2020-April 2020

Jan 2019-April 2019

MMBio 463 – Immunology Teaching Assistant

Brigham Young University, *Provo, UT*

Professor: K. Scott Weber

- Prepared review sessions for the class before each test to review materials learned
- Planned individual meetings with struggling students to tailor their needs
- Organized student poster and oral presentations and recruited faculty and graduate students to help assess student understanding of various immunological diseases
- Taught students about immunology principles such as immune cell types, B and T cell signaling and activation, cytokine and chemokine production, inflammatory responses, immune regulation, the complement system, receptor formation and antigen presentation, autoimmunity, immunodeficiencies, cancer, and immunology experimental methods

Sept. 2017-Dec. 2017
Sept. 2016-Dec. 2016

MMBio 522 - Flow Cytometry Teaching Assistant

Brigham Young University, *Provo, UT*

Professor: K. Scott Weber

- Trained students how to use three different flow cytometers: the BD Accuri, ThermoFisher Attune, and Beckman-Coulter Cytoflex
- Instructed students on flow cytometry principles such as compensation, voltage gating, software setup and analysis, cytometric panel construction, troubleshooting, sample preparation, and how to use FlowJo
- Revised software practice sets to enhance clarity for student understanding

Jan. 2016-April 2016

MMBio 465 - Virology Teaching Assistant

Brigham Young University, *Provo, UT*

Professor: Brad Berges

- Held review sessions for students, prepared quizzes to solidify students' knowledge about virology principles, and assisted students with scientific writing about current virology issues
- Graded and reviewed exams with students to improve their understanding of the concepts missed on the exam
- Instructed students on basic principles of virology, including viral structure, replication, viral-immune interface, viral diseases, treatment and prevention of viral infections, vaccine development, gene therapy, and experimental tools for studying viruses

Sept. 2014-April 2015

Anatomy and Physiology Adjunct Professor

Brigham Young University-Idaho, Biology Department, *Rexburg, ID*

- Applied understanding of human anatomy and previous work experience to teach concepts on systemic anatomical structure, specifically the skeletal, muscular, nervous, and sensory systems
- Planned class materials such as presentations and practice tests to aid student learning, understanding, and retention of the concepts taught
- Prepared quizzes and exams to assess students' knowledge of anatomical concepts

Jan. 2014-July 2014

TA and Dissection Lead for Biology 460: Human Anatomy

Brigham Young University-Idaho, Biology Department, *Rexburg, ID*

Professor: Sidney Palmer

- Applied knowledge of human anatomy to teach advanced anatomical concepts based on regional structure and function
- Instructed and supervised students in cadaver dissection and organized peer instruction and study groups
- Communicated with head professor to develop lesson plans and learning outcomes and coordinate teaching and testing schedules

Mentorship

Justin Grandall – 2016 Microbiology and Molecular Biology BYU graduate, currently working in biotech industry
Steven Ogden – 2019 Molecular Biology BYU graduate, currently Practice Manager at Lakeview Family Medicine, Drem, UT
Daniel Thompson – 2017 Microbiology BYU graduate, 2022 Molecular Biology BYU PhD graduate
Hyung Joon Kim – 2017 Microbiology and Molecular Biology BYU graduate
Tia Thomas – 2018 Neuroscience BYU graduate, currently studying law at Columbia Law School in New York, NY
John Hancock – 2015 Cell Biology BYU graduate, currently pursuing an MD/PhD at University of Utah Medical School
Nolan Beatty – 2017 Molecular Biology BYU graduate, currently pursuing an MD at the University of South Florida
Rachel Collier – 2019 Microbiology and Molecular Biology BYU graduate, genetic counseling student at University of California-Irvine
Brie Kingrey – 2018 Molecular Biology BYU graduate, 2021 BYU Law graduate
Jake Robins – 2019 Microbiology BYU graduate, pursuing a medical degree at Noorda College of Osteopathic Medicine
Kelsey Bennion – 2019 Microbiology and Molecular Biology BYU graduate, currently pursuing a PhD in Cancer Biology at Emory University
Charles Teames – 2019 Cell Biology BYU graduate, currently pursuing an MD at University of Utah Medical School
Josie Tueller – 2019 Microbiology BYU Master's graduate, currently working for TCRCure in Durham, North Carolina
Wyatt Magoffin – 2021 Neuroscience BYU graduate
Alexa Tall – 2020 Molecular Biology BYU graduate, currently a clinical research coordinator at Huntsman Cancer Institute
Jessica Townsend – 2020 Microbiology BYU graduate, attending Baylor College of Medicine's Physician Assistant Program
Topher Haynie – 2020 Molecular Biology BYU graduate, pursuing a Master's degree at Brigham Young University
Carlos Moreno – 2019 Biology BYU-Idaho graduate, pursuing a PhD at Brigham Young University
Kyle Reaveley – 2022 Microbiology graduate, pursuing a medical degree at Noorda College of Osteopathic Medicine
Isabella Wallwitz – 2022 Microbiology graduate
Joshua Teasdale – 2022 Microbiology graduate
Joshua Bennett - current undergraduate in the lab

Awards and Fellowships

September 2021-August 2022

Year-Round Fellow

Simmons Center for Cancer Research at Brigham Young University, Provo, UT
Title of Proposal: Characterization of Single Chain Antibodies for Cancer Immunotherapeutic Applications
Amount: \$30,000

May 2021-August 2021

Spring/Summer Fellow

Simmons Center for Cancer Research at Brigham Young University, Provo, UT
Title of Proposal: Characterization of the T cell co-receptor CD5: a metabolic study
Amount: \$9000

May 2020-August 2020

Spring/Summer Fellow

Simmons Center for Cancer Research at Brigham Young University, Provo, UT
Title of Proposal: The role of CD5 in receptor-ligand avidity in helper T cell activation
Amount: \$8000

May 2018-August 2018	<u>Spring/Summer Fellow</u> Simmons Center for Cancer Research at Brigham Young University, Provo, UT Title of Proposal: Engineering TKI-specific antibodies for immuno-therapeutic applications Amount: \$8000
May 2017-August 2017	<u>Spring/Summer Fellow</u> Simmons Center for Cancer Research at Brigham Young University, Provo, UT Title of Proposal: Engineering an Assassin: Developing a CAR-T Cell to Destroy Cancer Amount: \$7500
May 2016-August 2016	<u>Spring/Summer Fellow</u> Simmons Center for Cancer Research at Brigham Young University, Provo, UT Title of Proposal: Winning the Immunity Arms Race: Engineering Antibodies to Eliminate Cancer Amount: \$7000
September 2009-July 2014	<u>Full-Ride Tuition Scholarship</u> Brigham Young University-Idaho Amount: \$1800-\$2400 per semester

Lab Techniques and Skills

<u>Cellular Biology</u>	<u>Molecular Biology</u>	<u>Animal Care</u>	<u>Analysis Software</u>	<u>Specializations</u>
<ul style="list-style-type: none"> • Culture of splenic T cells and bone marrow-derived macrophages • Bacterial culturing of <i>E. coli</i> and <i>Listeria monocytogenes</i> • Fluorescence and light microscopy • Cancer cell line culturing (H460, CaOV3, A2780, etc.) • Phage genomic analysis 	<ul style="list-style-type: none"> • Molecular cloning: primer design, digestion, and ligation • Bacterial transformation • RNA, DNA, and plasmid purification • DNA gel analysis and extraction • PCR and reverse transcription • ELISA • Western blot • qPCR 	<ul style="list-style-type: none"> • Handling • Breeding • Tagging and genotyping of transgenics • Dissection of spleen, lymph nodes, bone marrow, and intestines • Post-orbital injection 	<ul style="list-style-type: none"> • MetaboAnalyst • Geneious • FlowJo • GraphPad Prism • DAVID • RaptorX 	<ul style="list-style-type: none"> • Calcium imaging • Animal behavior assays • Agilent metabolic assays • Human cadaver dissection

Publications and Presentations

Publications

- March 2022 CD5 deficiency alters helper T cell metabolic function and shifts the systemic metabolome
Published in *Biomedicines*, invited for Special Issue: Omics Data Analysis & Integration in Complex Diseases
Authors: **Kiara V. Whitley**, Claudia M. Tellez Freitas, Carlos Moreno, Joshua Bennett, John Hancock, Christopher Haynie, Brett Pickett, and K. Scott Weber
- January 2020 Genomics Education in the Era of Personal Genomics: Academic, Professional, and Public Considerations
Published in the *International Journal of Molecular Sciences*, invited for Special Issue: Feature Papers in Molecular Genetics and Genomics
Authors: **Kiara V. Whitley**, Josie A. Tueller, and K. Scott Weber
- October 2019 A full semester flow cytometry course improves graduate and undergraduate student confidence
Published in *Biochemistry and Molecular Biology Education*
Authors: Josie A. Tueller, **Kiara V. Whitley**, and K. Scott Weber
- July 2018 Characterization of two related *Erwinia* myoviruses that are distant relatives of the PhiKZ-like Jumbo phages
Published in *PLoS One*
Authors: Daniel K. Arens, T. Scott Brady, John L. Carter, Jenny A. Pape, David M. Robinson, Kerri A. Russell, Lyndsay A. Staley, Jason M. Stettler, Olivia B. Tateoka, Michelle H. Townsend, **Kiara V. Whitley**, Trevor M. Wienclaw, Taryn L. Williamson, Steven M. Johnson, and Julianne H. Grose
- November 2017 Genome Sequences of 19 Novel *Erwinia amylovora* Bacteriophages
Published in *American Society of Microbiology Genome Announcements*
Authors: Ian N. D. Esplin, Jordan A. Berg, Ruchira Sharma, Robert C. Allen, Daniel K. Arens, Cody R. Ashcroft, Shannon R. Bairett, Nolan J. Beatty, Madeline Bickmore, Travis J. Bloomfield, T. Scott Brady, Rachel N. Bybee, John L. Carter, Minsey C. Choi, Steven Duncan, Christopher P. Fajardo, Brayden B. Foy, David A. Fuhriman, Paul D. Gibby, Savannah E. Grossarth, Kala Harbaugh, Natalie Harris, Jared A. Hilton, Emily Hurst, Jonathan R. Hyde, Kayleigh Ingersoll, Caitlin M. Jacobson, Brady D. James, Todd M. Jarvis, Daniella Jaen-Anieves, Garrett L. Jensen, Bradley K. Knabe, Jared L. Kruger, Bryan D. Merrill, Jenny A. Pape, Ashley M. Payne Anderson, David E. Payne, Malia D. Peck, Samuel V. Pollock, Micah J. Putnam, Ethan K. Ransom, Devin B. Ririe, David M. Robinson, Spencer L. Rogers, Kerri A. Russell, Jonathan E. Schoenhals, Christopher A. Shurtleff, Austin R. Simister, Hunter G. Smith, Michael B. Stephenson, Lyndsay A. Staley, Jason M. Stettler, Mallorie L. Stratton, Olivia B. Tateoka, P. J. Tatlow, Alexander S. Taylor, Suzanne E. Thompson, Michelle H. Townsend, Trevor L. Thurgood, Brittian K. Usher, **Kiara V. Whitley**, Andrew T. Ward, Megan E. H. Ward, Charles J. Webb, Trevor M. Wienclaw,

Taryn L. Williamson, Michael J. Wells, Cole K. Wright, Donald P. Breakwell, Sandra Hope, Julianne H. Grose

December 2013 Adenoviral-delivered HE4-HSV-tk sensitizes ovarian cancer cells to ganciclovir
Published in Gene Therapy and Molecular Biology
Authors: Jennifer W. Rawlinson, **Kiara Vaden**, Joseph Hunsaker, David F. Miller,
and Kenneth P. Nephew

First Author Presentations

December 2021 CD5 deficiency alters helper T cell immunometabolism and shifts the systemic metabolome
Oral presentation given at 2021 American Society of Microbiology – Intermountain Branch
Conference (online)

November 2021 CD5-deficient mice have enhanced helper T cell function and a systemic metabolic shift in amino acids
Oral and poster presentations given at 2021 Autumn Immunology Conference

Characterization of Single Chain Antibodies against Thymidine Kinase I (TKI) for Cancer Immunotherapeutic Applications
Oral and poster presentations given at 2021 Autumn Immunology Conference

December 2020 The role of T cell co-receptor CD5 in T cell metabolism, the gut microbiome, and behavior
Oral presentation given at 2020 American Society of Microbiology – Intermountain Branch
(online)
Awarded Best in Session

November 2019 The influence of T cell signaling strength in helper T cell response
Oral and poster presentations given at 2019 Autumn Immunology Conference

August 2019 The influence of T cell signaling strength in helper T cell response
Oral presentation given at 2019 Graduate Retreat at Brigham Young University
Awarded Best in Session

April 2019 The role of avidity in helper T cell response to infection
Poster presentation given at 2019 American Society of Microbiology – Rocky Mountain Branch
Conference

April 2017 Determining the Optimal TCR: pepMHC Affinity for CD4+ T cell Primary and Memory Response
Poster presentation given at the American Society for Microbiology Intermountain Branch

January 2017 Determining the optimal TCR: pepMHC affinity for CD4+ T cell primary and memory response
Poster presentation given at 2017 Midwinter Conference of Immunologists

January 2016 Determining the optimal TCR: pMHC avidity for CD4+ T cell memory generation
Poster presentation given at 2016 Midwinter Conference of Immunologists

March 2013 Adenovirus Delivered Gene Therapy for Ovarian Cancer
Oral presentation given at BYU-Idaho Research and Creative Works Conference
Awarded 2nd Place in Oral Presentation – Biology Division

Co-Author Presentations

November 2021 CD5 signaling inhibits T cell metabolism at the transcriptomic level
Oral and poster presentation given at the Autumn Immunology Conference
Authors: Carlos Moreno, **Kiara V. Whitley**, Claudia M. Tellez Freitas, K. Scott Weber, Brett E. Pickett, and Brian Poole

Isolation and characterization of high-affinity antibodies against HPRT for immunotherapy development
Oral and poster presentation given at the Autumn Immunology Conference
Authors: Christopher Haynie, **Kiara V. Whitley**, Michelle Townsend, Stella Meier, Abby Johnson, Hunter Lindsay, Kim L. O'Neill, and K. Scott Weber

The T cell co-receptor CD5 alters mouse behavior and gut microbiome composition
Poster presentation given at the BYU CURA Research Conference
Authors: Kyle S. Reaveley, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Tyler Cox, Wyatt Magoffin, Isabella Wallwitz, Kimble Mahler, Christopher Haynie, Alexa Tall, Joshua Teasdale, and K. Scott Weber

October 2021 CD5 signaling inhibits T cell metabolism at the transcriptomic level
Oral presentation given at the American Society of Microbiology – Rocky Mountain Branch
Authors: Carlos Moreno, **Kiara V. Whitley**, Claudia M. Tellez Freitas, K. Scott Weber, Brett E. Pickett, and Brian Poole

RNA-Seq analysis of the role of CD5 on T cell metabolic function
Poster presentation given at the American Society for Microbiology Rocky Mountain Branch Meeting (online)
Authors: Carlos Moreno, **Kiara V. Whitley**, and K. Scott Weber

The role of CD5 in T cell activation
Poster presentation given at the American Society for Microbiology Rocky Mountain Branch Meeting (online)
Authors: Joshua S. Bennett, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Deborah Johnson, and K. Scott Weber
Awarded #3 ranked Poster Presentation

- April 2021 The T cell co-receptor CD5 alters mouse behavior and gut microbiome composition
Poster presentation given at the Roseman University Research Symposium
Authors: Kyle Reaveley, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Tyler Cox, Wyatt Magoffin, Isabella Wallwitz, Kimble Mahler, Christopher Haynie, Alexa Tall, Joshua Teasdale, and K. Scott Weber
- March 2021 The T cell co-receptor CD5 alters mouse behavior and gut microbiome composition
Poster presentation given at the BYU College of Life Sciences and Library Undergraduate Research Poster Competition
Authors: Kyle Reaveley, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Tyler Cox, Wyatt Magoffin, Isabella Wallwitz, Kimble Mahler, Christopher Haynie, Alexa Tall, Joshua Teasdale, and K. Scott Weber
- December 2020 Understanding the effects of T cell co-receptor CD5 on metabolic function and the metabolome
Poster presentation given at the American Society of Microbiology Intermountain Branch Meeting (online)
Authors: Isabella Wallwitz, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Tyler Cox, Wyatt Magoffin, Kyle Reaveley, Kimble Mahler, Christopher Haynie, Alexa Tall, Joshua Teasdale, and K. Scott Weber
- The Role of CD5 in regulating levels of T Follicular Helper cells
Poster presentation given at the American Society of Microbiology Intermountain Branch Meeting (online)
Authors: Christopher Haynie, **Kiara V. Whitley**, Claudia M. Tellez Freitas, and K. Scott Weber
- The T cell co-receptor CD5 alters mouse behavior and gut microbiome composition
Poster presentation given at the American Society of Microbiology Intermountain Branch Meeting (online)
Authors: Kyle Reaveley, **Kiara V. Whitley**, Claudia M. Tellez Freitas, Tyler Cox, Wyatt Magoffin, Isabella Wallwitz, Kimble Mahler, Christopher Haynie, Alexa Tall, Joshua Teasdale, and K. Scott Weber
Awarded Best Poster Presentation
- February 2020 Role of CD5 T cell coreceptor in T cell metabolism
Poster presentation given at the Utah Conference on Undergraduate Research
Authors: Christopher Haynie, Tyler Cox, Claudia M. Tellez Freitas, **Kiara V. Whitley**, and K. Scott Weber
- November 2019 The role of the CD5 co-receptor in T cell metabolism
Oral and poster presentation given at the Autumn Immunology Conference
Authors: Christopher Haynie, Claudia M. Tellez Freitas, Tyler Cox, **Kiara V. Whitley**, and K. Scott Weber
Awarded the AAI Undergraduate Award

- April 2019 Flow Cytometry Education: A semester long course
Poster presentation given at the American Society of Microbiology Rocky Mountain Branch
Authors: Josie Tueller, **Kiara V. Whitley**, and K. Scott Weber
- March 2019 Generation and characterization of a panel of monoclonal antibodies against the tumor biomarker Thymidine Kinase I for research, clinical and therapeutic applications
Presented at the American Association for Cancer Research Annual Conference
Authors: Edwin J. Velazquez, Taylor D. Brindley, Gajendra Shrestha, Rachel A. Skabelund, Corbin M. Lee, Zachary D. Ewell, Eliza E. Bitter, Michelle H. Townsend, Kelsey B. Bennion, Kai Li Ong, **Kiara V. Whitley**, Richard A. Robison, Scott K. Weber, Kim L. O'Neill.
- June 2018 Mechanistically Minded: A study of the surface co-localization of salvage pathway enzymes
Poster presentation given at the National Symposium for Undergraduate Research at St. Jude Children's Research Hospital
Authors: Michelle Townsend, Kelsey Bennion, Evita Weagel, Edwin J. Velazquez, **Kiara V. Whitley**, K. Scott Weber, and Kim O'Neill
- April 2018 Macrophage toll-like receptor-chimeric antigen receptors (MOTO-CARs) as a novel adoptive cell therapy for the treatment of solid malignancies
Poster presentation given at the American Association for Cancer Research Annual Meeting
Authors: Edwin J. Velazquez, Jake Lattin, Taylor Brindley, Zach Reinstein, Roger Chu, Lucy Liu, Evita Weagel, Michelle Townsend, **Kiara V. Whitley**, Eliza Lawrence, Brandon Garcia, K. Scott Weber, Richard A. Robinson, and Kim O'Neill
- Harnessing the immune system: a human engineered antibody specific to TKI
Poster presentation given at the American Association for Cancer Research Annual Meeting
Authors: Kelsey Bennion, Brie Kingrey, Michelle Townsend, **Kiara V. Whitley**, Edwin J. Velazquez, K. Scott Weber, and Kim O'Neill
- March 2018 Development of anti-thymidine kinase I antibody (WHEELZ) as a potential cancer immunotherapy
Poster presentation given at the BYU College of Life Science Poster Competition
Authors: Rachel Johnson, John C. Hancock, **Kiara V. Whitley**, and K. Scott Weber
- "Wheelz": A novel engineered human antibody for possible CAR T-cell therapy
Poster presentation given at the BYU College of Life Science Poster Competition
Authors: Kelsey Bennion, **Kiara V. Whitley**, Edwin J. Velazquez, Brie Kingrey, K. Scott Weber, and Kim O'Neill
- February 2018 Anti-TKI antibodies as potential antibody therapy for targeting cancer cells
Presented at the Utah Conference on Undergraduate Research
Authors: Rachel Johnson, **Kiara V. Whitley**, John Hancock, Josie Tueller, Steven Ogden, Hyung Joon Kim, and K. Scott Weber

- November 2017 Generation and metabolic characterization of TK-1 specific 2nd and 3rd Generation CAR Vectors
Presented at the Autumn Immunology Conference
Authors: Josie A. Tueller, **Kiara V. Whitley**, Edwin J. Velazquez, Evita G. Weagel, Kim L. O'Neill, and K. Scott Weber
- April 2017 Development of a TK1 specific chimeric antigen receptor T-cell for the treatment of non-small-cell lung cancer
Presented at the American Association for Cancer Research Annual Conference
Authors: Edwin J. Velazquez, **Kiara Vaden**, Michelle H. Townsend, Evita G. Weagel, Scott Weber, Richard A. Robison, Kim L. O'Neill
- A pre-clinical study of chimeric antigen receptor (CAR) T cells targeting Thymidine Kinase 1 (TK1) in lung cancer cell lines
Poster presentation given at the American Society for Microbiology – Intermountain Branch
Authors: Edwin J. Velazquez, Zachary Ewell, Jake Lattin, **Kiara Vaden**, Michelle Townsend, Evita Weagel, K. Scott Weber, Richard A. Robinson, and Kim O'Neill
Awarded First Place in poster presentation
- February 2017 Engineering a Cancer-Specific Third Generation CAR Immunotherapy
Poster presentation at the 11th Annual Utah Conference on Undergraduate Research
Authors: Josie Tueller, **Kiara Vaden**, and K. Scott Weber
- January 2017 Chimeric Antigen Receptor (CARs) for Thymidine Kinase 1 (TK1): A novel immunotherapy approach to fight cancer
Presented at Biomedical Engineering West Regional Conference
Authors: Edwin J. Velazquez, **Kiara Vaden**, Michelle Townsend, Evita G. Weagel, K. Scott Weber, Richard A. Robison, Kim L. O'Neill
- March 2016 Sequencing of an antibody specific for an epitope overexpressed on cancer cells
Presented at the Utah Conference on Undergraduate Research
Authors: Justin Crandall, **Kiara Vaden**, K. Scott Weber, and Kim L. O'Neill