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OBJECTIVE

A career in research of pathogenesis/immunology of human viruses in animal models

EDUCATION

University of Pennsylvania (1999-2005)

Ph.D. in Cell and Molecular Biology.

Dissertation: Gene Therapy of the Mucopolysaccharidosis VII Mouse Brain with a Herpes Simplex Virus Type 1 vector.

Brigham Young University (1993-94, 1996-99)

B.S. in Microbiology.

RESEARCH EXPERIENCE

Assistant Professor (July 2008-Aug 2016), *Associate Professor* (September 2016-present)
Brigham Young University, Department of Microbiology and Molecular Biology

We are using a humanized mouse model to study pathogenesis of human viruses, including HIV-1, the herpesviruses HHV-6A and KSHV, and arboviruses (Chikungunya). We also are interested in finding new ways to control methicillin-resistant *Staphylococcus aureus* (MRSA), including studies of how biofilms form and what roles biofilms have in antibiotic resistance gene sharing.

Postdoctoral Fellow (Jan. 2006-June 2008)

Colorado State University

Mentor: Dr. Ramesh Akkina. Development of new humanized mouse models for Human Immunodeficiency Virus (HIV) and Dengue virus infections and analysis of the subsequent human adaptive immune response. Development of a humanized mouse model to study antibody-dependent enhancement of dengue virus infection, dengue hemorrhagic fever, and dengue shock syndrome. Analysis of dengue virus cellular tropism in humanized mice. Establishment of a new model of HIV-1 mucosal transmission. Investigation of new anti-HIV gene therapies using lentiviral vectors.

Ph.D. Student

University of Pennsylvania (Sept. 1999-Dec. 2005)

Mentor: Dr. Nigel Fraser. Development of herpes simplex virus type 1 (HSV-1) as a vector for gene therapy of the brain using murine mucopolysaccharidosis type VII as a model disease. Made new recombinant viral vectors for investigation of the distribution of viral latency and transgene expression in the mouse brain as a function of various inoculation sites. Measured brain transduction at the levels of viral genome maintenance, transgene transcription, and enzyme expression. Published the first example of correction of an inherited disorder via HSV-mediated gene therapy.

PUBLICATIONS

- Laura J. Westhoff, Savannah J. Hughes, Erin Gill, Trent Walker, Abraham Quaye, **Bradford K. Berges**, and Brian D. Poole. Il-18 Overproduction Associated with NLRP1 Single Nucleotide Polymorphisms Linked to Risk for Vitiligo. **International Journal of Clinical and Experimental Dermatology** (2021) 6(2): 01.
- Guerrero-Arguero, Israel, Tellez-Freitas, Claudia M., Weber, K. Scott, **Berges, Bradford K.**, Robison, A. Richard and Pickett, Brett E. Alphavirus Pathogenesis, Immune Responses, and Vaccine and Treatment Updates. **Journal of General Virology** (2021) 102(8): 001644.
- Vijayalakshmi Nandakumar, Tracie Profaizer, Bucky K. Lozier, Marc G. Elgort, Erin T. Larragoite, Antonio Solis Leal, J Brandon Lopez, Elizabeth S.C.P Williams, **Bradford K. Berges**, Vicente Planelles, Jenna Rychert, Patricia R. Slev, Julio C. Delgado. Evaluation of a Surrogate ELISA- Based SARS-CoV-2 cPass™ Neutralization Antibody Detection Assay and Correlation with IgG Commercial Serology Assays. **Archives of Pathology and Laboratory Medicine**; (2021) 145(10): 1212-1220.
- Wubin He, Xiaoxu Huang, **Bradford K. Berges**, Yue Wang, Ni An, Rongjian Su, Yanyan Lu. Artesunate regulates Neurite outgrowth inhibitor protein B receptor (NgBR) to overcome resistance to sorafenib in hepatocellular carcinoma cells. **Frontiers in Pharmacology** 12 (2021): 615889.
- Benjamin H. Ogilvie, Antonio Solis-Leal, J. Brandon Lopez, Brian D. Poole, Richard A. Robison, and **Bradford K. Berges**†. Alcohol-free hand sanitizer and other quaternary ammonium disinfectants quickly and effectively inactivate SARS-CoV-2. **Journal of Hospital Infection** 108 (2021): 142-145.
- Pogue, K., Jensen, J. Stancil, C., Ferguson, D., Hughes, S., Mello, E., Burgess, R., **Berges, B.K.**, Quaye, A., and Poole, Brian D. † Influences on attitudes regarding potential COVID-19 vaccination in the United States. **Vaccines** (Basel) 2020; 8(4): 582.
- Wienclaw, Trevor M. and **Berges, Bradford K**†. The relationship between methicillin resistance and biofilm composition in *Staphylococcus aureus*. **American Journal of Biomedical Science & Research** 2020; 10(1): 11-15.
- Edwin J. Velazquez, Taylor D. Brindley, Gajendra Shrestha, Eliza E. Bitter, Jordan D. Cress, Michelle H. Townsend, **Bradford K. Berges**, Richard A. Robison, K. Scott Weber and Kim L. O'Neill†. Novel Monoclonal Antibodies Against Thymidine Kinase 1 and Their Potential Use for The Immunotargeting of Lung, Breast and Colon Cancer Cells. **Cancer Cell International**. 2020 20:127.
- Israel Guerrero-Arguero, Taalin Rasmussen Høj, E. Shannon Tass, **Bradford K. Berges**, Richard Robison†. A Comparison of Chikungunya Virus Infection, Progression, and Cytokine Profiles in Human U937 and Murine RAW Monocyte Derived Macrophages. **PLoS One** 2020 15(3):e0230328.
- Hair, Bryan B., Conley, Matthew E., Wienclaw, Trevor M., Conley, Mark J., Heaton, Matthew J., and **Berges, Bradford K.** Synergistic Activity of Silver Nanoparticles and Vancomycin Against a Spectrum of *Staphylococcus aureus* Biofilm Types. **J Bacteriol Mycol** 2018 5(9): 1089.
- Haskell, Kyler J., Schriever, Samuel R., Fonoimoana, Kenisi D., Haws, Benjamin, Hair, Bryan B., Wienclaw, Trevor M., Holmstead, Joseph G., Barboza, Andrew B., Berges, Erik T., Heaton, Matthew J., and **Berges, Bradford K.** Antibiotic resistance is significantly lower in *Staphylococcus aureus* isolated from antibiotic-free raw meat as compared to conventional raw meat. **PLoS ONE** 2018 13(12):e0206712.
- Fullwood, R. Amy, Low, Gregory M., Chase, Emily P., Grasley, Meagan, Beal, Soren S., McCrary, Ian M., Daniels, Christian W., Ingersoll, Kayleigh, **Berges, Bradford K.** The Kaposi's sarcoma-associated herpesvirus viral interleukin 6 gene affects metastasis and

expression of B cell markers in a murine xenograft model. **PLoS ONE** 2018 13(9):e0204947.

- Solis-Leal, A., and **Berges, Bradford K.** Advances in nucleases used for genome editing. **JSM Biochemistry and Molecular Biology** 2016 3(2): 1017.
- Benjamin, R., Berges, Bradford K., Solis-Leal, A., Igbinedion, O., Strong, C.L., and Schiller, M. TALEN gene editing takes aim on HIV. **Human Genetics** 2016 135(9): 1059-70.
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- Jensen, Kyle C., Hair, Bryan B., Wienclaw, Trevor M., Murdock, Mark H., Hatch, Jacob B., Trent, Aaron T., White, Tyler D., Haskell, Kyler J., and **Berges, Bradford K.** Isolation and Host Range of Bacteriophage with Lytic Activity against Methicillin-Resistant *Staphylococcus aureus* and Potential use as a Fomite Decontaminant. **PLoS ONE**, 2015 10(7): e0131714.
- Tanner, Anne, Hallam, Steven J., Nielsen, Stanton J., Cuadra, German I., and **Berges, Bradford K.** Development of Human B Cells and Antibodies Following Human Hematopoietic Stem Cell Transplantation to Rag2^{-/-}γc^{-/-} mice. **Transpl Immunol**, 2015 32:144-150.
- Horvat, B., **Berges, B.K.**, and Lusso, P. Recent Developments in Animal Models for Human Herpesvirus 6A and 6B. **Curr Opin Virology**, 2014. 9:97-103.
- Berges, B.K.** and Tanner, A. Modeling of human herpesvirus infections in humanized mice. **J Gen Virol**, 2014. 95(Pt 10): 2106-17.
- Anne Tanner, Stephen E. Taylor, Wittnee Decottignies, and **Bradford K. Berges.** Humanized mice as a model to study hematopoietic stem cell transplantation. **Stem Cells Dev**, 2014. 23(1):76-82.
- Anne Tanner, Stephanie A. Carlson, Masatoshi Nukui, Eain A. Murphy, and **Bradford K. Berges.** Human herpesvirus 6A infection and immunopathogenesis in humanized Rag2^{-/-}γc^{-/-} Mice. **J Virol**, 2013. 87(22):12020-8. *Spotlighted article.
- Sanchez, F.M., Cuadra, G.I., Nielsen, S.J., Tanner, A., and **Berges, B.K.** Production and characterization of humanized Rag2^{-/-}γc^{-/-} mice. **Methods Mol Biol**, 2013. 1031:19-26.
- Sanchez, F.M., and **Berges, B.K.** Characterization of HIV-1 infection in the humanized Rag2^{-/-}γc^{-/-} mouse model. **Methods Mol Biol**, 2013. 1031:215-22.
- Berges, B.K.**, and Rowan, M.R. “The utility of the new generation of humanized mice to study HIV-1 infection: transmission, prevention, pathogenesis, and treatment”. **Retrovirology**, 2011; 8:65. *Designated as a Highly Accessed article by BioMed Central.
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•**Berges, B.K.**, Wolfe, J.H. and Fraser, N.W. “Stable levels of long-term transgene expression driven by the latency-associated transcript promoter in a herpes simplex virus type 1 vector”. *Mol Ther* 2005 Dec;12(6):1111-9.

ABSTRACTS (since 2008)

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•Magaoay, Daniel and Berges, Bradford. One step closer to better HIV treatment: CRISPR and Humanized Mice BYU CURA Research Conference, 2021.

•Augenstein, Emilee and Berges, Bradford. Does DNA content correlate with biofilm strength in *S. aureus*? BYU CURA Research Conference, 2021.

•Scott, Tiana, Solis-Leal, Antonio, Lopez, J. Brandon, Robison, Richard, Berges, Bradford and Pickett, Brett. Analysis of differential host cell response to infection with Washington and New York strains of SARS-CoV-2. BYU CURA Research Conference, 2021.

•Gray, Madison, Guerrero-Arguero, Israel, Solis-Leal, Antonio, Robison, Richard, Berges, Bradford, and Pickett, Brett. Chikungunya Virus Time Course Infection of Human Macrophages. BYU CURA Research Conference, 2021.

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•Daniel Magaoay and Bradford K. Berges. One step closer to better HIV treatment: CRISPR and Humanized Mice. BYU CURA Research Conference, 2021.

•Emilee Augenstein and Bradford K. Berges. Does DNA content correlate with biofilm strength in *S. aureus*? BYU CURA Research Conference, 2021.

•Antonio Solis-Leal, Dalton Karlinsey, Brandon Lopez, and Bradford K. Berges. HIV vpr mutants (R36W and R77Q) and its effect in progression to AIDS. American Society of Microbiology Tri-Branch Meeting, December 2020.

- Israel Guerrero, Crystal Villalva, Bradford K. Berges, and Richard A. Robison. A Rag2-/-
γc-/- mouse model to study Chikungunya virus pathogenesis. American Society of
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Virology, 2020.
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antibiotic resistance? BYU CURA Research Conference, 2020.
- Mark Conley and Berges, Bradford K. Exploring the Ability of 4 Novel Phages in
Reducing and Inhibiting MRSA Biofilms. BYU CURA Research Conference, 2020.
- Aileen MacLachlan and Berges, Bradford K. Phage and Vancomycin Biofilm Reduction.
BYU CURA Research Conference, 2020.
- Jared Thompson and Bradford K. Berges. Antibiotic Resistance in Staphylococcus
aureus: Effects of Biofilm Synthesis in Gene Transfer. Utah Conference on Undergraduate
Research, 2020.
- Mark Conley and Bradford K. Berges. Exploring the Ability of 6 Novel Phages in
Reducing and Inhibiting MRSA Biofilms. Utah Conference on Undergraduate Research,
2020.
- Elisa McRae and Bradford K. Berges. Using CRISPR and gRNA to Alter the HIV
Genome. Utah Conference on Undergraduate Research, 2020.
- Bradley Richmond and Bradford K. Berges. The Influence of Staphylococcus Aureus
Biofilm-associated Gene Mutations on Biofilm Composition. Utah Conference on
Undergraduate Research, 2020.
- Brandon Lopez and Bradford K. Berges. Effects of specific mutations on HIV-1 vpr and
subsequent AIDS pathogenesis. Utah Conference on Undergraduate Research, 2020.
- Blake Hirschi, Brad Pickett, Dr. Bradford Berges. Different compositions of
Staphylococcus Aureus Biofilms Facilitate Antibiotic Resistance Gene Transfer at
Different Rates. American Society of Microbiology Branch Meeting, 2019.
- Hirschi, B., Barboza, A., Holmstead, J., and Berges, B.K. Antibiotic resistance is lower in
Staphylococcus aureus isolated from antibiotic-free raw meat as compared to conventional
raw meat. Utah Conference on Undergraduate Research, 2019.
- Ball, A., and Berges, Bradford K. Genes Involved in the Formation of Staphylococcus
aureus Biofilms. Utah Conference on Undergraduate Research, 2019.
- Holmstead, J. and Berges, Bradford K. Identifying mechanisms of icADBC operon
regulation leading to altered biofilm formation in Methicillin-resistant S. aureus. Utah
Conference on Undergraduate Research, 2019.
- McCrary, I. and Berges, Bradford K. Effect of Phage Treatment on the Biofilm of
Staphylococcus epidermidis on Silastic Catheter Material. Utah Conference on
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- Dalton Karlinsey, and Berges, Bradford K. Testing the effect of Viral Protein R (Vpr) on
the progression of the HIV-1 to AIDS. BYU College of Life Sciences poster competition,
2019.

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- Mark Conley, and Berges, Bradford K. Exploring the Ability of 12 Novel Phages in Breaking Down MRSA Biofilms. BYU CURA Research Conference, 2019.
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- Solís-Leal, A., Karlinsey, D.C., Berges, B.K. Testing the effect of Viral Protein R (Vpr) on the progression of the HIV-1 to AIDS. American Society of Microbiology Tri-Branch Meeting, 2018.
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- Spencer Bagley, Bradford Berges. Sequencing and Annotation of 12 Bacteriophage Genomes To Aid In Discovering a Treatment For Methicillin-Resistant *Staphylococcus aureus*. Utah Conference on Undergraduate Research, 2017.
- Matthew Smith, Kayleigh Ingersoll, and Bradford K. Berges. Modeling a Leukemia-Causing Virus: Developing a Humanized Mouse Model for Human T-Lymphotropic Virus Type 1 (HTLV-1). American Society of Microbiology Intermountain Branch Meeting, 2017.
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- Remling, L., Berges, B.K., and Akkina, R. ”Life-long chronic HIV-1 infection and persistent CD4 T cell depletion in a humanized Rag2^{-/-}γc^{-/-} (RAG-hu) mouse model.” Keystone Symposium on Molecular and Cellular Determinants of HIV Pathogenesis, 2009.
- Akkina, R., Berges, B. K., Akkina, S. R., Folkvord, J. M., and Connick, E. “Vaginal and rectal mucosal transmission of R5 and X4-tropic HIV-1 in humanized Rag2^{-/-}γc^{-/-} (RAG-hu) mice.” Keystone Symposium on Molecular and Cellular Determinants of HIV Pathogenesis, 2008.
- Berges, B. K., Akkina, S. R., Folkvord, J. M., Connick, E., and Akkina, R. “Vaginal and rectal mucosal transmission of R5 and X4-tropic HIV-1 in humanized Rag2^{-/-}γc^{-/-} (RAG-hu) mice.” Palm Springs Symposium on HIV/AIDS, 2008.
- Akkina, R., Berges, B., Akkina, S., Folkvord, J., and Connick, E. “A new humanized mouse model for testing HIV/AIDS therapies and microbicides.” International Conference on Drug Design and Discovery, 2008.

AWARDS

NIH Institutional Training Grant Fellow (University of Pennsylvania).

PROFESSIONAL AFFILIATIONS

The American Society of Gene Therapy.
The American Society for Virology.

FUNDING

Testing of quaternary ammonium compound formulations for cytotoxicity on human cell types. Funded by AP Goldshield, LLC. 2021.

Role: PI

Awarded (\$4,275)

Skaggs Distinguished Mentoring Fellowship, 2021

Role: PI

Awarded (\$20,000)

BYU Widtsoe Grant award, 2019. Do biofilms promote antibiotic resistance in *Staphylococcus aureus*?

Role: PI

Awarded (\$25,000)

BYU College of Life Sciences Technology Transfer Award 2017

Role: PI

Awarded (\$10,000)

BYU College of Life Sciences Turkey Vaccine Award 2016. Impact of antibiotic use in poultry on prevalence of *Staphylococcus aureus* and associated antibiotic resistance in raw poultry meat products

Role: PI

Awarded (\$10,000)

Screening of *K. pinnata* extracts and synthetic derivatives for anti-herpesvirus compounds, June 2016. Funded by KP Biosciences

Role: PI

Awarded (\$7,500)

BYU Mentoring Environment Grant, October 2015: Frequency of Pathogenic *Staphylococcus Aureus* in Commercial Meat Samples and Examination of new ways to Eliminate *Staphylococcus Aureus* Biofilms

Role: PI

Awarded (\$20,000)

BYU Turkey Vaccine Study Award, October 2014: Development of phage therapy to protect poultry from *Staphylococcus aureus* infections

Role: PI

Awarded (\$15,000)

BYU Mentoring Environment Grant, October 2014: Discovery and characterization of novel bacteriophage as a way to control Methicillin-Resistant *Staphylococcus Aureus*

Role: PI

Awarded (\$20,000)

Developmental Center for AIDS Research Pilot Award, November 2013: Are humanized mice a viable model to study hiv-1 evolutionary dynamics?

Role: co-PI

Awarded (\$50,000)

BYU Mentoring Environment Grant, October 2013: Analysis of the kinetics and recombinatorial mechanisms of HIV-1 evolution in vivo in humanized mice

Role: PI

Awarded (\$20,000)

Renewal of BYU Technology Transfer Grant, December 2012. Use of humanized mice to develop novel human monoclonal antibodies against Dengue virus

Role: PI

Awarded (\$26,673)

BYU Mentoring Environment Grant, October 2011. The role of the KSHV LANA protein in development of persistent infections in vivo

Role: PI

Awarded (\$20,000)

HHV6 Foundation Pilot Proposal Grant, September 2011. Development of Humanized Rag2^{-/-}γc^{-/-} Mice as a Model of HHV-6A Infection

Role: PI

Awarded (\$27,500)

BYU Graduate Mentoring Award, April 2011.

Role: Mentor

Awarded (\$4,000)

USTAR sub-contract via Dr. Michael Kay (University of Utah) to study humanized mice as a model to analyze the efficacy of D-peptide inhibitors of HIV-1 entry

Role: co-PI

Awarded (\$15,000)

BYU Technology Transfer Grant, September 2010. Use of humanized mice to develop novel human monoclonal antibodies against Dengue virus

Role: PI

Awarded (\$31,725)

BYU Mentoring Environment Grant, October 2009. Development of humanized mice to study Kaposi's Sarcoma Herpesvirus infections and pathogenesis

Role: PI

Awarded (\$20,000)

BYU Graduate Mentoring Award, January 2009.

Role: Mentor

Awarded (\$5,000)

RESIDENCY STATUS

U.S. Citizen

REFERENCES

Available upon request