

Emily M. Webb, PhD

One University Blvd Bluffton, SC 29909 | (864) 230-2967 | webbem@uscb.edu
www.linkedin.com/in/emily-m-webb

Education

DOCTOR OF PHILOSOPHY | MARCH 2022 | VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

- Major: Medical Entomology
 - › Focus: Arthropod-borne viruses; Molecular Virology
- Honors: ICTAS Doctoral Scholar Fellow

BACHELOR OF SCIENCE | MAY 2016 | UNIVERSITY OF SOUTH CAROLINA AIKEN

- Major: General Biology
 - › Focus: Premedical studies; Molecular Biology
- Honors: *Cum Laude*

Teaching Experience

- **Assistant Professor: Biological Principles I, Fundamental Genetics, Cell and Molecular Biology, & General Virology. University of South Carolina Beaufort. Beaufort, SC 29902. (Present)**
- Visiting Assistant Professor: Biological Principles I, Fundamental Genetics, & Cell and Molecular Biology. University of South Carolina Beaufort. Beaufort, SC 29902. (2023-2024)
- Graduate Student Teaching Assistant: Insects in Human Society. Virginia Polytechnic Institute and State University, Blacksburg, VA 24060. (2018-2019)
- Graduate Student Teaching Assistant: Cell and Molecular Biology and Pharmacology Lab. University of Montana, Missoula, MT 59801. (2016-2017)
- Undergraduate Student Teaching Assistant: Biological Principles I & II, Fundamental Microbiology, and General Virology. University of South Carolina Aiken, Aiken, SC 29803. (2014-2016)

Research Experience

- SARS-CoV-2 antiviral drug discovery/repurposing. J Weger-Lucarelli, PI (2020-2022)
- Alphavirus single-domain antibodies and transgenic mosquito colonies. J Weger-Lucarelli, PI (2018-2022)
- Cross-protective immunity among alphaviruses. AJ Auguste, PI. (2017-2018)
- Synthesis and characterization of TLR liposomes. DJ Burkhart, PI. (2016-2017)
- Analysis of anti-HIV siRNA activity. WH Jackson, PI. (2014-2016)
- Summer Undergraduate Research Program internship. The University of Texas Medical Branch Galveston, Texas. D Beasley, PI, B Friedrich Co-PI. (2015)
- Using a plasmid-based system to measure anti-HIV vif activity of hammerhead ribozymes. WH Jackson, PI. (2013)
- Developing a DNA transposon-based gene delivery system. WH Jackson, PI. (2013)

GRANTS

- Internal Graduate Research Grant Competition: Blocking alphavirus transmission in transgenic *Aedes aegypti* mosquitoes expressing novel single-domain antibodies. J Weger-Lucarelli, PI, EM Webb, Co-PI. Amount: \$750.

- GSA Graduate Research Development Program Grant: Investigating the effects of chikungunya immunity on Mayaro virus disease and epidemic potential in the new world. AJ Auguste, PI, EM Webb, Co-PI. Amount: \$1000.
- South Carolina Research Foundation Magellan Scholar Grant: Determining the effect down-regulating an essential HIV regulatory protein has on HIV replication. W Jackson, PI, EM Webb, Co-PI. Amount: \$3000. (May 2015-May 2016)

AWARDS

- Institute for Critical Technology and Applied Science (ICTAS) Doctoral Scholar Fellowship. Amount: \$33000/year. (2018-2022)
- Keystone Symposia Future of Science Fund. Investigating the effects of chikungunya immunity on Mayaro virus disease and epidemic potential in the new world. Amount: \$1250. (2019)
- American Society for Virology Travel Award. Investigating the effects of chikungunya immunity on Mayaro virus disease and epidemic potential in the new world. Amount: \$500. (2019)
- Virginia Tech GSA Travel Scholarship. Investigating the effects of chikungunya immunity on Mayaro virus disease and epidemic potential in the new world. Amount: \$500. (2019)
- Virginia Tech Hill Travel Scholarship. Investigating the effects of chikungunya immunity on Mayaro virus disease and epidemic potential in the new world. Amount: \$750. (2019)
- First Place in Recognition of Undergraduate Research. The University of South Carolina Discovery Day: Biology and Biomedical Sciences Poster Session. Amount: \$500. (April 2016)
- Best Poster Presentation in Vaccine Development. The University of Texas Medical Branch Summer Undergraduate Research Program Poster Symposium. Amount: \$500. (Summer 2015)
- Second Place in Recognition of Undergraduate Research. The University of South Carolina Discovery Day: Biology and Biomedical Sciences Poster Session. Amount: \$200. (April 2015)
- Gold Medal Award in Recognition of Outstanding Undergraduate Research. The University of South Carolina Aiken Research Day: Sciences Oral Session. Amount: \$500. (April 2014)
- South Carolina LIFE scholarship. Amount: \$7500/year. (2012-2016)

PEER-REVIEWED PUBLICATIONS

- **Webb EM**, Azar SR, Haller SL, Langsjoen RM, Cuthbert CE, Ramjag AT, Luo H, Plante K, Wang T, Simmons G, Carrington CVF, Weaver SC, Rossi SL, Auguste AJ. Effects of Chikungunya virus immunity on Mayaro virus disease and epidemic potential. *Sci Rep*. 2019 Dec 31;9(1):20399. doi: 10.1038/s41598-019-56551-3. PMID: 31892710; PMCID: PMC6938517.
- Liu JL*, **Webb EM***, Zabetakis D, Burke CW, Gardner CL, Glass PJ, Legler PM, Weger-Lucarelli J, Anderson GP, Goldman ER. Stabilization of a Broadly Neutralizing Anti-Chikungunya Virus Single Domain Antibody. *Front Med (Lausanne)*. 2021 Jan 28;8:626028. doi: 10.3389/fmed.2021.626028. PMID: 33585527; PMCID: PMC7876468. (***Co-primary authorship**)
- Chuong C, DuChane CM, **Webb EM**, Rai P, Marano JM, Bernier CM, Merola JS, Weger-Lucarelli J. Noble Metal Organometallic Complexes Display Antiviral Activity against SARS-CoV-2. *Viruses*. 2021 May 25;13(6):980. doi: 10.3390/v13060980. PMID: 34070524; PMCID: PMC8227008.
- Liu JL, Zabetakis D, Gardner CL, Burke CW, Glass PJ, **Webb EM**, Shriver-Lake LC, Anderson GP, Weger-Lucarelli J, Goldman ER. Bivalent single domain antibody constructs for effective neutralization of Venezuelan equine encephalitis. *Sci Rep*. 2022 Jan 13;12(1):700. doi: 10.1038/s41598-021-04434-x. PMID: 35027600; PMCID: PMC8758676.
- **Webb EM**, Compton A, Rai P, Chuong C, Paulson SL, Tu Z, Weger-Lucarelli J. Expression of anti-chikungunya single-domain antibodies in transgenic *Aedes aegypti* reduces vector competence for chikungunya virus and Mayaro virus. *Front Microbiol*. 2023 Jun 12;14:1189176. doi: 10.3389/fmicb.2023.1189176. PMID: 37378291; PMCID: PMC10291133.
- Rai P, **Webb EM**, Kang L, Weger-Lucarelli J. Insulin reduces the transmission potential of chikungunya virus and activates the Toll pathway in *Aedes aegypti* mosquitoes. *Insect Mol Biol*. 2023 Jun 19. doi: 10.1111/jmb.12863. Epub ahead of print. PMID: 37334906.

- Singh SK, King K, Gannett C, Chuong C, Joshi SY, Plate C, Farzeen P, **Webb EM**, Kunche LK, Weger-Lucarelli J, Lowell AN, Brown AM, and Deshmukh SA. *The Journal of Physical Chemistry Letters* 2023 14 (42), 9490-9499. DOI: 10.1021/acs.jpcllett.3c01749
- Hamilton MM, **Webb EM**, Peterson MC, Patel G, Porto M, Orekov T, Erasmus JH, Finneyfrock B, Cook A, Auguste AJ, Kar S. Comparative pathogenesis of three Mayaro virus genotypes in the cynomolgus macaque. *J Gen Virol.* 2024 Jul;105(7). doi: 10.1099/jgv.0.002001. PMID: 38995674.
- Rai P, **Webb EM**, Lucarelli J. Obesity's unexpected influence: reduced alphavirus transmission and altered immune activation in the vector. (*in review: 2024*)

PRESENTATIONS

- **Webb EM**, Jackson WH. Developing a DNA transposon-based gene delivery system. Poster presentation at the 2013 University of South Carolina Aiken Research Day. University of South Carolina Aiken, Aiken, SC 29803 (April 2013).
- **Webb EM**, Jackson WH. Measuring the effect of anti-HIV tat siRNAs on HIV replication. Oral presentation at the 2014 University of South Carolina Aiken Research Day. University of South Carolina Aiken, Aiken, SC 29803 (April 2014).
- **Webb EM**, Jackson WH. Measuring the effect of anti-HIV tat siRNAs on HIV replication. Oral presentation at the 2014 South Carolina Academy of Science Annual Meeting. Trident Technical College, Charleston, SC 29406 (April 2014).
- **Webb EM**, Jackson WH. Measuring the effect of anti-HIV tat siRNAs on HIV replication. Poster presentation at the 2014 University of South Carolina Discovery Day. University of South Carolina, Columbia, SC 29208 (April 2014).
- **Webb EM**, Jackson WH. siRNA-mediated downregulation of an essential HIV regulatory protein. Oral presentation at the 2015 University of South Carolina Aiken Research Day. University of South Carolina Aiken, Aiken, SC 29803 (April 2015).
- **Webb EM**, Jackson WH. siRNA-mediated downregulation of an essential HIV regulatory protein. Oral presentation at the 2015 South Carolina Academy of Science Annual Meeting. Furman University, Greenville, SC 29613 (April 2015).
- **Webb EM**, Jackson WH. Retroviral delivery of anti-HIV tat siRNAs. Poster presentation at the 2015 University of South Carolina Discovery Day. University of South Carolina, Columbia, SC 29208 (April 2015).
- **Webb EM**, Friedrich B, Beasley D. Analyzing the effect of attenuating and compensatory mutations within domain III of the WNV envelope protein on antigenicity. University of Texas Medical Branch, Galveston, Texas 77555 (August 2015).
- **Webb EM**, Jackson WH. Measuring the effectiveness of anti-HIV tat siRNAs on HIV replication and gene expression. Oral presentation at the 2016 South Carolina Academy of Science Annual Meeting. Winthrop University, Rock Hill, SC 29733 (April 2016).
- **Webb EM**, Jackson WH. Measuring the effectiveness of anti-HIV tat siRNAs on HIV replication and gene expression. Poster presentation at the 2016 University of South Carolina Discovery Day. University of South Carolina, Columbia, SC 29208 (April 2016).
- **Webb EM**, Auguste AJ, et al. Effects of Chikungunya virus immunity on Mayaro virus disease and epidemic potential. Poster presentation at ASTMH Annual Conference. New Orleans, LA (October 2018)
- **Webb EM**, Auguste AJ, et al. Effects of Chikungunya virus immunity on Mayaro virus disease and epidemic potential. Poster presentation at ICTAS Doctoral Scholars Symposium Virginia Tech, Blacksburg, VA (April 2019)
- **Webb EM**, Auguste AJ, et al. Effects of Chikungunya virus immunity on Mayaro virus disease and epidemic potential. Oral presentation at Keystone Conference: +ssRNA Viruses. Kerry Co., Killarney, Ireland (June 2019)
- **Webb EM**, Auguste AJ, et al. Effects of Chikungunya virus immunity on Mayaro virus disease and epidemic potential. Poster presentation at the American Society for Virology annual conference. University of Minneapolis, Minneapolis, MN (July 2019)

- **Webb EM**, Compton A, et al. Blocking alphavirus transmission in transgenic *Aedes aegypti* mosquitoes expressing novel single-domain antibodies. Poster presentation at ICTAS Doctoral Scholars Symposium Virginia Tech, Blacksburg, VA (April 2021)
- **Webb EM**, Compton A, et al. Blocking alphavirus transmission in transgenic *Aedes aegypti* mosquitoes expressing novel single-domain antibodies. Invited oral presentation at University of South Carolina Aiken, Aiken, SC (March 2022)
- **Webb EM**, Compton A, et al. Blocking alphavirus transmission in transgenic *Aedes aegypti* mosquitoes expressing novel single-domain antibodies. Invited oral presentation at University of South Carolina Beaufort, Beaufort, SC (February 2023)

Laboratory Experience

BENCHWORK

- Agarose and SDS gel electrophoresis, molecular cloning (e.g., restriction digest/ligation, TOPO, HiFi Assembly/Gibson Assembly, etc.), PCR, RT-PCR, qPCR, qRT-PCR, gel purification, plasmid purification, bacterial transformation, RNA isolation, in-direct ELISA, antigen-capture ELISA, absorbance/fluorescence/luminescence assay, bacterial protein expression, protein purification, protein quantification, Western blot, immunofluorescence assay (IFA), mosquito rearing, mosquito transgenesis, etc.

TISSUE CULTURE

- BSL-3 facilities, ACL-3 facilities, mammalian cell culture, insect cell culture, sub-culturing monolayer/suspension cells, freezing monolayer/suspension cells, media preparation, microscopy, cell counting/viability, cell plating, transfection, transduction, viral harvesting/stock preparation, virus quantification via plaque assay, PRNT, PBMC isolation, virus inactivation, mosquito vector competence, etc.

Community Service

- Faculty Advisor/Volunteer with National Marrow Donor Program (NMDP)
- Volunteer with Skype a Scientist non-profit.
- Volunteer with the Virginia Medical Reserve Corps (MRC).
- Volunteer reader/judge for Virginia Junior Academy of Science (VJAS) Research Symposium.
- Volunteer reader/judge for Blue Ridge Highlands Regional Science Fair.
- Volunteer for Graduate Student Assembly Annual Research Symposium and Exposition (GSA GSARS). Virginia Polytechnic Institute and State University.
- Judge for Virginia State Science and Engineering Fair (VSSEF).
- Reviewer of grant proposals for VT Graduate Student Assembly Graduate Research Development Program (GSA GRDP). Virginia Polytechnic Institute and State University.
- Reviewer of abstract proposals for VT Graduate Student Assembly Annual Research Symposium and Exposition (GSA GSARS). Virginia Polytechnic Institute and State University.
- ICU volunteer at Shriners Children's Texas (hospital in Galveston, Texas).
- President of Students for a Sustainable Campus: Service Group. University of South Carolina Aiken.
- Secretary of Tri-Beta National Biological Honor Society: Mu Nu Chapter. University of South Carolina Aiken.