



Kyle Seifert, Ph.D.

UNIVERSITY ADDRESS

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CURRENT POSITIONS

Interim Academic Unit Head, Department of Biology, James Madison University, January 2022-present
Professor of Biology, James Madison University, Harrisonburg, VA, 2017-present

PREVIOUS POSITIONS

Associate Unit Head, James Madison University, Harrisonburg, VA, 2019-present
Associate Academic Unit Head, Department of Biology, James Madison University, August, 2019-December, 2021
Associate Professor of Biology, James Madison University, 2010-2017
Assistant Professor of Biology, James Madison University, 2004-2010

EDUCATION

University of Florida, College of Medicine, Gainesville, FL
Ph.D. Biomedical Sciences, Immunology and Microbiology, 2004

Augustana College (now Augustana University), Sioux Falls, SD
Bachelor of Arts in Biology, 1997



PUBLICATIONS (underlines designate undergraduate authors from my lab, * designate Master's students from my lab)

Hyman, O.J., Doyle, E.A., Harsh, J., Mott, J., Pesce, A., Rasoul, B., **Seifert, K.**, and Enke, R.A. 2019. CURE-all: Large Scale Implementation of Authentic DNA Barcoding Research into First-Year Biology Curriculum. CourseSource. <https://doi.org/10.24918/cs.2019.10>

Gallagher TM*, Marafino JN, Wimbish BK, Volkers B, Fitzgerald, G, McKenna K, Floyd J, Minahan NT, Walsh B, Thompson K, Bruno D, Paneru M, Djikeng S, Masters S, Haji S, **Seifert K**, and Caran, KL. (2017) Hydra Amphiphiles: Using three heads and one tail to influence aggregate formation and to kill pathogenic bacteria. *Colloids Surf., B.*, 157: 440-448. <https://doi.org/10.1016/j.colsurfb.2017.06.010>

Minbiole KPC, Jennings MC, Ator LE, Black JW, Grenier MC, LaDow JE*, Caran KL, **Seifert K**, Wuest WM. (2016) From antimicrobial activity to mechanism of resistance: the multifaceted role of simple quaternary ammonium compounds in bacterial eradication. *Tetrahedron*, 72 (25):3559-3566, <https://doi.org/10.1016/j.tet.2016.01.014>. doi:10.1016/j.tet.2016.01.014

Marafino JN, Gallagher TM*, Barragan J, Volkers BL, Ladow JE*, Bonifer K, Fitzgerald G, Floyd JL, McKenna K, Minahan NT, Walsh B, **Seifert K**, Caran KL. (2015) Colloidal and antibacterial properties of novel triple-headed, double-tailed amphiphiles: Exploring structure-activity relationships and synergistic mixtures. *Bioorg Med Chem.*, 23(13):3566-73. (PMID:25936261)

Cockburn C, Amoroso M, Carpenter M, Johnson B, McNeive R, Miller A, Nichols AE, Riotto A, Rzepakowski A, Croshaw CMS, **Seifert K**, and Vaidyanathan R. (2013) Gram-Positive bacteria isolated from the common bed bug, *Cimex lectularius* L. *Entomologica Americana* 119(1 & 2):23-29. DOI: 10.1664/12-RA-042R.1

Seifert K, Gandia NC, Wilburn JK, Bower KS, Sia RK, Ryan DS, Deaton ML, Still KM, Vassilev VC, Laurie GW, McKown RL. (2012) Tear Lacritin levels by age, gender, and time of day in healthy adults. *Invest Ophthalmol Vis Sci.*, 53(10) 6610-6616. (PMID:22918641)
Grenier, MC, Davis, RW, Wilson-Henjum, KL, Ladow, JE*, Black, JW, Caran, KL, **Seifert, K**, and Minbiole, KPC. (2012). The antibacterial activity of 4,4'-bipyridinium amphiphiles with conventional, bicephalic and gemini architectures. *Bioorganic and Medicinal Chemistry Letters*, 22(12), 4055-4058. (PMID:22578455)

LaDow JE, Warnock DC, Hamill KM, Simmons KL, Davis RW, Schwantes CR, Flaherty DC, Willcox JAL, Wilson-Henjum K, Caran KL, Minbiole KPC, and **Seifert K**. (2011) Bicephalic



amphiphile architecture affects antibacterial activity. *Eur. J. Med. Chem.*, Sep;46(9):4219-26. (PMID:21794958)

Seifert K, Fenster A, Dilts JA, and Temple L. (2009) An investigative, cooperative learning approach to the general microbiology laboratory, *Cell Biol. Educ.*, 8: 147-153. (PMID:19487504)

Seifert K, Hurney CA, Wigtil CJ, and Sundre DL. (2009) Using the Academic Skills Inventory to assess the Biology major. *Assessment Update*, Volume 21(3): 1-2, 14-15.

Seifert KN, Adderson EE, Whiting AA, Bohnsack JF, Crowley PJ, and Brady LJ. (2006) A unique serine-rich repeat protein (Srr-2) and novel surface antigen (ϵ) associated with a virulent lineage of serotype III *Streptococcus agalactiae*. *Microbiology*, 152: 1029-1040. (PMID:16549667)

Seifert KN, McArthur WP, Bleiweis AS, and Brady LJ (2003) Characterization of group B streptococcal glyceraldehyde 3-phosphate dehydrogenase: surface localization, enzymatic activity, and protein-protein interactions. *Canadian Journal of Microbiology*. 49: 350-356. (PMID:12897829)

Dorn BR, Burks JN, **Seifert KN**, and Progulsk-Fox A (2000) Invasion of endothelial and epithelial cells by strains of *Porphyromonas gingivalis*. *FEMS Microbiology Letters*. 187: 139-144. (PMID:10856647)

Munce T, **Seifert K**, and Spencer CN 1998. Comparative energy flow to the fish community in a prairie system and a forested stream using growth rate and stable isotope analysis. *Proc. S.D. Acad. Sci.* 77:29-40.

POSTER PRESENTATIONS AND TALKS (underlines designate undergraduate authors from my lab, * designates Masters students from my lab)

Fadak Alali, Kyle Sperber, Ariana Simeone*, Kevin Caran, Ph.D., and **Kyle Seifert, Ph.D.** Simeone, A. Antimicrobial Properties of Novel Amphiphiles. Oral presentation at American Society for Microbiology Virginia Branch 2019 Annual Meeting, Farmville, VA, November 8, 2019.

Ariana Simeone*, Fadak Alali, Kyle Sperber, **Kyle Seifert, Ph.D.**, Kevin Caran, Ph.D., The effect of varying carbon spacer lengths on minimum inhibitory concentration, time-kill, and



biofilm disruption. Poster presented at American Society for Microbiology Virginia Branch 2019 Annual Meeting, Farmville, VA, November 8, 2019.

Terry, E., Yu, H., Miller, T., Caran, K., **Seifert, K.** The Effect of Spacer Length Variation on Novel Cationic Bipyrimidine Amphiphile Antimicrobial Activity. Poster presented at: Mid-Atlantic Regional Conference of Undergraduate Scholarship; 2018 Oct 6; Amherst, VA.

Terry, E., Yu, H., Miller, T., Caran, K., **Seifert, K.** The Effect of Spacer Length Variation on Novel Cationic Bipyrimidine Amphiphile Antimicrobial Activity. Poster presented at: Mid-Atlantic Regional Conference of Undergraduate Scholarship; 2018 Virginia Tech.

Smita Bajgain, Elizabeth Rogers*, Stephanie Sharpes*, David Duncan*, Kevin Caran, and **Kyle Seifert**. The effect of tail length variation on minimum inhibitory concentration, and biofilm disruption. NCUR Annual Meeting, University of Central Oklahoma, April 5-7, 2017; poster presentation.

Reafa Hossain, Beth Terry, David Duncan*, Stephanie Sharpes*, Kevin Caran, and **Kyle Seifert**. Antibacterial Properties of Novel Amphiphiles: Exploring Structure-Activity Relationships, Presented at the 20th annual Undergraduate Research Symposium in the Chemical and Biological Sciences, University of Maryland, Baltimore County, October 14, 2017; poster presentation.

Stephanie Masters, Monica Paneru, Sybelle Djikeng, Elizabeth Rogers*, Kevin Caran, **Kyle Seifert**. Antibacterial Properties of Novel Amphiphiles: Exploring Structure-Activity Relationships, NCUR 2017 conference from April 6-8, 2017 in Memphis, TN. Poster presentation.

Tim Bloss, **Kyle Seifert**, Oliver Hyman and Joanna Mott, New Horizons in Biology at James Madison University, Association of Southeastern Biologists, March 29-April 1, Montgomery AL. Poster presentation.

Elizabeth Rogers* and **Kyle Seifert**. The Antibacterial and Biofilm Disruption Activity of Novel Amphiphiles. 16th Annual Graduate Research Symposium, College of William & Mary, March 24 & 25, 2017. Oral presentation.

Elizabeth Rogers*, Stephanie Sharpes*, Stephanie Masters, Sybelle Djikeng, Monica Paneru, Rawan Nour, **Dr. Kyle Seifert**, and Dr. Kevin Caran The Antibacterial and Biofilm Disruption Activity of Novel Amphiphiles, ASM Conference on Antibacterial Development, December 11-14, 2016, Washington, DC, poster presentation.



Monica Paneru, Stephanie Masters, Sybelle Djikeng, Elizabeth Rogers*, John N. Marafino, Kevin Caran, **Kyle Seifert**. Triple Headed Amphiphiles and their Effectiveness at Disrupting *P. aeruginosa* Biofilms. Presented at the 2016 Annual Biomedical Research Conference for Minority Students (ABRCMS), Tampa Convention Center, Tampa, FL, November 9-12, 2016. Poster presentation.

E.A. Rogers*. Advisor: **Kyle Seifert**. Antimicrobial Activity of Novel Amphiphiles, Presented at the 15th Annual Graduate Research Symposium, College of William & Mary, March 2016; talk.

Stephanie Masters, Monica Paneru, Sybelle Djikeng, Suma Haji, Caroline Dilworth, Tara Gallagher*, John N. Marafino, Brandi Volkers, Brenna Walsh, Kirstie Thompson, Nicholas Minahan, Jason Floyd, Jade Ladow*, Kyle Bonnifer, Louis Damiano, Kristin McKenna, Kevin Caran, **Kyle Seifert**. The colloidal, antibacterial, and cytotoxicity properties of tris-cationic, triple-headed amphiphiles. Presented at the 2015 Annual Biomedical Research Conference for Minority Students (ABRCMS), Washington State Convention Center, Seattle, WA, November 11-14, 2015; poster presentation.

T. M. Gallagher*, J. Marafino, B. Volkers, J. Floyd, N. Minahan, J. Barragan, K. McKenna, B. Walsh, J. LaDow*, K. Bonifer, M. Paneru, S. Djikeng, C. Dilworth, S. Haji, S. Masters, G. Fitzgerald, K. Caran, **K. Seifert**; The Colloidal, Antibacterial, and Cytotoxicity Properties of Tris-cationic, Triple-headed Amphiphiles, presented at the American Society for Microbiology General Meeting, New Orleans, LA, June 2, 2015; poster presentation.

Ryan DS, Sia RK, Peppers L, Rivers BA, **Seifert K**, McKown RL, Soyars C, Eaddy JB, Logan LA, Stutzman RD, Bower KS. Lacritin in Human Tears after Laser Refractive Surgery. June 2015. Fort Belvoir Community Hospital First Annual Research and Innovation Competition and Symposium.

First Place in the Research category.

Thompson, K.; Walsh, B.; Marafino, J. N.; McKenna, K.; Damiano, L.; Gallagher, T. M.*; Schmachtenberg, M.; Kou, K.; Wenzel, M; **Seifert, K.**; Caran, K. L. Synthesis and study of polycationic amphiphiles as potent antiseptics and novel colloids: Exploring structure activity relationships. Presented at the Regional Meeting of the American Chemical Society, Department of Chemistry, University of Virginia, April 11, 2015; poster presentation.

Walsh, B.; Thompson, K.; Marafino, J. N.; Damiano, L.; McKenna, K.; Gallagher, T.*; **Seifert, K.**; Caran, K. L. Synthesis and study of novel amphiphiles as potent antiseptics. Presented at the 17th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences, University of Maryland, Baltimore County, October 25, 2014; poster presentation. **Brenna and Kirstie won first prize in their section for this poster.**



Tara Gallagher,* John N Marafino, Brandi Volkers, Brenna Walsh, Kirstie Thompson, Nicholas Minahan, Jason Floyd, Jade Irby*, Kyle Bonifer, Louis Damiano, Kristin McKenna, Kevin Caran, **Kyle Seifert**. Antibacterial Activity of Triscationic Amphiphiles
VA Branch of the American Society for Microbiology, James Madison University. October 14, 2014; poster presentation
This poster won first place.

Antimicrobial Analysis of a Novel Series of Amphiphiles, Kyle S. Bonifer¹, Crystal F. Manning¹, Jade E. LaDow¹, Gabriel Fitzgerald², Jhosdyn Barragan², Kevin L. Caran², Kevin P. C. Minbiole³, and **Kyle Seifert**¹, Department of Biology¹ and Department of Chemistry and Biochemistry², James Madison University, Department of Chemistry³, Villanova University, American Society of Microbiology Shenandoah Valley Regional Meeting, April 6th, 2013, Mary Baldwin College; poster presentation.
This poster won an award.

Antimicrobial Analysis of a Novel Series of Amphiphiles, Kyle S. Bonifer¹, Crystal F. Manning¹, Jade E. LaDow¹, Gabriel Fitzgerald², Jhosdyn Barragan², Kevin L. Caran², Kevin P. C. Minbiole³, and **Kyle Seifert**¹, Department of Biology¹ and Department of Chemistry and Biochemistry², James Madison University, Department of Chemistry³, Villanova University, 70th American Society for Microbiology Virginia branch meeting, November 3rd-4th, 2012, Old Dominion University, poster presentation.

Antimicrobial Analysis of a Novel Series of Amphiphiles, Kyle S. Bonifer¹, Crystal F. Manning¹, Jade E. LaDow¹, Gabriel Fitzgerald², Jhosdyn Barragan², Kevin L. Caran², Kevin P. C. Minbiole³, and **Kyle Seifert**¹, Department of Biology¹ and Department of Chemistry and Biochemistry², James Madison University, Department of Chemistry³, Villanova University, 14th Marcus Conference, October 13, 2012, Sweet Briar College, poster presentation.

Synthesis, Antibacterial Activity, and Structure-Function Analysis of a Novel Series of Multi-Headed Amphiphiles, Jade E. LaDow¹, Daniel J. Moon², Jhosdyn Barragan², Kelsey Wilson-Henjum¹, Kevin L. Caran², Kevin P. C. Minbiole², and **Kyle Seifert**¹, Department of Biology¹ and Department of Chemistry and Biochemistry², James Madison University, 112th General Meeting of the American Society for Microbiology, June 16-19, 2012, San Francisco, CA, poster presentation.

Joachim, B. T., Irons, J. G., **Seifert, K. X.**, Arana, R. E., Van Patten, R. A., Whited, R. W., Bergeria, C. L., & McMullen, D. J. (2012, March). Assessing the Utility of a Brief Abstinence Test for Initiating Caffeine Abstinence Among College Students. Annual meeting of the Virginia Association of Behavior Analysis, Harrisonburg, VA, poster presentation.



JAMES MADISON
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J. E. LaDow*, J. A. Barragan, D. J. Moon, K. L. Caran, K. P. C. Minbiole, **K. Seifert**; Synthesis, Antibacterial Activity, and Structure-Function Analysis of a Novel Series of Multi-Headed Amphiphiles, 11th Annual Graduate Research Symposium (GRS) at the College of William & Mary on March 23 & 24, 2012, poster presentation.

J. E. LaDow*, J. A. Barragan, D. J. Moon, K. L. Caran, K. P. C. Minbiole, **K. Seifert**; Synthesis, Antibacterial Activity, and Structure-Function Analysis of a Novel Series of Multi-Headed Amphiphiles, Virginia Council of Graduate Schools (VCGS) Graduate Student Research Forum. February 16, 2012, University of Virginia (Charlottesville), poster presentation.

Robert L. McKown, Veronica C. Vassiley, Kraig S. Bower, Denise S. Ryan, Rose K. Sia, **Kyle Seifert**; Immunodetection of a Lacritin-like Protein in Human Breast Milk, 2011 Annual Meeting of The Association for Research in Vision and Ophthalmology, May 6-10, Fort Lauderdale, FL, poster presentation.

Katherine M. Still, C. L. Soyars, F. Velez, K. S. Bower, R. K. Sia, D. S. Ryan, **K. Seifert**^{1B}, G. W. Laurie, R.L. McKown; Development of Quantitative Sandwich ELISAs for Lacritin and the Lacritin-c Splice Variant in Human Tears, 2011 Annual Meeting of The Association for Research in Vision and Ophthalmology, May 6-10, Fort Lauderdale, FL, poster presentation.

Robert L. McKown, N. Gandia, J. K. Wilburn, K. S. Bower, R. K. Sia, D. S. Ryan, **K. Seifert**, G. W. Laurie, Lack of Diurnal Variation of the Human Tear Protein Lacritin in Healthy Adults, Robert L. McKown, N. Gandia, J. K. Wilburn, K. S. Bower, R. K. Sia, D. S. Ryan, **K. Seifert**, G. W. Laurie, 2011 Annual Meeting of The Association for Research in Vision and Ophthalmology, April 30-May 6, Fort Lauderdale, FL, poster presentation.

Davis, R.; Schwantes, C.; Flaherty, D.; Caran, K.; Minbiole, K.; **Seifert, K.** Polycephalic (Multi-Headed) Cationic Amphiphiles as Novel Surfactants and Antimicrobial Agents Virginia Academy of Science - 2010 Annual Meeting, James Madison University, Harrisonburg, VA, May 22, 2010, poster presentation.

K. Seifert, N. Gandia, K.S. Bower, D. S. Ryan, C. D. Coe, Lamarr Peppers, R.L. McKown, and G.W. Laurie; Development of a Protein Microarray Assay for Human Tear Lacritin, poster presentation, 2010 Annual Meeting of The Association for Research in Vision and Ophthalmology, May 1-7, Fort Lauderdale, FL, poster presentation.

K. Seifert, A. Matherly, K.S. Bower, D. Sediq, R.L. McKown, and G.W. Laurie., Development of an Immunoassay for Human Tear Lacritin, poster presentation, 2009 Annual Meeting of The Association for Research in Vision and Ophthalmology, May 2-7, Fort Lauderdale, FL, poster presentation.



Stephanie Feulner, Robert McKown, and **Kyle Seifert**, Development of a Quantitative Enzyme-Linked Immunosorbant Assa (ELISA) for the Detction of Lacritin in Tear Samples, National Council for Undergraduate Research, April 10-12, 2008, Salisbury, MD., poster presentation.

K. N. Seifert, D. D. Rich, P. J. Crowley, L. J. Brady, Elimination of *srr-2* attenuates virulence of Group B *Streptococcus*, American Society for Microbiology, 107th General Meeting, May 21-25, 2007, Toronto, Canada, poster presentation.

Allyson L. Samselski*, Amanda J. Billings, and Paul R. Watson (Dr. Kyle Seifert), Cloning, Expression, and Purification of Serine-Rich Repeat Proteins of Group B *Streptococcus* for Determination of Glycoxylation Patterns, Presented at NCUR[®] 20 at the University of North Carolina Asheville, April 6-8, 2006, poster presentation.

K.N. Seifert*, J.F. Bohnsack, and L.J. Brady. Association of Group B Streptococcal Delta/Epsilon Surface Antigen Expression with a Chromosomal Deletion, RDP Type, and Acyl-Carrier Protein. Presented at the 103rd General Meeting of the American Society of Microbiology, May 2003, Washington, DC, poster presentation.

K.N. Seifert*, W.P. McArthur, A.S. Bleiweis, and L.J. Brady. Characterization of Group B Streptococcal Glyceraldehyde 3-Phosphate Dehydrogenase, Presented at the Southeastern Branch of the American Society for Microbiology Meeting, Nov. 2002, Gainesville, FL, poster presentation.

K.N. Seifert* and L.J.Brady. Characterization of the □/□ Antigen of Group B Streptococci, Presented at the American Society for Microbiology 101st General Meeting, May 2001, Orlando, FL, poster presentation.

K.N. Seifert* and L.J. Brady. Partial Characterization of the d and e Surface Markers of Group B Streptococci, Presented at the American Society for Microbiology 100th General Meeting, May 2000, Los Angeles, CA, poster presentation.

AWARDED AND PROVISIONAL PATENTS

“Methods and Reagents for Diagnosing Sjogren's Syndrome”, Inventors: McKown, Seifert, Raab. Patent # 10,912,830. Granted Feburary, 9, 2021.

"Novel Triscationic Amphiphile Compounds, Compositions, and Methods for Making Same”, Inventors: Caran, Seifert. Patent # 10,905,118. Granted February 2, 2021.



"Novel Triscationic Amphiphile Compounds, Compounds Having a Pendent Alcohol Group, Compositions Thereof, and Methods for Making Same", Inventors: Caran, Seifert. Patent #US9,556,109. Granted January 31, 2017.

"Antimicrobial Amphiphiles and Methods for Their Use", Inventors: Minbiole, Caran, Seifert. Patent #US 8,980,925. Granted February 17, 2015.

"Methods and Compositions for Diagnosing and Preventing a Group B Streptococcal Infection", Inventors: Brady, Seifert, Adderson, Bohnsack. Patent #7,588,773. Granted September 15, 2009.

COMPLETED RESEARCH SUPPORT

4-VA at James Madison University
Caran, Seifert, Feitosa
2016-2019

Dr. Kevin Caran, Dr. Kyle Seifert, and Dr. Klebert Feitosa, A Novel Multidisciplinary Approach to Combat Pathogenic Bacteria
Role: Co-PI

James Madison Innovations Grant
Seifert, Caran (PIs)
05/26/15-07/31/15

Developing Novel Antibacterial Compounds for a Variety of Applications. This award supported student salaries and supplies for this ongoing project.
Role: PI (with Caran)

James Madison University College of Science and Mathematics Summer
Seifert (PI)
5/2014-8/2014

Development of Novel Antimicrobial Compounds. This award supported faculty salary for this ongoing project.
Role: PI

Department of Defense, US Army Medical Research and Materiel Command (USAMRMC)
Ryan (PI)
9/28/11-10/27/14

Award W81XWH-11-1-0838
Levels of the Novel Glycoprotein Lacritin in Human Tears After Laser Refractive Surgery



This award is to determine the levels of lacritin in tears before and after laser refractive surgery using a quantitative ELISA technique in collaboration with Walter Reed Army Medical Center.
Role: PI. (sub-award)

Research Corporation for Science Advancement

Caran (PI)

1/01/10 – 12/31/12

Polycephalic (Multi-Headed) Cationic Amphiphiles as Novel Surfactants and Antimicrobial Agents

This award provided the initial funding for the collaborative effort between the three research groups (Caran, Minbiole, Seifert) to prepare and study the colloidal and antimicrobial activities of polycephalic amphiphiles.

Role: Co-PI

Commonwealth Health Research Board

McKown (PI)

07/01/08 – 06/30/2010

Development of Novel Diagnostics and Treatments for Ocular Diseases

The goal of this study was to develop a quantitative immunoassay to detect the human tear protein lacritin.

Role: Co-PI.

Jeffress Memorial Trust

Seifert (PI)

7/01/05 – 3/30/10

The role of *srr-2* and accessory secretory genes in the pathogenesis of a highly virulent lineage of group B streptococci

The goal of this project was to determine the roles of various genes only found in highly virulent strains of *Streptococcus agalactiae*.

Role: PI.

National Science Foundation

Walton (PI)

2007-2009

NSF BIOMATH Interdisciplinary Training for Undergraduates in Biological and Mathematical Sciences (UBM)

The goal of this study was to provide long-term research experiences for undergraduates as well as curricular improvement activities in both mathematics and biology.

Role: Participant (faculty mentor).

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The Institute for Infrastructure and Information Assurance James Madison University
McKown (PI)

03/01/07-08/24/07

Development of Novel Diagnostics and Treatments for Ocular Diseases

The goal of this study was to produce reagents such as antisera to be used to develop a diagnostic assay for the detections of the human tear protein lacritin.

Role: Co-PI.

The Institute for Infrastructure and Information Assurance, James Madison University
Raab (PI)

04/01/06-09/30/06

The Production of Ebola Virus Recombinant Protein to Create Critical Reagents for the Development of Diagnostic Systems for the U.S. Army Warfighter

The goal of this project was to produce recombinant Ebola virus proteins to be used to generate biological reagents for the detection of Ebola virus.

Role: Co-Investigator.

James Madison University College of Science and Mathematics

Seifert (PI)

5/2004-8/2004

Characterization of unique genes found in a virulent group B streptococcal phylogenetic lineage
The goal of this project was to characterize the structure and role of Srr-2, a protein found on the surface of virulent strains of group B streptococci.

Role: PI.

OTHER AWARDS

Best Entrepreneurship Paper Award, Caran and Seifert, 2016, Center for Faculty Entrepreneurship, James Madison University

TEACHING EXPERIENCE

Medical Microbiology (BIO 426/526, 448/548, Course number changed to BIO 348 in 2017)

Developer and lecture and lab instructor. This class focuses primarily on microorganisms of medical importance, mainly bacteria and viruses. Key topics for each organism are discussed and include general cell structure, unique structures/functions, epidemiology of the disease that the organism causes, mechanisms of pathogenesis, isolation and identification of the organism, and treatment options. Particular attention is paid to how the body responds to infection and how the



organism causes disease in the face of this response. Material presented in lecture is reinforced by reading and discussion of scientific journal articles.

Laboratory focuses on isolating and identifying unknown bacteria of medical importance. The students use a variety of media and biochemical tests for identification, which relate directly to the material presented in lecture.

General Microbiology (BIO 380, Course number changed to BIO 245)

Lecture and lab instructor. This course focuses on bacteria – their structure, physiology, genetics, ecology, health-related roles, and taxonomy. We used the *Core Themes and Concepts for and Introductory Microbiology Course* as recommended by the American Society for Microbiology as the basis for the course.

Microbiology Seminar (BIO 246)

Lecture instructor. Seminars, readings and discussions of the primary scientific literature with a focus on the current research in the field of microbiology.

Allied Health Microbiology (BIO 280)

Lecture and lab instructor. The course is an introduction to the biology and significance of microorganisms, particularly prokaryotes. Lecture and lab focused on health-related topics.

Lecturer for Introductory Virology course for University of Florida College of Dentistry, Fall 2001. As a Ph.D. student, I gave introductory lectures on RNA viruses, DNA viruses, and methods of cultivation and detection. Wrote test questions pertaining to the lecture material.

Teaching Assistant for Immunology course for University of Florida College of Dentistry, Spring 2000. As a Ph.D. student, I led discussion groups on relevant applications for the use of immunological techniques for the dental profession. Administered and corrected quizzes pertaining to the discussion material.

LEADERSHIP POSITIONS AND OPPORTUNITIES

Interim Academic Unit Head (Jan 2022 – present)

I took over as Interim Academic Unit Head in January, 2022 after the current Unit Head resigned to take another job. During the ensuing months, I learned many things and accomplished much in a relatively short period of time. I currently manage a multi-million dollar budget with ~\$750,000 of non-personnel expenditures. I have now done formal annual evaluations of faculty



and staff, and successfully advocated for faculty and staff needs. I am also currently in the process of reviewing four promotion applications (one with tenure).

I have worked collaboratively with multiple entities across campus since Biology is connected to many other programs, either directly or indirectly. Some examples would include the nursing program (course offerings and staffing), the General Education program (course offerings and staffing), the Physics and Mathematics and Statistics departments (Biology major cognate requirements). Each group has different needs, and it is important to be able to work together with each of these groups to provide the best educational experience to our students as possible.

The department as a whole has accomplished many significant things during this interim period. We completed and submitted our departmental response to our external Academic Program Review Evaluation. I was originally a member of this committee, but then switched roles once I became Interim AUH. We have implemented many of the recommendations from the external review, especially those centered around communication and transparency. One of our responses included starting and maintaining a Canvas site for the department where information can be shared, added to, edited, etc., so that it is more of a "one-stop shop" for information. We also completed four hires in the spring of 2022. I negotiated all of the contracts, start-up amounts, etc. In addition, we successfully advocated hiring two tenure-track faculty from a single search, which will increase our teaching power in an area of high demand, and have started the hiring process for another three positions in the fall of 2022.

We have formalized our pre-tenure mentoring within the department in an effort to ease the transition of new faculty in the department. We first met with the mentees to determine what they would like to focus on for the term, and set the parameters for how often they'll meet, etc. We then communicated this with the mentors. We are currently asking mentor/mentee pairs to meet at least once a month about a given topic, and for the mentor to take notes during these meetings. At the end of the semester, the mentors will provide a short synopsis of their experience (what worked?, what didn't work?, suggestions for improvement). In return for being mentors and providing feedback, the mentors can count it as service to the department, so it's a win-win-win scenario (mentees, mentors, AUH team).

I have enjoyed finding solutions or creative ways to "say yes" to reasonable requests. For example, I allocated departmental funds to finish the Biocommons renovations (wall coverings and furnishings) to support our DEI efforts, we have found ways to get more research-active faculty to 9 contact hours/semester to support research efforts, and provided more summer support for students than the previous year to support faculty, undergraduate student, and graduate student scholarship.



Associate Unit Head (fall 2019 – Dec 2021)

As Associate Unit Head, some of my primary responsibilities included making the semester teaching schedule, coordinating and presenting at Open House events for potential JMU students, presenting and answering questions about the department and program from admitted students at JMU's CHOICES events, and coordinating the department's participation in Summer Springboard for incoming declared Biology majors. I worked with the Athletics department to meet individually with prospective student-athletes and met with students and parents who visit the department outside of JMU-coordinated events. After admission to JMU, I worked with the Assistant Unit Head to offer scholarships to potential students.

I was also responsible for handling most applications or inquiries concerning transfer credit. Recently, JMU migrated to handling most of these transfer requests online (Transfer Equivalency System [TES]) so that a database of transfer equivalencies can be stored and accessed in future inquiries. However, since we were implementing this system, I handled a variety of requests outside of those from TES. I have also worked closely with the Virginia Community Colleges to ensure that introductory classes in Biology taken at any of the Virginia Community Colleges are able to be transferred into JMU as Biology credits. This has been a coordinated effort for both the community colleges and 4-year schools in Virginia.

In addition to the responsibilities listed above, I did a variety of sporadic or ad hoc tasks, including, but not limited to, helping to plan the yearly departmental retreat, coordinating department workshops, and taking over the responsibilities of the Unit Head when she was unavailable.

Undergraduate Program Director (fall 2016-2019)

As Undergraduate Program Director, I was responsible for the undergraduate curriculum and assessment (more on my role in assessment below). I was responsible for oversight of all relevant committees. This involved having a firm grasp of the entire curriculum so as to provide information to all groups of people, from faculty to students.

Microbiology Concentration Coordinator (fall 2016-2019)

For this position, I oversaw the continued development and implementation of the undergraduate microbiology concentration. I was responsible for assembling the group, organizing meetings, getting approval for the concentration from the department, college, and university. Once implemented, I handled all logistical issues associated with the concentration, including fielding student requests about course substitutions and meeting graduation requirements.



In 2018, the group decided to combine two microbiology courses, BIO 245 for majors, and BIO 280 for non-majors since there was significant overlap with the classes. These classes had been taught separately since before I arrived at JMU in 2004. This was a significant task considering the number of faculty involved and that the combined course would now serve both Biology majors and non-majors. I shepherded this project from conception until it's implementation in the fall of 2019. I communicated with all affected programs at JMU to make sure each individual program's needs would still be met after the changes. I was also more heavily involved with the lab portion of the class, proposing the topics and lab activities for the semester.

Chair of First Year Experience Curriculum Committee (fall 2014-2018)

In response to the 2010 Academic Program Review, the Undergraduate Program Committee performed an outward facing study of first-year experiences at peer and aspirational institutions and recommended modifications to the first-year curriculum to better align with "best practices" in Biology education. In December 2014, the faculty voted 47-2 in favor of re-envisioning the entire first year experience, which led to changes in the entire "core" (1st and 2nd year) curriculum. The curriculum redesign followed Biology Education initiatives recommended by the American Association for the Advancement of Science (AAAS) and the National Science Foundation (NSF), and are consistent with the Department's mission to provide a comprehensive curriculum that inspires learning. The revised core curriculum emphasizes active learning approaches, including investigative laboratories associated with every course. Changes to the 1st year courses, BIO 140 and BIO 150, were adopted in Fall 2016 and Spring 2017, respectively; changes to the 2nd year courses, BIO 240 and BIO 250, were adopted in 2019 and 2018, respectively.

Chair of Undergraduate Program Committee (fall 2013-spring 2022)

The Undergraduate Program Committee (UPC) was reformed in the fall of 2013 to address a number of issues regarding the Biology major at JMU, with a focused effort at understanding the "student prospective", which is an interest of the current university president.

The overall charge of the UPC was to investigate/address the following questions:

Are we providing the most beneficial best/well-structured/education to graduating Biology majors? Is the curriculum current and engaging? Are graduates leaving with the skills they need to enter the workforce or go to graduate/professional school? Are we missing necessary courses/experiences? Are there current models that work? How aligned are we with Vision & Change (AAAS) - what resources are there out there for us to use, are there schools that have already changed? What Assessment data do we have? What are we using? How should we incorporate findings into courses? How can we use feedback from students?



To this end, the committee began to address the relatively high level of attrition out of, and after taking, BIO 114, the first required class of curriculum. It was recommended that a group be formed to update the first-year experience to be more dynamic and engaging, align with major initiatives and publications regarding biology education, as well as offer a smoother transition to students coming into the program from community colleges or as transfer students.

Co-Chair and Chair, Institutional Biosafety Committee (2013-2015)
Member, Institutional Biosafety Committee (2006 – 2013)

The JMU Institutional Biosafety Committee is responsible for ensuring that research requiring the use of recombinant DNA technology “is conducted in accordance with the National Institutes of Health Guidelines For Research Involving Recombinant DNA Molecules as published in the Federal Register on 7/5/1995.” This committee meets at least once a year to discuss new proposals as well as proposal renewals. I served as co-chair and then chair of this committee for a few years, and prior to that, as a regular committee member. During my time on the committee, JMU was in full compliance with NIH guidelines and regulations.

Chair, JMU Biology Assessment Committee (2008-2014), Member, JMU Biology Assessment Committee (2006-2007)

The Assessment Committee is involved in assessing the senior biology majors for content (biology knowledge) and experiences. The data collected are used to determine potential changes in the curriculum or to provide ancillary information that can't be determined through standardized tests. This committee is responsible for planning and coordinating all Assessment Day activities and for working with the Center for Assessment and Research Studies (CARS) to determine how to best use the data to support the goals of the Biology Department. During my tenure on the committee and as Chair, the assessment program became recognized as a very good program for assessing a complex major such as biology at a Regional Masters University. As such, as chair of the Assessment Committee, I was asked to lead and facilitate workshops at national educational meetings.

Based on work that was presented at one of these meetings in 2011, I was asked to submit our work on assessment as a case study for developing quantitative skills in the sciences for a larger project coordinated in Australia. Our case study was accepted for study and I coordinated a visit by an Australian group so that they could conduct interviews and collect data for their project. Because of this work and our program at JMU, I was invited to give the keynote address and conduct workshops at an annual educational meeting in Sydney, Australia in Dec 2012. I also co- led an assessment workshop with Kelly Matthews in Hamilton, Ontario in October 2012 (More details are given below in the Invited talks section).



Additionally, in 2008, JMU began evaluating the assessment programs of all departments. Since the evaluation process went into effect, the Biology Department's assessment program has been rated as "exemplary" according to the criteria set forth by the university.

Co-Director, JMU Medicinal Research Collaborative (2009-2013)

This group was interested in medically related research and had members from Biology, Chemistry, Stanford Research Institute, Psychology, Business, and Technology Transfer. We met infrequently to discuss possible research collaborations, funding opportunities, etc.

MENTORING OPPORTUNITIES AND LEADERSHIP TRAINING

Participant, Project Kaleidoscope Summer Leadership Institute (2021)

Although I had already participated in this institute as a mentor in 2012 and as a participant in 2008, my career goals have changed to more administrative leadership and felt the institute could be of great benefit to my development and to my career. I applied for, and was selected by Project Kaleidoscope and AAC&U to participate in the institute a second time as a participant. The institute is a week-long, work-intensive experience used to help develop the leaders in STEM education in the 21st century.

Participant and Mentor of Early-Career Faculty, Project Kaleidoscope Summer Leadership Institute (2008 and 2012)

In 2008, I applied to be a participant at PKAL's Summer Leadership Institute. I was in the early stages of my academic career, but I was also the head of the Assessment Committee, with plans to not only develop the assessment program at JMU into one of national recognition, but also to learn leadership skills for my entire career. It was one of the most transformative experiences of my life, and I was honored, when in 2012, I was asked to serve as one of the mentors at the institute.

As a mentor, I was assigned with leading a session on effective communication. I also worked closely with two faculty members from other institutions to offer suggestions and advice as to how to affect change on their own campuses. This was an amazing experience and taught me skills that I still use when in a leadership position. More information about this experience can be found at <https://www.aacu.org/summerinstitutes/sli>.



Mentor, First-Year Faculty Member (Dr. Morgan Steffen, 2014-15)

I was asked by the Unit Head to serve as a mentor to a first-year faculty member. We met weekly to discuss ways to be successful in the classroom and in the research lab.

Post-Doctoral Advisor (Dr. Hatajai Lassiter, 2018)

I was offered the opportunity by the Office of Access and Inclusion and the Department of Biology at JMU to search for a Preparing Future Faculty Fellow (PFF) in 2018 to “provide teaching opportunities to doctoral candidates prior to the completion of the dissertation and also to create opportunities to attract more minority candidates to the teaching profession.” The supported fellow completed her residency and her Ph.D. in 2018, and was then hired as a post-doctoral associate in the Department of Biology after a national search (I was chair of the hiring committee). In 2021, she was offered, and accepted a position within the department as a non-tenure track Renewable Term Appointment at the rank of Assistant Professor.

INVITED TALKS, PANEL MEMBER, OR WORKSHOP LEADER

Invited panelist, First Generation Student Panel Discussion sponsored by the Center for First-Generation Students, September 14, 2022.

Invited panelist, First Generation Student Q & A with members of the Biology Students of Color Organization, Spring 2022

Invited speaker and workshop leader, O. Hyman, K. Seifert, and J.A. Harsh. 2018. Large Scale Implementation of Authentic DNA Barcoding Research into First-Year Biology Curriculum. Association of American Colleges and Universities: Transforming Higher Education Conference. Atlanta, GA.

Invited speaker, *One Way to Get a Position and Succeed at a Primarily Undergraduate Institution*, University of Florida Interdisciplinary Program in Biomedical Sciences Career Development Seminar Series, Gainesville, Florida, January 8, 2015.

Invited keynote speaker and workshop leader, *Assessing Student Learning in a Complex Major at a Comprehensive University*, Conference: CUBEnet-VIBEnet-QS in Science symposium Game on!: Preparing our biology and biomedical graduates for the future, Sydney, Australia, December 2012.

Invited workshop leader, *Making curriculum visible: strategies for articulating, communicating and evaluating degree program learning outcomes at large, research-intensive*



universities, Conference: International Society for the Scholarship of Teaching & Learning 12: “Research on teaching and learning: integrating Practices”, Hamilton, Ontario, October 2012.

Invited speaker, “*Antimicrobial Compounds, Dry Eye, and Bed Bugs – Three Collaborative Research Projects at James Madison University*”, Augustana College Homecoming Biology Department Seminar, Sioux Falls, SD, October 2012.

Invited workshop co-leader, Session Title: *Assessing Complex and Interdisciplinary STEM Majors: The Biology and Biotechnology Majors at James Madison University*, AACU Meeting – Engaging STEM Learning: From Promising to Pervasive Practices– Miami, March 24-26, 2011.

Invited workshop facilitator, Submitted JMU’s biotech program as a Case Study for developing an assessment program, AAC&U Annual Meeting – GLOBAL POSITIONING: Essential Learning, Student Success, and the Currency of U.S. Degrees, San Francisco, January 26-29, 2011.

Invited panelist and facilitator, representing JMU and Project Kaleidoscope at the 96th Annual Meeting of the Association of American Colleges and Universities, “The Wit, the Will, & the Wallet: Supporting Educational Innovation, Shaping our Global Futures”, Washington, DC, January 20-23, 2010.

OTHER LEADERSHIP AND/OR SERVICE OPPORTUNITIES

Search Committee Member or Chair

I have served on approximately 11 search committees during my time at JMU, from early in my career (chair of a search for a microbiologist in 2006), to recently, as a member of the search committee for the College of Science and Mathematics Dean in 2021-22 and for the the Dean of the College of Science and Mathematics in 2022 and for the Unit Head of Biology in 2018-2019.

PROFESSIONAL MEMBERSHIPS

American Society for Microbiology, 1999-present
Council on Undergraduate Research, 2004-2012
Project Kaleidoscope, 2005-present



OTHER SERVICE NOT DESCRIBED ABOVE

Reviewer:

Reviewer for Proposals for 2019, 2020, 2021 AAC&U/PKAL STEM Conference
Journal of Dairy Science
ACS Applied Materials & Interfaces
AAC&U STEM Conference, 2018 – proposal reviewer
AAC&U Tides Program – grants reviewer
Transforming STEM Higher Education Network for Academic Renewal Conference – proposal reviewer
QS in Science Special Edition – 2013

OTHER COMMITTEES/SERVICE OPPORTUNITIES

Online Harassment Task Force, James Madison University (Fall 2021-present)
Academic Program Review Committee, Member (2006 and 2021)
Task Force on Targeted Harassment, Member, University Committee (2021-present)
Departmental Biosafety Committee, Member (2016-present)
Biotechnology Program Steering Committee, Member (2012-2018)
Biology Representative in Faculty Senate (2020)
Chair, BA in Biology and Human Health Committee (2018-2021)