

## Curriculum vitae

David J. Westenberg

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### Education:

- 1991 Ph.D. University of California, Los Angeles, Microbiology and Mol. Genetics.  
Dissertation Advisor: Dr. Robert Gunsalus  
Dissertation Title: Structure and Function of the Quinone-Binding subunits of  
*Escherichia coli* Fumarate Reductase
- 1982 B. S. Michigan State University, Microbiology and Public Health

### Research and Teaching Appointments:

- 2022-Present Curators Distinguished Teaching Professor, Missouri S&T
- 2020-Present Professor of Biology, Missouri S&T
- 2003-2020 Associate Professor of Biology, Missouri S&T
- 2016-2017 Interim Chair, Biology, Missouri S&T
- 2005 Visiting scientist, Cell Biology, University of Marburg, Marburg, FRG
- 2004 Visiting scientist, Biochemistry, University of Missouri - Columbia
- 1997-2003 Assistant Professor of Biology, Missouri S&T

### Awards and recognitions (Last 5 years)

- 2021 College of Arts, Sciences, and Business Dean's Medal.
- 2020 American Society for Microbiology (ASM) Carski Award.
- 2020 UMSys President's Award for Community Engagement.
- 2020-2021 UMSys Presidential Engagement Fellow.
- 2017 Academy of Sciences, St. Louis Science Educator Award.

### Funding (Current).

**2018 – 2023 National Science Foundation, \$649,962.** "Enriching the Undergraduate Experience through Personalized Learning and Mentoring" (15%)

### Funding (Completed Last 5 Years).

**2020-2022 Pegasus Technical Services, \$62,025** "Copper and Silver Treatment Optimization for *Legionella Pneumophila* and Biomarker Discovery of Cell Culturability Study" (40%)

**2020-2022 Pegasus Technical Services, \$23,500** "WA 5-30, Support for Material Characterization and Analysis for Emerging Materials Research" (30%)

**2008 - 2018 Missouri Dept. of Higher Education ITQG \$2,030,215 (total for multiple proposals)** Science Education & Quantitative Literacy: An Inquiry-based Approach (20%)

**2020-2021 Missouri S&T 150th Anniversary Mini-Grant Program, \$5000** "STEMfest 2020 (100%)

**2018 Missouri S&T Center for Biomedical Research, \$16,000** Antimicrobial Properties of Bioactive Glasses with Engineered Surface pH (25%)

**Refereed Publications (\*Undergraduate Co-Authors) (Last 5 Years)**

Xu, L.; Sigler, A.; Chernatynskaya, A.; Rasmussen, L.; Lu, J.; Sahle-Demessie, E.; Westenberg, D. J.; Yang, H.; Shi, H. 2024 "Study of Legionella Pneumophila Treatment with Copper in Drinking Water by Single Cell-ICP-MS" Analytical and Bioanalytical Chemistry (In Press)

Lamba, A., Kopel, J., Westenberg, D.J., and S. Kapila. 2023 "A qualitative investigation of volatile organic components of antimicrobial oil smoke vapors" Adv. Microbiol. 13(1): 76-87 <https://doi.org/10.4236/aim.2023.131005>

Lamba, A., Kopel, J., Westenberg, D.J., and S. Kapila. 2023 "Fatty Acids, Esters, and Biogenic Oil Disinfectants: Novel Agents against Bacteria" Baylor University Medical Center Proceedings <https://doi.org/10.1080/08998280.2023.2167191>

Ramamurthy, S., Kopel, J., Westenberg, D.J., and S. Kapila. 2022 An Initial Report of the antimicrobial activities of volatiles produced during rapid volatilization of oils. Antibiotics 11:1742. <https://doi.org/10.3390/antibiotics11121742>

Han, S., Thapa, K., Liu, W., Westenberg, D., and Wang, R. 2022 Enhancement of electricity production of microbial fuel cells by using DNA nanostructures as electron mediator carriers. ACS Sustainable Chemistry & Engineering <https://doi.org/10.1021/acssuschemeng.2c04399>

Westenberg, D.J., \*Viswanathan, R., \*Kadyk, D.L., \*Hibbs, S. \*Kopel, J., and D. Day. 2021. Evaluation of Three Borate-Bioactive Glass Compositions for Antibacterial Applications. Advances in Microbiology 11(11):646-656

Khanjani, M., Westenberg, D.J., Kumar, A. and Ma, H. 2021. Tuning Polymorphs and Morphology of Microbially Induced Calcium Carbonate: Controlling Factors and Underlying Mechanisms. ACS Omega, 6(18): 11988-12003. <https://doi.org/10.1021/acsomega.1c00559>

Westenberg D, \*Kopel J. 2021. A food microbiology classroom activity to draw connections between microbes and students' lives. J. Microbiol. Biol. Educ. 22(1): 10.1128/jmbe.v22i1.2119

Gheni, N. and D.J. Westenberg. 2020 Quantitative Real-Time PCR Assay with Immunohistochemical evaluation of HER2/neu Oncogene in Breast Cancer Patients and Correlation with Clinicopathological Findings. Indian Journal of Pathology and Microbiology. 63:123-28

**Invited Talks (Last 5 years)**

**Lab Presentations**

The Plant Whisperers: How Soil Microbes Benefit the Plant Kingdom and Society. Fujian Agriculture and Forestry University, Fuzhou, China. Presented online May 16, 2023

The Plant Whisperers: How Soil Microbes Benefit the Plant Kingdom and Society. Academy of Science Saint Louis lecture. Presented online October 13, 2022

Subterranean Rhizoremediation Blues: Putting Rhizosphere Microbes to Work. Missouri S&T Department of Chemistry, Rolla, MO, October 5, 2020

Subterranean Rhizoremediation Blues: Putting Rhizosphere Microbes to Work. ASM Microbe, Chicago, IL, June 18, 2020 \*Presented online July 20, 2020

New Antimicrobial Treatments for 21<sup>st</sup> Century Medicine, China Medical University, July 4, 2018.

### **Education Presentations**

Past, Present, and Future of Antibiotics. University of Wisconsin – Milwaukee OSHER course. Three sessions – 10/31/2023, 11/7/2023 and 11/14/2023

Effective Teaching: Tips from Award-Winning Teachers. Focus on Teaching Technology Conference. St. Louis, MO (10/6/2023)

ASM Studio presentation on making microbial connections through humor, games and storytelling during ASM Microbe (6/18/2023)

Teaching Vaccinations and Adaptive Immunity With HHMI BioInteractive. HHMI BioInteractive virtual workshop. Two sessions – 1/9/2023 and 2/7/2023

Using BioInteractive Resources To Explore The World of Viruses. HHMI BioInteractive virtual workshop. Two sessions – 7/25/2022 and 8/16/2022

Outbreaks from History. University of Wisconsin – Milwaukee OSHER course. 5/31/2022

Eavesdropping on the Microbial World. University of Wisconsin – Milwaukee OSHER course. 6/7/2022

Microbes: the Good, the Bad, and the Beautiful. University of Wisconsin – Milwaukee OSHER course. Two sessions – 6/9/2021 and 6/16/2021

Guiding Students to Discover Connections to Our Microbial World. Australian Society for Microbiology, Educon, Presented via Zoom 6/4/2021

Designer Genes: Innovation and Design Thinking in the Life Sciences. UMSys OSHER course 1/20/21

Student Mental Well-Being Efforts at Missouri S&T. College of Arts, Sciences, and Business Dean's Leadership Council Fall Meeting. Rolla, MO \*Presented via Microsoft Teams 9/30/20

Good Evening Ladies and Germs: Using Humor, Story Telling, and Games To Discover Connections to Our Microbial World. ASM Conference for Undergraduate Educators, Bellevue, WA, July 12, 2020 \*Plenary talk presented online July 9, 2020

Using Humor, Story Telling, and Games To Discover Connections to Our Microbial World. ASM Microbe, Chicago, IL, June 18, 2020 \*Presented online July 20, 2020 as Carski Award Presentation

Lessons from the Great Influenza: Public Health Legacy From WWI. Missouri S&T, Rolla, MO November 19, 2019

### **Peer Reviewed Abstracts (Presentations and Posters) (Undergraduate\* Co-Authors)**

#### **Lab Research Posters**

Westenberg, D. 2021. Antimicrobial Activity Of Oil Smoke Vapors. World Microbe Forum

(ASM Microbe) Virtual.

A. Dowdney, K. Fabrice, T. Dowdney, W. Hao, C. Reeves, Y. Wang, D. Westenberg. 2021 Antiviral Personal Fans: The Development Of A Portable Disinfection/air Purification Device Using 254nm Uvc Light. World Microbe Forum (ASM Microbe) Virtual.

Mohtashami, E., Westenberg, D.J. and Deng, W. 2018. Influence of Essential Nutrient Component Distribution on Microbial Induced Calcite Precipitation Distribution. American Geophysical Union Fall Meeting, Washington, DC.

### **Education Presentations**

Westenberg, D.J. and J. Moberg-Parker. Writing learning objectives and aligning assignments. ASM Conference for Undergraduate Educators, Phoenix, AZ November 19, 2023

Westenberg, D.J. Modeling Virus, Vector, and Host Interactions with HHMI BioInteractive Resources. ASM Conference for Undergraduate Educators, Phoenix, AZ November 19, 2023

Westenberg, D.J., D. Foster-Hartnett, G. Hunt, J. Torruellas Garcia, K. Lopez-Moreno. Agar art: Hands-on activities for your microbiology classroom. ASM Conference for Undergraduate Educators, Virtual July 14, 2023

Close, P and D. J. Westenberg. Unpacking the CRISPR-Cas9 molecular toolbox. Interface B. Virtual February 24, 2022

Close, P and D. J. Westenberg. Covid and beyond! Exploring the World of Viruses. Interface B. Virtual February 23, 2022

Westenberg, D.J. Quantifying and Modeling the Role of Microbes in Biogeochemical Cycles with HHMI Biointeractive. ASM Conference for Undergraduate Educators, July 1, 2021

Close, P and D.J. Westenberg 2021 Scientist Role Models. InterfaceB, Virtual, February 18, 2021

Close, P and D.J. Westenberg. How Science Works. InterfaceB, Virtual, February 17, 2021

Westenberg, D.J. Engaging Students to Ask Scientific Questions through the Use of Videos, Images and Data, ASM Conference for Undergraduate Educators, Tysons, VA, August 1, 2019.

### **Courses Taught (Past 5 years)**

BioSc 2223 General Genetics, BioSc 1201 Introduction to Biological Sciences (4 times), BioSci 3313 Microbiology (5 times), BioSc 3319 Microbiology Lab (5 times), BioSc 5313 Pathogenic Microbiology (3), BioSci 4010 Senior Seminar, BioSci 4493 General Virology (2 times), BioSc 4001 Virology Lab, BioSc 1103/2001 Microbes and Man/Epidemics in a Changing World (15), BioSc 5001 Pathogenic Microbiology Lab

### **Professional Development Workshops (Presenter/Facilitator)**

Microbiology by Design: Bringing Excitement into the Microbiology Curriculum. ASM Conference for Undergraduate Educators, Virtual (2022)

Presenting Case Studies to Build Quantitative Skills Using HHMI Biointeractive Resources, ASM Conference for Undergraduate Educators, Tysons, VA (2019)

### Graduate Students Advised (Last 5 years)

#### Major Graduate Advisor for:

Sarah Fakher	candidate for MS in BioSci (began FS 2022)
Catalina Vega-Hurtado	graduated with MS in BioSc, 2020

### Undergraduate Research Students Supervised

*Undergraduate students in my lab have earned 81 OURE and 18 OURE Fellows awards, 4 FYRE Awards, 2 American Society for Microbiology Undergraduate Research Fellows. Undergraduate students contributed to 2 publications and 11 presentations/posters at regional and national conferences.*

#### Current students and projects:

Ryan Fagan	Antibacterial properties of novel wound healing materials.
Emily Korff	Biofuel production from glycerol.
Amelia Markwell	Quorum Sensing in <i>Bradyrhizobium japonicum</i> . Amelia is the recipient of a 2023 First Year Research Experience (FYRE) award and 2023-24 OURE award.
Alexis Morgan	Drought tolerance in <i>Bradyrhizobium japonicum</i> .
Delany Neely	Quorum Sensing in <i>Bradyrhizobium japonicum</i> . Brooke is the recipient of a 2023-24 OURE award.
Shay Pelfrey	Drought tolerance in <i>Bradyrhizobium japonicum</i> . Shay is the recipient of a 2023 (OURE) award.
Yaroslav Rynza	Antibacterial properties of bioactive glass. Yaroslav is the recipient of a 2023-24 OURE award.

### Professional Service (Current)

Editor, Journal of Microbiology and Biology Education, American Society for Microbiology Conference for Undergraduate Educators (Chair 2023, Vice-Chair 2022, Microbrew editor 2021). ASM Education department sub-committee on undergraduate education.

### UM System, Missouri S&T, and Departmental Service

Missouri S&T (Current) Faculty Senate Secretary, Conflict of Interest, Athletics Advisory, JED Campus (Co-Chair Faculty Engagement sub-committee), Institutional Research Board (campus co-chair), Faculty Senate Personnel Committee (Chair), Humans vs. Zombies (Student organization advisor), National Society of Leadership and Success (Student organization advisor), Helix club (Student organization co-advisor), and IGEM (Student design team co-advisor). Department (Current) Faculty Senator

### Outreach Activities

Presentations and activities with community organizations, science clubs, student organizations, visiting student groups and visiting school classes, Supervisor for Science Fair Projects (36 students), USA Science and Engineering Festival, Washington DC (2011, 2012, 2014, 2016, 2018), Workshops for Expanding your Horizons, Girls Scouts Science Days, Science Olympiad Events, Judge for local, regional and national science fairs, public forums.