

Steven Van Alstine, PhD_(he/him)

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Microbiology PhD eager to cultivate curiosity in the minds of blossoming health professionals

Highlights

- Microbiology lecture teaching experience throughout graduate school and post-graduate work, taught medical microbiology course and managed undergraduate TAs, guest lectured at Northeastern University
- Academic and industry experience in aseptic technique, microbial cultivation and growth characteristic, bacterial isolation and identification of unknown species, and testing of antimicrobial effectiveness.

Education

University of Massachusetts, Amherst MA

June 2022

Ph.D. in Microbiology

Graduate Researcher with Dr. Steven Sandler

DNA replication, recombination, and cell division in E.coli

- Generated multiple variants of E. coli recombinase, RecA, uncovering the physiological and biochemical activities conferred by these mutations on homologous recombination and the SOS response which can affect antimicrobial effectiveness and virulence factor expression.
- Performed statistical analysis on microscope image data sets using Excel and Matlab
- Designed and executed genetic screen to isolate mutations to map interactions between RecA and SOS response repressor, LexA
- Mentored and trained two undergraduate students. Both have gone on to jobs in biotechnology and medical fields
- Presented to laboratory (30 students) and lecture (300 students) sections, designed and graded essay assignments, prepared discussion material and moderated discussion sections, managed laboratory personnel, reagents, and equipment, held office hours

Wisconsin Lutheran College, Milwaukee WI

May 2015

B.S. in Biochemistry

Research associate with Dr. John Werner

Explore E. coli as a biotechnology tool

- Founding member of school iGEM team
- Designed and executed high throughput genetic screen to characterize newly isolated E. coli phages enriched from municipal sources
- Determined effect of osmolarity on MreB protein levels in E. coli during ASM Undergraduate Research Fellowship (URF)

Work/Research Experience

Northeastern University, Boston MA

April 2024 - Present

Bioengineering Postdoctoral Associate with Dr. Elizabeth Libby

- Guest lectured for class of 30 students exploring career pathways in engineering
- Assisted with mentorship and training of two graduate students. Presented weekly reports.
- Collaborated with an external company, Oxford Nanopore, ensuring proper microbial cultivation and growth characteristics to facilitate easier protein isolation and identification. Presented monthly reports.
- Measured effectiveness of antimicrobial compounds to evaluate physiological and biochemical activities of Bacillus subtilis kinase, PrkC and mutations made to PrkC gene.
- Created tunable living biosensor using Bacillus subtilis to sense DNA in complex mixtures.

Conagen Inc, Bedford MA
Strain Development Scientist II

January 2022 - August 2023

- Leveraged knowledge of the physiological and biochemical activities of *E. coli* and *Corynebacterium glutamicum* to build metabolic pathways to optimize protein expression and small molecule production while ensuring the preclusion of unknown species from microbial cultivation
- Presented bi-weekly meetings to research team and higher level advisors
- Developed high-throughput genetic screen testing antimicrobial effectiveness as a proxy for high gene expression

University of Massachusetts, Amherst MA
Microbiology Graduate Researcher

September 2015 - June 2022

- Published a first author paper in the Journal of Bacteriology on *E. coli* recA mutants that confer constitutive expression of the SOS response and may inform mechanisms of infection, resistance to host immune response, and horizontal gene transfer, leading to the spread of virulence factors and resistance to antibiotic drugs
- Presented both chalk talks and slide presentations at regular research group meetings and annual departmental student seminars. Presented posters at numerous conferences: Molecular Genetics of Bacteria and Phages Meeting 2019, Boston Bacterial Meeting 2018, 2019. Pioneer Valley Microbiology Symposium 2016, 2017, 2018, 2019
- Mentored and trained two undergraduate students. Trainees learned aseptic technique, microbial cultivation and growth characteristic, and testing of antimicrobial effectiveness.

Publications

[S. Van Alstine and S.J. Sandler](#). April 20 2022. Positive Charges are important for the SOS constitutive phenotype in recA730 and recA1202 in *Escherichia coli* K-12

Mentorship/Teaching Experience

- Principle TA for Introduction to Medical Microbiology laboratory course culturing BSL 2 organisms. Taught aseptic technique, microbial cultivation and growth characteristics, bacterial isolation and identification of unknown species, and antimicrobial effectiveness. Delivered laboratory lectures before beginning wet work. Oversaw one laboratory classroom with 30 nursing students while managing 2 undergraduate TAs. Students went on to health professional fields.
- Principle TA for General Microbiology, overview lecture-based course for majors (300+ students). Wrote and graded examinations and essay assignments.
- Principle TA for Biology of Cancer and AIDS, a lecture-based general education biology requirement for non-science majors (500+ students). Prepared discussion material and ran review sessions and held office hours for students.
- Principle TA for Introduction to Biotechnology laboratory. Assisted professor in a team-based learning laboratory environment, mimicking the applications of biotechnology in researching and developing a product utilizing an insect cell culture and viral recombinant protein production system. Oversaw one laboratory classroom while managing 2 undergraduate TAs.