Dean M. Sanders, M.S.

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Education

University of Wisconsin-Madison — Madison, WI
Doctorate of Philosophy (Ph.D.)
Area of Study: Genetics
Expected — GPA: 3.78, Spring 2018 (5) / Fall 2019 (6)

University of Wisconsin-Madison — Madison, WI
Master of Science (M.S.)
Area of Study: Bacteriology
Graduated — GPA: 3.91, Spring 2013

University of Wisconsin-Oshkosh — Oshkosh, WI
Baccalaureate of Science (B.S.)
Major: Microbiology — Minor: Chemistry
Graduated — GPA: 3.45, May 2011

University of Wisconsin- Colleges — Sheboygan, WI
Associate of Arts and Science (A.A.S)
Graduated — GPA: 3.60, May 2008

Publications

Sanders D, Fieweger R, Lu L, Qian S, Dowell J, Denu JM, Zhong X (2017) Histone lysine-to-methionine mutations reduce histone methylation and cause developmental pleiotropy. *Plant Physiology*.173, 2243-2252.

Sanders D, Katarzyna B, Fikrullah K, Rakowski S, Lozano M, Filutowicz M (2017) Multiple dictyostelid species destroy biofilms of Klebsiella oxytoca and other Gram negative species. *Protist.* 168, 311-325.

Lu L, Chen X, **Sanders D**, Qian S, Zhong X (2015) High-resolution mapping of H4K16 and H3K23 acetylation reveals conserved and unique distribution patterns in Arabidopsis and rice. *Epigenetics*. 10, 1044-1053.

Patents:

Marcin Filutowicz, Katarzyna Dorota Borys, Dean Sanders (2014). Dictyostelid amoeba and biocontrol uses thereof. US20140056850 A1. Amoebagone, Llc

Honors and Awards

- Stone Travel Award. UW-Madison. July 2016.
- Bacteriology Masters of Science Student Performance Award. Spring 2013. UW-Madison.
- Funded for the undergraduate student and faculty collaborative research grant. Spring 2009. UW-Oshkosh.
- Graduated with honors from the University of Wisconsin-Sheboygan. Spring 2008. UW-Sheboygan.

Scientific Meeting Presentations

- **Sanders D**, Fieweger R, Lu L, Qian S, Dowell J, Denu JM, Zhong X. Histone 3 lysine-to-methionine mutation acts in a dominant negative manner to suppress endogenous histone methylation and gene expression in plants. American Society for Plant Biology. Austin, TX. July 2016. (talk and poster)
- Lu L, Chen X, **Sanders D**, Qian S, Zhong X. H4K16ac exhibits a species specific effect on gene expression in *Arabidopsis thaliana.* American Society for Plant Biology. Minneapolis, MN. July 2015. (poster)
- Zhong X, **Sanders D**. DRM3 mediates DNA methylation through PolV interaction in *Arabidopsis thaliana*. Midwest Chromatin and Epigenetics Meeting. Madison, WI. May 2014. (poster)
- **Sanders D**, Borys K, Filutowicz M. *Klebsiella* biofilm succumbs to an amoebic predator. Kenneth Raper Symposium. University of Wisconsin. Madison, WI. August 2012. (poster)
- **Sanders D**, McClusky Z, Kedrowski B. The Antiviral Organic Compounds Present in the American Cranberry (*Vaccinium macrocarpon*). Wisconsin Science and Technology Conference. Green Bay, WI. July 2010. (poster)
- **Sanders D**, McClusky Z, Kedrowski B. The Antiviral Organic Compounds Present in the American Cranberry (*Vaccinium macrocarpon*). UW- Oshkosh celebration of scholarship. Oshkosh, WI. April 2009. (poster)

Teaching/Outreach

- ***Mentoring experience:***
  - Sandhya Srinivasan. 2016- 2017
  - Fieweger, Rachael. 2014-2016
    - Attending Cornell Microbiology graduate program since Fall 2016
  - Chen, Yang. 2013-2015
    - 3rd year microbiology major at UW-Madison
  - Sims, Greg. 2012-2013
    - Attending physicians assistant school in Las Vegas, Nevada
- ***Teaching assistantship:***
  - Genetics 133: Genetics in the News, University of Wisconsin, Spring 2018
  - Genetics 133: Genetics in the News, University of Wisconsin, Fall 2017

- Genetics 466: General Genetics. University of Wisconsin, Spring 2015.

- ***Public outreach presentations:***
  - Rural High School Science Camp Presentation at Wisconsin Institute for Discovery. "Exploring epigenetics mechanisms and its impact on molecular transcription". July 25-27, 2017. UW-Madison.
  - DIY science instructor at Wisconsin Institute for Discovery: March 11, 2016. UW-Madison.
  - Summer Science Camp Presentation at Wisconsin Institute for Discovery. "Fine control of the genome, a story of continuous modification". July 2015. UW-Madison.
  - Summer Science Camp Presentation at Wisconsin Institute for Discovery. "Epigenetic modification and its implications in plant biotechnology". June 2015. UW-Madison.
  - Presentation to 1st yr genetics students on general epigenetics in plants and mammals. April 2015, UW-Madison.
  - Summer Science camp presentation. "Trans-generational epigenetic inheritance: does an ancestors life condition affect the present generation?" Wisconsin Institute for Discovery. March 2015. UW-Madison.
  - Science Saturday exhibit. Wisconsin Institute for Discovery. "Applications of epigenetic modifications to the world of biology". Fall 2014. UW-Madison.
  - Summer Science camp presentation and epigenetic experiment demonstration. Wisconsin Institute for Discovery. September 2014. UW-Madison.
  - "High throughput screening for antimicrobial production in the genus Dictyostelium" Genomic Science Spring 2012 presentations. March 2012. UW-Madison.
  - Interviewed July 16, 2010 by channel 5 WRST news station (Green Bay, WI) on the correlation between *E.coli* levels on Lake Michigan beaches and pathogen load.

Scientific Skills

- **General molecular biology**: proper aseptic technique, microscopy, staining, quantification, microbial culturing techniques, centrifugation.
- **Forward and reverse genetic techniques**: Mutagenesis, Plasmid Isolation, molecular cloning, PCR, Sanger sequencing, next generation sequencing and cloning analysis software.
- **Computing skills**: Unix and Windows OS. Bioinformatics analysis experience with:
  - RNA-Seq
  - ChIP-Seq
  - BS-Seq
  - Python for advanced program design
  - R for data management and plotting
  - shell and awk for data handling and process automation
- **Biochemical techniques**: Personal training in HPLC and ESI-MS/MS orbi-trap mass spectrometry sample prep and data analysis
- **Mathematics**: Algebra, Trigonometry, Calculus, Statistics

Relevant Coursework

Cell and Molecular Biology, Microbial genetics, Biostatistics, Sequence analysis, Genomics, Enzyme Kinetics, Microbial physiology, Bacteriology, Medical Bacteriology, Immunology, Biochemistry, Organic Chemistry I&II, Ecology and Evolution.

Previous Research Experience

- Investigated the breakdown of bacterial biofilms and production of antimicrobial secondary metabolites by social amoeba from the family Dictyosteliaceae with Dr. Marcin Filutowicz, Dr. Kalin Vetsigian, Dr. Doug Wiebel and Dr. Greg Barret-Wilt. University of Wisconsin-Madison, September 2011- May 2013.
    - Epiflourescence microscopy, genetic manipulation, general microbiology
    - C-18 solid phase extraction, HPLC and LC/MS-TOF
    - Mentoring undergraduate research students
    - Sequencing new species of *Dictyostelium*
- Isolation of organic dyes and antimicrobials from *Isatis tinctoria* a temperate perennial with Dr. Arlene Haffa. University of Wisconsin-Oshkosh. Sept-December 2010.
    - HPLC and lyophilization
    - Chemical extraction of indigotin from *Isatis tinctoria*
    - Determined minimum inhibitory concentration of the extract against *S. aureus*, and *E. coli*.
- Construction of *petCII* knockout mutant in *Synechococcus 7002* through megaprimer design and homologous recombination with Dr. Tovio Kallas, University of Wisconsin-Oshkosh. Sept-March 2011.
    - Plasmid and chromosomal DNA extraction
    - Electroporation, conjugation, recombination experiments
    - PCR, and megaprimer construction
- Testing the antiviral properties of cranberry juice by separation and spectroscopic analysis with Dr. Brant Kedrowski and Dr. Teri Shors, University of Wisconsin-Oshkosh, Feb 2009- May 2011.
    - Isolated multiple HPLC fractions with potent antiviral activity
    - Utilized solid phase extraction for separation of mixtures of compounds
- Study of the effect of environmental variables on *E. coli* runoff levels on the shores of Lake Michigan with Dr. Colleen McDermott, Dr. Rebecca Abler, Dr. Greg Kleinheinz, and Dr. Richard Hein. University of Wisconsin-Manitowoc. May-August of 2010, May-August of 2011.
    - Quantified *E.coli* levels at Manitowoc beaches through defined substrate reactions
    - Precisely measured environmental variables
    - Data analysis: searching for correlation of environmental conditions leading to increased bacterial load on local beaches