

# HEATHER D. BEAN

ASSISTANT PROFESSOR • ARIZONA STATE UNIVERSITY • SCHOOL OF LIFE SCIENCES

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## EDUCATION

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- 2002 - 2008      **Doctor of Philosophy in Chemistry**  
Georgia Institute of Technology, Atlanta, GA  
*Dissertation:* Prebiotic Synthesis of Nucleic Acids; *Advisor:* Nicholas V. Hud, PhD
- 1995 - 1999      **Bachelor of Science in Chemistry, Biochemistry track**  
Georgia Institute of Technology, Atlanta, GA  
*Summa cum Laude*

## RESEARCH & EMPLOYMENT HISTORY

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- 2015 - present      **Assistant Professor**, Biomedicine & Biotechnology, School of Life Sciences,  
Arizona State University, Tempe, AZ
- 2013 - 2015      **Carol Basbaum Cystic Fibrosis Foundation Postdoctoral Fellow**, Thayer School of  
Engineering Dartmouth College, Hanover, NH; *Advisor:* Jane E. Hill, PhD
- 2009 - 2013      **Postdoctoral Fellow**, School of Engineering,  
University of Vermont, Burlington, VT; *Advisor:* Jane E. Hill, PhD
- 2008 - 2009      **Postdoctoral Research Associate**, School of Chemical Engineering,  
Texas A&M University, College Station, TX; *Advisor:* Thomas K. Wood, PhD
- 2003 - 2008      **Graduate Research Assistant**, School of Chemistry & Biochemistry,  
Georgia Institute of Technology, Atlanta, GA; *Advisor:* Nicholas V. Hud, PhD
- 2003 - 2006      **Graduate Student Assistant**, Bioanalytical Mass Spectrometry Center,  
Georgia Institute of Technology, Atlanta, GA
- 2002 - 2003      **Graduate Teaching Assistant**, Biochemistry Lab I, II,  
Georgia Institute of Technology, Atlanta, GA
- 1999 - 2002      **Associate Quality Analyst**  
Merck & Co., Inc., Albany, GA

## SELECTED HONORS, POSITIONS & AWARDS

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- 2017 - present      Honors Faculty, Barrett, The Honors College, Arizona State University
- 2017      Packard Foundation Research Award, School of Life Sciences Nominee
- 2016      Blavatnik Award for Innovation in the Life Sciences, Arizona State University Nominee
- 2014      Genzo Shimadzu Best Oral Presentation Award, 11<sup>th</sup> GC×GC Symposium, Italy
- 2014      Emerald Award for Service to the Green Mountain Section of the ACS
- 2012      Carol Basbaum Memorial Research Fellow for best priority score, Cystic Fibrosis Found.
- 2012      Young Investigator Travel Award, NISBRE
- 2012      CASSS Travel Award, 36<sup>th</sup> ISCC & 9<sup>th</sup> GC×GC Symposium, Riva del Garda, Italy
- 2011      NACFC Junior Investigator Best Abstract in Basic Science Award, Finalist
- 2010      American Chemical Society Younger Chemist Committee Leadership Award, Runner-up
- 2007      Graduate Student Award, School of Chemistry & Biochemistry, Georgia Tech
- 2006      Session Chair, Gordon Research Conference: Origin of Life
- 2006      Co-Chair, Gordon-Kenan Graduate Research Seminar: Origin of Life
- 2006      Suddath Award, Parker H. Petit Institute of Bioengineering and Biosciences
- 2005      Molecular Biophysics Trainee, Georgia Institute of Technology
- 2003      Outstanding Performance as a Graduate Teaching Assistant Award
- 1999      Analytical Chemistry Undergraduate Achievement Award
- 1999      Texaco Scholarship
- 1998      American Institute of Chemists Foundation Student Award
- 1996      Freshman Chemistry Chemical Rubber Company (CRC) Award
- 1996      National Collegiate Natural Sciences Award

19. Mavra Nasir, **Heather D. Bean**, Christiaan A. Rees, Edith Zemanick, Jane E. Hill. (2018) Volatile molecules from bronchoalveolar lavage fluid can “rule-in” *Pseudomonas aeruginosa* and “rule-out” *Staphylococcus aureus* infection in cystic fibrosis patients. *Scientific Reports*. **8**, 826.  
**Featured in Plenary Session I of the North American Cystic Fibrosis Conference, Oct 19, 2018**
18. Lawrence A. Adutwum, A. Paulina de la Mata, **Heather D. Bean**, Jane E. Hill, James J. Harynuk. (2017) Estimation of start and stop numbers for cluster resolution feature selection algorithm; An empirical approach using null distribution analysis of fisher ratios. *Analytical and Bioanalytical Chemistry*. **409**, 6699-6708.
17. **Heather D. Bean\***, Christiaan A. Rees\*, Jane E. Hill. (2016) Comparative analysis of the volatile metabolomes of *Pseudomonas aeruginosa* clinical isolates. *Journal of Breath Research*. **10**, 047102. [\*co-first authors]
16. Alex Gifford, Sven Willger, Emily Dolben, Lisa Moulton, Dana Dorman, **Heather D. Bean**, Jane E. Hill, Thomas Hampton, Alix Ashare, Deborah A. Hogan. (2016) The use of a multiplex transcript method for the analysis of the *Pseudomonas aeruginosa* gene expression profiles in the cystic fibrosis lung. *Infection and Immunity*. **84**, 2995-3006.
15. **Heather D. Bean\***, Theodore R. Mellors\*, Jiangjiang Zhu, Jane E. Hill. (2015) Profiling aged artisanal cheddar cheese using secondary electrospray ionization-mass spectrometry (SESI-MS). *Journal of Agricultural and Food Chemistry*. **63**, 4386-4392. [\*co-first authors]
14. **Heather D. Bean**, Jane E. Hill, Jean-Marie D. Dimandja. (2015) Improving the quality of biomarker candidates in untargeted metabolomics via peak table-based alignment of two dimensional gas chromatography-mass spectrometry data. *Journal of Chromatography A*. **1394**, 111-117.
13. **Heather D. Bean\***, Jaime Jiménez-Díaz\*, Jiangjiang Zhu, Jane E. Hill. (2015) Breathprints of model murine bacterial lung infections are linked with immune response. *European Respiratory Journal*. **45**, 181-190.  
[\*co-first authors]  
**Editorial Feature Article: *European Respiratory Journal*. **45**, 21-24.**
12. **Heather D. Bean\***, Jiangjiang Zhu\*, Jackson C. Sengle, Jane E. Hill. (2014) Identifying methicillin-resistant *Staphylococcus aureus* (MRSA) lung infections in mice via breath analysis using secondary electrospray ionization-mass spectrometry (SESI-MS). *Journal of Breath Research*. **8**, 041001. [\*co-first authors]  
**Publisher Featured Article**
11. Jiangjiang Zhu, Jaime Jiménez-Díaz, **Heather D. Bean**, Nirav A. Daphary, Minara I. Aliyeva, Lennart K. A. Lundblad, Jane E. Hill. (2013) Robust detection of *P. aeruginosa* and *S. aureus* acute lung infections by secondary electrospray ionization-mass spectrometry (SESI-MS) breathprinting: From initial infection to clearance. *Journal of Breath Research*. **7**, 037106.
10. Jiangjiang Zhu, **Heather D. Bean**, Jaime Jiménez-Díaz, Jane E. Hill. (2013) Secondary electrospray ionization-mass spectrometry (SESI-MS) breathprinting of multiple bacterial pathogens, a mouse model study. *Journal of Applied Physiology*. **114**, 1544-1549.
9. Jiangjiang Zhu, **Heather D. Bean**, Matthew J. Wargo, Laurie W. Leclair, Jane E. Hill. (2013) Detecting bacterial lung infections: *In vivo* evaluation of *in vitro* fingerprints. *Journal of Breath Research*. **7**, 016003.  
**Publisher Featured Article**
8. **Heather D. Bean**, Jean-Marie D. Dimandja, Jane E. Hill. (2012) Bacterial volatile discovery using solid phase microextraction and comprehensive two-dimensional gas chromatography – time-of-flight mass spectrometry. *Journal of Chromatography B*. **901**, 41-46.
7. Lakshmi N. Anumukonda, Avery Young, David G. Lynn, Ragan Buckley, Amena Warrayat, Christina L. Graves, **Heather D. Bean**, and Nicholas V. Hud. (2011) Adenine synthesis in a model prebiotic reaction: Connecting origins of life chemistry with biology. *Journal of Chemical Education*. **88**, 1698-1701.

6. **Heather D. Bean**, Jiangjiang Zhu, Jane E. Hill. (2011) Characterizing bacterial volatiles using secondary electrospray ionization mass spectrometry. *Journal of Visualized Experiments*. **52**, <http://www.jove.com/details.php?id=2664>.
5. Jiangjiang Zhu, **Heather D. Bean**, Yin-Ming Kuo, Jane E. Hill (2010). Fast detection of volatile organic compounds from bacterial cultures by SESI-MS. *Journal of Clinical Microbiology* **48**, 4426-4431.
4. Irena Mamajanova, Aaron E. Engelhart, **Heather D. Bean**, Nicholas V. Hud (2010). DNA and RNA in anhydrous media: Evidence for duplex, triplex, and G-quadruplex secondary structures in a deep eutectic solvent. *Angewandte Chemie, International Edition* **49**, 6310-6314.
3. Yinghong Sheng, **Heather D. Bean**, Irena Mamajanov, Nicholas V. Hud, Jerzy Leszczynski (2009). Comprehensive investigation of the energetics of pyrimidine nucleoside formation under prebiotic conditions. *Journal of the American Chemical Society* **131**, 16088-16095.
2. **Heather D. Bean**, Yinghong Sheng, James P. Collins, Frank A. L. Anet, Jerzy Leszczynski, Nicholas V. Hud (2007). Formation of a  $\beta$ -pyrimidine nucleoside by a free pyrimidine base and ribose in a plausible prebiotic reaction. *Journal of the American Chemical Society* **129**, 9556-9557.
1. **Heather D. Bean**, Frank A. L. Anet, Ian R. Gould, Nicholas V. Hud (2006). Glyoxylate as a backbone linkage for a prebiotic ancestor of RNA. *Origins of Life and Evolution of Biospheres* **36**, 39-63.

#### **BOOK CHAPTERS, REVIEW ARTICLES & EDITORIALS**

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3. Emily A. Higgins Keppler<sup>G</sup>, Carrie L. Jenkins<sup>G</sup>, Trenton J. Davis<sup>G</sup>, **Heather D. Bean** (2018). Advances in the application of comprehensive two-dimensional gas chromatography in metabolomics. *Invited review, Trends in Analytical Chemistry* **109**, 275-286.
2. **Heather D. Bean**, Joachim D. Pleil, Jane E. Hill (2015). Editorial: New analytical and statistical approaches for interpreting the relationships among environmental stressors and biomarkers. *Biomarkers* **20**, 1-4.
1. **Heather D. Bean**, David G. Lynn, Nicholas V. Hud (2009). Self-Assembly and the origin of the first RNA-like polymers, in *Chemical Evolution II: From the Origins of Life to Modern Society*, Zaikowski, L., Friedrich, J. M. and Seidel, S. R., Eds. Washington, DC, American Chemical Society. **1025**: 109-132.

#### **RESEARCH SUPPORT**

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##### **Current Support, Collaborative**

Cystic Fibrosis Foundation "NIH-Unfunded" Pilot Grant HILL17P0

02/2018 – 12/2019

Project title: Improving Outcomes in CF Patients: Toward Rapid Detection of *P. aeruginosa*

Role: Co-PI (Jane Hill, Dartmouth College, Lead PI; Edith Zemanick, U. Colorado, Co-PI)

Cystic Fibrosis Foundation Therapeutics HILL18A0

04/2018 – 03/2021

Project title: Improving *P. aeruginosa* Detection in Non-Expectorators Via Breath Testing

Role: Co-PI (Jane Hill, Dartmouth College, PI; Edith Zemanick, U. Colorado, Co-PI)

Arizona Biomedical Research Commission AZ New Investigator Award ADHS18-198861

04/2018 – 03/2021

Project Title: Volatile Biomarkers for a Valley Fever Breath Test

Role: PI (Key Personnel: Bridget Barker, Northern Arizona U.; Douglas Lake, ASU; Tom Grys, Mayo Clinic)

NASA Space Biology Program 16-16ROSBDFP-0025

06/2018 – 05/2021

Project title: Contributions of the Microbiome in Astronaut Health: A New Dimension in Modeling Crew Infectious Disease Risks

Role: Co-I (Cheryl Nickerson, ASU, PI)

NIH R56, High Priority, Short-Term Project "Bridge Award" 1R56HL139846-01A1

09/2018 – 08/2019

Project title: Improving Outcomes in CF Patients: Toward Rapid Detection of *P. aeruginosa*

Role: Co-I (Jane Hill, Dartmouth College, PI; Edith Zemanick, U. Colorado, Co-I)

### **Completed Support, Individual**

Cystic Fibrosis Foundation Postdoctoral Research Fellowship

*Carol Basbaum Memorial Fellow for the Best Priority Score*

05/2012 – 04/2015

05/2015 – 04/2016 No Cost Extension

Project title: Volatile Biomarkers of *P. aeruginosa* Adaptation to the CF Lung

Role: PI

### **Completed Support, Collaborative**

Cystic Fibrosis Foundation Pilot and Feasibility Grant

04/2016 – 03/2018

Project title: Rapid, Non-Invasive Detection of *Pseudomonas* and *Staph* CF Lung Infections

Role: Co-I (Jane Hill, Dartmouth College, PI)

### **Completed Support (Prior Institutions), Collaborative**

Dartmouth Neukom CompX Faculty Grant

02/2015 – 01/2016

Project title: Integrating Rich Data from Lung Infections for Contextually-Framed Biomarker Discovery

Role: Lead Scientist (Jane Hill, Dartmouth College, PI)

Dartmouth Synergy Pilot Award

05/2015 – 04/2016

Project title: Biomarker Discovery and Validation for Lung Infection in CF Patients

Role: Co-I (Jane Hill, Dartmouth College and Alix Ashare, Dartmouth College, co-PIs)

Cystic Fibrosis Foundation Therapeutics

04/2015 – 03/2016 Access to samples, no funding

Project title: Determination and Validation of the Volatile Molecular Signature for *Pseudomonas* and *Staphylococcus* Lung Infections in CF Patients using BALF

Role: Lead Scientist (Jane Hill, Dartmouth College, PI)

### **Arizona State University Internal Trainee Research Funding (Recipient, Date, Sponsor)**

Ava Karanjia	2018 – 2019	NASA Space Grant Scholar
Ava Karanjia	2018 – 2019	SOLUR Researcher Award
Sarah West	2018 – 2019	SOLUR Researcher Award
Ava Karanjia	2018	Grand Challenge Scholars Program Research Award
Charity Bhebhe	2017 – 2018	SOLUR Fellow Award
Jonathan Kiermayr	2017	CLAS Undergraduate Summer Enrichment
Lea Witzel	2017	SOLUR Researcher Award
Charity Bhebhe	2016 – 2017	SOLUR Researcher Award
Darrin Ellison	2016 – 2017	SOLUR Researcher Award
Amritha Venguideshe	2016 – 2017	SOLUR Researcher Award

### **Travel Grants (Recipient, Date, Sponsor, Purpose)**

Ava Karanjia	2018	SWE	Collegiate Research Competition
Ava Karanjia	2018	GCURS	Gulf Coast Undergrad. Research Symposium, TX
Heather Bean	2017	ASMS	Pacific Northwest MS Group seminar, Seattle, WA
Heather Bean	2016	Chromaleont	40th ISCC & 13th GCxGC Symposium, Italy
Heather Bean	2016	Leco	Am. Soc. for Mass Spectrometry, San Antonio, TX

## CONFERENCE PODIUM PRESENTATIONS (\*AWARDS, † INVITED)

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Mar 2019	Pittcon	Philadelphia, PA
† “Application of Comprehensive Two-Dimensional Gas Chromatography to Breath Biomarker Discovery”		
Jun 2018	International Association for Breath Research Summit	Maastricht, Netherlands
“Investigating Metabolic Adaptation in <i>P. aeruginosa</i> Chronic Lung Infections Using GC×GC-TOFMS”		
Jun 2018	American Society for Microbiology Microbe	Atlanta, GA
Poster Talk: “Characterization of the <i>P. aeruginosa</i> Clinical Volatile Metabolome”		
May 2018	Canadian Society for Chemistry	Edmonton, Canada
† “Investigating Metabolic Selection in <i>P. aeruginosa</i> Infections Using GC×GC-TOFMS”		
May 2018	42 <sup>nd</sup> ISCC & 15 <sup>th</sup> GC×GC Symposium	Riva del Garda, Italy
“Investigating Metabolic Selection in <i>P. aeruginosa</i> Infections Using GC×GC-TOFMS”		
Oct 2017	North American Cystic Fibrosis Conference	Indianapolis, IN
“Microbial Interactions” Session Introductory Talk		
May 2017	41 <sup>st</sup> ISCC & 14 <sup>th</sup> GC×GC Symposium	Fort Worth, TX
† (Keynote) “Tracking Chronic Lung Disease Progression through Volatile Biomarkers of <i>P. aeruginosa</i> ”		
Oct 2016	North American Cystic Fibrosis Conference	Orlando, FL
“Biomarkers of <i>P. aeruginosa</i> Chronic Lung Infections and Associated Bacterial Phenotypes”		
Sep 2016	International Association for Breath Research Summit	Zurich, Switzerland
† (Keynote) “Bridging Gaps: Linking <i>In Vivo</i> to <i>In Vitro</i> , and Metabolomes to Transcriptomes to Identify Volatile Biomarkers of Bacterial Phenotypes”		
May 2016	40 <sup>th</sup> ISCC & 13 <sup>th</sup> GC×GC Symposium	Riva del Garda, Italy
† “GC×GC-TOFMS for the Identification of Soluble and Volatile Biomarkers in Bronchoalveolar Lavage Fluid”		
Apr 2016	32 <sup>nd</sup> Intl. Symposium on Microscale Separations & Bioanalysis	Toronto, ON
† “Discovering biomarkers using GC×GC-TOFMS for the detection of infection phenotypes directly from lung samples”		
May 2015	39 <sup>th</sup> ISCC & 12 <sup>th</sup> GC×GC Symposium	Fort Worth, TX
† “GC×GC-TOFMS for the Identification of Volatile Biomarkers of Chronic Bacterial Lung Infections”		
Aug 2014	American Chemical Society, 248 <sup>th</sup> National Meeting	San Francisco, CA
“Murine Lung Exposure to Bacterial Antigens Leads to Predictive Breathprints”		
May 2014	38 <sup>th</sup> ISCC & 11 <sup>th</sup> GC×GC Symposium	Riva del Garda, Italy
* “Discovering Volatile Biomarkers of <i>P. aeruginosa</i> Adaptation during Chronic Lung Infections using GC×GC-TOFMS and Chemometrics”		
May 2013	10 <sup>th</sup> GC×GC Symposium & 37 <sup>th</sup> ISCC	Palm Springs, CA
† “Identifying Biomarkers of <i>P. aeruginosa</i> Antibiotic Susceptibility Using GC×GC-TOFMS and Fisher Ratios”		
Jan 2013	4 <sup>th</sup> Multidimensional Chromatography Workshop	Toronto, Canada
† “Identifying Biomarkers of <i>P. aeruginosa</i> Antibiotic Susceptibility Using GC×GC-TOF and Statistical Compare”		
May 2012	36 <sup>th</sup> ISCC & 9 <sup>th</sup> GC×GC Symposium	Riva del Garda, Italy
* “Bacterial Volatile Discovery Using SPME and GC×GC-TOFMS”		
Feb 2011	Mass Spectrometry Applications to the Clinical Lab	San Diego, CA
* “Characterizing the Adaptation of <i>P. aeruginosa</i> to the CF Lung Using GC×GC-TOF and SESI-MS”		

Aug2010	American Chemical Society, 240 <sup>th</sup> National Meeting	Boston, MA
*	“Volatile Signature of <i>P. aeruginosa</i> Adaptation to the Cystic Fibrosis Lung”	
Jul 2006	Gordon Research Conference: Origin of Life	Lewiston, ME
†	“gaNA: Plausible Prebiotic Synthesis of a Proto-RNA Backbone”	

**INVITED SCIENTIFIC LECTURES & SEMINARS (\*AWARDS)**

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May 2018	Mountain West Cystic Fibrosis Meeting	Phoenix, AZ
	“Progress Toward Breath-Based Diagnostics for CF Lung Infections”	
Mar 018	University of Arizona School of Medicine	Phoenix, AZ
	“Microbial Metabolomics in Polymicrobial Infections”	
Aug 2017	5 <sup>th</sup> Telluride Workshop on Cystic Fibrosis	Telluride, CO
	“ <i>P. aeruginosa</i> Metabolomic Changes in Chronic CF Infections”	
Mar 2017	Pacific Northwest Mass Spectrometry Group	Seattle, WA
	“Mass Spectrometry for the Discovery of Volatile Biomarkers of Lung Infections: A Chromatographer’s Perspective”	
Nov 2016	Marine Biological Laboratory Workshop	Woods Hole, MA
	“A Brief History of Breath-Based Diagnostics: From Hippocrates to the Era of Personalized Medicine”	
Nov 2016	ASU School of Life Sciences Staff Lunch and Learn	Tempe, AZ
	“More Than Just Hot Air! Breath-Based Diagnostics for Lung Infections”	
Oct 2016	Microbiology Graduate Student Association, ASU	Tempe, AZ
	“Discovering Volatile Biomarkers for Phenotyping Lung Infections”	
Oct 2016	ASU, School of Mathematical and Natural Sciences	Glendale, AZ
	“Discovering Volatile Biomarkers for Phenotyping Lung Infections”	
Sep 2016	Arizona State University, School of Science and Mathematics	Mesa, AZ
	“Discovering Volatile Biomarkers for Phenotyping Lung Infections”	
Jun 2016	American Society for Mass Spectrometry, LECO Seminar	San Antonio, TX
	“Discovering Volatile Biomarkers Using GC×GC-TOFMS: Detecting and Phenotyping Infections Directly From Lung Samples”	
Oct 2015	Microbiology and MCB Annual Retreat, ASU	Tempe, AZ
	“Signatures of the Host in Breath Biomarkers of Lung Infections”	
Aug 2015	Molecular and Cellular Biology Colloquium, ASU	Tempe, AZ
	“Microbial Metabolomics and Biomarkers of Lung Infections”	
Aug 2015	4 <sup>th</sup> Telluride Workshop on Cystic Fibrosis	Telluride, CO
	“Volatile Metabolomics in CF”	
Feb 2015	Drexel University, College of Medicine	Philadelphia, PA
	“Developing Breath-Based Diagnostics for Acute and Chronic Bacterial Lung Infections”	
Feb 2015	Arizona State University, School of Life Sciences	Tempe, AZ
	“Developing Breath-Based Diagnostics for Acute and Chronic Bacterial Lung Infections”	
Jan 2015	IUPUI, Department of Chemistry & Chemical Biology	Indianapolis, IN
	“Identifying Biomarkers of Lung Infections using SESI-MS and GC×GC-TOFMS: Progress Toward Breath-based Diagnostics”	

Dec 2014	University of Tennessee, Department of Chemistry	Knoxville, TN
"Identifying Biomarkers of Lung Infections using SESI-MS and GC×GC-TOFMS: Progress Toward Breath-based Diagnostics"		
Oct 2014	Northeast Laboratory Conference	Portland, ME
"Breath-based Diagnostics for Lung Infections: Promise and Progress"		
Feb 2014	Cambridge Metabolomics Symposium	Boston, MA
"Identifying Biomarkers of <i>P. aeruginosa</i> Antibiotic Susceptibility Using GC×GC-TOFMS and Fisher Ratios"		
Jan 2014	5 <sup>th</sup> Multidimensional Chromatography Workshop	Toronto, Canada
"Discovering Volatile Biomarkers of Chronic <i>P. aeruginosa</i> Infections Using GC×GC-TOF and GC Image"		
Dec 2013	San Diego State University, Department of Chemistry	San Diego, CA
"Developing Breath-Based Diagnostics: Applications of GC×GC-TOFMS and SESI-MS"		
Dec 2013	UVM School of Medicine, Division of Infectious Diseases	Burlington, VT
"Developing Breath-Based Diagnostics for Bacterial Lung Infections"		
Aug 2013	Emory+Children's Center for Cystic Fibrosis Research	Atlanta, GA
"Developing Breath-Based Diagnostics for Acute and Chronic Bacterial Lung Infections"		
Apr 2013	University of Vermont, Department of Chemistry	Burlington, VT
"Developing Breath-Based Diagnostics: Applications of GC×GC-TOFMS and SESI-MS"		
Mar 2013	Vermont Lung Center, University of Vermont	Burlington, VT
"Developing Breath-Based Diagnostics for Acute and Chronic Bacterial Lung Infections"		
Dec 2012	Florida State University, Department of Chemistry	Tallahassee, FL
"Putting 'Bad Breath' to Good Use: Developing Breath-Based Diagnostics for Lung Infections"		
Apr 2012	Children's Healthcare of Atlanta Center for CF Research	Atlanta, GA
" <i>P. aeruginosa</i> Volatile Biomarkers: Discovery and Application"		
Oct 2007	Graduate Student Award Presentation, Georgia Tech	Atlanta, GA
* "Prebiotic Synthesis of Nucleic Acids"		
Mar 2007	Suddath Symposium Award Presentation, Georgia Tech	Atlanta, GA
* "Investigating the Origin and Molecular Evolution of RNA"		
Feb 2007	Università degli Studi di Roma, La Sapienza	Rome, Italy
"From Small Molecules to Polymers. The Synthesis of Nucleic Acid Polymers in Prebiotic Environments"		
Feb 2007	Università della Tuscia	Viterbo, Italy
"From Small Molecules to Polymers. The Synthesis of Nucleic Acid Polymers in Prebiotic Environments"		

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**TRAINEE PODIUM PRESENTATIONS (<sup>G</sup>Graduate, <sup>U</sup>Undergraduate, <sup>T</sup>Technician, **Presenter**, \*Awards)**

Oct 2018	Gulf Coast Undergraduate Research Symposium	Houston, TX
<u>Ava V. Karanjia</u> <sup>U</sup> , Trenton J. Davis <sup>G</sup> , <b>Heather D. Bean</b>		
* "Modification of Quorum Sensing Regulatory Systems in <i>Pseudomonas aeruginosa</i> "		

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**TRAINEE POSTER PRESENTATIONS (<sup>G</sup>Graduate, <sup>U</sup>Undergraduate, <sup>T</sup>Technician, **Presenter**, \*Awards)**

**Regional, National & International Conferences and Symposia**

Oct 2018	American Institute of Chemical Engineers Annual Meeting	Pittsburgh, PA
<u>Ava V. Karanjia</u> <sup>U</sup> , Sarah B. West <sup>U</sup> , Trenton J. Davis <sup>G</sup> , <b>Heather D. Bean</b>		
* "Characterizing Quorum Sensing Phenotypes and Pathways of <i>Pseudomonas aeruginosa</i> "		

Oct 2018 Society of Women Engineers WE Conference Minneapolis, MN  
Ava V. Karanjia<sup>U</sup>, Sarah B. West<sup>U</sup>, Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
 \* “Characterizing Quorum Sensing Phenotypes and Pathways of *Pseudomonas aeruginosa*”

Oct 2018 Zombie Apocalypse Medicine Meeting Tempe, AZ  
Emily A. Higgins Keppler<sup>G</sup>, Alex May, Shrinath Narayanan, Athena Aktipis, Ghazal Ebadzadsahrai, Scott Soby,  
**Heather D. Bean**  
 “Microbial Metabolism as a Window into Synergism and Antagonism in Microbial Communities”

Oct 2018 North American Cystic Fibrosis Conference Denver, CO  
 Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
 “Investigating Metabolic Adaptation in *Pseudomonas aeruginosa* Chronic Infections”

Jun 2018 American Society for Microbiology Microbe Atlanta, GA  
Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
 “Analysis of the Volatile Metabolomes of *Pseudomonas aeruginosa* Early and Late Infection Isolates Using GCxGC-TOFMS”

Nov 2017 North American Cystic Fibrosis Conference Indianapolis, IN  
 Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
 “Volatile Metabolites as Biomarkers for Characterizing Pyocyanin Production and Mucoidity in *Pseudomonas aeruginosa*”

Oct 2017 Biomedical Engineering Society Annual Meeting Phoenix, AZ  
Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
 “Volatile Metabolites as Biomarkers for Characterizing Pyocyanin Production and Mucoidity in *Pseudomonas aeruginosa*”

Apr 2017 55<sup>th</sup> Annual ASM AZ/Southern NV Branch Meeting Tucson, AZ  
Charity N. Bhebe<sup>U</sup>, Darrin Ellison<sup>U</sup>, Leanne Misra<sup>T</sup>, Seth Montes<sup>T</sup>, **Heather D. Bean**  
 “Phenotypic Analysis of *Pseudomonas aeruginosa* Isolates from Cystic Fibrosis Lung Infections”

Apr 2017 55<sup>th</sup> Annual ASM AZ/Southern NV Branch Meeting Tucson, AZ  
Lea Witzel<sup>U</sup>, **Heather D. Bean**  
 “Effects of Environmental Conditions on Pyocyanin Production in *Pseudomonas aeruginosa*”

Mar 2017 AZBio Expo Phoenix, AZ  
Charity N. Bhebe<sup>U</sup>, Darrin Ellison<sup>U</sup>, Leanne Misra<sup>T</sup>, Seth Montes<sup>T</sup>, **Heather D. Bean**  
 “Phenotypic Analysis of *Pseudomonas aeruginosa* Isolates from Cystic Fibrosis Lung Infections”

Mar 2017 AZBio Expo Phoenix, AZ  
Amritha Venquideshe<sup>U</sup> and **Heather D. Bean**  
 “The Effect of Changes in Environmental Conditions on the Protease Production of *P. aeruginosa*”

Mar 2017 AZBio Expo Phoenix, AZ  
Lea Witzel<sup>U</sup>, **Heather D. Bean**  
 “Effects of Environmental Conditions on Pyocyanin Production in *Pseudomonas aeruginosa*”

Apr 2016 55<sup>th</sup> Annual ASM AZ/Southern NV Branch Meeting Tempe, AZ  
Charity Bhebe<sup>U</sup>, Nathan Dacasin<sup>U</sup>, Darrin Ellison<sup>U</sup>, **Heather D. Bean**  
 “Developing Breath-Based Diagnostics to Detect *P. aeruginosa* Exoproducts in CF Lung Infections”

Apr 2016 55<sup>th</sup> Annual ASM AZ/Southern NV Branch Meeting Tempe, AZ  
Jonathan Kiermayr<sup>U</sup>, Amritha Venquideshe<sup>U</sup>, Lea Witzel<sup>U</sup>, **Heather D. Bean**  
 “Developing Breath-Based Diagnostics to Detect *P. aeruginosa* Motility and Antibiotic Resistance in CF Lung Infections”

## Arizona State University

- Nov 2018 Fulton Undergraduate Research Initiative Symposium Tempe, AZ  
Ava V. Karanjia<sup>U</sup>, Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
“Modification of Quorum Sensing Regulatory Systems in *Pseudomonas aeruginosa*”
- Apr 2018 ASU 25<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Charity N. Bhebhe<sup>U</sup>, **Heather D. Bean**  
“Genetic Manipulation of *Pseudomonas aeruginosa* Clinical Isolates”
- Apr 2018 ASU 25<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Ava V. Karanjia<sup>U</sup>, Sarah B. West<sup>U</sup>, Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
“Characterizing Quorum Sensing Phenotypes of *Pseudomonas aeruginosa*”
- Apr 2018 ASU 25<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Sarah B. West<sup>U</sup>, Ava V. Karanjia<sup>U</sup>, Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
“Changes in *Pseudomonas aeruginosa* Antibiotic Resistance Throughout Infection”
- Oct 2017 ASU Microbiology and MCB Graduate Programs Retreat Tempe, AZ  
Trenton J. Davis<sup>G</sup>, **Heather D. Bean**  
“Volatile Metabolites as Biomarkers for Characterizing Pyocyanin Production and Mucoidy in *Pseudomonas aeruginosa*”
- Apr 2017 Barrett Celebrating Honors Symposium Tempe, AZ  
Jonathan P. Kiermayr<sup>U</sup>, **Heather D. Bean**  
“Influencing Rhamnolipid Production of *P. aeruginosa* with Environmental Changes to Resemble the CF Lung”
- Apr 2017 Barrett Celebrating Honors Symposium Tempe, AZ  
Amritha Venguideshe<sup>U</sup>, **Heather D. Bean**  
“The Effect of Changes in Environmental Conditions on the Protease Production of *P. aeruginosa*”
- Apr 2017 Barrett Celebrating Honors Symposium Tempe, AZ  
Lea Witzel<sup>U</sup>, **Heather D. Bean**  
“Effects of Environmental Conditions on Pyocyanin Production in *Pseudomonas aeruginosa*”
- Mar 2017 ASU 24<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Charity N. Bhebhe<sup>U</sup>, Darrin Ellison<sup>U</sup>, Leanne Misra<sup>T</sup>, Seth Montes<sup>T</sup>, **Heather D. Bean**  
“Phenotypic Analysis of *Pseudomonas aeruginosa* Isolates from Cystic Fibrosis Lung Infections”
- Mar 2017 ASU 24<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Jonathan P. Kiermayr<sup>U</sup>, **Heather D. Bean**  
“Influencing Rhamnolipid Production of *P. aeruginosa* with Environmental Changes to Resemble the CF Lung”
- Mar 2017 ASU 24<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Amritha Venguideshe<sup>U</sup> and **Heather D. Bean**  
“The Effect of Changes in Environmental Conditions on the Protease Production of *P. aeruginosa*”
- Mar 2017 ASU 24<sup>th</sup> Annual Undergraduate Research Symposium Tempe, AZ  
Lea Witzel<sup>U</sup>, **Heather D. Bean**  
“Effects of Environmental Conditions on Pyocyanin Production in *Pseudomonas aeruginosa*”
- Apr 2016 ASU Sch. of Life Sciences Undergraduate Research Symposium Tempe, AZ  
Charity Bhebhe<sup>U</sup>, Nathan Dacasin<sup>U</sup>, Darrin Ellison<sup>U</sup>, **Heather D. Bean**  
“Developing Breath-Based Diagnostics to Detect *P. aeruginosa* Exoproducts in CF Lung Infections”
- Apr 2016 ASU Sch. of Life Sciences Undergraduate Research Symposium Tempe, AZ  
Jonathan Kiermayr<sup>U</sup>, Amritha Venguideshe<sup>U</sup>, Lea Witzel<sup>U</sup>, **Heather D. Bean**  
“Developing Breath-Based Diagnostics to Detect *P. aeruginosa* Motility and Antibiotic Resistance in CF Lung Infections”

## TEACHING & CURRICULUM DEVELOPMENT

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### ***Arizona State University, School of Life Sciences, Primary Instructor***

#### **Microbiology, MIC 205**

3 credit science elective for non-majors

A broad overview of microbiology is presented. Students are expected to understand the principles of microbial life, including bacteria, viruses, fungi, and parasites, and how these organisms impact health and ecology, with an emphasis on medical microbiology.

**Spring 2017**, co-Instructor, 20 lectures (78 students)

#### **Advanced Bacteriology Laboratory, MIC 302**

2 credit laboratory course required for Microbiology undergraduates

This course is designed to allow students to work more independently and more quantitatively than in previous labs they may have taken. In addition, the class counts for literacy credit "L" and thus a substantial part of the grade derives from formal lab reports. The course objectives are for the students to :1) Become adept at using quantitative measurements in biological experiments; 2) Learn new microbiology techniques; 3) Learn to write lab reports in the style of a microbiology journal article; 4) Utilize computer programs such as Excel to graph experimental data; 5) Become more independent in designing and executing experiments correctly, including organizing your time and data collection; 6) Critically think and evaluate experimental results, including problem solving and troubleshooting of experiments.

**Fall 2016** (3 sections; 42 students)

**Fall 2017** (3 sections; 39 students)

**Fall 2018** (3 sections; 43 students)

#### **Biomarkers and Medical Diagnostics, BIO 498 / BIO 591**

3 credit elective for graduate students and senior undergraduates

Biomarkers and clinical measurements underpin medical diagnostics and the medical enterprise. The aim of this course is to familiarize students with diagnostic tests in the clinical laboratory through an emphasis on cross-cutting healthcare areas such as infectious diseases, oncology, cardiology, and metabolic disorders. An overview of foundational principles cover concepts central to microbiology, molecular biology, chemistry, and imaging technologies. An introduction to quality assurance and quality control in clinical testing includes an overview of the clinical trial and FDA approval process for drugs and devices. The latter third of the course emphasizes research into cutting-edge diagnostic modalities reported in the scientific literature. Expert guest lecturers from the Mayo Clinic, AzTE, ASU School of Biological and Health Systems Engineering and College of Law present on specialized topic areas. This course appeals to students who have a background in biotechnology, bioengineering, and the applied sciences, including pre-medicine and business-oriented students who are seeking to advance their knowledge of clinical diagnostics and medical devices.

**Fall 2015** (7 students)

#### **Emergent Properties of Microbiomes, MIC 591**

1 credit seminar for graduate students

In this journal club-style class we explored the idea that a fundamental characteristic of microbiomes is that they have emergent properties, which are properties that are created by group interactions that cannot be predicted by the sum of the properties of individual members. We delved into two theoretical frameworks on emergent properties – the bubble model and the Black Queen hypothesis – and challenged the applicability of these theories to microbiomes and microbial interactions at different scales. We also explored core concepts related to the establishment and maintenance of microbiomes and their inter-specific relationships, including syntrophy, facilitation, character displacement, niche creation, and shared public goods, and discussed experimental approaches to test hypotheses about the roles of these various relationships in generating emergent properties in microbial communities.

**Spring 2018**, co-instructor, led 3 class sessions of 14 (9 students)

### **Careers in Life Sciences Recitation, BIO 189**

5 lectures, required for undergraduate Life Sciences majors

*Topic: Biology: Life imitates art!* We explore an amazing new biological technology (Gene Drives with CRISPR/Cas9) that sounds like it comes straight out of science fiction. We will talk about the science, its applications to medicine, conservation, and agriculture, the ethical implications of the technology, and how pop culture can influence the public's acceptance or rejection of the new technology.

**Fall 2016** (18 students)

**Fall 2017** (19 students)

### **Undergraduate Research, BIO/MIC/MBB/BCH 495**

1-3 credit undergraduate elective

Supervised research in biology, microbiology, and molecular biosciences and biotechnology.

**Fall 2016 – present** (6 students)

### **Honors Directed Study, BIO/MIC/MBB 492/493**

1-3 credit undergraduate elective

Supervised honors thesis research in biology, microbiology, and molecular biosciences and biotechnology.

**Fall 2016 – present** (5 students)

### **Guest Lectures**

2016, Spring Deep Evolution (BIO 494) Arizona State University, Tempe, AZ

“Proto-RNA in the Origin of Life” – 1 lecture

2017, Spring Microbiology I (BMMSG 525), Northwestern University, Glendale, AZ

“Microbial Metabolomics and Biomarkers of Lung Infections” – 1 lecture

2017, Fall Foundations in Microbiology (MIC 501) Arizona State University, Tempe, AZ

“Microbial Metabolomics and Biomarkers of Lung Infections” – 1 lecture

2018, Fall Biology of Microorganisms (MIC 220) Arizona State University, Tempe, AZ

“Bacterial Metabolism” – 2 lectures

### **Instruction & Curriculum Development, Prior Institutions**

Center for Chemical Evolution, Georgia Institute of Technology

Developed 2 laboratory experiments for high school science classes

School of Chemistry & Biochemistry, Georgia Institute of Technology

CHEM 4581: Biochemistry Laboratory I, 60 Undergraduate students, 4 sections

Head teaching assistant, 1 semester

CHEM 4582: Biochemistry Laboratory II, 6 Undergraduate Students

Teaching assistant, 1 semester

CHEM 2803: Evolution of Life, 18 Undergraduate Students

Guest lecturer, 1 class

School of Engineering & Honors College, University of Vermont

CE 256: Biological Processes and Water/Wastewater Treatment, 30 Undergraduate Students

Guest lecturer, 1.5 weeks

ME 312: Multi-scale Bioengineering, 17 Undergraduate Students

Guest lecturer, 1 class

HCOL 185L: Sex, Fear, and Anxiety, 20 Undergraduate Students

Guest lecturer, 1 class

## MENTORING

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### Graduate Research Mentor

#### **Primary Advisor**

- 2016 – present **Trenton Davis**, ASU Microbiology PhD pre-candidate; Spring 2018 ASU Graduate College Fellowship
- 2017 – present **Carrie Jenkins**, ASU Molecular and Cellular Biology PhD candidate
- 2017 – present **Emily Higgins Keppler**, ASU Microbiology PhD pre-candidate

#### **Co-Advisor**

- 2016 – 2017 **Michele Vening**, ASU Microbiology PhD pre-candidate

#### **Rotation Advisor**

- 2017, Fall **Roslyn Dermody**, ASU Microbiology PhD pre-candidate

### Undergraduate Research Mentor

#### **Primary Advisor**

- 2017 – present **Sarah West**, ASU Barrett Honors Student; 2017 SOLUR Apprentice; 2018 SOLUR Researcher
- 2017 – present **Ava Karanjia**, ASU Barrett Honors Student; 2017 SOLUR Apprentice; 2018 SOLUR Researcher; 2018 NASA Space Grant Fellow; First Place 2018 SWE Collegiate Technical Poster Session; First Place 2018 American Institute of Chemical Engineers Undergraduate Poster in Microbes at Biomedical Interfaces
- 2018 – present **Brianna Lopez**, ASU Barrett Honors Student; 2018 SOLUR Apprentice
- 2018 – present **Carolyn Metcalfe**, ASU
- 2015 – 2018 **Charity Bhebhe**, ASU Barrett Honors Student; 2015 SOLUR Apprentice; 2016 SOLUR Researcher; 2017 SOLUR Fellow; 2017 TGen Helios Scholar; Cambridge Gates Foundation PhD Fellowship
- 2015 – 2017 **Amritha Venguideshe**, ASU Barrett Honors Student; 2015 SOLUR Apprentice; 2016 SOLUR Researcher
- 2017 – 2017 **Jeffrey Luo**, ASU Barrett Honors Student
- 2015 – 2017 **Darrin Ellison**, ASU; 2015 SOLUR Apprentice; 2016 SOLUR Researcher
- 2015 – 2017 **Jonathan Kiermayr**, ASU Barrett Honors Student; 2015 SOLUR Apprentice; 2016 CLAS USE Scholar
- 2015 – 2017 **Lea Witzel**, ASU Barrett Honors Student; 2015 SOLUR Apprentice; 2016 SOLUR Researcher
- 2015 – 2016 **Nathan Dacasin**, ASU; 2015 SOLUR Apprentice
- 2015 – 2016 **Julianne Matics**, ASU

#### **Co-Advisor**

- 2016 – 2018 **Hayden Kutemeier**, ASU Barrett Honors Student

### Graduate Student Thesis Committees

- 2016 – present *PhD Thesis Adviser*, **Trenton Davis**, School of Life Sciences, ASU  
Volatile metabolomics of *Pseudomonas aeruginosa* adaptation in chronic infections
- 2017 – present *PhD Thesis Adviser*, **Carrie Jenkins**, School of Life Sciences, ASU  
Volatile metabolomics of *Staphylococcus aureus* adaptation in chronic infections
- 2017 – present *PhD Thesis Adviser*, **Emily Higgins Keppler**, School of Life Sciences, ASU  
Metabolic interactions between fungi and bacteria
- 2016 – 2017 *PhD Thesis Co-Adviser (Krajmalnik-Brown, Co-Adviser)*, **Michelle Vening**, School of Life Sciences, ASU  
Gut microbiome metabolism in autism
- 2015 – present *PhD Thesis Committee Member*, **Natalie Mitchell**, School of Life Sciences, ASU  
Biomarkers of Valley fever

- 2016 – present *PhD Thesis Committee Member, Jason Maarsingh*, School of Life Sciences, ASU  
Virulence of *Mycobacteria*
- 2018 – present *PhD Thesis Committee Member, Roslyn Dermody*, School of Life Sciences, ASU  
Antimicrobial peptides and non-Tuberculosis *Mycobacteria*
- 2018 – present *PhD Thesis Committee Member, Karla Franco*, School of Life Sciences, ASU  
Effect of low fluid shear on *Salmonella* Typhimurium metabolism
- 2018 – present *PhD Thesis Committee External Examiner, Mavra Nasir*, Quantitative Biomedical  
Sciences, Dartmouth College  
Volatile biomarkers of *P. aeruginosa* lung infections
- 2015 – 2016 *MS Thesis Committee Member, Devika Krishnamurthy*, School of Biological and  
Health Systems Engineering, ASU  
Volatile biomarkers of female fertility
- 2016 – 2018 *MS Thesis Committee Member, Tawny Casteneda*, School of Biomedical Sciences,  
Midwestern University  
Discovery and characterization of *Pseudomonas* spp. in cranberry galls
- 2017 – 2018 *MS Thesis Committee Member, Stephanie Ong*, School of Biological and Health  
Systems Engineering, ASU  
“Comprehensive analysis of volatile biomarkers for female fertility”
- 2018 – 2018 *MS Thesis Committee Member, Zenan Tao*, School of Life Sciences, ASU  
“Protein-protein interactions in *Salmonella* Typhimurium”
- 2018 – 2018 *PSM Thesis Committee Member, Zain Bukhari*, Department of Physics, ASU  
“Torsion spring contributions to the F<sub>1</sub>-ATPase molecular motor mechanism”
- 2018 – 2018 *MS Applied Project Committee Member, Samantha Brenna*, School of Biological and  
Health Systems Engineering, ASU  
“Metadata analysis: GC-MS biomarker discovery and clinical use”

#### **Barrett Honors Undergraduate Thesis Committees**

- 2015 – 2018 *Thesis Director, Charity Bhebhe*, School of Life Sciences, ASU  
“Genetic manipulation of *Pseudomonas aeruginosa* clinical isolates”
- 2016 – 2018 *Thesis Director, Hayden Kutemeier*, School of Life Sciences, ASU  
“The inactivation of pathogens in contaminated medications via selection photonic  
disinfection”
- 2015 – 2017 *Thesis Director, Jonathan Kiermayr*, School of Molecular Sciences, ASU  
“The effects of environmental changes on the rhamnolipid production in *Pseudomonas*  
*aeruginosa*”
- 2015 – 2017 *Thesis Director, Lea Witzel*, School of Life Sciences, ASU  
Environmental influences on *P. aeruginosa* pyocyanin production
- 2015 – 2017 *Thesis Director, Amritha Venguideshe*, School of Molecular Sciences, ASU  
Environmental influences on *P. aeruginosa* protease production
- 2017 – 2018 *Second Reader, Chandler Petrovich*, School of Life Sciences, ASU  
Enhancing antibiotics for treating biofilms
- 2017 – present *Third Reader, Natalie Iannuzo*, School of Life Sciences, ASU  
Antimicrobial peptide treatment of *M. abscessus*
- 2016 – 2017 *Second Reader, Zachary Elwell*, School of Life Sciences, ASU  
Chronic rhinosinusitis and cystic fibrosis
- 2016 – 2017 *Second Reader, Isaac Berger*, School of Life Sciences, ASU  
Bacterial antibiotic resistance

2016 – 2017	<i>Second Reader</i> , <b>Alexandra Olson</b> , School of Life Sciences, ASU <i>Mycobacteria</i> lipids
2018 – present	<i>Second Reader</i> , <b>Nan Qiu</b> , School of Molecular Sciences, ASU Iron-Intake in <i>E. coli</i> via cardiolipin transporter YejM
2017 – present	<i>Thesis Director</i> , <b>Sarah West</b> , School of Life Sciences, ASU Influence of <i>S. aureus</i> on <i>P. aeruginosa</i> chronic infection phenotypes
2017 – present	<i>Thesis Director</i> , <b>Ava Karanjia</b> , School of Life Sciences, ASU Role of quorum sensing regulators on <i>P. aeruginosa</i> chronic infection phenotypes
2018 – present	<i>Thesis Director</i> , <b>Brianna Lopez</b> , School of Life Sciences, ASU <i>P. aeruginosa</i> chronic infection phenotypes
2018 – present	<i>Third Reader</i> , <b>Farizah Ali</b> , School of Molecular Sciences, ASU Antibacterial activity of inorganic materials against <i>Mycobacteria ulcerans</i>

### **Undergraduate Capstone Research Paper Mentor**

2016, Spring	<b>Andrew Becker</b>
2016, Spring	<b>Tylor Bahle</b>
2016, Fall	<b>Darrin Ellison</b>
2016, Fall	<b>Brendan O'Halloran</b>
2017, Spring	<b>Hussein Hadid</b>
2017, Spring	<b>Ava Mendez</b>
2017, Fall	<b>Nicholas Galluzzo</b>
2017, Fall	<b>Abigail Montag</b>
2018, Spring	<b>Jasmin Villezcas</b>
2018, Spring	<b>Shaila Watson</b>
2018, Fall	<b>Vanessa Sanchez</b>

### **Graduate Teaching Assistant Mentor**

2016, Fall	Advanced Bacteriology Lab (MIC 302) <b>Daniel Roush, Sambhavi Subramanian, Michelle Vening</b>
2017, Fall	Advanced Bacteriology Lab (MIC 302) <b>Trenton Davis, Roslyn Dermody, Carrie Jenkins</b>
2018, Fall	Advanced Bacteriology Lab (MIC 302) <b>Roslyn Dermody, Tony Foster, Daniel Roush</b>

### **Postdoctoral Mentoring**

Co-founding adviser for the School of Life Sciences and Biodesign Institute Postdoctoral Group.

### **Mentoring at Prior Institutions**

#### **Graduate Researchers**

Theodore Mellors (Dartmouth, 2013 – 2015)  
Christiaan Rees (Dartmouth, 2014 – 2015)  
Jackson Sengle (Dartmouth, 2012 – 2015)  
Jaime Jiménez-Díaz (U. Vermont, 2012 – 2013)  
Kristi Herzer (U. Vermont, 2012 – 2013)  
Jiangjiang Zhu (U. Vermont, 2009 – 2013)  
Yijian Zhang (U. Vermont, 2011 – 2013)

#### **High School Educators**

Avery Smith (Georgia Tech, 2007)  
Lakshmi Anumukonda (Georgia Tech, 2007)

#### **Undergraduate & Post-Baccalaureate Researchers**

Di'Venni Lucas (Stanford, 2014)  
Jasmine Williams (Spelman, 2013)  
Daniel Kendall (U. Vermont, 2012 – 2013)  
Pierre Galea (U. Vermont, 2011 – 2013)  
Theodore Mellors (U. Vermont, 2010 – 2011)  
Megan Liamos (U. Vermont, 2011)  
Zachary Silberman (U. Vermont, 2011)  
Jared Hinrichs (U. Vermont, 2010)  
Kaycee Quarles (Georgia Tech, 2007 – 2008)  
Ryan Hayn (Georgia Tech, 2006 – 2007)  
James P. Collins (Georgia Tech, 2002 – 2005)  
Jeffrey Boyles (Georgia Tech, 2004 – 2005)

## PROFESSIONAL SERVICE

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### International, National, and Regional

#### Conferences, Symposia, and Professional Organizations

2018	Canadian Society for Chemistry	Poster Judge
2018	15 <sup>th</sup> GC×GC Symposium	Session Chair/Poster Judge
2017	North American Cystic Fibrosis Conference	Session Chair
2017	14 <sup>th</sup> GC×GC Symposium	Poster Judge
2016	13 <sup>th</sup> GC×GC Symposium	Session Chair
2016	55 <sup>th</sup> Annual ASM AZ/Southern NV Branch Meeting	Co-Organizer
2015	12 <sup>th</sup> GC×GC Symposium	Session Chair/Poster Judge
2014	248 <sup>th</sup> ACS National Meeting	ENVR Symposium Organizer
2012, 2013	American Chemical Society, Green Mountain Local Section	Chair
2011	American Chemical Society, Green Mountain Local Section	Chair-Elect
2006	Gordon-Kenan Graduate Research Seminar: Origin of Life	Co-Chair
2006	Gordan Research Conference: Origin of Life	Session Chair

#### Grant Reviewer

2016	Natural Sciences and Engineering Research Council of Canada	Ad-hoc Reviewer
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#### Manuscript Reviewer (26)

Analytica Chimica Acta, Analytical & Bioanalytical Chemistry, ACS Infectious Diseases, Astrobiology, Biopolymers, Biotechnology Journal, Journal of Breath Research, Journal of Chromatography B, Journal of Molecular Evolution, Journal of the American Chemical Society, Journal of Separation Sciences, Metabolomics, RNA-A, Scientific Reports

Record at ASU (15 reviews): <https://publons.com/author/1237268/heather-bean>

### Arizona State University

#### Committees and Groups

2016 – Present	School of Life Sciences, Seminar Series	Chair
2015 – 2016	Microbiome Faculty Search Committee	Member
2015 – 2016	Molecular and Cellular Biology Graduate Admissions Committee	Ad-hoc Member
2015 – Present	School of Life Sciences, Communications Committee	Member
2016 – Present	School of Life Sciences, Postdoc Group	Advisor
2017	Microbiology Graduate Admissions Committee	Ad-hoc Member
2018	SOLUR Researcher/Fellow Fellowship Committee	Ad-hoc Member
2018 – 2019	Microbiome Faculty Search Committee	Member

#### Classes

2016, Spring	MIC 401: Research Paper (2 students)	Reader
2016, Fall	MIC 401: Research Paper (2 students)	Reader
2017, Spring	MIC 401: Research Paper (2 students)	Reader
2017, Fall	MIC 401: Research Paper (2 students)	Reader
2018, Spring	MIC 401: Research Paper (2 students)	Reader
2018, Fall	MIC 401: Research Paper (1 student)	Reader

#### Grant Reviewer

2016	Mayo-ASU Team Science Grants	Ad-hoc Reviewer
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### Educational & Professional Outreach

2018	Postdoc Lunch & Learn – Steps in Obtaining a Faculty Position, ASU	Panelist
2018	SOLS Graduate Retreat, ASU	Panelist
2018	Estrella Mountain Community College Transfer Student Workshop, ASU	Panelist
2017	BioBridge, School of Life Sciences, ASU	Faculty Mentor
2017	Work/Life Balance Panel Discussion for SOLUR, ASU	Panelist
2016	Center for Chemical Evolution Annual Meeting, Atlanta, GA	Career Panelist

2016	ASU School of Life Sciences Faculty/Staff Research Seminar	Presenter
2016	Intel International Science and Engineering Fair	Judge
2016	BioBridge, School of Life Sciences, ASU	Faculty Mentor
2012-2015	ACS Green Mountain Section, US National Chemistry Olympiad	Coordinator
2012	National Chemistry Week, Burlington VT	Co-coordinator
2011-2013	Vermont State Science & Math Fair	Judge
2010	Women Can Do!, Vermont Works for Women	Workshop Presenter
2010	Community Rounds, University of Vermont College of Medicine	Workshop Presenter
2005	Buzz on Biotechnology High School Open House, Georgia Tech	Workshop Presenter
1997	Georgia Science Olympiad	Event Facilitator

## PROFESSIONAL DEVELOPMENT

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2018	Writing Your Next Grant Proposal Workshop (2 of 2 sessions)	ASU
2018	Mastering the CV and Personal Statement Workshop	ASU
2017	SBIR/STTR Road Tour	Phoenix, AZ
2017	DARPA Young Faculty Award Proposers' Day	Webinar
2017	Writing Successful NIH Grants (4 of 4 sessions)	Webinar
2016	College of Liberal Arts and Sciences Instructional Demofest	ASU
2016	Alan Alda Center for Communicating Science Workshop	ASU
2016	Evidence-Based Teaching in STEM (2 of 4 sessions)	ASU
2015 - 2016	New Faculty Workshop Series; College of Liberal Arts and Sci. (5 of 5 sessions)	ASU
2012	Science: Becoming the Messenger; NSF Workshop	Burlington, VT
2011	American Chemical Society Leadership Institute	Ft. Worth, TX
2009 - 2010	Make Learning a Win/Win for You and Your Students (4 of 4 sessions)	U. Vermont
2009	Toward Career Success in Science (12 of 12 sessions)	U. Vermont

## PROFESSIONAL AFFILIATIONS

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2004 - Present	American Chemical Society
2010 - Present	American Society for Microbiology
2016 - Present	American Society for Mass Spectrometry
2016 - Present	Arizona State University Faculty Women's Association
2016 - Present	Biodesign Center for Fundamental and Applied Microbiomics, ASU
2016 - Present	Biodesign Center for Immunotherapy, Vaccines, and Virotherapy, ASU
2003 - 2008	Center for Fundamental and Applied Molecular Evolution (FAME), Georgia Tech
2007 - 2008	Center for Chemical Evolution, Georgia Tech