

Jeffrey Michael Boyd

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A. Professional Preparation

Iowa State University
B. S., Microbiology, Immunology, and Preventive Medicine
8/1995-5/1999

Utah State University
Ph.D., Biochemistry
5/2000-8/2005

University of Wisconsin-Madison
Postdoctoral Fellow
8/2005-12/2009

University of Iowa
Postdoctoral Fellow
1/2010-6/2010

B. Appointments

July 2010-	<u>Assistant Professor</u> Microbial biochemistry and genetics Microbial pathogenesis	Rutgers University Dept. of Biochemistry and Microbiology New Brunswick, NJ
Jan. 2010- June 2010	<u>Postdoctoral Research Fellow</u> <i>Staphylococcus aureus</i> physiology and neutrophil interaction with Profs. W. Nauseef and A. Horswill	University of Iowa Inflammation Program Iowa City, IA
Sept. 2005- Dec. 2009	<u>Postdoctoral Research Fellow</u> Genetics and biochemistry of iron-sulfur cluster metabolism with Prof. Diana Downs	University of Wisconsin Dept. of Bacteriology Madison, WI
Aug. 2000- Aug. 2005	<u>Ph.D. Candidate</u> Biochemistry and physiology of bacterial ketone/ hydrocarbon metabolism with Prof. Scott Ensign	Utah State University Chem and Biochem Logan, UT

Sept. 1999- June 2000	<u>Research Assistant</u> Biochemistry and physiology of bacterial formaldehyde oxidation with Prof. Alan DiSpirito	Iowa State University Dept. Microbiology Ames, IA
Aug. 1997- May 1999	<u>Research Undergraduate</u> Biochemistry and physiology of bacterial methane metabolism with Prof. Alan DiSpirito	Iowa State University Dept. Microbiology Ames, IA
Aug. 1996- May 1997	<u>Research Undergraduate</u> Physiology of magnetotactic bacteria with Prof. Dennis Bazylinski	Iowa State University Dept. Microbiology Ames, IA

C. Teaching

Rutgers University

2017

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

Guest lecturer in 16:682:501, 11:115:321, 16:682:521:01, 11:115:436, 11:115:422

2016

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

Guest lecturer in 16:682:501, 11:115:321, 16:682:521:01

2015

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

Guest lecturer in 16:682:501, 11:115:321, 16:682:521:01

2014

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

Guest lecturer in 16:682:501, 11:115:321, 16:682:521:01

2013

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

Guest lecturer in 16:682:501, 11:115:321, 16:682:521:01

2012

Instructor: Microbial Physiology 16:682:503

Instructor: Microbial Physiology 11:680:481

2011

Instructor: Bacterial Physiology 16:682:503

SIRS ONLINE SURVEY								Evaluation Responses	Teaching Effectiveness (Max=5)		Course Quality (Max=5)	
S/Yr	Course Title	Course ID	Credits	MOI	Aud	Resp	Enrl		Instructor	Dept Mean	Instructor	Dept Mean
Fa 17	Biochemical mechanisms of Toxicology	11:115:422	3	lec	um	7%*		%				
Fa 17	Microbial life	16:682:501	3	lec	grad	4%*	12	%				
Fa 17	Contemporary Issues in Biochemistry	11:115:321	3	lec	um	4%*	25	%				
Sp 17	Microbial Physiology	11:680:481	3	lec	um	100% [‡]	21	21	4.95	4.29	4.81	4.22
Sp 17	Microbial Physiology	16:682:503	3	lec	grad	100% [‡]	11	10	4.70	4.83	4.70	4.68
Sp 17	Molecular Toxicology Lab	11:115:436	2.5	lab	um	7%*	12	%				
Fa 16	Microbial life	16:682:501	3	lec	grad	4%*	15	%				
Fa 16	Contemporary Issues in Biochemistry	11:115:321	3	lec	um	4%*	24	%				
Fa 16	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	7	%				
Sp 16	Microbial Physiology	11:680:481	3	lec	um	100% [‡]	30	27	4.88	4.37	4.81	4.32
Sp 16	Microbial Physiology	16:682:503	3	lec	grad	100% [‡]	9	9	4.88	4.55	4.88	4.39
Fa 15	Microbial life	16:682:501	3	lec	grad	4%*	24	%				
Fa 15	Contemporary Issues in Biochemistry	11:115:321	3	lec	um	4%*	21	%				
Fa 15	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	16	%				
Sp 15	Microbial Physiology	11:680:481	3	lec	um	100% [‡]	15	15	4.73	4.25	4.60	4.10
Sp 15	Microbial Physiology	16:682:503	3	lec	grad	100% [‡]	11	11	4.91	4.82	4.90	4.68
Fa 14	Microbial life	16:682:501	3	lec	grad	4%*	20	%				
Fa 14	Contemporary Issues in Biochemistry	11:115:321	3	lec	um	4%*	24	%				
Fa 14	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	13	%				
Sp 14	Microbial Physiology	11:680:481	3	lec	um	100% [‡]	17	8	4.38	4.09	4.38	4.01
Sp 14	Microbial Physiology	16:682:503	3	lec	grad	100% [‡]	19	18	4.61	4.20	4.56	4.19
Fa 13	Microbial life	16:682:501	3	lec	grad	4%*	31	%				
Fa 13	Contemporary Issues in Biochemistry	11:115:321	3	lec	um	4%*	23	%				
Fa 13	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	18	%				
Sp 13	Microbial Physiology	11:680:481	3	lec	um	100% [‡]	19	16	4.69	3.96	4.44	3.81
Sp 13	Microbial Physiology	16:682:503	3	lec	grad	100% [‡]	16	15	4.67	4.40	4.80	4.33
Fa 12	Microbial Life	16:682:501	1	lec	grad	4%*	36	%				
Fa 12	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	20	%				
Sp 12	Microbial Physiology	11:680:481	3	lec	grad	50%	7	6	4.83	4.04	4.83	3.96
Sp 12	Microbial Physiology	16:682:503	3	lec	un	100%	9	7	4.71	4.33	4.57	4.36
Fa 11	Seminar in Microbial Biology	16:682:521	3	sem	grad	7%*	12	%				
Fa 11	Microbial Life	16:682:501	3	lec	grad	4%*	24	%				
Fa 11	Ethics Biochemistry Research	11:115:321	3	lec	un	7%	21	%				
Sp 11	Microbial Physiology	16:682:503	3	lec	grad	50%	12	10	4.50	4.53	4.33	4.49
Fa 10	Seminar in Microbial Biology	16:682:521	1	sem	grad	7%*	14	%				

* One Guest lecture

[‡] Course was cross-listed. The students were co-taught and graduate students had to complete additional weekly assignments and a final research proposal.

% I was not considered a primary faculty member teaching these classes; therefore, I was not provided access to the evaluation responses.

University of Wisconsin

2008

Co-instructor: Bacterial Physiology (Bact 526)(Fall semester)

2007

Teaching Fellow: Howard Hughes Medical Institute (Fall-Spring semesters)

Utah State University

2004

Teaching Assistant: Recitations—General chemistry for science majors under teaching supervisor: Prof. Rick Hotz (Chem. 1210)(Fall semester)

Iowa State University

1999

Teaching Assistant: Laboratory—Microbial physiology for majors under teaching supervisor: Prof. Alan DiSpririto (Micro 430)(Spring semester)

D. Mentoring—Student and Postdoctoral Researchers Advised

Students for whom I have acted as the primary Advisor:

Postdoctoral fellows:

Harsimranjit K. Chahal, 9/2012-3/2013

Kerrie May, 11/2013-12/2014

Sharron Crane, 12/2014-3/2014

Ph.D. students:

Zuelay Rosario-Cruz, Microbial Biology, 2010-2016

Ameya Mashruwala, Microbial Biology, 2011-2017

Hassan Al-Tameemi (formerly Jasim), Microbial Biology, 2012-present

Javiera Norambuena Morales, Microbial Biology (co-adviser Tamar Barkay), 2014-present

Hu Shuangfang, visiting from South China University of Technology, 2016-2017

Mary Foley, Microbial Biology, 2017-present

M.S. students:

Shiven Bhatt, Microbial Biology, 2011-2017

Josh Sumoski, Microbial Biology, 2012-2016

Shiming Tang, Microbial Biology, 2014-2015

Christina Roberts, Microbiology Molecular Genetics, 2014-2016

Adriana van de Guchte, Microbial Biology, 2015-present

Siamak Garabaglu, Microbial Biology, 2017-present

Undergraduate students:

Bhavana Narala, 2010-2012

Valarie Raziano, 2010-2014

Benjamin Nuta, 2011

Adriana van de Guchte, 2012-2015

Jeffrey Matthews, summer 2012

Carly Earle, 2013-2015

Sakshi Gandhi, 2013-2016

Mariusz Kocur, 2014-2015

Juan Cerezo, 2015-present

Catherine Bernhardt, 2015-2016

Geunhye Hong, 2015-2016

Mackenzie Purdy, 2016-2017

Nisa Mohammed, 2016-present

Juan Villegas, summer 2016
Srinivas Rajagopalan, 2017-present
Tarek Abdelazeez, 2016-present
Tochi Unegbu-Ogbonna, 2017-present
Primit Desai, 2017-present

High School Students:

Emily Milan-Rea, Wall High School, 2014

Graduate students who have or will rotate in my lab, but are not listed above:

Arwa Gabr, Molecular Biosciences Ph.D. student (2017/2018)
John Favate, Molecular Biosciences Ph.D. student (2017/2018)
Atila Lima, Molecular Biosciences Ph.D. student (2017/2018)
Alia Hassan, Molecular Biosciences M.S. student (current)
Unnati Chauhan, Molecular Biosciences Ph.D. student
Valdir Barth, Molecular Biosciences Ph.D. student
Eric Huselid, Molecular Biosciences Ph.D. student
Ibrahim Alsawaf, Microbial Biology Ph.D. student
Hamidah Raduwan, Microbial Biology Ph.D. Student
Alison Morel, Molecular Biosciences Ph.D. student
Xiao Qian, Microbial Biology Ph.D. student

I have served on the following graduate students' thesis committees:

Ameya Mashruwala, Microbial Biology Ph.D. program
Zuelay Rosario-Cruz, Microbial Biology Ph.D. program
Hassan Jasim, Microbial Biology Ph.D. program
Javiera Norambuena-Morales, Microbial Biology Ph.D. program
Anaya Agarwal, Microbial Biology Ph.D. program
Chengsheng Zhu, Microbial Biology Ph.D. program
Fatima Foflonker, Microbial Biology Ph.D. program
Xiao Qian, Microbial Biology Ph.D. program
Jose Ramon Planta, Microbiology and Molecular Genetics Ph.D. program
Ian Bezar, Microbiology, Molecular Genetics Ph.D. program
Yijun Zhou, Microbiology, Molecular Genetics Ph.D. program
David Santos, Microbial Biology M.S. program
Nick Rose, Microbial Biology M.S. program
Shiven Bhatt, Microbial Biology M.S. program
Josh Smoski, Microbiology and Molecular Genetics M.S. program
Christina Roberts, Microbiology and Molecular Genetics M.S. program
Austin Thekkumthala, Microbial Biology M.S. program
Veronica L. Cavera, Microbial Biology M.S. Program
Jennifer Goff, Microbial Biology Ph.D. program
Yuan Zhang, Microbial Biology M.S. program
Andrew Tanner, Biological Sciences Ph.D. program, Rutgers-Newark
David Shire, Biological Sciences Ph.D. program, Rutgers-Newark
Jillian Cortese, Microbiology and Molecular Genetics M.S. program
Ryan Rieder, Microbial Biology M.S. Program
Julia Greendyk, Microbial Biology M.S. Program
Edgar F. Ferrer-Gonzalez, Microbiology and Molecular Genetics Ph.D. program

Lamia Harper, NYU School of Medicine, Ph.D. Program in Microbiology

I have acted as the primary Aresty research advisor for the following students:

Carle Earle, 2015
Sakshi Ghandi, 2015
Catherine Bernhardt, 2016
Mackenzie Purdy, 2017
Nisa Mohammed, 2017
Juan Cerezo, 2017

I have served as an advisor for the following G.H. Cook Scholars Honors Students:

Valarie Raziano, 2014
Carle Earle, 2015
Purandhri Pandya, 2015 (co-advisor with Bryce Nickels)
Sakshi Ghandi, 2016
Sangeevan Vellappan, 2016 (co-advisor with Huizhou Fan)
Aaron Wu, 2016 (co-advisor with Ruth Steward)
Nicholas Raffa, 2016 (reader)
Sai M. Guntaka, 2016 (co-advisor with Estela Jacinto)
Lauren Foy, 2017 (reader)
Mackenzie Purdy, 2017
Nisa Mohammed, 2018
Juan Cerezo, 2018

E. Funding / Resources Secured:

National Institutes of Health, Ruth L. Kirschstein postdoctoral training fellowship.

Busch Biomedical Grant, Rutgers University internal research grant. Role: PI
\$50,000; 2011-2012.

USDA multistate Hatch research grant. Mechanisms of bovine mastitis. Role: Co-PI
\$5,000 annually

NJAES SEED DNA sequencing grant. Role: PI
\$8,000

Research contract with consumer health products company. The role of tin and zinc in
toxifying oral pathogenic bacteria. Role: PI
\$145,740; 2015

Busch Biomedical Grant, Rutgers University internal research grant. Role: PI
\$25,000; 2015-2016

Johnson and Johnson Foundation: Role of blue light on the survival of *Propionibacterium
acnes*. Role: PI
\$45,000; 2016

Rutgers University: Compound library of all FDA approved drugs. Role: PI
Approximate value \$5,000; 2016

Johnson and Johnson Foundation: Mechanism of blue light killing of *Propionibacterium acnes*. Role: PI
\$60,000; 2017

F. Pending Proposals:

Mechanisms of cellular respiration-dependent cell lysis and its impact on biofilm formation and disassembly in *Staphylococcus aureus*.

National Institutes of Health

\$1,880,575 total and \$1,250,000 direct

This proposal scored in the 19th percentile. The 2017 payline for new investigators was in the 18th percentile. If not funded it will be sent to special council by my program officer.

Iron-sulfur cluster assembly in *Bacillus subtilis*.

National Institutes of Health

\$1,848,676 total and \$1,250,000 direct

Iron-sulfur cluster assembly in *Bacillus subtilis*.

National Science Foundation

\$1,677,318 total and \$1,094,560 direct

G. Honors and Awards:

Howard Hughes Teaching Fellow, 2007

Ruth L. Kirschstein postdoctoral training fellowship, NIH, 2007

Phi Kappa Phi honor society, 2006

Utah State University Graduate Student Senate travel grant, 2006

Young Investigator Travel Grant, Gordon Research Conferences, 2006

Best paper presentation, Utah State Graduate Research Symposium, 2005

Thomas F. Emery Research Scholar in Biochemistry Memorial Award, 2004

Young Investigator Travel Grant, Gordon Research Conferences, 2004

Utah State University Graduate Student Senate travel grant, 2004

D.A. Greenwood Memorial Award in Biochemistry, 2003

H. Peer Reviewed Publications (chronological order) Manuscripts from #17 on were completed after joining the Rutgers faculty. I have underlined student/postdoctoral researchers that were under my tutelage at Rutgers.

1. Zahn J.A., Bergmann D.J., **Boyd J.M.**, Kunz R.C., and DiSpirito A.A. Membrane-associated quinoprotein formaldehyde dehydrogenase from *Methylococcus capsulatus* Bath. *J Bacteriol.* 2001 Dec;183(23):6832-40. PMID: 11698372
2. Choi D.W., Kunz R.C., Boyd E.S., Semrau J.D., Antholine W.E., Han J.I., Zahn J.A., **Boyd J.M.**, de la Mora A.M., DiSpirito A.A. The membrane-associated methane monooxygenase (pMMO) and pMMO-NADH:quinone oxidoreductase complex from *Methylococcus capsulatus* Bath. *J Bacteriol.* 2003 Oct;185(19):5755-64. PMID: 13129946

3. Nocek B., **Boyd J.M.**, Ensign S.A., Peters J.W. Crystallization and preliminary X-ray analysis of an acetone carboxylase from *Xanthobacter autotrophicus* strain Py2. **Acta Crystallogr. D. Biol. Crystallogr.** 2004 Feb;60(Pt 2):385-7. PMID: 14747734
4. Clark D.A., **Boyd J.M.**, and Ensign S.A. The stereoselectivity and catalytic properties of *Xanthobacter autotrophicus* 2-[(R)-2-Hydroxypropylthio]ethanesulfonate dehydrogenase are controlled by interactions between C-terminal arginine residues and the sulfonate of coenzyme M. **Biochemistry.** 2004 Jun 1;43(21):6763-71. PMID: 15157110
5. **Boyd J.M.**, Ellsworth H., Ensign S.A. Bacterial acetone carboxylase is a manganese-dependent metalloenzyme. **J Biol Chem.** 2004 Nov 5;279(45):46644-51. PMID: 15337755
6. **Boyd J.M.*** and Ensign S.A. ATP Dependent enolization of acetone by acetone carboxylase from *Rhodobacter capsulatus*, **Biochemistry.** 2005; 44(23): 8543-53. PMID: 15938645

* **Chosen as a faculty 1000 must-read.**

7. **Boyd J.M.** and Ensign S.A. Evidence for a metal-thiolate intermediate in alkyl group transfer from epoxypropane to coenzyme M and cooperative metal binding in epoxide-CoM transferase, **Biochemistry.** 2005; 44(39): 13151-62. PMID: 16185083
8. **Boyd J.M.**, Ellsworth A., and Ensign S.A. Characterization of 2-bromoethanesulfonate as a selective inhibitor of the coenzyme m-dependent pathway and enzymes of bacterial aliphatic epoxide metabolism. **J Bacteriol.** 2006 Dec;188(23):8062-9. PMID: 16997966
9. Dougherty M.J., **Boyd J.M.**, and Downs D.M. Inhibition of fructose-1,6-bisphosphatase by aminoimidazole carboxamide ribotide prevents growth of *Salmonella enterica* purH mutants on glycerol. **J Biol Chem.** 2006 Nov 10;281(45):33892-9. PMID: 16987812
10. **Boyd J.M.**, Lewis J.A, Escalante-Semerena J.C. and Downs D.M. *Salmonella enterica* requires ApbC function for growth on tricarballylate: Evidence of functional redundancy between ApbC and IscU. **J Bacteriol.** 2008 Jul; 190(13):4596-602. PMID: 18441067
11. **Boyd J.M.**, Pierik A.J., Netz D.J.A., Lill R., Downs D.M. Bacterial ApbC can bind and effectively transfer iron-sulfur clusters. **Biochemistry.** 2008 Aug; 47(31):8195-202. PMID: 18616280
12. **Boyd J.M.** Sondelski J.L., Downs D.M., Bacterial ApbC has two biochemical activities that are required for *in vivo* function. **J Biol Chem.** 2009 Jan 2;284(1):110-8. PMID: 19001370
13. Lewis J.A., **Boyd J.M.**, Downs D.M., and Escalante-Semerena, J.C. Involvement of the Cra global regulatory protein in the expression of the *iscRSUA* operon revealed during studies of tricarballylate catabolism in *Salmonella enterica*. **J Bacteriol.** 2009 Apr; 191(7): 2069-2076. PMID: 19136587
14. **Boyd J.M.**, Drevland R.M., Downs D.M., and Graham D.E. Archaeal ApbC/Nbp35 homologs function as iron-sulfur cluster carrier proteins. **J Bacteriol.** 2009 Mar; 191(5): 1490-7. PMID: 19114487
15. **Boyd J.M.**, Clark D.D., Kofoed M.A. and Ensign S.A. Mechanism of inhibition of aliphatic epoxide carboxylation by the Coenzyme M analog 2-bromoethanesulfonate.

- J Biol Chem.** 2010 Aug; 285(33): 25232-42. PMID: 20551308
16. **Boyd J.M.**, Endrizzi J.A., Hamilton T.L., Christopherson, M.R., Downs, D.M., and Peters, J.W. FAD binding by ApbE protein from *Salmonella enterica*: a new class of FAD binding proteins. **J Bacteriol.** 2011 Feb;193(4):887-95. PMID: 21148731
17. **Boyd J.M.**, Teoh W.P., and Down, D.M., Decreased transport suppresses the growth defect of an *apbC* mutant on tricarballate. **J Bacteriol.** 2012 Feb; 194(3):576-83. PMID: 22101844
18. Yu J., Madsen M.L., Carruthers M.D., Phillips G.J., Kavanaugh J.S., **Boyd J.M.**, Horswill A.R., Minion F.C. Analysis of autoinducer-2 quorum sensing in *Yersina pestis*. **Infect Immun.** 2013 Nov;81(11):4053-62. PMID: 24247266.
19. Price-Whelan A., Poon C.K., Benson M.A., Eidem T.T., Roux C.M., **Boyd J.M.**, Dunman P.M., Torres V.J., Krulwich T.A., Transcriptional profiling of *Staphylococcus aureus* during growth in 2 M NaCl leads to clarification of physiological roles for Kdp and Ktr K⁺ uptake systems. **MBio.** 2013 Aug 20; 4(4). PMID: 23963175.
20. Pang Y.Y., Schwartz J., **Boyd J.M.**, Horswill A.R., Nauseef W.M., Methionine sulfoxide reductases Protect against oxidative stress in *Staphylococcus aureus* encountering exogenous oxidants and human neutrophils. **J Innate Immun.** 2014;6(3):353-64. PMID: 24331053
21. Walker J.N., Spaulding A., Salgado-Pabón W., Schlievert P.M., **Boyd J.M.**, Horswill A.R., The *Staphylococcus aureus* ArIRS two-component system is a novel regulator of agglutination and pathogenesis. **PLoS Pathog.** 2013;9(12):e1003819. PMID: 24367264.
22. Perrineau M.M, Gross J., Zelzion E., Price D.C., **Boyd J.M.**, Bhattacharya D., Evolution of salt tolerance in a laboratory reared population of *Chlamydomonas reinhardtii*. **Environ Microbiology.** 2014 Jun;16(6):1755-66. PMID 24373049
23. Joska T.M., Mashruwala A., **Boyd J.M.***, and Belden W.J.*. A universal cloning method based on yeast homologous recombination that is simple, efficient, and versatile. **J Microbial Methods.** 2014 May;100:46-51. PMID: 2441681
- * **co-corresponding authors**
24. White M.J., **Boyd J.M.**, Horswill A.R., Nauseef W.M., Phosphatidylinositol-specific phospholipase C contributes to survival of *Staphylococcus aureus* USA300 in human blood and neutrophils. **Infect Immun.** 2014 Apr;82(4):1559-71. PMID: 24452683
25. Perrineau M.M, Gross J., Zelzion E., Price D.C. Levitan O., **Boyd J.M.**, Bhattacharya D., Using natural selection to explore the adaptive potential of *Chlamydomonas reinhardtii*. **PLoS One.** 2014 Mar 21;9(3):e92533. PMID: 24658261.
26. Boyd E.S., Thomas K.M., Dai Y., **Boyd J.M.***, Outten F.W.* Interplay between oxygen and Fe-S cluster biogenesis: Insights from the Suf pathway. **Biochemistry.** 2014 Sep 23;53(37):5834-47. PMID: 25153801

* **co-corresponding authors**

27. Mashruwala A.A., Pang Y.Y., Rosario-Cruz Z., Chahal H.K., Benson M.A., Anzaldi-Mike L.L., Skaar E.P., Torres V.J., Nauseef W.M., **Boyd J.M.** Nfu facilitates that maturation of iron-sulfur proteins and participates in virulence in *Staphylococcus aureus*. *Mol Micro*. 2015 Feb;95(3):383-409. PMID: 25388433
28. Rosario-Cruz Z., Chahal H.K., Anzaldi-Mike L.L., Skaar E.P., and **Boyd J.M.** Bacillithiol has a role in Fe-S cluster biogenesis in *Staphylococcus aureus*. *Mol Micro*. 2015 Oct;98(2):218-42. PMID: 26135358
29. Rosario-Cruz Z. and **Boyd J.M.** Physiological roles of bacillithiol in intracellular metal processing. *Curr Genet*. 2016 Feb;62(1):59-65. PMID: 26259870
30. Mashruwala A.A., Bhatt S., Poudel S., Boyd E.S., and **Boyd J.M.** The DUF59 containing protein SufT is involved in the maturation of iron-sulfur (FeS) proteins during conditions of high FeS cofactor demand in *Staphylococcus aureus*. *PLoS Genetics*. 2016 Aug 12;12(8):e1006233. PMID: 27517714
31. Choby J.E., Mike L.A., Mashruwala A.A., Dutter B.F., Dunman P.M., Sulikowski G.A., **Boyd J.M.***, and Skaar E.P.* A small-molecule inhibitor of iron-sulfur cluster assembly uncovers a link between virulence regulation and metabolism in *Staphylococcus aureus*. *Cell Chemical Biology*. 2016 Nov 17;23(11):1351-1361. PMID:27773628
- * *co-corresponding authors*
32. Mashruwala A.A., Roberts C., Bhatt S., May K.L., Carroll R.K., Shaw L.N., **Boyd J.M.** *Staphylococcus aureus* SufT: an essential iron-sulfur cluster assembly factor in cells experiencing a high-demand for lipoic acid. *Mol Micro*. 2016 Dec;102(6):1099-1119. PMID: 27671355
33. Mashruwala A. A., **Boyd J.M.** The *Staphylococcus aureus* SrrAB regulatory system modulates hydrogen peroxide resistance factors, which imparts protection to aconitase during aerobic growth. *PLoS One*. 2017 Jan 18;12(1):e0170283. PMID: 28099473
34. Mashruwala A.A., Van de Guchte A., **Boyd J.M.** Impaired respiration elicits SrrAB-dependent programmed cell lysis and biofilm formation in *Staphylococcus aureus*. *eLife*. 2017 Feb 21;6. PMID: 28221135
35. Roberts C., Al-Tameemi H.M., Mashruwala A.A., Rosario-Cruz Z., Chauhan U., Sause, W., Torres V.J., and **Boyd J.M.** The Suf iron-sulfur cluster biosynthetic system is essential for *Staphylococcus aureus* viability and defective Fe-S cluster biosynthesis results in broad metabolic defects and decreased survival in neutrophils. *Infect Immun*. 2017 May 23;85(6). PMID: 28320837
36. Tanner A.W., Carabetta V.J., Martinie R.J., Mashruwala A.A., **Boyd J.M.**, Krebs C., Dubnau D., The RicAFT (YmcA-YlbF-YaaT) complex carries two [4Fe-4S]²⁺ clusters and may respond to redox changes. *Mol Micro*. 2017 Jun;104(5):837-850. PMID: 28295778
37. Mashruwala A.A., Gries, C.M., Scherr T.D., Kielian, T., **Boyd J.M.** SaeRS is responsive to the cellular respiratory status and regulates fermentative biofilm formation in *Staphylococcus aureus*. *Infect Immun*. 2017 Jun. PMID: 28507069

38. Mashruwala A.A., **Boyd J.M.** Investigating the role(s) of SufT and the domain of unknown function 59 (DUF59) in the maturation of iron-sulfur proteins. ***Curr Genet.*** 2017 Jun. PMID: 28589301
39. Norambuena J., Wang Y., Hanson T., **Boyd J.M.**, Barkay T. Low molecular weight thiols and thioredoxins are important players in Hg(II) tolerance for *Thermus thermophilus* HB27. ***Appl Environ Micro.*** 2017 **Accepted**

*Chosen as a spotlight article by the editor

40. Harper L., Balasubramania D., Ohneck E.A., Sause W.E., Chapman J., Mejia-Sosa B., Lhaxhang T., Heguy A., Tsigos A., Ueberheide B., **Boyd J.M.**, Lun D.S., Torres V.J., *Staphylococcus aureus* senses the central metabolite pyruvate to regulate virulence and pathogenicity. ***mBio.*** 2017 **Accepted**

Additional Publications

1. Chahal H.K., **Boyd J.M.***, and Outten F.W.* Iron-sulfur cluster biogenesis in Archaea and Bacteria. Book Chapter in ***Metals and Cells.*** 2012. Series editors Robert Scott and Valerie Culotta.

* ***co-corresponding authors***

2. Eveleigh D.E., Häggblom M., and **Boyd J.M.** The early challenges of antibiotic discovery. ***Microbe.*** 2015 Nov; 10 (11): 449-450.
3. Mashruwala A.A., and **Boyd J.M.** *De novo* assembly of plasmids using yeast recombinational cloning. ***Methods Mol Biol.*** 2016;1373:33-41. PMID: 26194707 Series editor Jeffery Bose.

Publications In Revision

Rosario-Cruz Z., Eletsky A., Daigham N.S., Swapna G.V.T., Szyperski T., Montelione G.T., and **Boyd J.M.** The *copBcbI* Operon Protects *Staphylococcus aureus* from Copper Intoxication: Cbl is an Extracellular Membrane-Associated Copper-Binding Protein. **In revision for *J Biol Chem.*** 2017

Mashruwala A.A., Eilers B.J., Fuchs A., Earle C.A., Van De Guchte A., Copié V., **Boyd J.M.** The ClpCP complex modulates respiratory, but not fermentative metabolism in *Staphylococcus aureus* and is regulated in a SrrAB-dependent manner. **In review at *J Bacteriol.***

Bezar I.F., Mashruwala A.A., **Boyd J.M.**, Stock A.M., Drug-like Fragments Inhibit *agr*-Mediated Virulence Expression in *Staphylococcus aureus*. **In review at *Nature Scientific Reports.*** 2017

Publications in Review

Dubovoy V., Ganti A., Zhang T., Cerezo J., Al-Tamini H.M., **Boyd J.M.***, Asefa T.* One-pot hydrothermal synthesis of benzalkonium-templated mesoporous silica antimicrobial agents. In review at *JACS.*

*** co-corresponding authors**

Kaul M., Ferrer-González E., Mark L., Al-Tameemi H.M., Parhi A.K., **Boyd J.M.**, LaVoie E.J., Pilch D.S., Combination with the FtsZ-Targeting Prodrug TXA709 Repurposes Oxacillin for Use in the Treatment of MRSA Infections. In review at *ACS Chemical Biology*

Publications In Preparation

Boyd J.M. and Hu, S. The NfuA iron-sulfur cluster carrier is necessary for *Salmonella enterica* to synthesize thiamine and grow on tricarballylate. Written for submission to *J Bacteriol*

Boyd J.M., Purdy M., Mohammed N., Dunn K., Fassih A., Wen-Hwa L., 440 nm light is effective at killing *Propionibacterium acnes*. Written for submission to *Lasers in Medical Sciences*.

Roberts C., Al-Tameemi H.W., Mashruwala A.A., and **Boyd J.M.** Sigma factor B modulates flux through central metabolic pathways to decreased the demand for lipoic acid in *Staphylococcus aureus*.

Mashruwala A.A., Van De Guchte A., **Boyd J.M.** The SrrAB and SaeSR regulatory system sense respiratory flux to trigger biofilm dispersal in *Staphylococcus aureus*.

I. Invited presentations (chronological order)

Evidence for ATP dependent acetone enolization by acetone carboxylase isolated from *Rhodobacter capsulatus* Strain B10. *American Chemical Society Northwest/Rocky mountain regional meeting*, Logan, Utah, 2004.

Hydrocarbon metabolism by *Xanthobacter autotrophicus*. Dept. of Bacteriology, University of Wisconsin-Madison. 2005.

Dissecting metabolic complexity using *Salmonella enterica* as a model system. Dept. of Bacteriology, University of Wisconsin-Madison. 2007.

Biochemical analysis of proteins involved in [Fe-S] cluster metabolism in *Salmonella enterica*. *International Conference on Fe-S Cluster Biogenesis and Regulation*. Grenoble, France. 2007.

Thiamine biosynthesis, iron-sulfur cluster biosynthesis, and ORFs of unknown function; addressing metabolic complexity in *Salmonella enterica*. Institut für Zytobiologie und Zytopathologie. Philipps Universität. Marburg, Germany. 2007.

Thiamine biosynthesis, iron-sulfur cluster biosynthesis, and ORFs of unknown function; addressing metabolic complexity in *Salmonella enterica*. Thermal Biology Institute. Montana State University. Bozeman, MT. 2008.

- Thiamine, tricarballylate, iron-sulfur clusters, and ORFs of unknown function: using *Salmonella enterica* to dissect metabolic complexity. Dept. of Microbiology and Biochemistry. Rutgers University. New Brunswick, NJ. 2009.
- Thiamine, tricarballylate, iron-sulfur clusters, and ORFs of unknown function: using *Salmonella enterica* to dissect metabolic complexity. Inflammation Program and Dept. of Internal Medicine, University of Iowa, Iowa City, IA. 2010.
- An Enemy at the Gates: Investigating the *Staphylococcus aureus* human neutrophil interface. Rutgers University Microbiology Symposium. Rutgers University. New Brunswick, NJ. 2011.
- Methicillin-Resistant *Staphylococcus aureus*. Biology Seminar Series. Fairleigh Dickinson University. Teaneck, NJ. 2011.
- Intracellular iron metabolism in *Staphylococcus aureus*. *Eastern meeting on iron-sulfur proteins*. Blacksburg, VA. 2012.
- Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. *International Conference on Gram-Positive Pathogens*. Omaha, NE. 2012.
- Intracellular iron metabolism as an antimicrobial target. Symposium for the 60th anniversary of Selman Waksman Nobel Prize. Rutgers University. 2012.
- Iron-sulfur cluster metabolism in *Staphylococcus aureus*. *International Conference on Fe-S Cluster Biogenesis and Regulation*. University of South Carolina. Columbia, SC. 2013.
- Investigating the mechanisms of intracellular iron metabolism in an environmental isolate. Fermentation Club seminar series. Dept. of Biochemistry and Microbiology. Rutgers University. 2013.
- A role for bacillithiol in iron-sulfur cluster metabolism in *Staphylococcus aureus*. *Eastern meeting on iron-sulfur proteins*. Athens, GA. 2013.
- Investigating the mechanisms of intracellular iron metabolism in *Staphylococcus aureus*. University of Wisconsin, Dept. of Bacteriology. Madison, WI. 2013.
- Investigating the mechanisms of intracellular iron metabolism in *Staphylococcus aureus*. Public Health Research Institute, New Jersey School of Medicine and Dentistry. Newark, NJ. 2013.
- Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. *Meeting on the Molecular Genetics of Bacteria and Phages*, Madison, WI. 2014.
- Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. *International Conference on Gram Positive Pathogens*, Omaha, NE. 2014.
- Defective respiration as a trigger for programmed cell death in *Staphylococcus aureus*. Dept. of Molecular Biology and Biochemistry. Rutgers University. Piscataway, NJ. 2015.

- Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. University of Delaware. Chemistry and Biology interface seminar series. Dept. of Chemistry and Biochemistry. Newark, DE. 2015.
- Iron-sulfur cluster biogenesis in *Staphylococcus aureus*: a potential antimicrobial target? *International conference on Fe-S cluster biogenesis and regulation*, Bergamo, Italy. 2015.
- Iron-sulfur cluster biogenesis in *Staphylococcus aureus*: a potential antimicrobial target? University of Kaiserslautern. Dept. of Biochemistry. Kaiserslautern, Germany. 2015.
- Cellular respiration as a trigger for biofilm formation in *Staphylococcus aureus*. Montana State University. Dept. of Microbiology. Bozeman, MT. 2015.
- Iron-sulfur cluster biogenesis as a potential antimicrobial target. Dept. of Chemistry. Wake Forest University. Winston-Salem, NC. 2015
- Towards a holistic understanding of Fe-S cluster biogenesis in gram-positive bacteria. *Eastern meeting on iron-sulfur proteins*. Winston-Salem, NC. 2015.
- Targeting essential cellular processes and behavior modification with antimicrobial therapy. *Meeting of the New Jersey Antimicrobial Resistance Working Group*. Piscataway, NJ. 2015.
- Re-examining the mechanisms of copper detoxification in *Staphylococcus aureus*. *Rutgers Microbiology Symposium*. Rutgers University, New Brunswick, NJ. 2016.
- Mechanisms of methicillin and metal resistance in *Staphylococcus aureus*. *Mechanisms of Antimicrobial Resistance workshop*. Center for Integrative Proteomics Research. Rutgers University, Piscataway, NJ. 2017.
- Staphylococcal metabolism; Fueling the future of antimicrobial discovery. I served as the Discussion leader. *Gordon Research Conference on Staphylococcal diseases*. 2017. Waterville Valley, NH.
- Adventures in staphylococcal biology: what we have discovered and where we are going. Dept. of Biochemistry and Microbiology. Rutgers University, New Brunswick, NJ 9/2017. Promotion seminar.
- Targeting cellular respiration and metal ion homeostasis to prevent or control staphylococcal infections. Department of Microbiology and immunology. Dartmouth University, 10/2017.

Forthcoming Presentations

Georgetown University, 3/22/2018. Biology department.

International Meeting on Respiration and its Regulation, 3/11/2018. Saint Tropez, France

J. Research Conference Presentations (chronological order) (Names of contributors that were under my tutelage at Rutgers are underlined.)

Poster. Boyd, J.M., Kunz, R. C., and DiSpirito, A. A. Membrane-associated formaldehyde dehydrogenase from *Methylococcus capsulatus* Bath. **Regional Meeting of the American Society of Microbiology**, Ames, IA, 1999.

Poster. Boyd, J.M., Larsen, R.A., and Ensign, S.A. Cloning and characterization of an aldehyde dehydrogenase required for growth on alkenes from *Xanthobacter autotrophicus*. **General Meeting of the American Society of Microbiology**, Salt Lake City, UT, 2002.

Poster. Boyd, J.M. and Ensign, S.A. Evidence for ATP dependent acetone enolization by acetone carboxylase isolated from *Rhodobacter capsulatus* Strain B10. **Gordon Research Conference on the Molecular Basis of Microbial One-Carbon Metabolism**, 2004.

Poster. Boyd, J.M. and Ensign, S.A. Evidence for ATP dependent acetone enolization by acetone carboxylase isolated from *Rhodobacter capsulatus* Strain B10. **American Chemical Society Northwest/Rocky mountain regional meeting**, Logan, Utah, 2004.

Paper. Boyd, J.M.* Evidence for a thiolate-Zn intermediate in alkyl group transfer to coenzyme M and cooperative metal binding in *Xanthobacter autotrophicus* Strain Py2 epoxide-CoM transferase. **Utah State University Graduate Research Symposium**, Logan, Utah, 2005

*** Awarded best paper presentation.**

Poster. Boyd, J.M. Sondelski, J., and Downs, D.M. Biochemical analysis of proteins involved in Fe-S cluster metabolism in *Salmonella enterica*. **Gordon Research Conference on Iron-Sulfur Enzymes**, 2006.

Poster. Boyd, J.M. and Downs, D.M. Biochemical analysis of proteins involved in Fe-S cluster metabolism in *Salmonella enterica*. **Kenneth Raper Symposium on microbiological research**, Madison, WI, 2006.

Poster. Boyd, J.M. and Downs, D.M. Biochemical analysis of proteins involved in Fe-S cluster metabolism in *Salmonella enterica*. **Iron-Sulfur cluster biogenesis and regulation meeting**, Grenoble, France, 2007.

Poster. Boyd, J.M. and Downs, D.M. Biochemical analysis of proteins involved in Fe-S cluster metabolism in *Salmonella enterica*. **Kenneth Raper Symposium on microbiological research**, Madison, WI, 2007.

Poster. Boyd, J.M., Teoh, W.P., and Downs, D.M. Tricarballoylate metabolism as a tool to probe microbial iron-sulfur cluster metabolism. **Gordon Research Conference on Iron-Sulfur Enzymes**, 2008.

Poster. Boyd, J.M., Teoh, W.P., and Downs, D.M. Tricarballoylate metabolism as a tool to probe microbial iron-sulfur cluster metabolism. **Kenneth Raper Symposium on microbiological research**, Madison, WI, 2008.

- Poster.** **Boyd, J.M.**, and Downs, D.M. Investigating metabolic integration using a bacterial model system. **Steenbock Symposium: Synthetic Genes to Synthetic Life.** Madison, WI, 2009.
- Poster.** **Boyd, J.M.**, and Downs, D.M. Genetic and biochemical studies of proposed intermediate [Fe-S] cluster carriers. **Iron-Sulfur cluster biogenesis and regulation meeting.** University of Georgia, Athens, GA, 2009.
- Poster.** **Boyd, J.M.***, Pace, A.M. and Downs, D.M. Investigating metabolic integration using a bacterial model system. **Kenneth Raper Symposium on microbiological research,** Madison, WI, 2009.
- Poster.** Mashruwala A., and **Boyd, J.M.** Investigating two-component regulation in *Staphylococcus aureus*. **Rutgers Microbiology Symposium.** Rutgers University. New Brunswick, NJ, 2011.
- Paper.** **Boyd, J.M.**, Mashruwala, A., Pang, Y.Y., Nauseef, W., Torres, V. An Enemy at the Gates: Investigating the *Staphylococcus aureus* human neutrophil Interface. **Rutgers Microbiology Symposium.** Rutgers University. New Brunswick, NJ, 2011.
- Paper.** **Boyd, J.M.**, Mashruwala, A., Pang, Y.Y., Nauseef, W., Torres, V. Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. **Wind River Conference on Prokaryotic Biology.** Estes Park, CO, 2011.
- Poster.** **Boyd, J.M.**, Mashruwala, A., Pang, Y.Y., Nauseef, W., Torres, V. Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. **International Conference on Iron-Sulfur Cluster Biogenesis and Regulation.** Cambridge, U.K., 2011.
- Poster.** **Boyd, J.M.**, Mashruwala, A.A., Bhatt, S., Pang, Y.Y., Benson, M., Nauseef, W., Torres, V. Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. **Gordon Research Conference on Iron-Sulfur enzymes.** Mount Holyoke College, MA, 2012.
- Paper.** **Boyd, J.M.** Mashruwala, A.A., Bhatt, S. Intracellular iron metabolism in *Staphylococcus aureus*. **Eastern Meeting on Iron-Sulfur Proteins.** Blacksburg, VA, 2012.
- Paper.** **Boyd, J.M.**, Mashruwala, A.A., Pang, Y.Y., Benson M., Nauseef, W., Torres, V. Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. **International Conference on Gram-Positive Pathogens.** Omaha, NE, 2012.
- Poster.** Mashruwala A.A. and **Boyd, J.M.** Involvement of the staphylococcal respiratory regulatory system (SrrAB) in the oxidative stress response of *Staphylococcus aureus*. **International Conference on Gram-Positive Pathogens.** Omaha, NE, 2012.
- Poster.** Walker JN, Meyer S., **Boyd J.M.**, Voyich J.M. Horswill A.R. ArlRS Regulation of Agglutination and Pathogenesis in Methicillin-resistant *Staphylococcus aureus*. **International Conference on Gram-Positive Pathogens.** Omaha, NE, 2012
- Poster.** White M.J., **Boyd J.M.**, Horswill A.R., Nauseef W.M. The putative *Staphylococcus aureus* virulence factor, PI-PLC, is responsive to oxidative stress. **International Conference on Gram-Positive Pathogens.** Omaha, NE, 2012.
- Poster.** Bhatt S.K., **Boyd J.M.** The staphylococcus SufT protein is involved in iron-sulfur

cluster metabolism. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2013.

Poster. Mashruwala A.A. and **Boyd J.M.** The staphylococcal respiratory regulatory system (SrrAB) is involved in the *Staphylococcus aureus* oxidative stress response. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2013.

Poster. Rosario-Cruz Z.E., Anzaldi-Mike L., Skaar E., and **Boyd J.M.** Studying the role of the low-molecular-weight thiol bacillithiol in trace metal metabolism in *Staphylococcus aureus*. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2013.

Paper. Rosario-Cruz Z.E., Anzaldi-Mike L., Skaar E., and **Boyd J.M.** Studying the role of the low-molecular-weight thiol bacillithiol in trace metal metabolism in *Staphylococcus aureus*. **Northeastern Microbiologists Meeting** (NEMPET), Blue Mountain Lake, NY, 2013.

Poster. Rosario-Cruz Z.*, Anzaldi-Mike L., Skaar E., and **Boyd J.M.** Studying the role of the low-molecular-weight thiol bacillithiol in trace metal metabolism in *Staphylococcus aureus*. **Rutgers Joint Molecular Biosciences Graduate Student Annual Symposium**. Rutgers University, Piscataway, NJ, 2013.

* **Awarded best student poster**

Poster. Mashruwala A.A. and **Boyd J.M.** The staphylococcal respiratory regulatory system (SrrAB) is involved in the *Staphylococcus aureus* oxidative stress response. **Gordon Research Conference on Staphylococcal Diseases**. Waterville Valley, NH, 2013.

Poster. **Boyd J.M.**, Mashruwala A.A., Pang Y.Y., Bhatt S., Rosario-Cruz Z., Benson M.A., Anzaldi A., Skaar E., Torres V.J., Nauseef W.M. Iron-sulfur cluster metabolism and *Staphylococcus aureus* virulence. **Gordon Research Conference on Staphylococcal Diseases**. Waterville Valley, NH, 2013.

Paper. **Boyd J.M.**, Mashruwala A.A. The staphylococcal respiratory regulatory system (SrrAB) is involved in the *Staphylococcus aureus* oxidative stress response. **Molecular Genetics of Bacteria and Phage Meeting**. Madison, WI, 2013.

Poster. Mashruwala A.A., **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. **International Meeting on Gram-Positive Pathogens**. Omaha, NE, 2014.

Poster. Tanner A., Carabetta V., Mashruwala A.A., **Boyd J.M.**, and Dubnau D. Stimulating the Phosphorelay Through Redox: A Complex of Proteins That Control Development in *Bacillus subtilis*. **General Meeting of the American Society of Microbiology**. Boston, MA, 2014.

Paper. Rosario-Cruz Z., Anzaldi-Mike, L., Skaar, E., and **Boyd J.M.** In vivo evidence suggesting a role for bacillithiol in iron-sulfur cluster metabolism in *Staphylococcus aureus*. **Rutgers Joint Molecular Biosciences Graduate Student Symposium**. New Brunswick, NJ, 2014.

Poster. Rosario-Cruz Z.*, Anzaldi-Mike, L., Skaar, E., and **Boyd J.M.** Investigating the role of Bacillithiol in iron-sulfur cluster metabolism in *Staphylococcus aureus*. **General Meeting of the American Society of Microbiology**. Boston, MA, 2014.

*** Awarded outstanding student poster (1 of 40 posters chosen out of approx. 3000 entries)**

Poster. Rosario-Cruz Z.*, Anzaldi-Mike, L., Skaar, E., and **Boyd J.M.** Investigating the role of Bacillithiol in iron-sulfur cluster metabolism in *Staphylococcus aureus*. **American Society of Microbiology Meeting in Miniature** (Theobald Smith Society), New Brunswick, NJ, 2014.

*** Awarded best student poster**

Poster. Mashruwala A.A.*, **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2015.

*** Awarded best student poster**

Poster. Mashruwala A.A., Jasim H., **Boyd J.M.** TsrKR is required for thermal homeostasis in *Staphylococcus aureus*. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2015.

Poster. Rosario-Cruz Z. and **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **Rutgers Microbiology Symposium**. Rutgers University. New Brunswick, NJ, 2015.

Paper. Mashruwala A.A., and **Boyd J.M.** Cellular respiration as a trigger for programmed cell death and biofilm formation in *Staphylococcus aureus*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University. New Brunswick, NJ, 2015.

Poster. Mashruwala A.A., van de Guchte A.*, **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University. New Brunswick, NJ, 2015.

*** Awarded best undergraduate student poster.**

Poster. Rosario-Cruz Z.*, Gandhi S., **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2015.

***Awarded best graduate student poster.**

Poster. Bernhardt C., Crane S., Barkay T., **Boyd J.M.** Inhibiting the Oral Biofilm with Zinc and Tin Compounds. **Douglass Project's STEM Summer Research Poster Session**. Rutgers University, New Brunswick, NJ, 2015.

Poster. Gandhi S.*, Rosario-Cruz Z., **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **Aresty Undergraduate Research Symposium**. Rutgers University, New Brunswick, NJ, 2015.

*** Received honorable mention for best presentation award.**

Poster. Mashruwala A.A., Earle C., van de Guchte A., and **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. **Aresty Undergraduate Research Symposium.** Rutgers University, Piscataway, NJ, 2015.

Poster. Mashruwala A.A., Earle C., van de Guchte A., and **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2015.

Poster. Kocur M., Norambuena Morales J., Crane S., Barkay T., and **Boyd J.M.** Examining the effects of fluoride, tin, zinc, and zinc oxide on *Streptococcus mutans*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2015.

Poster. Mashruwala A.A., van de Guchte A.*, **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. **William Patterson Undergraduate Research Symposium.** Wayne, NJ, 2015.

*** Received honorable mention for best presentation award.**

Poster. Gandhi S., Rosario-Cruz Z., **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **University of São Paulo International Symposium of Scientific Initiation.** São Paulo, Brazil, 2015.

Poster. Earle C., Mashruwala, A.A., van de Guchte A., **Boyd J.M.** Regulation of the Clp proteases by SrrAB in *Staphylococcus aureus*. **University of São Paulo International Symposium of Scientific Initiation.** São Paulo, Brazil, 2015.

Poster. Rosario-Cruz Z., Gandhi S., **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **General Meeting of the American Society of Microbiology.** New Orleans, LA, 2015.

Poster. Rosario-Cruz Z., Gandhi S., **Boyd J.M.** Copper homeostasis in *Staphylococcus aureus*. **Meeting of the New Jersey Antimicrobial Resistance Working Group.** Rutgers University, Piscataway, NJ, 2015.

Poster. Mashruwala A.A., van de Guchte A., **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. **Meeting of the New Jersey Antimicrobial Resistance Working Group.** Rutgers University, Piscataway, NJ, 2015.

Poster. Mashruwala A.A., van de Guchte A., Roberts C., Eveleigh D.E., **Boyd J.M.** Microbes, Miracles, Medicine—A history of antibiotics at Rutgers. **Meeting of the New Jersey Antimicrobial Resistance Working Group.** Rutgers University, Piscataway, NJ, 2015.

Poster. Bernhardt C. and **Boyd J.M.** investigating of how zinc and tin inhibit *Streptococcus mutans*. **Aresty Undergraduate Research Symposium.** Rutgers University, Piscataway, NJ, 2016.

Poster. Mashruwala A., Earle C., van de Guchte A., **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2016.

Poster. Norambuena-Morales J., Hanson T., Wang Y., **Boyd J.M.** Barkay T. The *mer* operon of *Thermus thermophilus*: evidence for a direct link between low-molecular weight thiol metabolism and mercury stress. **General Meeting of the International Society for Microbial Ecology (ISME)**. Montreal, Canada, 2016.

Poster. Roberts C., Al-Tameemi H.M., Mashruwala A.A., Rosario-Cruz Z. Sause W., Torres V., **Boyd J.M.** The Suf iron-sulfur cluster biosynthetic system is essential for *Staphylococcus aureus* viability and decreased Suf function results in global metabolic defects and decreased survival in human neutrophils. **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2016.

Poster. Al-Tameemi H.M.*, Mashruwala A.A., Tanner A.W., Carabetta, V.J., Dubnau, D., **Boyd J.M.** The YaaT, YlbF, and YmcA proteins are necessary for sporulation in *Bacillus subtilis*, but what are their functions in the non-sporulating bacterium *Staphylococcus aureus*? **New Jersey American Society of Microbiology Meeting in Miniature** (Theobald Smith Society). Rutgers University, New Brunswick, NJ, 2016.

*** Awarded prize for best poster presentation.**

Poster. Mashruwala A.A., Earle C., van de Guchte A., **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. **Joint Molecular Biosciences Graduate Student Association Meeting**. Rutgers University, Piscataway, NJ, 2016.

Poster. Roberts C., Al-Tameemi H.M., Mashruwala A.A., Rosario-Cruz Z. Sause W., Torres V., **Boyd J.M.** The Suf iron-sulfur cluster biosynthetic system is essential for *Staphylococcus aureus* viability and decreased Suf function results in global metabolic defects and decreased survival in human neutrophils. **Joint Molecular Biosciences Graduate Student Association Meeting**. Rutgers University, Piscataway, NJ, 2016.

Poster. Al-Tameemi H.M., Mashruwala A.A., Tanner A.W., Carabetta, V.J., Dubnau, D., **Boyd J.M.** The YaaT, YlbF, and YmcA proteins are necessary for sporulation in *Bacillus subtilis*, but what are their functions in the non-sporulating bacterium *Staphylococcus aureus*? **Joint Molecular Biosciences Graduate Student Association Meeting**. Rutgers University, Piscataway, NJ, 2016.

Poster. Rosario-Cruz Z.*, Liu G., Montelione G., **Boyd J.M.** The ACME Encoded *copBcbI* operon protects *Staphylococcus aureus* from copper intoxication: Cbl is an extracellular membrane-associated copper-binding protein. **Joint Molecular Biosciences Graduate Student Association Meeting**. Rutgers University, Piscataway, NJ, 2016.

*** Awarded prize for best poster presentation.**

Poster. Mashruwala A.A., Earle C., van de Guchte A., **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. **Rutgers Microbiology Symposium**. Rutgers University, New Brunswick, NJ, 2016.

- Poster.** Rosario-Cruz Z., Liu G., Montelione G., **Boyd J.M.** The ACME Encoded *copBcbl* operon protects *Staphylococcus aureus* from copper intoxication: Cbl is an extracellular membrane-associated copper-binding protein. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2016.
- Poster.** Al-Tameemi H.M., Mashruwala A.A., Tanner A.W., Carabetta, V.J., Dubnau, D., **Boyd J.M.** The YaaT, YlbF, and YmcA proteins are necessary for sporulation in *Bacillus subtilis*, but what are their functions in the non-sporulating bacterium *Staphylococcus aureus*? ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2016.
- Poster.** Roberts C., Al-Tameemi H.M., Mashruwala A.A., Rosario-Cruz Z., Sause W., Torres V., **Boyd J.M.** The Suf iron-sulfur cluster biosynthetic system is essential for *Staphylococcus aureus* viability and decreased Suf function results in global metabolic defects and decreased survival in human neutrophils. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2016.
- Poster.** Mashruwala A.A., Bhatt S., **Boyd J.M.** The Duf59 containing protein SufT is required for the maturation of iron-sulfur (FeS) proteins during conditions of high FeS cofactor demand in *Staphylococcus aureus*. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2016.
- Poster.** Tanner, A., Carabetta, V.J., Martine R., Mashruwala, A.A., **Boyd J.M.** Krebs C., Dubnau D. 1 [4Fe-4S] protein complex that regulates sporulation in *Bacillus subtilis* in response to oxygen. ***Penn State Bioinorganic Chemistry Workshop.*** State College PA, 2016.
- Poster.** **Boyd J.M.**, Crane S., Dunn K., Fourre T., Fassih A., Wen- Hwa Li, Miksa D., Purdy M., Villegas J., Southall M., Utilization of 440 nm Blue Light to Target *Propionibacterium acnes* for Treating Acne Vulgaris. ***American Academy of Dermatology Meeting.*** Orlando, FL, 2017.
- Poster.** Cerezo, J., Al-Tameemi, H.M., **Boyd J.M.** Screening the Library of FDA Approved Drugs for Inhibitors of Bacterial Iron-Sulfur Cluster Assembly. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2017.
- * Awarded best student poster (5 awards out of 64 posters)**
- Poster.** Mashruwala A.A., Earle C., van de Guchte A., **Boyd J.M.** Regulation of Clp proteases by SrrAB in *Staphylococcus aureus*. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2017.
- Poster.** Mashruwala A.A., van de Guchte A., **Boyd J.M.** Cellular respiration as a trigger for multicellular behavior in *Staphylococcus aureus*. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2017.
- Poster.** Norambuena-Morales J.*, Wang Y., Hanson T., **Boyd J.M.**, and Barkay T., The *mer* operon of *Thermus thermophilus*: evidence for a direct link between low- molecular weight thiol metabolism and mercury stress. ***Rutgers Microbiology Symposium.*** Rutgers University, New Brunswick, NJ, 2017.

*** Awarded best student poster (5 awards out of 64 posters)**

Poster. Al-Tameemi H.M., **Boyd J.M.** Copper Stress in *Staphylococcus aureus* involves Perturbing Iron Homeostasis. **Rutgers Microbiology Symposium.** Rutgers University, New Brunswick, NJ, 2017.

Poster. Purdy M.*, Mohammed N.*, Crane S., **Boyd J.M.** Effect of Blue Light on *Propionibacterium acnes*. **Rutgers Microbiology Symposium.** Rutgers University, New Brunswick, NJ, 2017.

*** Awarded top student poster (5 awards out of 64 posters)**

Poster. Cerezo J.*, Al-Tameemi H.M., **Boyd J.M.** Screening the Library of FDA Approved Drugs for Inhibitors of Bacterial Iron-Sulfur Cluster Assembly. **Aresty Research Symposium.** Rutgers University, Piscataway, NJ, 2017.

*** Awarded honorable mention for poster presentation.**

Poster. Purdy M., Mohammed N., Crane S., **Boyd J.M.** Effect of Blue Light on *Propionibacterium acnes*. **Aresty Research Symposium.** Rutgers University, Piscataway, NJ, 2017.

Poster. Mohammed, N., Purdy M., Crane S., **Boyd J.M.** Blue light selectively affects the survival of *Propionibacterium acnes*. **Aresty Research Symposium.** Rutgers University, Piscataway, NJ, 2017.

Poster. Al-Tameemi H.M., Roberts C., Mashruwala A.A., Rosario-Cruz Z., Sause W., Torres V.J., Belden W.J., **Boyd J.M.** Iron Sulfur Protein Assembly: A viable Target for Antimicrobial Therapy in *Staphylococcus aureus* **American Society of Microbiology General Meeting.** New Orleans, LA, 2017.

Poster. Mashruwala A.A., Gries C.M., Scherr T.D., van de Guchte, A., Kielian T., **Boyd J.M.** Cellular respiration as a signal for programmed cell lysis in *Staphylococcus aureus*. **Gordon Research Conference on Staphylococcal Biology.** Waterville Valley, NH, 2017.

Poster. Rosario-Cruz Z., Eletsy, Nourhan A., Daigham S., Swapna G.V.T., Szyperski T., Montelione G.T., **Boyd J.M.** NMR Studies of the CopB Protein of the Arginine Catabolic Mobile Element from *Staphylococcus aureus* and *Bacillus subtilis*. **Center for Advanced Biology and Medicine Meeting.** Rutgers University, Piscataway, NJ, 2017.

Poster. Norambuena-Morales J., Hanson T., Wang Y., **Boyd J.M.**, Barkay T. Superoxide dismutase and pseudocatalase are responsible for Hg(II) tolerance in *Thermus thermophilus* HB27. **NASA Astrobiology Meeting.** Coyhaique, Chile, 2017.

Poster. Li W.W., Miller D., Fassih A., Dunn K., **Boyd J.M.**, Friscia D., Fitzgerald L., Southall M.D., Efficacy of a New Low-Level Blue and Red Light Therapy Face Mask for Acne. Annual meeting of the European Academy of Dermatology and Venerology. Geneva, Switzerland 10/2017.

K. Related Work Experience Since My Arrival at Rutgers

Invited ad hoc manuscript reviewer for: Molecular Microbiology, Biochemistry, Antioxidants & Redox Signaling, PLoS Pathogens, Metallomics, Infection and Immunity, Microbiology and Molecular Biology reviews, FEBS Journal, Applied and Environmental Microbiology, PLoS One, Journal of Bacteriology, Research in Microbiology, Biochemica et Biophysica Acta, Journal of Basic Microbiology, Journal of Applied Microbiology, Journal of Biological Inorganic Chemistry, and Antonie van Leeuwenhoek.

Invited ad hoc grant proposal reviewer for: National Science Foundation, National Institutes of Health (COBRE).

Rutgers University Biological Safety Committee, 2016-present

G.H. Cook Honors Program Committee, 2016-2021

Section Chair (Microbiology) for G.H. Cook Honors presentations, 2014-2016

Microbial Biology Graduate Program Membership and Nominations Committee, 2014-2017

Microbial Biology Graduate Program Comprehensive Examination Committee, 2010-present

Microbial Biology Graduate Program Admissions and Academic Standards Committee, 2010-2014

Chair of the Microbial Biology Admissions and Academic Standards Committee, 2013-2014

Robison Award Committee, 2011-present

Organizing committee for symposium for 60th anniversary of Selman Waksman's Nobel Prize in Physiology or Medicine, 2012

Organizing Committee for Rutgers Microbiology Symposium 2016-present

Lipman Hall Safety Committee, 2012-present

Moderator, Rutgers Microbiology Symposium, 2012

Reviewer for the Busch Biomedical Grant Program, 2013, 2016

Rutgers (SEBS) Biology Curriculum Exploration Committee, 2014-2015

Section Moderator, at the International Conference on Gram-Positive Pathogens, Omaha, NE, 2014

Discussion leader, Gordon Research Conference on Staphylococcal Diseases, 2017

L. Professional Affiliations

Phi Kappa Phi

American Society of Microbiology

American Society of Biochemistry and Molecular Biology