Dana A. Baum, Ph.D.

Saint Louis University
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May 2020

EDUCATION

Ph.D. in Chemistry, *University of Kentucky, Lexington, KY* **August 2005**
Dissertation: *In Vitro* and *In Vivo* Characterization of a Trans Excision-Splicing Ribozyme
Advisor: Dr. Stephen M. Testa

B.A. in Chemistry (cum laude), *Washington University in St. Louis, St. Louis, MO* **May 1999**
Area of Concentration: Biochemistry

RESEARCH

07/14 – present	**Associate Professor of Chemistry**, Saint Louis University
08/08 – 06/14	**Assistant Professor of Chemistry,** Saint Louis University
08/05 – 08/08	**Postdoc,** University of Illinois at Urbana-Champaign (with S. K. Silverman)
2002 – 2005	**Graduate Research Associate,** University of Kentucky
2001 – 2002	**Graduate Teaching Assistant,** University of Kentucky
1999 – 2000	**Senior Lab Technician,** Washington University Genome Sequencing Center

SERVICE

Active

07/15 – present	Chemistry Graduate Program Coordinator, SLU
08/11 – present	Member, Graduate Admissions Committee, Department of Chemistry, SLU
09/15 – present	Member, Assessment Committee, Department of Chemistry, SLU
04/15 – present	Member, Career Preparation Committee, A&S, SLU
07/19 – present	Chairperson, Radiation Safety Committee, SLU
01/16 – present	Member, Radiation Safety Committee, SLU
06/19 – present	Member, Dean Search Committee, College of Arts and Sciences, SLU
07/18 – present	Southeast Regional Director, Sigma Xi
07/18 – present	President, SLU Chapter of Sigma Xi
2017 – present	Member, University of Kentucky Chemistry Department Alumni Board

Previous

11/17 – 01/19	Member, Science and Engineering Task Force, SLU
01/09 – 12/18	Program Committee Chair, St. Louis Section of the American Chemical Society
2016 - 2017	Member, Faculty Search Committee, Department of Chemistry, SLU
2015 - 2016	Member, NMR Facility Manager Search Committee, Department of Chemistry, SLU
10/15 – 8/16	Member, Program Review Committee, Department of Chemistry, SLU
Fall 2014	Member, Faculty Search Committee, Department of Chemistry, SLU
08/12 – 05/14	Chemistry representative, Arts and Sciences Faculty Council, SLU
08/14 – 05/16	Member, Graduate Faculty Membership Committee, A&S, SLU
01/12 – 12/15	Alternate member, Radiation Safety Committee, SLU
09/17 – 06/19	Vice Chairperson, Radiation Safety Committee, SLU
07/17 – 06/18	President-elect, SLU Chapter of Sigma Xi
07/15 – 06/17	Secretary, SLU Chapter of Sigma Xi
2016	Writer of Coursepack Quiz Questions for Biochemistry textbook, W.W. Norton

Reviewer *Analyst, Analytica Chimica Acta, Analytical Chemistry, Analytical Methods, Biochemistry, Biomacromolecules, Biophysical Chemistry, Chemical Communications, Chemical Science, ChemMedChem, Dalton Transactions, FEBS Letters, Journal of the American Chemical Society, Journal of Biological Inorganic Chemistry, Journal of the Electrochemical Society, Journal of Molecular Biology, Journal of Molecular Evolution, Journal of the Royal Society Interface, Journal of Visualized Experiments, Langmuir, National Aeronautics and Space Administration, National Institutes of Health SBC-A (ad hoc – 06/14, 02/16), SBIR (03/18), and ZRG1 BCMB-H90 (06/17), National Science Foundation, Nucleic Acids Research, Organic & Biomolecular Chemistry, PLOS ONE, RNA, RSC Advances, Scientific Reports, Swiss National Science Foundation, U.S. Department of Energy*

MEMBERSHIPS

2012	The Electrochemical Society
2007	The RNA Society
2003	American Chemical Society
2001	American Association for the Advancement of Science
1999	Sigma Xi

FELLOWSHIPS, HONORS, AND AWARDS

October 2010	James W. and Carolyn L. Taylor MUACC Travel Award
2006-2008	Postdoctoral Research Fellowship – National Institutes of Health
2007	*ACS Chemical Biology*-sponsored poster prize – 2007 RNA Society Meeting
2001-2005	Research Challenge Trust Fund I Fellowship – University of Kentucky
2001	Tuttle Fellowship – University of Kentucky
June 2000	Washington University Genome Sequencing Center Employee of the Month

COURSES TAUGHT

- CHEM 6900 - Introduction to Proposal Writing and Oral Presentations (Fall 2019 - 2015)
- CHEM 5630/CHEM 593 – Introduction to Chemical Biology and Biotechnology (Fall 2018, 2016, 2012)
- CHEM 509 – Advances in Analysis and Modeling Chemical Systems (Summer 2013)
- CHEM 5000/CHEM 500 – Introduction to Chemical Research (Summer 2019 - 2015)
- CHEM 464 – Biochemistry II (Spring 2012, 2011)
- CHEM 4625/CHEM 465 – Biochemistry Lab II (Spring 2020 - 2009)
- CHEM 4610/CHEM 462 – Biochemistry I (Fall 2019, 2017, 2015, 2013)
- CHEM 463 – Biochemistry Lab I (Fall 2010, 2009, 2008)
- CHEM 391 – Introduction to Chemical Literature (Spring 2014)
- CHEM 164 – General Chemistry II (Fall 2009, 2008)

LAB MEMBERS WHILE AT SLU

Graduate Students

- Kennedy Alila (1/2009 – 08/2011, M.S.)
- Amber Eischen (07/2015 – 05/2017, M.S.)
- Ismaila Emahi (08/2010 – 07/2015, M.S. & Ph.D.)
- Nina Hausmann (Co-mentor, 04/2012 – 07/2013, Ph.D.)
- Allen Mason (07/2011 – 05/2013)
- Ali Parvez (01/2019 – present)
- Marc Polaske (07/2015 – 08/2017, M.S.)
- Jack Samuelian (01/2017 - present)
- Kelsey Schlund (07/2011 – 08//2013, M.S.)
- Erienne TeSelle (07/2013 – 01/2019, M.S. & Ph.D.)
- Mi Zhang (01/2009 – 05/2011, M.S.)
- Ling Zhong (08/2016 – 12/2018, M.S.)

Undergraduate Lab Members

- Ethan Bayer (08/2019 – present)
- Scott Becker (Augustana College – Summer 2019)
- Abraham Behrmann (08/2009 – 05/2010)
- Anit Behera (01/2011 – 05/2012)
- Sujit Bhimireddy (07/2009 – 06/2010)
- Ross Brooker (08/2019 – present)
- Sabrina Bruozas (05/2018 – 05/2019)
- Kyle Buller (06/2010 – 08/2010)
- Jimmy Chakkalakel (08/2016 – 05/2018)
- Johan Carballo (08/2018 – 05/2020)
- Christopher David (01/2017 – 05/2018)
- Catherine Entriken (09/2010 – 05/2011)
- Katherine Foley (01/2013 – 05/2014)
- Lisa Green (08/2014 – 05/2016)
- Rebecca Grout (08/2010 – 05/2011)
- Paige Gruenke (08/2013 – 05/2015)
- Nicholas Guidry (05/2016 – 05/2017)
- Mengyu Han (05/2010 – 05/2011, 01/2012 – 02/2013)
- Thaddeus Hitschler (02/2014 – 05/2015)
- Nicholas Jesse (06/2012 – 12/2013)
- Amanda Koenig (Missouri University of Science and Technology - Summer 2009)
- Hannah Livengood (08/2009 – 05/2010)
- Michael Mitchell (02/2014 – 05/2015)
- Sarah Neisch (01/2018 – 05/2019)
- Minh Pham (05/2018 – present)
- Tejas Pulisetty (01/2010 – 07/2010)
- Syed Rahman (01/2009 – 07/2009)
- John Samuelian (01/2015 – 05/2016)
- Shailja Sheth (05/2016 – 12/2017)
- Derek Sonnenberg (01/2012 – 08/2012, 01/2013 – 12/2013)
- Nickolas Steinauer (08/2012 – 05/2014)
- Andrew Stevens (09/2015 – 05/2016)
- Neha Thakkar (01/2013 – 05/2015)
- Prerak Trivedi (01/2015 – 03/2018)
- John Truong (01/2012 – 05/2012)
- Joanna Wnorowski (08/2010 – 10/2010)

High School Students (Summer unless otherwise noted)

- Christopher Bakker (STARS student 2018)
- Blake Andrews (STARS student 2017)
- Nicholas Lee (STARS student 2016)
- Anjali Pante (STARS student 2016)
- Gavin Turner (STARS student 2015)
- Vickie Williams (STARS student 2015)
- Praveen Bagavandoss (STARS student 2014)
- Lucy Freitag (STARS student 2013)
- Isa Mulvihill (STARS student 2012)
- Dushyant Bhatnagar (2011)
- Daniel Nightingale (STARS student 2011)
- Beenish Qayum (STARS student (2010)

PUBLICATIONS AND PRESENTATIONS

Publications while at SLU

19. TeSelle, E. K. & **Baum, D. A.** (2018) "Isolation of DNA aptamers for herbicides under varying divalent metal ion conditions" Aptamers, **2**, 82-87. ISSN: 2514-3247
18. Emahi, I., Mitchell, M. P., & **Baum, D. A.** (2017) “Electrochemistry of pyrroloquinoline quinone (PQQ) on multi-walled carbon nanotube-modified glassy carbon electrodes in biological buffers” *J. Electrochem. Soc.*, **164**, H3097-H3102. DOI: 10.1149/2.0151703jes
17. Emahi, I., Gruenke, P. R., & **Baum, D. A.** (2015) “Effect of Aptamer Binding on the Electron-Transfer Properties of Redox Cofactors” *J. Mol. Evol.*, **81**, 186-193. DOI: 10.1007/s00239-015-9707-7
16. Emahi, I., Mulvihill, I. M., & **Baum, D. A.** (2015) “Pyrroloquinoline quinone maintains redox activity when bound to a DNA aptamer” *RSC Adv.*, **5**, 7450-7453. DOI: 10.1039/c4ra11052h
15. Hausmann, N. Z., Minteer, S. D., & **Baum, D. A.** (2014) “Controlled Placement of Enzymes on Carbon Nanotubes using Comb-Branched DNA” *J. Electrochem. Soc.*, **161**, H3001-H3004. DOI: 10.1149/2.0011413jes

14. Korang, J., Emahi, E., Grither, W. R., Baumann, S. M., **Baum, D. A.**, & McCulla, R. D. (2013) "Photoinduced DNA cleavage by atomic oxygen precursors in aqueous solutions" *RSC Adv.*, **3**, 12390-12397. DOI: 10.1039/C3RA41597J
13. Behera, A. K., Schlund, K. J., Mason, A. J., Alila, K. O., Han, M., Grout, R. L., & **Baum, D. A.** (2013) "Enhanced deoxyribozyme-catalyzed RNA ligation in the presence of organic cosolvents" *Biopolymers*, **99**, 382-391. DOI: 10.1002/bip.22191
12. Zhang, M., Xu, S., Minteer, S. D., & **Baum, D. A.** (2011) "Investigation of a deoxyribozyme as a biofuel cell catalyst" *J. Am. Chem. Soc.,* **133**, 15890-15893. DOI: 10.1021/ja206787h
11. Alila, K. O, & **Baum, D. A.** (2011) "Modulation of an RNA-branching deoxyribozyme by a small molecule" *Chem. Commun.* **47**, 3227-3229. DOI: 10.1039/C0CC04971A
10. Silverman, S. K. & **Baum, D. A.** (2009) "Use of Deoxyribozymes in RNA Research" *Methods Enzymol.* **469**, 95-117. DOI: 10.1016/S0076-6879(09)69005-4

Publications as a postdoc or graduate student

9. **Baum, D. A.** & Silverman, S. K. (2008) "Deoxyribozymes: Useful DNA Catalysts In Vitro and In Vivo" *Cell. Mol. Life Sci.* **65**, 2156-2174. DOI: 10.1007/s00018-008-8029-y
8. Pradeepkumar, P. I., Höbartner, C., **Baum, D. A.** & Silverman, S. K. (2008) "DNA-Catalyzed Formation of Nucleopeptide Linkages" *Angew. Chem. Int. Ed.* **47**, 1753-1757. DOI: 10.1002/anie.200703676
7. Patel, M. P., **Baum, D. A.** & Silverman, S. K. (2008) "Improvement of DNA Adenylation Using T4 DNA Ligase with a Template Strand and a Strategically Mismatched Acceptor Strand" *Bioorg. Chem.* **36**, 46-56. DOI: 10.1016/j.bioorg.2007.10.001
6. **Baum, D. A.** & Silverman, S. K. (2007) "Deoxyribozyme-Catalyzed Labeling of RNA" *Angew. Chem. Int. Ed.* **46**, 3502-3504. DOI: 10.1002/anie.200700357.
5. **Baum, D. A.** & Testa, S. M. (2005) "In Vivo Excision of a Single Targeted Nucleotide from an mRNA by a Trans Excision-Splicing Ribozyme" *RNA* **11**, 897-905. DOI: 10.1261/rna.2050505
4. Alexander, R. C., **Baum, D. A.**, & Testa, S. M. (2005) "5' Transcript Replacement in vitro Catalyzed by a Group I Intron-Derived Ribozyme" *Biochemistry* **44**, 7796-7804. DOI: 10.1021/bi047284a
3. **Baum, D. A.***, Sinha, J.* & Testa, S. M. (2005) "Molecular Recognition in a Trans Excision-Splicing Ribozyme: Non-Watson-Crick Base Pairs at the 5' Splice Site and ωG at the 3' Splice Site Can Play a Role in Determining the Binding Register of Reaction Substrates" *Biochemistry* **44**, 1067-1077. DOI: 10.1021/bi0482304 **Contributed equally to this work*
2. Johnson, A. K., **Baum, D. A.**, Tye, J., Bell, M. A., & Testa, S. M. (2003) "Molecular Recognition Properties of IGS-Mediated Reactions Catalyzed by a Pneumocystis carinii Group I Intron" *Nucleic Acids Res.* **31**, 1921-1934. DOI: 10.1093/nar/gkg280
1. International Human Genome Sequencing Consortium (2001) "Initial sequencing and analysis of the human genome" *Nature* **409**, 860-921. (Member of the Washington University Genome Sequencing Center)

Oral Presentations while at SLU

* indicates undergraduate students, † indicates graduate students, § indicates high school students

02/2020 STEP Program, Truman State University

12/2019 Department of Chemistry, University of Illinois at Urbana-Champaign

07/2018 Telluride Workshop on Nucleic Acid Chemistry, Telluride Science Research Center, Telluride, CO, July 22 – 27, 2018 (*invited participant*).

10/2016 **Dana A. Baum** "Branching out to organize biomolecules" Midwestern Universities Analytical Chemistry Conference (MUACC) 2016, University of Illinois at Urbana-Champaign, Champaign, IL, October 14, 2016.

09/2016 Department of Chemistry, Middle Tennessee State University

09/2016 Department of Chemistry, Rhodes College

12/2015 **Dana A. Baum** "Developing DNA-based sensors for small molecule pollutant detection" Pacifichem 2015, Honolulu, HI, December 19th, 2015 (*Invited presentation).*

12/2015 **Dana A. Baum** "Employing DNA for bioelectrocatalysis" Pacifichem 2015, Honolulu, HI, December 18th, 2015.

11/2015 Erienne K. TeSelle and **Dana A. Baum** "Investigating Different Metal Ion Concentrations for In Vitro Selection of DNA Aptamers for Pesticide Targets" 71st SWRM/67th SERMACS ACS Regional Meeting, Memphis, TN, November 5, 2015.

04/2015 Department of Chemistry, Southeast Missouri State University

08/2014 Department of Bioengineering, University of Missouri - Columbia

10/2013 Nina Z. Hausmann, Erienne K. TeSelle, and **Dana A. Baum** "Controlled Placement of Enzymes on Electrodes using Comb-branched DNA" 48th ACS Midwest Regional Meeting, Springfield, MO, October 17, 2013.

02/2013 **Dana A. Baum** "Developing DNA components for biofuel cells" Indo-US Workshop on Electrocatalytic Materials for Fuel and Biofuel Cells, Banaras Hindu University, Varanasi, India, February 27, 2013.

01/2013 Department of Chemistry, Creighton University

10/2012 Anit K. Behera*, Allen J. Mason†, Kelsey J. Schlund†, and **Dana A. Baum** "Effects of organic cosolvents on RNA ligation by deoxyribozymes" 47th ACS Midwest Regional Meeting, Omaha, NE, October 25, 2012.

09/2012 **Dana A. Baum** "Deoxyribozymes and Alcohols: An Interesting Mix" Midwestern Universities Analytical Chemistry Conference (MUACC) 2012, University of Wisconsin, Madison, WI, September 28, 2012.

09/2012 Department of Chemistry, Washington University in St. Louis

09/2012 Department of Chemistry and Biochemistry, Bradley University

08/2012 Department of Chemistry, University of Kentucky

05/2012 Mi Zhang†, Ismaila Emahi†, Catherine Entriken*, Dushyant Bhatnagar§, Daniel Nightingale§, and **Dana A. Baum** "Progress towards the development of deoxyribozyme-based biofuel cells" 221st ECS Meeting, Seattle, WA, May 7, 2012.

03/2012 Department of Chemistry, Missouri State University

12/2011 Department of Chemistry and Biochemistry, University of Missouri – St. Louis

08/2011 Kennedy Alila†, Anit Behera*, Rebecca Grout*, Mengyu Han*, and **Dana A. Baum** "Pesticide-dependent DNA aptazymes for sensor development" 242nd ACS National Meeting, Denver, CO, August 29, 2011.

03/2011 Kennedy O. Alila†, Mengyu Han*, Rebecca Grout*, Sujit Bhimireddy*, and **Dana A. Baum** "Development of DNA-based Small Molecule Sensors" 241st ACS National Meeting, Anaheim, CA, March 28, 2011.

10/2010 **Dana A. Baum** "Development of DNA-based Sensors for Small Molecule Pollutants" Midwestern Universities Analytical Chemistry Conference (MUACC) 2010, Purdue University, West Lafayette, IN, October 8, 2010.

05/2010 Department of Biochemistry, Saint Louis University

02/2009 Department of Biology, Saint Louis University

10/2008 **Dana A. Baum** & Scott K. Silverman "Utilizing Deoxyribozymes to Enable Studies of RNA Structure and Function" 43rd ACS Midwest Regional Meeting, Kearney, NE, October 10, 2008. (*Invited presentation)*

Poster Presentations while at SLU

08/2018 **Dana A. Baum** "Investigating the redox properties of aptamer-cofactor complexes" Aptamers in Boulder, Boulder, CO, August 3, 2018.

11/2016 **Dana A. Baum** "Developing Functional DNA Components for Sensors and Biofuel Cells" Sigma Xi Annual Meeting and Research Symposium, Atlanta, GA, November 11, 2016.

09/2013 Allen J. Mason†, Derek M. Sonnenberg, and **Dana A. Baum** "Effects of organic cosolvents on RNA-cleaving deoxyribozyme metal specificity" 246th ACS National Meeting, Indianapolis, IN, September 8, 2013.

04/2013 Allen J. Mason†, Kelsey J. Schlund†, Anit K. Behera*, and **Dana A. Baum** "Influence of organic cosolvents on deoxyribozyme activity" 245th ACS National Meeting, New Orleans, LA, April 7, 2013.

07/2011 Kennedy O. Alila†, Mengyu Han*, Rebecca Grout*, Anit Behera*, Sujit Bhimireddy*, and **Dana A. Baum** "Development of small molecule sensors using DNA aptazymes" Gordon Research Conference: Nucleosides, Nucleotides, and Oligonucleotides, Newport, RI, July 3 - 8, 2011.

Oral Presentations by SLU students

04/2020 Johan A. Carballo*. Synthesis and Characterization of an Amine Reactive Formylmethylflavin. 50th Annual Leopard Marcus Award Competition, Saint Louis University (online), April 27, 2020. *Marcus Award Winner*

10/2019 Jack Samuelian†, Seth Staller, Radhav Poudyal, Maddie S. Willis, Manami Roychowdhury-Saha, Johan Carballo*, Xiao Heng, Donald Burke, and **Dana A. Baum**. An FAD-binding RNA Aptamer that Changes the Redox Potential of FAD. 2019 RNA Cornbelt Meeting, Columbia, MO, October 18, 2019.

06/2019 Jack Samuelian†, Seth Staller, Maddie S. Willis, David Porciani, Johan Carballo*, Radhav Poudyal, Manami Roychowdhury-Saha, Xiao Heng, **Dana A. Baum,** and Donald Burke. A FAD-binding RNA Aptamer that Increases the Redox Potential of FAD. 2019 Astrobiology Science Conference, Seattle, WA, June 27, 2019.

11/2016 Marc R. Polaske†, Erienne K. TeSelle†, and **Dana A. Baum** "Construction of a Deoxyribozyme-containing Glucose Biosensor using Comb-branched DNA" 51st MWRM ACS Regional Meeting, Manhattan, KS, October 27, 2016.

12/2015 Erienne K. TeSelle† and **Dana A. Baum** "Directed biomolecule immobilization on comb-branched DNA" Pacifichem 2015, Honolulu, HI, December 18, 2015.

11/2015 Erienne K. TeSelle† and **Dana A. Baum** "Immobilization of biomolecules on multiple-branched DNA structures" 71st SWRM/67th SERMACS ACS Regional Meeting, Memphis, TN, November 5, 2015.

10/2014 Ismaila Emahi†, Michael P. Mitchell*, Praveen Bagavandoss§, and **Dana A. Baum** "Investigating the Ability of DNA Aptamer-Pyrroloquinoline Quinone (PQQ) Complexes to Oxidize Various Substrates" 66th Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, October 17, 2014.

05/2014 Ismaila Emahi†, Paige Gruenke*, Lucy Freitag§, and **Dana A. Baum** "Investigating the Redox Abilities of DNA Aptamers Bound to Redox Cofactors for Possible Application in Biofuel Cells" 225th ECS Meeting, Orlando, FL, May 13, 2014.

09/2013 Ismaila Emahi†, Lucy Freitag§, Isa M. Mulvihill§, Mengyu Han*, Derek M. Sonnenberg*, and **Dana A. Baum** "DNA aptamers for redox cofactors as possible catalysts for biofuel cells" 246th ACS National Meeting, Indianapolis, IN, September 8, 2013.

04/2011 Catherine Entriken* "Progress Towards Identifying an Aldehyde Dehydrogenase Deoxyribozyme For Use in Biofuel Cells" 41st Annual Leopold Marcus Award Competition, April 6, 2011.

04/2011 Rebecca Grout* "In Vitro Selection of RNA-Ligating DNA Aptazymes for Use in Pesticide Biosensors" 41st Annual Leopold Marcus Award Competition, April 6, 2011.

03/2011 Mi Zhang†, Kyle Buller*, Joanna Wnorowski*, and **Dana A. Baum** "Investigation of deoxyribozymes as catalysts for biofuel cells" 241st ACS National Meeting, Anaheim, CA, March 30, 2011.

03/2011 Kennedy O. Alila†, Rebecca Grout*, Mengyu Han*, and **Dana A. Baum** "Development of DNA-based Small Molecule Sensors" 241st ACS National Meeting, Anaheim, CA, March 31, 2011.

Poster Presentations by SLU students

* indicates undergraduate students, † indicates graduate students, § indicates high school students

05/2020 Jack Samuelian†, Thoman Gremminger, Radhav Poudyal, Seth Staller, Maddie Willis, David Porciani, Johan Carballo*, Xiao Heng, Donald H. Burke, and **Dana A. Baum**. Modulation of Reduction Potential by Redox-Sensitive RNA Aptamer to Flavin Adenine Dinucleotide. 2020 RNA Society Meeting, Virtual Meeting, May 26 – 31, 2020.

11/2019 Johan Carballo*, Jack S. Samuelian†, and **Dana A. Baum**. Synthesis and Characterization of an Amine Reactive Formylmethylflavin. 2019 ACS/SAS Sections Undergraduate Research Symposium, St. Louis, MO, November 16, 2019. *1st Place Poster Award*

10/2019 Jack Samuelian†, Seth Staller, Radhav Poudyal, Maddie S. Willis, Manami Roychowdhury-Saha, Johan Carballo*, Xiao Heng, Donald Burke, and **Dana A. Baum**. An FAD-binding RNA Aptamer that Changes the Redox Potential of FAD. 2019 RNA Cornbelt Meeting, Columbia, MO, October 18, 2019. *Poster Award sponsored by the RNA Society*

05/2019 Jack Samuelian†, Johan Carballo*, Seth Staller, Radhav Poudyal, Maddie S. Willis, Manami Roychowdhury-Saha, Xiao Heng, Donald Burke, and **Dana A. Baum**. A Positive Shift in the RNA World Hypothesis: An RNA Aptamer that Increases the Redox Potential of FAD. 2019 Sigma Xi Research Symposium, Saint Louis University, May 6, 2019.

05/2019 Sabrina Bruozas*, John Throgmorton, **Dana A. Baum**, and Ryan D. McCulla. Comparing The Effect of Oligonucleotide Length on Cleavage By Atomic Oxygen Generated from Dibenzothiophene-S-Oxide (DBTO). 2019 Sigma Xi Research Symposium, Saint Louis University, May 6, 2019.

05/2019 Johan Carballo*, Jack Samuelian†, Seth Staller, Radhav Poudyal, Maddie S. Willis, Manami Roychowdhury-Saha, Xiao Heng, Donald Burke, and **Dana A. Baum**. UV-Vis Spectroscopy Studies of FAD-Binding RNA Aptamers. 2019 Sigma Xi Research Symposium, Saint Louis University, May 6, 2019.

04/2019 Sabrina Bruozas*, John Throgmorton, **Dana A. Baum**, and Ryan D. McCulla. Comparing The Effect of Oligonucleotide Length on Cleavage By Atomic Oxygen Generated from Dibenzothiophene-S-Oxide (DBTO). 49th Annual Leopard Marcus Award Competition, Saint Louis University, April 29, 2019.

11/2018 Sarah E. Neisch*, Erienne K. TeSelle† and **Dana A. Baum**. Advances in comb-branched DNA synthesis. 2018 ACS-St. Louis Section Undergraduate Research Symposium, Southern Illinois University-Edwardsville, November 2, 2018. *Honorable Mention*

05/2018 Christopher David*, Jimmy Chakkalakel* Marc Polaske†, and **Dana A. Baum**. Design of an Isolation Method for Adenylated Oligonucleotides Using an Adenosine Aptamer. 2018 Sigma Xi Research Symposium, Saint Louis University, May 1, 2018.

05/2018 John S. Samuelian†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Spectroscopic Investigations of FAD-binding RNA Aptamers. 2018 Sigma Xi Research Symposium, Saint Louis University, May 1, 2018.

05/2018 Erienne K. TeSelle† and **Dana A. Baum**. Effects of Aptamer and Deoxyribozyme Choice on Aptazyme Performance. 2018 Sigma Xi Research Symposium, Saint Louis University, May 1, 2018.

05/2018 Ling Zhong†, John Throgmorton, Amber M. Eischen, Ryan McCulla, and **Dana A. Baum**. Aptamer Structure Probing by Photoactivated Atomic Oxygen from Dibenzothiophene-S-Oxide (DBTO). 2018 Sigma Xi Research Symposium, Saint Louis University, May 1, 2018.

04/2018 John S. Samuelian†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Spectroscopic Investigations of FAD-binding RNA Aptamers. 24th Annual Saint Louis University Graduate Research Symposium, April 27, 2018.

04/2018 Erienne K. TeSelle† and **Dana A. Baum**. Effects of Aptamer and Deoxyribozyme Choice on Resulting Aptazyme Performance. 24th Annual Saint Louis University Graduate Research Symposium, April 27, 2018.

04/2018 Ling Zhong†, John Throgmorton, Amber M. Eischen, Ryan McCulla, and **Dana A. Baum**. Aptamer Structure Probing by Photoactivated Atomic Oxygen from Dibenzothiophene-S-Oxide (DBTO)-Linked Ligands. 24th Annual Saint Louis University Graduate Research Symposium, April 27, 2018.

05/2017 Amber M. Eischen†, John Throgmorton, Ryan McCulla, and **Dana A. Baum**. Aptamer structure probing using dibenzothiophene-S-oxide (DBTO)-linked ligands. 2017 Sigma Xi Research Symposium, Saint Louis University, May 1, 2017.

05/2017 Marc R. Polaske†, Erienne K. TeSelle†, and **Dana A. Baum**. Biomolecular Immobilization on Comb-Branched DNA for Improved Sensor Performance. 2017 Sigma Xi Research Symposium, Saint Louis University, May 1, 2017.

05/2017 Erienne K. TeSelle† and **Dana A. Baum**. Aptamer Characterization and Aptazyme Development for Herbicide Detection. 2017 Sigma Xi Research Symposium, Saint Louis University, May 1, 2017.

04/2017 Marc R. Polaske†, Erienne K. TeSelle†, and **Dana A. Baum**. Using Comb-Branched DNA to Construct Deoxyribozyme-Based Biosensors. 253rd ACS National Meeting, San Francisco, CA, April 2, 2017.

03/2017 Marc R. Polaske†, Erienne K. TeSelle†, and **Dana A. Baum**. Using Comb-Branched DNA to Construct Deoxyribozyme-Based Biosensors. 23rd Annual Saint Louis University Graduate Research Symposium, March 31, 2017.

05/2016 Amber M. Eischen†, John S. Samuelian*, Ismaila Emahi†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Electrochemical characterization of Flavin adenine dinucleotide-binding RNA aptamers. 2016 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 3, 2016.

05/2016 Lisa C. Green*, Prerak B. Trivedi* Erienne K. TeSelle†, and **Dana A. Baum**. Investigating the Effect of Minimization on DNA Aptamers 2016 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 3, 2016.

05/2016 Marc R. Polaske†, Erienne K. TeSelle†, and **Dana A. Baum**. Use of Comb-Branched DNA for Construction of a Deoxyribozyme-Containing Glucose Biosensor. 2016 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 3, 2016.

05/2016 Erienne K. TeSelle† and **Dana A. Baum**. Identification and Characterization of Atrazine and Alachlor Aptamers. 2016 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 3, 2016.

04/2016 John S. Samuelian*, Ismaila Emahi†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Electrochemical investigations of FAD-binding RNA aptamers. 46th Annual Leopold Marcus Award Competition, April 28, 2016. *Marcus Award Winner*

04/2016 Amber M. Eischen†, John S. Samuelian*, Ismaila Emahi†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Electrochemical characterization of Flavin adenine dinucleotide-binding RNA aptamers. 22nd Annual Saint Louis University Graduate Research Symposium, April 22, 2016.

04/2016 Erienne K. TeSelle† and **Dana A. Baum**. Identification and Characterization of Atrazine and Alachlor Aptamers. 22nd Annual Saint Louis University Graduate Research Symposium, April 22, 2016.

04/2016 Lisa Green* Investigating the Effect of Minimization on DNA Aptamers for Alachlor and Atrazine. 2016 Senior Legacy Symposium, Saint Louis University, April 20, 2016.

04/2016 John Samuelian* Electrochemical investigations of FAD-binding RNA aptamers. 2016 Senior Legacy Symposium, Saint Louis University, April 20, 2016.

12/2015 Erienne K. TeSelle† and **Dana A. Baum.** Aptamer immobilization on comb-branched DNA scaffolds for bioanalytical applications. Pacifichem 2015, Honolulu, HI, December 19, 2015.

11/2015 John S. Samuelian*, Ismaila Emahi†, Radhav Poudyal, Seth S. Staller, Donald H. Burke, and **Dana A. Baum**. Electrochemical investigations of FAD-binding RNA aptamers. 71st SWRM/67th SERMACS ACS Regional Meeting, Memphis, TN, November 6, 2015.

05/2015 Ismaila Emahi†, Michael P. Mitchell*, and **Dana A. Baum**. Characterization of Pyrroloquinoline Quinone (PQQ)-Aptamer Complexes as Possible Catalysts for Biofuel Cells. 2015 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 04, 2015. *1st place poster prize*

05/2015 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum**. Investigating the Redox Activity of NADH and FAD When Complexed to Aptamers. 2015 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 04, 2015.

05/2015 Erienne K. TeSelle† and **Dana A. Baum**. Identifying Atrazine and Alachlor Aptamers using Structure-Switching In Vitro Selection. 2015 Sigma Xi / IFSA Research Symposium & Spring Meeting, Saint Louis University, May 04, 2015.

04/2015 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum**. Investigating the Redox Activity of NADH and FAD When Complexed to Aptamers. 45th Annual Leopold Marcus Award Competition, April 27, 2015.

04/2015 Ismaila Emahi†, Michael P. Mitchell*, Paige R. Gruenke*, and **Dana A. Baum**. Developing optimal MWCNT-modified electrodes for studying the electrochemistry of key redox cofactors and their aptamers. 21st Annual Saint Louis University Graduate Research Symposium, April 24, 2015.

04/2015 Erienne K. TeSelle† and **Dana A. Baum**. Identifying Atrazine and Alachlor Aptamers using Structure-Switching In Vitro Selection. 21st Annual Saint Louis University Graduate Research Symposium, April 24, 2015.

04/2015 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum**. Investigating the Redox Activity of NADH and FAD When Complexed to Aptamers. Senior Legacy Symposium, Saint Louis University, April 22, 2015.

03/2015 Ismaila Emahi†, Paige R. Gruenke*, Michael P. Mitchell*, and **Dana A. Baum**. Redox Cofactor-Aptamer Complexes as Possible Catalysts for Biofuel Cells. 249th American Chemical Society (ACS) National Meeting and Exposition, Denver, CO. March 24, 2015.

03/2015 Ismaila Emahi†, Michael P. Mitchell*, Paige R. Gruenke*, and **Dana A. Baum**. Developing optimal MWCNT-modified electrodes for studying the electrochemistry of key redox cofactors and their complexes with aptamers. 249th American Chemical Society (ACS) National Meeting and Exposition, Denver, CO. March 24, 2015.

10/2014 Michael P. Mitchell*, Ismaila Emahi†, and **Dana A. Baum** "Redox Activity of Pyrroloquinoline Quinone in Various Biological Buffers" 66th Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, October 19, 2014.

10/2014 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum** "Investigating Redox Activity of NADH and FAD When Complexed to DNA Aptamers" 66th Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, October 18, 2014.

10/2014 Erienne K. TeSelle†, Nina Z. Hausmann†, and **Dana A. Baum** "Comb-Branched DNA for Enzyme Immobilization on Electrodes" 66th Southeastern Regional Meeting of the American Chemical Society, Nashville, TN, October 17, 2014.

05/2014 Ismaila Emahi†, Paige R. Gruenke*, Michael P. Mitchell*, and **Dana A. Baum** "Reversible redox chemistry of pyrroloquinoline quinone on multi-walled carbon nanotube-modified glassy carbon electrodes in physiological buffers" Sigma Xi Research Symposium, Saint Louis University, May 5, 2014.

05/2014 Katherine C. Foley*, Nickolas P. Steinauer*, Nicholas J. Jesse*, Kelsey J. Schlund†, and **Dana A. Baum** "Characterization of DNA-ligating deoxyribozymes" Sigma Xi Research Symposium, Saint Louis University, May 5, 2014.

05/2014 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum** "Electrochemical Characterization of a DNA Aptamer for Nicotinamide Adenine Dinucleotide" Sigma Xi Research Symposium, Saint Louis University, May 5, 2014.

05/2014 Erienne TeSelle†, Nina Hausmann†, and **Dana A. Baum** "Comb-Branched DNA Formation and Purification for Enzyme Immobilization on Electrodes" Sigma Xi Research Symposium, Saint Louis University, May 5, 2014.

04/2014 Katherine C. Foley*, Nickolas P. Steinauer*, Nicholas J. Jesse*, Kelsey J. Schlund†, and **Dana A. Baum** "Characterization of DNA-ligating deoxyribozymes" 44nd Annual Leopold Marcus Award Competition, April 28, 2014.

04/2014 Katherine C. Foley*, Nickolas P. Steinauer*, Nicholas J. Jesse*, Kelsey J. Schlund†, and **Dana A. Baum** "Characterization of DNA-ligating deoxyribozymes" Senior Legacy Symposium, Saint Louis University, April 23, 2014.

04/2014 Katherine C. Foley*, Nickolas P. Steinauer*, Nicholas J. Jesse*, Kelsey J. Schlund†, and **Dana A. Baum** "Characterization of DNA-ligating deoxyribozymes" St. Louis Section ACS Undergraduate Research Symposium, April 11, 2014. *1st place poster prize*

04/2014 Paige R. Gruenke*, Ismaila Emahi†, and **Dana A. Baum** "Electrochemical Characterization of a DNA Aptamer for Nicotinamide Adenine Dinucleotide" St. Louis Section ACS Undergraduate Research Symposium, April 11, 2014.

04/2014 Ismaila Emahi†, Paige R. Gruenke*, Lucy Freitag§, and **Dana A. Baum** "Electrochemical Characterization of DNA Aptamers for Redox Cofactors" 20th Annual St. Louis University Graduate Research Symposium, April 11, 2014.

03/2014 Katherine C. Foley*, Nickolas P. Steinauer*, Nicholas J. Jesse*, Kelsey J. Schlund†, and **Dana A. Baum** "Characterization of DNA-ligating deoxyribozymes" 247th ACS National Meeting, Dallas, TX, March 16 &17, 2014.

09/2013 Nickolas P. Steinauer*, Nicholas J. Jesse*, Katherine C. Foley*, Kelsey J. Schlund†, and **Dana A. Baum** "Selection of DNA-ligating deoxyribozymes for aptazyme development" 246th ACS National Meeting, Indianapolis, IN, September 9, 2013.

04/2013 Kelsey J. Schlund†, Nicholas J. Jesse*, Nickolas P. Steinauer*, and **Dana A. Baum** "Identification of herbicide-dependent aptazymes" Sigma Xi/IFSA Research Symposium and Spring Meeting, Saint Louis University, April 29, 2013. *1st place poster prize*

04/2013 Allen J. Mason† and **Dana A. Baum** "The effect of organic cosolvents on RNA-cleaving deoxyribozymes" Sigma Xi/IFSA Research Symposium and Spring Meeting, Saint Louis University, April 29, 2013.

04/2013 Ismaila Emahi†, Mengyu Han*, Isa M. Mulvihill§, Derek M. Sonnenberg*, and **Dana A. Baum** "Characterization of DNA aptamers for pyrroloquinoline quinone" Sigma Xi/IFSA Research Symposium and Spring Meeting, Saint Louis University, April 29, 2013.

04/2013 Kelsey J. Schlund†, Nicholas J. Jesse*, Nickolas P. Steinauer*, and **Dana A. Baum** "Identification of herbicide-dependent aptazymes" 19th Annual St. Louis University Graduate Research Symposium, April 26, 2013.

04/2013 Allen J. Mason† and **Dana A. Baum** "The effect of organic cosolvents on RNA-cleaving deoxyribozymes" 19th Annual St. Louis University Graduate Research Symposium, April 26, 2013.

04/2013 Ismaila Emahi†, Mengyu Han*, Isa M. Mulvihill§, Derek M. Sonnenberg*, and **Dana A. Baum** "Characterization of DNA aptamers for pyrroloquinoline quinone" 19th Annual St. Louis University Graduate Research Symposium, April 26, 2013. *2nd place poster prize*

04/2013 Nicholas J. Jesse*, Nickolas P. Steinauer*, Kelsey J. Schlund†, and **Dana A. Baum** "Selection of DNA-ligating deoxyribozymes for aptazyme development" St. Louis Section ACS Undergraduate Research Symposium, April 12, 2013.

08/2012 Kelsey J. Schlund†, Anit K. Behera*, Allen J. Mason†, Derek M. Sonnenberg*, and **Dana A. Baum** "Enhanced activity of RNA-ligating deoxyribozymes in organic cosolvents" 244th ACS National Meeting, Philadelphia, PA, August 19, 2012.

08/2012 Allen J. Mason†, Derek M. Sonnenberg*, and **Dana A. Baum** "Effect of organic cosolvents on RNA-cleaving deoxyribozymes" 244th ACS National Meeting, Philadelphia, PA, August 19, 2012.

08/2012 Ismaila Emahi†, Mengyu Han*, Isa M. Mulvihill§, and **Dana A. Baum** "Identification and characterization of DNA aptamers for pyrroloquinoline quinone" 244th ACS National Meeting, Philadelphia, PA, August 21, 2012.

05/2012 Anit Behera* and **Dana A. Baum** "Characterization of alcohol-tolerant deoxyribozymes" St. Louis Section ACS Undergraduate Research Symposium, May 4, 2012.

05/2012 Mengyu Han*, Ismaila Emahi†, and **Dana A. Baum** "Characterization of DNA Aptamers for Pyrroloquinoline Quinone" St. Louis Section ACS Undergraduate Research Symposium, May 4, 2012.

04/2012 Anit Behera* and **Dana A. Baum** "Characterization of alcohol-tolerant deoxyribozymes" 42nd Annual Leopold Marcus Award Competition, April 30, 2012. *Marcus Award Winner*

04/2012 Ismaila Emahi†, Mengyu Han*, and **Dana A. Baum** "Identification of DNA Aptamers for Pyrroloquinoline Quinone" 18th Annual Saint Louis University Graduate Research Symposium, April 27, 2012.

11/2011 Ismaila Emahi†, Allen J. Mason†, Kelsey J. Schlund†, and **Dana A. Baum** "Identification of DNA Aptamers for a Redox Cofactor" Midwestern Universities Analytical Chemistry Conference (MUACC) 2011, St. Louis, MO, November 11, 2011.

11/2011 Allen J. Mason† and **Dana A. Baum** "Incorporating destabilizing modifications into deoxyribozymes to achieve multiple turnover catalysts for sensors" Midwestern Universities Analytical Chemistry Conference (MUACC) 2011, St. Louis, MO, November 11, 2011.

11/2011 Kelsey J. Schlund† and **Dana A. Baum** "DNA-RNA Chimera Aptazymes as Sensors" Midwestern Universities Analytical Chemistry Conference (MUACC) 2011, St. Louis, MO, November 11, 2011.

10/2011 Anit K. Behera*, Kennedy O. Alila†, and **Dana A. Baum** "Investigation of alcohol-tolerant deoxyribozymes" 46th Midwest and 39th Great Lakes Joint Regional ACS Meeting, St. Louis, MO, October 20, 2011.

10/2011 Ismaila Emahi†, Allen J. Mason†, Kelsey J. Schlund†, and **Dana A. Baum** "Identification of DNA Aptamers for a Redox Cofactor" 46th Midwest and 39th Great Lakes Joint Regional ACS Meeting, St. Louis, MO, October 20, 2011.

08/2011 Anit K. Behera*, Kennedy O. Alila†, Rebecca Grout*, Mengyu Han*, and **Dana A. Baum** "Kinetic studies of pesticide-dependent DNA aptazymes" 242nd ACS National Meeting, Denver, CO, August 29, 2011.

12/2010 Kennedy O. Alila† & **Dana A. Baum** "Modulation of an RNA-branching deoxyribozyme by a small molecule" 66th Southwest and 62nd Southeastern Regional Meeting of the ACS, New Orleans, LA, December 1, 2010.

12/2010 Mi Zhang† & **Dana A. Baum** "The construction of deoxyribozyme-based biofuel cells" 66th Southwest and 62nd Southeastern Regional Meeting of the ACS, New Orleans, LA, December 1, 2010.

Presentations as a postdoc or graduate student prior to SLU

08/2008 **Dana A. Baum** & Scott K. Silverman "Progress Towards General Deoxyribozymes for Synthesis of Linear and Branched RNA" 13th Annual Meeting of the RNA Society, Berlin, Germany, July 28 – August 3, 2008. (*Poster presentation)*

05/2007 **Dana A. Baum** & Scott K. Silverman "DECAL: Deoxyribozyme-Catalyzed Labeling of RNA" 12th Annual Meeting of the RNA Society, University of Wisconsin, Madison, WI, May 29 – June 3, 2007. *Winner of ACS Chemical Biology-sponsored poster prize.*

05/2005 **Dana A. Baum** & Stephen M. Testa "In Vivo Excision of a Single Targeted Nucleotide from an mRNA by a Trans Excision-Splicing Ribozyme" 10th Annual Meeting of the RNA Society, Banff, Alberta, Canada, May 27, 2005. (*Oral presentation)*

05/2005 **Dana A. Baum** & Stephen M. Testa "In Vivo Excision of a Single Targeted Nucleotide from an mRNA by a Trans Excision-Splicing Ribozyme" The 2005 Naff Symposium on Chemistry and Molecular Biology, University of Kentucky, Lexington, KY, April 15, 2005. (*Poster presentation)*

06/2004 **Dana A. Baum**, Joy Sinha, & Stephen M. Testa "Molecular Recognition of 5' and 3' Splice-Sites in a Trans Excision-Splicing Reaction" 9th Annual Meeting of the RNA Society, University of Wisconsin, Madison, WI, June 1 – June 6, 2004. (*Poster presentation)*

FUNDING WHILE AT SLU

01/2017 - 01/2021	National Aeronautics and Space Administration (NNX17AE88G - Subcontract) Project Title: Metabolite-linked RNA Transcripts Role: Co-I
06/2012 – 05/2015	National Institutes of Health (1R15GM101595-01) Project Title: Identification of DNA aptazymes for small-molecule sensors
01/2010 – 05/2011	President's Research Fund, Saint Louis University Project Title: Redox Deoxyribozymes for Biofuel Cells
08/2008 – 07/2011	Start-up Funds, Saint Louis University