Dana A. Baum, Ph.D.

Saint Louis University
Department of Chemistry
3501 Laclede Avenue
Monsanto Hall 225
St. Louis, MO 63103

(314) 977-2842
(314) 977-2521 FAX

e-mail: dana.baum@slu.edu
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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
07/19 – present	Chairperson, Radiation Safety Committee, SLU
01/16 – present	Member, Radiation Safety Committee, SLU
07/18 – present	Southeast Regional Director, Sigma Xi
2017 – present	Member, University of Kentucky Chemistry Department Alumni Board
07/21 – present	Treasurer, SLU Chapter of Sigma Xi

Previous

President, SLU Chapter of Sigma Xi (07/18 – 07/21); President-elect, SLU Chapter of Sigma Xi (07/17 – 06/18); Secretary, SLU Chapter of Sigma Xi (07/15 – 06/17); Member, Dean Search Committee, College of Arts and Sciences, SLU (06/19 – 10/20); Member, Science and Engineering Task Force, SLU (11/17 – 01/19); Program Committee Chair, St. Louis Section of the American Chemical Society (01/09 – 12/18); Member, Faculty Search Committee, Department of Chemistry, SLU (2016 – 2017); Member, NMR Facility Manager Search Committee, Department of Chemistry, SLU (2015 - 2016); Member, Program Review Committee, Department of Chemistry, SLU (10/15 – 8/16); Member, Career Preparation Committee, A&S, SLU (2015); Member, Faculty Search Committee, Department of Chemistry, SLU (Fall 2014); Chemistry representative, Arts and Sciences Faculty Council, SLU (08/12 – 05/14); Member, Graduate Faculty Membership Committee, A&S, SLU (08/14 – 05/16); Alternate member, Radiation Safety Committee, SLU (01/12 – 12/15); Vice Chairperson, Radiation Safety Committee, SLU (09/17 – 06/19); Writer of Coursepack Quiz Questions for Biochemistry textbook, W.W. Norton (2016).

Reviewer

ACS Catalysis, *Analyst, Analytica Chimica Acta, Analytical Chemistry, Analytical Methods, Biochemistry, Biochimie, Bioconjugate Chemistry, Biomacromolecules, Biophysical Chemistry, Chemical Communications, Chemical Science, ChemBioChem, 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, Talanta, U.S. Department of Energy

MEMBERSHIPS

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

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 2021 - 2015)
- CHEM 5630/CHEM 593 – Introduction to Chemical Biology and Biotechnology (Fall 2020, 2018, 2016, 2012)
- CHEM 509 – Advances in Analysis and Modeling Chemical Systems (Summer 2013)
- CHEM 5000/CHEM 500 – Introduction to Chemical Research (Summer 2021 - 2015)
- CHEM 464 – Biochemistry II (Spring 2012, 2011)
- CHEM 4625/CHEM 465 – Biochemistry Lab II (Spring 2021 - 2009)
- CHEM 4610/CHEM 462 – Biochemistry I (Fall 2021, 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, Ph.D.)
- Nina Hausmann (Co-mentor, 04/2012 – 07/2013, Ph.D.)
- Allen Mason (07/2011 – 05/2013)
- Ali Parvez (01/2019 – present)
- Trevor Pentland (07/2021 – 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, 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 – 05/2021)
- 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 – 05/2020)
- 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)
- Regan Orr (01/2022 – present)
- Sheena Patel (08/2020 – present)
- Shreya Patel (08/2020 – present)
- Minh Pham (05/2018 – 05/2021)
- Tejas Pulisetty (01/2010 – 07/2010)
- Syed Rahman (01/2009 – 07/2009)
- Blake Recupido (08/2021 – present)
- 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)
- Kirsten Sully (08/2021 – present)
- 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)

Oral Presentations by SLU students (2011 – present) = 16

Poster Presentations by SLU students (2010 – present) = 76

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

12/2021 Pacifichem 2021, Virtual, December 16 - 17, 2021 (*2 presentations, 1 Invited).*

10/2021 ACS Midwest Regional Meeting, Springfield, MO, October 21, 2021.

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 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 Pacifichem 2015, Honolulu, HI, December 18 – 19, 2015 (*2 presentations, 1 invited).*

11/2015 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 48th ACS Midwest Regional Meeting, Springfield, MO, October 17, 2013.

02/2013 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 47th ACS Midwest Regional Meeting, Omaha, NE, October 25, 2012.

09/2012 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 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 242nd ACS National Meeting, Denver, CO, August 29, 2011.

03/2011 241st ACS National Meeting, Anaheim, CA, March 28, 2011.

10/2010 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 43rd ACS Midwest Regional Meeting, Kearney, NE, October 10, 2008. (*Invited presentation)*

Poster Presentations while at SLU

08/2018 Aptamers in Boulder, Boulder, CO, August 3, 2018.

11/2016 Sigma Xi Annual Meeting and Research Symposium, Atlanta, GA, November 11, 2016.

09/2013 246th ACS National Meeting, Indianapolis, IN, September 8, 2013.

04/2013 245th ACS National Meeting, New Orleans, LA, April 7, 2013.

07/2011 Gordon Research Conference: Nucleosides, Nucleotides, and Oligonucleotides, Newport, RI, July 3 - 8, 2011.

Presentations as a postdoc or graduate student prior to SLU

08/2008 13th Annual Meeting of the RNA Society, Berlin, Germany, July 28 – August 3, 2008. (*Poster presentation)*

05/2007 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 10th Annual Meeting of the RNA Society, Banff, Alberta, Canada, May 27, 2005. (*Oral presentation)*

05/2005 The 2005 Naff Symposium on Chemistry and Molecular Biology, University of Kentucky, Lexington, KY, April 15, 2005. (*Poster presentation)*

06/2004 9th Annual Meeting of the RNA Society, University of Wisconsin, Madison, WI, June 1 – June 6, 2004. (*Poster presentation)*

FUNDING WHILE AT SLU

08/2021 - 07/2026 National Aeronautics and Space Administration (80NSSCV21K0596 – Subcontract)
Project Title: Brining RNA to Life – Emergence of Biological Catalysis
Role: Co-I

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