

Dana A. Baum, Ph.D.

Saint Louis University
Department of Chemistry
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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

POSITIONS

07/25 – present **Administrative Fellow**, School of Science and Engineering, Saint Louis University
07/22 – 06/25 **Associate Dean for Graduate Affairs**, School of Science and Engineering, Saint Louis University
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

01/25 – present Member, Graduate Education Administrative Review Task Force, SLU
07/19 – present Chairperson, Radiation Safety Committee, SLU
01/16 – present Member, Radiation Safety Committee, SLU
2017 – present Member, University of Kentucky Chemistry Department Alumni Board
07/21 – present Treasurer, SLU Chapter of Sigma Xi

Previous

Southeast Regional Director, Sigma Xi (07/18 – 06/24); Chemistry Graduate Program Coordinator, SLU (07/15 – 06/22); Member, Chemistry Graduate Admissions Committee, SLU (08/11 – 06/22); Member, Chemistry Assessment Committee, SLU (09/15 – 06/22); 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, Analysis & Sensing, Analyst, Analytica Chimica Acta, Analytical Chemistry, Analytical Methods, Biochemistry, Biochimie, Bioconjugate Chemistry, Biomacromolecules, Biophysical Chemistry, Biosensors, 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, National Science Foundation, Nucleic Acids Research, Organic & Biomolecular Chemistry, PLOS ONE, RNA, RSC Advances, Scientific Reports, Small, 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

2023	2023 Saint Louis University Scholarly Works Award, Senior Faculty, Non-Books (Articles)
October 2010	James W. and Carolyn L. Taylor MUACC Travel Award
2006-2008	Postdoctoral Research Fellowship – National Institutes of Health
2007	ACS <i>Chemical Biology</i> -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 2024, 2022, 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 2023 - 2025, 2021 - 2009)
- CHEM 4610/CHEM 462 – Biochemistry I (Fall 2021, 2019, 2017, 2015, 2013)
- CHEM 4615/CHEM 463 – Biochemistry Lab I (Fall 2023, 2010 - 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.)
- Brian Kamusinga (03/2024 – present)
- Usna Khan (06/2024 – present)
- Nina Hausmann (Co-mentor, 04/2012 – 07/2013, Ph.D.)
- Meghan Lingle (10/2023 – present)
- 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 – 07/2022, Ph.D.)
- 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 Chakkalake (08/2016 – 05/2018)
- Siri Chevuru (01/2023 – 05/2024)
- Johan Carballo (08/2018 – 05/2020)
- Vicky Coneva (01/2025 – present)
- Christopher David (01/2017 – 05/2018)
- Catherine Entriiken (09/2010 – 05/2011)
- Emily Falk (8/2022 – 05/2024)
- 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)
- Megan Hughes (08/2024 – present)
- 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 – 05/2023)
- Sheena Patel (08/2020 – 05/2022)
- Shreya Patel (08/2020 – 05/2022)
- Minh Pham (05/2018 – 05/2021)
- DaPhane Polanowski (01/2025 – present)
- Tejas Pulisetty (01/2010 – 07/2010)
- Syed Rahman (01/2009 – 07/2009)
- Blake Recupido (08/2021 – 05/2023)
- John Samuelian (01/2015 – 05/2016)
- Maya Sarkis (01/2023 – present)
- 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 – 08/2023)
- Neha Thakkar (01/2013 – 05/2015)
- Prerak Trivedi (01/2015 – 03/2018)
- John Truong (01/2012 – 05/2012)
- Joanna Wnorowski (08/2010 – 10/2010)
- John Zieroff (08/2024 – present)

High School Students (Summer unless otherwise noted)

- Prosperine Murhwa-Nabintu (ACS SEED 2024)
- Scott Becker (SLU REU 2019)
- 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) = 23**Poster Presentations by SLU Students (2010 - present) = 95****PUBLICATIONS AND PRESENTATIONS***Publications while at SLU*

23. Chiura, T., Pham, M. N., **Baum, D. A.**, & Mak, P. J. (2025) "Interactions between heme and G-quadruplex DNA involve the oxygen of guanine" *J. Inorg. Bio.* **266**, 112843. DOI: 10.1016/j.jinorgbio.2025.112843
22. Parvez, A. & **Baum, D. A.** (2024) "DNA Aptamers That Bind to Alginate Hydrogels" *ACS Biomater. Sci. Eng.* **10**, 7507-7515. DOI: 10.1021/acsbiomaterials.4c01436
21. Samuelian, J. S., Gremminger, T. J., Song, Z., Poudyal, R. R., Li, J., Zhou, Y., Staller, S. A., Carballo, J. A., Roychowdhury-Saha, M., Chen, S., Burke, D. H., Heng, X., & **Baum, D. A.** (2022) "An RNA aptamer that shifts the reduction potential of metabolic cofactors" *Nat. Chem. Biol.*, **18**, 1263-1269. DOI:10.1038/s41589-022-01121-4
20. Samuelian, J. S. & **Baum, D. A.** (2022) "Identification of DNA Aptamers for Benzodiazepine Detection in Synthetic Urine" *Anal. Sens.*, **2**, e202200044. DOI: 10.1002/anse.202200044 Cover Feature DOI: 10.1002/anse.202200107
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., Minter, 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., Minter, 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 ω G 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

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|---------|---|
| 12/2023 | Inaugural SLU Bio-Chem Research Symposium, St. Louis, MO, December 9, 2023 |
| 10/2023 | Midwest-Great Lakes Regional ACS Meeting, St. Charles, MO, October 19, 2023 |
| 03/2023 | Spring 2023 ACS National Meeting, Indianapolis, IN, March 28, 2023 |
| 01/2023 | Department of Chemistry, Truman State University |
| 12/2021 | Pacificchem 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 - National Aeronautics and Space Administration (80NSSCV21K0596 – Subcontract)
07/2026 Project Title: Brining RNA to Life – Emergence of Biological Catalysis
Role: Co-I
- 01/2017 - National Aeronautics and Space Administration (NNX17AE88G - Subcontract)
01/2021 Project Title: Metabolite-linked RNA Transcripts
Role: Co-I
- 06/2012 – National Institutes of Health (1R15GM101595-01)
05/2015 Project Title: Identification of DNA aptazymes for small-molecule sensors
- 01/2010 – President's Research Fund, Saint Louis University 05/2011
Project Title: Redox Deoxyribozymes for Biofuel Cells
- 08/2008 – Start-up Funds, Saint Louis University
07/2011