

ADAM SCOTT DUERFELDT, PH.D.

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EDUCATION

The University of Kansas, Lawrence, KS
Ph.D. in Medicinal Chemistry 2011
Dissertation: "A New Generation of Hsp90 Inhibitors: Addressing Isoform Selectivity and Heat Shock Induction"

Central College, Pella, IA
B.A. in Chemistry 2006
Highest Distinction

PROFESSIONAL EXPERIENCE

Excitant Therapeutics, Oklahoma City, OK 2018 –
Co-Founder

University of Oklahoma, Norman, OK
Center for Applied Research & Development (CARD) Faculty Fellow 2016 –

University of Oklahoma, Norman, OK
Assistant Professor 2014 –

The Scripps Research Institute, La Jolla CA
American Cancer Society Postdoctoral Fellow 2012 – 2014
Advisor: Professor Dale L. Boger

The University of Kansas, Lawrence, KS
Madison and Lila Self Graduate Fellow 2006 – 2011
Advisor: Professor Brian S. J. Blagg

Central College, Pella, IA
Undergraduate Research Assistant 2005 – 2006
Advisor: James A. Shriver

HONORS

Journal of Natural Products Jack L. Beal Award 2017
University of Oklahoma CBR Outstanding Professor of the Year (student voted) 2017
University of Oklahoma Inaugural Faculty Leadership Academy Fellow 2015 – 2016
American Cancer Society Special Friend: Researcher Award 2015
Elsevier Top 10 Reviewer for Bioorganic & Medicinal Chemistry Letters 2013
The University of Kansas Irsay–Dahle Award 2011
The University of Kansas Cancer Symposium Excellence in Research Award 2009
ESPN the Magazine Academic All-American Player of the Year 2006
IIAC Duane Schroeder Scholar of the Year 2006
Woody Hayes Division-III National Scholar Athlete of the Year 2006
Alpha Zeta Mu 2006
ESPN the Magazine First Team Academic All-American 2005 and 2006

FELLOWSHIPS

University of Oklahoma College of Arts & Sciences Junior Faculty Fellowship	2016
University of Oklahoma Vice President of Research Junior Faculty Fellowship	2015
American Cancer Society Postdoctoral Fellowship	2012 – 2014
Institute for Advancing Medical Innovation Fellowship (KU)	2010
American Foundation for Pharmaceutical Education (AFPE) Pre-doctoral Fellowship	2010
Sanofi-Aventis AFPE Pre-doctoral Fellowship	2009
Josiah Kirby Lilly, Sr. Memorial AFPE Pre-doctoral Fellowship	2008
Madison and Lila Self Graduate Fellowship (KU)	2006 – 2010
NCAA Postgraduate Fellowship	2006

MEMBERSHIPS (Organizations and Research Centers)

American Society of Microbiology	2018 –
Harold Hamm Diabetes Center	2016 –
American Society of Pharmacognosy	2015 –
Stephenson Cancer Center, Experimental Therapeutic Research Program	2015 –
American Association for the Advancement of Science	2011 –
American Chemical Society	2006 –

PROFESSIONAL DEVELOPMENT WORKSHOPS (INDEPENDENT CAREER)

University of Oklahoma Faculty Leadership Academy	2015 – 2016
New Faculty in Organic and Biological Chemistry Mentoring Workshop (NIH-NIGMS)	2015

SCIENTIFIC SERVICE (INDEPENDENT CAREER)

Skype a Scientist Participant	2017 –
Full Faculty Member, F1000	2016 –
Review Panelist, National Science Foundation (GRFP)	2016
Co-Chair, ACS National Meeting 2016 MEDI Symposium	2015 – 2016
Seminar Committee, Department of Chemistry & Biochemistry	2015 –
Research Mentor, First-Year Research Experience (FYRE)	2014 – 2016
Organizing Committee, 2015 American Society of Pharmacognosy National Meeting	2014 – 2015

EXTRACURRICULAR SERVICE

Scientific Consultant, i2E	2016 –
OU Innovation Prize Task Force	2016
Guest Pitch Competition Judge for New Venture Development II (ENT 4113)	2015 –
Faculty Mentor for OU Entrepreneurial Activities	2015 –
<i>2015 Governor's Cup High Growth Undergraduate Champion (Raw)</i>	
<i>2015 Tri-state Runner-up (Raw)</i>	
Central College National Advisory Committee	2015 – 2017
Biotechnology Advisory Committee, Moore Norman Technology Center	2015 –
Board Member, Timothy Yates Heggen Foundation	2002 – 2015

MANUSCRIPT REVIEW

Beilstein Journal of Organic Chemistry, Journal of Chemical Information and Modeling, Organic Letters, Bioorganic & Medicinal Chemistry, ACS Medicinal Chemistry Letters, Journal of Medicinal Chemistry, Bioorganic & Medicinal Chemistry Letters, Oklahoma Journal of Undergraduate Research

PUBLICATIONS

Refereed Papers/Articles

18. Lavey, N.P.; Duerfeldt, A.S., *Clostridium difficile* ClpP Homologs are Capable of Uncoupled Activity and Exhibit Different Levels of Susceptibility to Acyldepsipeptide Modulation, *Epub*, Nov. 9, 2018.
17. Que, N.L.S.; Crowley, V.M.; Duerfeldt, A.S.; Zhao, J.; Kent, C.N.; Blagg, B.S.J.; Gewirth, D.T. Structure Based Design of a Grp94-Selective Inhibitor: Exploiting a Key Residue in Grp94 to Optimize Paralog-Selective Binding. *J. Med. Chem.*, **2018**, *61*, 2793.
16. Dou, X.; Nath, D.; Shin, Y.; Ma, J.; Duerfeldt, A.S. Structure-Guided Evolution of a 2-Phenyl-4-carboxyquinoline Chemotype into PPAR α Selective Agonists: New Leads for Oculovascular Conditions. *Bioorg. Med. Chem. Lett.*, **2018**, *28*, 2717.
15. Li, Y.; Lavey, N.P.; Coker, J.A.; Knobbe, J.E.; Truong, D.C.; Yu, H.; Lin, Y.S.; Nimmo, S.L.; Duerfeldt, A.S. Consequences of Depsipeptide Substitution on the ClpP Activation Activity of Antibacterial Acyldepsipeptides. *ACS Med. Chem. Lett.*, **2017**, *8*, 1171-1176.
14. Avila, Q.P., Zgurskaya, H.I.; Duerfeldt, A.S. Recent Advances towards Rational Antibacterial Discovery: Addressing Permeation and Efflux. *ACS Med. Chem. Rev.* **2017**, *52*, 319-339.
13. Di, X.J.; Wang, Y.J.; Han, D.Y.; Duerfeldt, A.S.; Blagg, B.S.J.; Mu, T.W. Grp94 Delivers γ -aminobutyric Acid Type A (GABA $_A$) Receptors to Hrd1-Mediated Endoplasmic Reticulum-Associated Degradation. *J. Biol. Chem.* **2016**, *291*, 9526–9539.
12. Crowley, V.M.; Khandelwal, A.; Mishra, S.; Stothert, A.R.; Huard, D.J.E.; Zhao, J., Muth, A.; Duerfeldt, A.S.; Kizziah, J.L.; Lieberman, R.L.; Dickey, C.A.; Blagg, B.S.J. Development of Glucose Regulated Protein 94-Selective Inhibitors Based on the Bnlm and Radamide Scaffold. *J. Med. Chem.* **2016**, *59*, 3471–3488.
11. Lavey, N.P.; Coker, J.A.; Ruben, E.A.; Duerfeldt, A.S. Sclerotiamide: The First Non-Peptide Based Natural Product Activator of Bacterial Caseinolytic Protease P. *J. Nat. Prod.*, **2016**, *79*, 1193–1197.
10. Anderson, E.D.; Duerfeldt, A.S.; Zhu, K.; Glinkerman, C.M.; Boger, D.L. Cycloadditions of Noncomplementary Substituted 1,2,3-Triazines. *Org. Lett.* **2014**, *16*, 5084–5087.
9. Duerfeldt, A.S.; Boger, D.L. Stereoselective Syntheses of (–)-Pyrimidoblastic Acid and P-3A. *J. Am. Chem. Soc.* **2014**, *136*, 2119–2125.
8. Wolfe, A.L., Duncan, K.K., Lajiness, J.P., Zhu, K., Duerfeldt, A.S., Boger, D.L. A Fundamental Relationship between Hydrophobic Properties and Biological Activity for the Duocarmycin Class of DNA Alkylating Antitumor Drugs: Hydrophobic Binding-Driven-Bonding. *J. Med. Chem.* **2013**, *56*, 6845–6857.
7. Suntharalingam, A.; Abisambra, J.F.; O’Leary, J.C.; Koren III, J.; Zhang, B.; Kuk Joe, M.; Blair, L.J.; Hill, S.E.; Jinwal, U.K.; Cockman, M.; Duerfeldt, A.S.; Tomarev, S.; Blagg, B.S.J.; Lieberman, R.L.; Dickey, C.A. Glucose-regulated Protein 94 Triage of Mutant Myocilin through Endoplasmic Reticulum-associated Degradation Subverts a More Efficient Autophagic Clearance Mechanism. *J. Biol. Chem.* **2012**, *287*, 40661–40669.
6. Duerfeldt, A.S.; Peterson, L.B.; Maynard, J.C.; Ng, C.L.; Eletto, D.; Ostrovsky, O.; Shinogle, H.E.; Moore, D.S.; Argon, Y.; Nicchitta, C.V.; Blagg, B.S.J. Development of a Grp94 Inhibitor. *J. Am. Chem. Soc.* **2012**, *134*, 9796–9804.
5. Kusuma, B.R.; Duerfeldt, A.S.; Blagg, B.S.J. Synthesis and Biological Evaluation of Arylated Novobiocin Analogs as Hsp90 Inhibitors. *Bioorg. & Med. Chem. Lett.* **2011**, *21*, 7170–7174.

4. [Duerfeldt, A.S.](#); Blagg, B.S.J. Hsp90 Inhibition: Elimination of Shock and Stress. *Bioorg. & Med. Chem. Lett.* **2010**, *20*, 4983–4987.
3. Jadhav, V.; [Duerfeldt, A.S.](#) Blagg, B.S.J.; Design, Synthesis and Biological Activity of Bicyclic Radester Analogues as Hsp90 Inhibitors. *Bioorg. & Med. Chem. Lett.* **2009**, *19*, 6845–6850.
2. [Duerfeldt, A.S.](#); Brandt, G.E.L. Blagg, B.S.J.; Design, Synthesis and Biological Evaluation of Conformationally Constrained *cis*-Amide Hsp90 Inhibitors. *Org. Lett.* **2009**, *11*, 2353–2356.
1. [Duerfeldt, A.S.](#); Blagg, B.S.J. Hydrating for Resistance. *ACS Chem. Biol.* **2009**, *4*, 245–247.

Patents

3. [Duerfeldt, A.S.](#); Ma, J.X.; Sinh, Y.; Nath, D.; Dou, X.; Agonists of Peroxisome Proliferator-Activated Receptor-Alpha (PPAR α) and Methods of Use, filed provisional patent application 62/643,998 Mar. 16, 2018.
2. Ma, J.X.; [Duerfeldt, A.S.](#); Moran, E.; Deng, G.; Phenylquinoline Compositions for Treatment of Ocular Disorders and Conditions, filed international patent 16/097,353 Apr. 28, 2017.
1. Blagg, B.S.J.; [Duerfeldt, A.S.](#); Grp94 Inhibitors, U.S. Patent 8,685,966, April 1, 2014.

Non-Refereed Contributions

19. F1000 Review: DOI: 10.3410/f.734368160.793553488
 - [Article Reviewed](#): The CryoEM Method MicroED as a Powerful Tool for Small Molecule Structure Determination. *ACS Cent. Sci.*, **2018**, *4*, 1587,
18. F1000 Review: DOI: 10.3410/f.727449235.793553487
 - [Article Reviewed](#): Structural basis for specific ligation of the peroxisome proliferator-activated receptor δ . *Proc. Nat. Acad. Sci.*, **2017**, *114*, E2563.
17. F1000 Review: DOI: 10.3410/f.733998655.793551100
 - [Article Reviewed](#): Superoxide Dismutase Activity Confers (p)ppGpp-mediated Antibiotic Tolerance to Stationary-phase *Pseudomonas aeruginosa*. *Proc. Nat. Acad. Sci.*, **2018**, *115*, 9797.
16. F1000 Review: DOI: 10.1021/acs.jmedchem.7b00718
 - [Article Reviewed](#): Quest for Novel Chemical Entities through Incorporation of Silicon in Drug Scaffolds. *J. Med. Chem.*, **2017**, *61*, 3779.
15. F1000 Review: DOI: 10.1038/s41598-017-11336-4
 - [Article Reviewed](#): Glucosyltransferase Activity of *Clostridium difficile* Toxin B Triggers Autophagy-mediated Cell-Growth. *Sci. Rep.*, **2017**, *7*, 10532.
14. F1000 Review: DOI: 10.1126/science.aan0003
 - [Article Reviewed](#): A Modular and Enantioselective Synthesis of Pleuromutilin Antibiotics. *Science*, **2017**, *356*, 956.
13. F1000 Review: DOI: 10.1021/acs.jmedchem.6b01727
 - [Article Reviewed](#): Structure-Activity Relationship of 2,4-Dichloro-N-(3,5-dichloro-4-(quinolin-3-yloxy)phenyl)benzenesulfonamide (INT131) Analogs for PPAR γ -Targeted Antidiabetics. *J. Med. Chem.*, **2017**, *60*, 4584.
12. F1000 Review: DOI: 10.3410/f.726854959.793526968
 - [Article Reviewed](#): Arginine Phosphorylation Marks Proteins for Degradation by a ClpP Protease. *Nature*, **2016**, *539*, 48.
11. F1000 Review: DOI: 10.3410/f.727412755.793530690
 - [Article Reviewed](#): Catalytic Synthesis of N-Heterocycles via Direct C(sp³)-H Amination Using an Air-Stable Iron (III) Species with a Redox-Active Ligand. *J. Am. Chem. Soc.*, **2017**, *139*, 5117.
10. F1000 Review: DOI: 10.3410/f.726596128.793526810
 - [Article Reviewed](#): Oxidative diversification of amino acids and peptides by small-molecule iron catalysis. *Nature*, **2016**, *537*, 214-219.
9. F1000 Review: DOI: 10.3410/f.726443578.793521804

- Article Reviewed: Development of a Dual-Acting Antibacterial Agent (TNP-2092) for the Treatment of Persistent Bacterial Infections. *J. Med. Chem.*, **2016**, *59*, 6645.
8. F1000 Review: DOI: 10.3410/f.726375486.793519527
 - Article Reviewed: Cholesterol Autoxidation Revisited: Debunking the Dogma Associated with the Most Vilified of Lipids. *J. Am. Chem. Soc.*, **2016**, *138*, 6932.
 7. F1000 Review: DOI: 10.3410/f.726303649.793519008
 - Article Reviewed: A Conformationally Constrained Cyclic Acyldepsipeptide Is Highly Effective in Mice Infected with Methicillin-Susceptible and -Resistant *Staphylococcus aureus*. *PLoS ONE*, **2016**, *11*, e0153912.
 6. F1000 Review: DOI 10.3410/f.726204404.793517336
 - Article Reviewed: ReAsH as a Quantitative Probe of In-Cell Protein Dynamics. *Biochemistry*, **2016**, *55*, 1968.
 5. F1000 Review: DOI: 10.3410/f.12541956.13766061
 - Article Reviewed: Identification of Heat-Shock Protein 90 Beta in Japanese Encephalitis Virus-Induced Secretion Proteins. *J. Gen. Virol.*, **2011**, *92*, 2803-2809.
 4. F1000 Review: DOI: 10.3410/f.4023957.3790057
 - Article Reviewed: The Palladium-Catalyzed Trifluoromethylation of Aryl Chlorides. *Science*, **2010**, *328*, 1679-1681.
 3. F1000 Review: DOI: 10.3410/f.3213956.2898054
 - Article Reviewed: D-Amino Acids Trigger Biofilm Disassembly. *Science*, **2010**, *328*, 627-629.
 2. F1000 Review: DOI: 10.3410/f.1226961.694060
 - Article Reviewed: Human Liver Microsomal Metabolism of (+)-Discodermolide. *J. Nat. Prod.*, **2009**, *72*, 1748-1754.
 1. F1000 Review: DOI: 10.3410/f.1165088.627080
 - Article Reviewed: Inhibitors Selective for Mycobacterial Versus Human Proteasomes. *Nature*, **2009**, *461*, 621-626.

SEMINARS AND PAPERS PRESENTED (INDEPENDENT CAREER)
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Invited Presentations (ASD)

University of Connecticut (<i>Storrs, CT</i>)	2018.03.05
Department of Medicinal Chemistry	
<i>Small Molecule and Macromolecular Insights into ClpP Modulation as an Antibacterial Strategy</i>	
American Chemical Society Midwest Regional Meeting (<i>Lawrence, KS</i>)	2017.10.19
Session: Chemical Biology of Infectious Disease	
<i>Chemical and Macromolecular Insights into ClpP Modulation as an Antibacterial Strategy</i>	
Oklahoma State University (<i>Stillwater, OK</i>)	2016.04.19
Oklahoma Center for Respiratory and Infectious Diseases	
<i>Exploration of ClpP Activation to Treat Respiratory Infections in Cystic Fibrosis</i>	
University of Oklahoma Health Sciences Center (<i>Oklahoma City, OK</i>)	2015.11.10
Department of Microbiology & Immunology	
<i>Bacterial ClpP Activation: Expanding the Arsenal and Assessing the Therapeutic Potential</i>	
Central College (<i>Pella, IA</i>)	2015.11.05
Department of Chemistry	
<i>A Multifaceted Approach Towards the Identification of Novel Bacterial Caseinolytic Protease P Activators</i>	
American Chemical Society Midwest Regional Meeting (<i>St. Joseph, MO</i>)	2015.10.22
<i>A Multifaceted Approach Towards the Identification of Novel Bacterial Caseinolytic Protease P Activators</i>	

EXTERNAL COMPETITIVE GRANT ACQUISITIONS

NIH-NIAID R01 (R01AI136795) <i>Predictive Models for Small-Molecule Accumulation in Gram-Negative Bacteria</i> Role: Co-investigator	2018 – 2023
NIH COBRE Phase II (P20GM103640) <i>Structure, Function, and Therapeutic Potential of Clostridium difficile Caseinolytic Protease P</i> Role: Project Leader	2017 – 2022
NIH R21 (R21EY028279) <i>Hit to Lead Optimization of a Systemically Available Treatment for Diabetic Retinopathy</i> Role: Principal Investigator	2017 – 2019
Harold Hamm Oklahoma Diabetes Center (HHDC) COBRE Pilot Project Grant <i>Hit to Lead Optimization of a Novel PPARα Agonist Towards a Systemically Available Treatment for Diabetic Retinopathy</i> (Parent grant: NIH 5P20GM104934)	2017
Oklahoma Center for Respiratory & Infectious Disease (OCRID) Pilot Project Grant <i>Exploration of ClpP Activation to Treat Respiratory Infections in Cystic Fibrosis</i> (Parent grant: NIH P20GM103648)	2015
Oklahoma Center for the Advancement of Science (OCAST) <i>Exploration of Bacterial ClpP as a Treatment Strategy for Hospital-Acquired Infections</i> Role: Principal Investigator	2015 – 2018
American Cancer Society (ACS): \$150,000 <i>Design, Synthesis, and Evaluation of Novel Bleomycin Analogs</i>	2012 – 2014

INTERNAL COMPETITIVE FUNDING ACQUISITIONS

University of Oklahoma Growth Fund <i>Pre-clinical Assessment of Small Molecule Drug Leads for Ocular Microvasculature Diseases</i>	2018 – 2019
University of Oklahoma CAS Junior Faculty Fellowship <i>Development of a New Natural Product Extract Screening Method: Simplifying the Search for Natural Drug Leads</i>	2016
University of Oklahoma VPR Junior Faculty Fellowship <i>Identification and Validation of Natural Product ClpP: Activators Capitalizing on an Unexploited Strategy for New Antibiotic Development</i>	2015

CURRENT RESEARCH TEAM

Dinesh Nath, Ph.D. – postdoctoral research associate
Ziwei Hu, Ph.D. – postdoctoral research associate
Nathan P. Lavey – graduate student
2016 Robberson Travel Grant recipient
Quentin Avila, M.S. – graduate student
Xiaozheng Dou – graduate student
2018 Robberson Travel Grant recipient

2015 Kenneth M. Nicholas Graduate Summer Fellowship

Jessica Gardner – graduate student

April Aloway, M.S. – graduate student

Julie Lee – graduate student

Jessica Knobbe – undergraduate researcher

2016 UROP grant recipient

Dat Truong – undergraduate researcher

2016 UROP grant recipient

FYRE Symposium 2016 – *Outstanding FYRE Student of the Year Awardee*

FYRE Symposium 2016 – *Best FYRE Project Awardee*

Karla Bonic – undergraduate researcher

Anh Hoang – undergraduate FYRE student

RESEARCH GROUP ALUMNI

Yangxiong Li, Ph.D. – postdoctoral researcher

Postdoc at OUSHC

Gopal Peddabuddi – postdoctoral researcher

Employed at Accele BioPharma

Hailee Rau – graduate student

Apryl Saunders – graduate student

2016 Kenneth M. Nicholas Graduate Summer Fellowship

Jesse A. Coker – undergraduate researcher

Graduate student at Oxford

2014 & 2015 summer internship at Vanderbilt University with Stephen Fesik Group

2015 UROP grant recipient

2015 Astellas Pharma Scholarship

2016 HRAP Awardee

2016 Goldwater Scholarship Recipient

2016 Rhodes Scholar Finalist

Yanjia (Cici) Zhou – undergraduate student

Medical student at OUHSC

Accepted to Scripps (La Jolla, CA) and Stephenson Cancer Center (Oklahoma City, OK) summer research programs

Joshua Lujan – undergraduate researcher

Ryan Johnston – 2015 FYRE student

FYRE Symposium 2015 – Best FYRE Project Awardee

Sean Nguyen – 2015 FYRE student

Tristan Lilley – undergraduate student

Delaney Finn – undergraduate student

Josie Smith – undergraduate student

TEACHING RECORD

CHEM 3053	Undergraduate Organic Chemistry I	Sp. 2019
CHEM 5491	Organic Seminar/Colloquium	Sp. 2019
CHEM 3053	Undergraduate Organic Chemistry I	Fa. 2018
CHEM 5491	Organic Seminar/Colloquium	Fa. 2018
CHEM 5450	Organic Characterization	Sp. 2018
CHEM 5491	Organic Seminar/Colloquium	Sp. 2018
CHEM 3053	Organic Chemistry I	Fa. 2017
CHEM 5491	Organic Seminar/Colloquium	Fa. 2017
CHEM 5491	Organic Seminar/Colloquium	Sp. 2017
CHEM 5480	Practicum in Organic Characterization	Sp. 2017
CHEM 5450	Organic Characterization	Sp. 2017
CHEM 5491	Organic Seminar/Colloquium	Fa. 2016

CHEM 5470	Medicinal Chemistry	Fa. 2016
CHEM 5491	Organic Seminar/Colloquium	Sp. 2016
CHEM 5480	Practicum in Organic Characterization	Sp. 2016
CHEM 5450	Organic Characterization	Sp. 2016
CHEM 5491	Organic Seminar/Colloquium	Fa. 2015
CHEM 5470	Introduction to Medicinal Chemistry (<i>developed</i>)	Fa. 2015
CHEM 6411	Organic Seminar/Colloquium	Fa. 2014
CHEM 6680	Organic Spectroscopy	Fa. 2014

COLLABORATIONS

Ongoing

Stanley Spinola, M.D., Indiana University, Department of Microbiology and Immunology <i>Towards the development of two-component system activators as antibacterials</i>	2016 –
Jian-Xing Ma, Ph.D., OUHSC, Department of Physiology <i>Towards the development of novel small molecule treatments for diabetic retinopathy</i>	2016 –
Jimmy Ballard, Ph.D., OUHSC, Department of Microbiology & Immunology <i>Towards new treatment modalities for C. difficile</i>	2015 –