

## CURRICULUM VITAE

### PERSONAL

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### ACADEMIC APPOINTMENTS

- Utah State University, Logan, UT 84322  
R. Gaurth Hansen Assistant Professor in Biochemistry 2013-present  
Research areas: Development and use of custom high-resolution optical and scanning probe techniques for analyzing protein-lipid interactions; Elucidating the role of type three secretion systems at the pathogen-host cell interface; Determining the role of bile salts in the virulence of enteric pathogens through biophysical characterization of type three secretion system tip proteins; Working at the interface of chemistry and biology.

### EDUCATION and PROFESSIONAL TRAINING

- Oklahoma State University, Stillwater, OK 74078  
NIH Postdoctoral Fellow 2009-2013  
Research area: Biophysical characterization of *in vitro* models providing insight into type three secretion system based *Shigella flexneri* virulence (William Picking laboratory)
- University of Kansas, Lawrence, KS 66045  
Postdoctoral Fellow 2008-2009 (Moved to OSU with PI)  
Research area: Probing mechanistic triggers of *Shigella flexneri* type three secretion apparatus tip complex maturation (William Picking laboratory)
- University of Kansas, Lawrence, KS 66045  
Ph.D. in Bio-Analytical Chemistry July 2008  
Research area: Single molecule studies of transport and structural dynamics of the nuclear pore complex (Robert Dunn laboratory)
- Lewis Clark State College, Lewiston, ID 83501  
B.S. Chemistry May 2003  
B.S. Human Biology May 2003  
Undergraduate research: Phylogenetic analysis of a potentially new *Leptodactylon* species (Joanna Schultz laboratory)

### AWARDS AND HONORS

Presidential Award, Lewis Clark State College 1999-2003  
B.S. Cum Laude, Lewis Clark State College, 2003  
Emily V. Berger Award, University of Kansas 2003-2004  
Dynamic Aspects of Chemical Biology NIH Predoctoral training grant, 2005-2008  
J.K. Lee Award in Analytical Chemistry, University of Kansas 2008  
Ph.D. Defense, Honors, University of Kansas 2008  
NIH (NIAID) Ruth L. Kirschstein National Research Service Award 2009-2011  
R. Gaurth Hansen Assistant Professor 2013-present  
USU College of Science Valedictorian *Escort* May 2015

### CERTIFICATIONS

Laboratory Safety Training (USU)  
Recombinant DNA Lab Certification (USU)  
Biosafety Level 2 Lab Certification (USU)

### FUNDING HISTORY

#### Awarded

#### **Dynamic Aspects of Chemical Biology NIH Predoctoral training grant, 2005-2008**

This was a competitive NIH sponsored program housed at the University of Kansas geared toward the training predoctoral students in chemistry, biological sciences, pharmacology, and medicinal chemistry.

NIH Application ID: T32GM08545  
Start date: 06/01/2005  
Completion Date: 06/01/2008  
Amount of Award: ~\$65,000

**NIH (NIAID) Ruth L. Kirschstein National Research Service Award 2009-2011**

Title: "Probing localization, interactions, and effector properties of *Shigella* IpaD".

IpaD has traditionally been defined as an important structural component of the *Shigella* type three secretion system, however, recent results suggest that it may also play a critical role as an effector as well. This project determined that IpaD is secreted in a host contact dependent manner and has identified a number potential intracellular binding partners. Work is ongoing to determine the role of intracellular IpaD within host cells.

NIH Application ID: 1F32AI084203-01  
Start date: 07/22/2009  
Completion Date: 07/21/2011  
Amount of Award: \$92,824  
Role: PI

**NIH (NIAID) K22 Career Development Award**

Title: "Lipid raft effects on *Shigella* type III secretion system-based interactions"

Many important human pathogens utilize one or more type three secretion systems (T3SSs) as essential virulence factors necessary for causing disease. Using *Shigella flexneri* as a model organism, this project aims to understand the specific interactions that occur between the maturing T3SS apparatus and the lipid membranes of host cells targeted for infection.

NIH Application ID: 1K22AI099086-01A1  
Start date: 08/01/2013  
Completion Date: 07/31/2016  
Amount of Award: \$268,400  
Role: PI

**ACS SEED Award**

This award will provides funding for three summer research fellowships (in combination with \$2500 in local sources) for economically disadvantaged high school students. The students participate in an 8 week research program, conducting research in host labs within the Department of Chemistry and Biochemistry. In addition to research experience, the students participate in chemical safety programs as well as receive college and career counseling by USU faculty.

Start date: 06/01/2015  
Completion Date: 07/31/2015  
Amount of Award: \$5,000  
Role: PI (Coordinator)

**NSF Major Research Instrumentation (MRI) Award**

Title: "MRI:Acquisition of a Beckman ProteomeLab-XLI Analytical Ultracentrifuge to Enhance Research and Training.

This award provides funds for the purchase of an analytical ultracentrifuge (AUC) that will be housed in the Department of Chemistry and Biochemistry and available to all USU researchers. Access to an AUC will provide opportunities to strengthen and expand existing research programs as well as provide important training opportunities for undergraduate and graduate students across campus.

Start date: 09/01/2015  
Completion Date: 08/31/2018  
Amount of Award: \$271,706  
Role: PI

**Invited Book Chapters (4 total)**

P. R. Adam, M. L. Barta, and **N. E. Dickenson\***. Characterization of Type Three Secretion System Translocator Interactions with Phospholipid Membranes. In *Type 3 Secretion Systems: Methods and Protocols*; Edited by Nilles, M.L. and Condry, D. Springer Publishing Co., New York, NY; **IN PRESS**.

M. L. Barta, P. R. Adam, and **N. E. Dickenson\***. Recombinant Expression and Purification of the *Shigella* Translocator IpaB. In *Type 3 Secretion Systems: Methods and Protocols*; Edited by Nilles, M.L. and Condry, D. Springer Publishing Co., New York, NY; **IN PRESS**.

O. Arizmendi and **N. E. Dickenson\***. Dissecting *Shigella flexneri* Type III Secretion System Tip Complex Maturation. In *Shigella: Molecular and Cellular Biology*; Edited by Picking, W.D. Caister Academic Press, Poole, U.K.; **2015**

**N. E. Dickenson**, O. L. Mooren, E. S. Erickson, and R. C. Dunn. Near-Field Scanning Optical Microscopy: A New Tool for Exploring Biological Structure and Function. In *Surface Analysis and Techniques in Biology*; Edited by Smentkowski, V.S. Springer Inc., New York; **2014**.

**Peer Reviewed publications (20 total) h-index = 9 ISI Web of Science 03/22/2016**

*Publications since joining Utah State University (6)*

A.R. Bernard, S.M. Duarte, P. Kumar, and **N.E. Dickenson\***. Detergent isolation stabilizes and activates the *Shigella* type III secretion system translocator protein IpaC. *Journal of Pharmaceutical Science*. **2016** 105(7):2240-2248 PMID: PMC4921279. Impact factor 2.59.

J.L. Burgess, H.B. Jones, P. Kumar, R.T. Toth 4<sup>th</sup>, C.R. Middaugh, E. Antony\*, and **N.E. Dickenson\***. Spa47 is an oligomerization-activated type three secretion system (T3SS) ATPase from *Shigella flexneri*. *Protein Science*. **2016** 25:1037-1048. PMID: PMC4838647. Impact factor 2.85

X. Chen, S. P. Choudhari, F. J. Martinez-Becerra, J. H. Kim, **N. E. Dickenson**, R. T. Toth , S. B. Joshi, J. C. Greenwood, J. D. Clements, W. D. Picking, C. R. Middaugh, and W. L. Picking\*. Impact of detergent on the biophysical properties and immune response of the IpaDB Fusion protein, a candidate subunit vaccine against *Shigella* spp. *Infection and Immunity*. **2015** 83(1): 292-299. PMID: PMC4288857. Impact factor 4.16

P. R. Adam, **N. E. Dickenson**, J. C. Greenwood, W. L. Picking and W. D. Picking\*. Influence of Oligomerization State on the Structural Properties of Invasion Plasmid Antigen B (IpaB) from *Shigella flexneri* in the Presence and Absence of Phospholipid Membranes. *Proteins*. **2014** 82(11): 3013-3022. PMID: PMC4206658. Impact factor 2.92

**N. E. Dickenson**, O. Arizmendi, M. Patil, W. D. Picking, and W. L. Picking\*. The N-terminus of IpaB provides a potential anchor to the *Shigella* type III secretion system tip complex protein IpaD. *Biochemistry*. **2013** 52(49): 8790-8799. PMID: PMC3946325. Impact factor 3.19

F. J. Martinez-Becerra, X. Chen, **N. E. Dickenson**, S. P. Choudhari, K. Harrison, J. D. Clements, W. D. Picking, L. L. Van De Verg, R. I. Walker, W. L. Picking\*. Characterization of a novel fusion protein of IpaB and IpaD of *Shigella* and its potential as a pan-*Shigella* vaccine. *Infection and Immunity*. **2013** 81(12): 4470-4477. PMID: PMC3837967. Impact factor 4.16

Asterisk \* Indicates corresponding author  
Underlined indicates a graduate student author  
Double underlined indicates an undergraduate author

*Published prior to Utah State University (14)*

S. R. Lotlikar, S. B. Hnatusko, **N. E. Dickenson**, S. P. Choudhari, W. L. Picking, and M. A. Patrauchan. Three functional carbonic anhydrases in *P. aeruginosa* PAO1. Role in survival in ambient air. *Microbiology*. **2013** 159(8): 1748-1759. PMCID: PMC4089032. Impact factor 2.84

**N. E. Dickenson**, S. Choudhari, P. R. Adam, R. M. Kramer, S. B. Joshi, C. R. Middaugh, W. L. Picking, and W. D. Picking. Oligomeric States of the *Shigella* Translocator Protein IpaB Provide Structural Insights into Formation of the Type III Secretion Translocon. *Protein Science*. **2013** 22(5):614-627. PMCID: PMC3649263. Impact factor 2.86

G. Schönknecht, W. Chen, C. M. Ternes, G. G. Barbier, R. P. Shrestha, M. Stanke, A. Bräutigam, B. J. Baker, J. F. Banfield, R. M. Garavito, C. Benning, K. Carr, C. Wilkerson, S. A. Rensing, D. Gagneul, **N. E. Dickenson**, C. Oesterhelt, M. J. Lercher, and A. P.M. Weber. Gene Transfer from Bacteria and Archaea Facilitated Evolution of an Extremophilic Eukaryote. *Science*. **2013** 339(6124):1207-1210. PMID: 23471408. Impact factor 31.02

**N. E. Dickenson** and W. D. Picking. Förster resonance energy transfer (FRET) as a tool for dissecting molecular interactions within the bacterial type III secretion needle tip complex. *International Journal of Molecular Sciences*. **2012** 13(11):15137-15161. PMCID: PMC3509632. Impact factor 2.34

P. R. Adam, M. Patil, **N. E. Dickenson**, M. L. Barta, S. Choudhari, B. V. Geisbrecht, W. L. Picking and W. D. Picking. Binding Affects the Tertiary and Quaternary Structures of the *Shigella* Translocator Protein IpaB and its Chaperone IpgC. *Biochemistry*. **2012** 51:4062-4071. PMCID: PMC3903306. Impact factor 3.19

C. R. Epler, **N. E. Dickenson**, E. Bullitt, and W. L. Picking. Ultrastructural analysis of IpaD at the tip of the nascent MxiH type III secretion apparatus of *Shigella flexneri*. *Journal of Molecular Biology*. **2012** 420:29-39. PMCID: PMC3367090. Impact factor 4.00

M. L. Barta, **N. E. Dickenson**, M. Patil, W. D. Picking, W. L. Picking, and B. V. Geisbrecht. The crystal structures of coiled-coil domains from type three secretion system first translocator proteins reveal homology to pore-forming toxins. *Journal of Molecular Biology*. **2012**, 417(5):395-405. PMCID: PMC3304007. Impact factor 4.00

M. L. Barta, M. Guragain, P. R. Adam, **N. E. Dickenson**, B. V. Geisbrecht, W. L. Picking, and W. D. Picking. Identification of the bile salt binding site on IpaD from *Shigella flexneri* and the influence of ligand binding on IpaD structure. *Proteins*. **2011**, 80(3):935-945. PMCID: PMC3903301. Impact factor 2.92

**N. E. Dickenson**; L. Zhang, C. R. Epler, P. R. Adam, W. L. Picking, and W. D. Picking. Conformational Changes in IpaD from *Shigella flexneri* Upon Binding Bile Salts Provide Insight into the Second Step of Type III Secretion. *Biochemistry*. **2011** 50:172-180. PMCID: PMC3130115. Impact factor 3.19

**N. E. Dickenson**; K. P. Armendariz; H. A. Huckabay; P. W. Livanec R. C. Dunn. Near-field scanning optical microscopy: a tool for nanometric exploration of biological membranes. *Analytical and Bioanalytical Chemistry*. **2010**, 396(1):31-43. PMID: 19730836. Impact factor 3.58

C. R. Epler; **N. E. Dickenson**; A. J. Olive; W. L. Picking; W. D. Picking. Liposomes recruit IpaC to the *Shigella flexneri* type III secretion apparatus needle as a final step in secretion induction. *Infection and Immunity*. **2009**, 77(7):2754-61. PMCID: PMC2708540. Impact factor 4.16

**N. E. Dickenson**; E. S. Erickson; O. L. Mooren; R. C. Dunn. Characterization of Power Induced Heating and Damage in Fiber Optic Probes for Near-Field Scanning Optical Microscopy. *Review of Scientific Instruments*. **2007**, 78, 53712-53716. PMID: 17552830. Impact factor 1.58

**N. E. Dickenson**; D. Moore; K. A. Suprenant; R.C. Dunn. Vault Ribonucleoprotein Particles and the Central Mass of the Nuclear Pore Complex. *Photochemistry and Photobiology*. **2007**, 83, 1-6. PMID: 17576379. Impact factor 2.68

O. L. Mooren; E. S. Erickson; **N. E. Dickenson**; R. C. Dunn. Extending Near-Field Scanning Optical Microscopy for Biological Studies. *Journal of the Association for Laboratory Automation*. **2006**, 11, 268-272. Impact factor 1.50

### **RCSB PROTEIN DATA BANK PUBLICATIONS**

3TUL: Barta, M.L., **Dickenson, N.E.**, Patel, M., Keightley, J.A., Picking, W.D., Picking, W.L., Geisbrecht, B.V. Crystal structure of N-terminal region of Type III Secretion Major Translocator SipB (residues 82-226)

3R9V: Barta, M.L., **Dickenson, N.E.**, Picking, W.L., Picking, W.D., Geisbrecht, B.V. Cocystal Structure of Proteolytically Truncated Form of IpaD from *Shigella flexneri* Bound to Deoxycholate

### **TEACHING & STUDENT TRAINING**

#### **Graduate Students Trained**

Jamie Burgess (2016-present), MS student  
Heather B. Jones (2016-present), Ph.D. student  
Abram Bernard (2014-present), Ph.D. student  
Robert Burgess (2014-present), MS student

#### **Supervisory member**

I have served as a member on 16 PhD and MS committees (13 within Chemistry and Biochemistry, one from Biological Engineering, one from Computer Science, and one from ADVS).

#### **Undergraduate Teaching Fellows**

Emily Frampton (August 2013 - December 2014) Chem5700, Principles of Biochemistry  
Kalie McCulloch (August 2013 - December 2014) Chem5700, Principles of Biochemistry  
Carson Jessop (August 2014 - December 2014) Chem5700, Principles of Biochemistry  
Chad Apuli (August 2014 - December 2014) Chem5700, Principles of Biochemistry  
Jamie Kingsford (August 2015 - December 2015) Chem5700, Principles of Biochemistry  
Jordan Wilkes (August 2015 - December 2015) Chem5700, Principles of Biochemistry

#### **USU Blanding Native American Mentorship Program Host Lab**

Kristin Henry (June 2015)  
Autumn Warren (June 2015)

#### **High School Student Host Lab**

Hillary Shelton (July 2014) CIB Biotechnology Summer academy for high school students

Morgan Vanderwall (July 2014) CIB Biotechnology Summer academy for high school students  
Crystal Vejar (June-July 2015) USU/ACS Project SEED participant

**Undergraduate Researchers**

Name	Duration	Activities/Honors	Current position
Jordan Hughes	Summer 2016	USU Summer intern	Undergraduate at BYU
Jordan Strobel	2016-Present		Undergraduate at Utah State University
Ryden Crowther	2016-Present		Undergraduate at Utah State University
Crystal Vejar	2015-2016	Worked in my lab as a part of the ACS SEED project	Student at InTech High School
Maci Winn	Summer 2015	USU Summer intern	Undergraduate at Southern Utah University
Jamie Burgess (Maiden name: Kingsford)	2015-present	2014 Honors contract, URCO 2015 2015 Hansen best Undergraduate poster Award 2015 – Selected to Present Research on Capitol Hill UTF of the Year 2016	Graduate Student USU (My lab)
Heather Jones	Summer 2014	USU Summer intern Joined USU Graduate program	Graduate Student USU (My lab)
Carson Jessop	2014-present	Harris O. and Eleanor Y. Van Orden Award in Biochemistry, URCO 2015, COS Valedictorian	Research Intern at the Huntsman Cancer Institute
Jenna Bouvang (Maiden name: Hawley)	2014-present	SURCO 2014 Undergraduate Research Scholar URCO 2015 2015 Honors Contract	Undergraduate at USU
Thomas Sprouse	2014		Undergraduate at USU
Ryan Hirschi	2013-2014		Undergraduate at USU
Cody Hancock	2013		Undergraduate at USU
Shari Duarte	2013-2015	SURCO 2014, USU COS Undergrad representative for Research on Capital Hill 2015, Research designation on transcript	Research Intern at NIH

Summer Undergraduate Research and Creative Opportunity Grant (SURCO)  
Undergraduate Research and Creativity Opportunity Grant (URCO)

**Classes Taught (UG=undergraduate; G=graduate)**

Introduction to Microbiology (~200 students), UG (guest lecturer)  
Fall 2011 and Fall 2012  
Chemistry 5700, Principles of Biochemistry I (60-75 students), UG & G  
Fall 2013, Fall 2014, and Fall 2015  
Chemistry 6700, Advanced Biochemistry I (6-8 students), G (includes some undergraduates)  
Fall 2014 and Fall 2015  
Chemistry 7610, Analytical Separations (2 students), G (includes some undergraduates)  
Fall 2014  
Chemistry 7800, Biochemistry Seminar (10-15 students), G  
Fall 2014  
Chemistry 5070, Biophysical Chemistry (29 students), UG  
Team taught Fall 2015  
Chemistry 7770, Advanced Microscopy and Spectroscopy (3 students), G  
Spring 2016

## SERVICE

### Professional

Ad-hoc reviewer for the journals *Biochemistry*, *Molecular Microbiology*, *Cell Host and Microbe*, *Protein Science*, *Critical Reviews in Analytical Chemistry*, and *Nature Communications*

### University

USU Undergraduate Research Advisory Board (URAB) member (2015-present)

Judge for the USU Robinson Legacy Award (2014 - 2016)

USU Dissertation Enhancement Proposal Committee (2013)

### Department

Graduate Studies Committee (2014-present)

Graduate Recruiting Committee (2013-present)

Facilitate faculty visits to "feeder schools" (2013-2016)

R. Gaurth Hansen Advisory Committee (2013-present)

Raised funds for the 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> annual Hansen Life Sciences Retreats

Development and coordinator for a new Biochemical Methods class now offered as a part of the Biochemistry graduate core curriculum (First offered fall 2014)

Expanding department infrastructure

Assisted in the development of a proposal for a new department high speed centrifuge (Funded) 2013

Organized and prepared a proposal for a departmental gel imaging station (Funded) 2014

PI for NSF MRI for an analytical ultracentrifuge (Funded) 2015

Judge for Chemistry Capstone course final presentations (2014)

Organize a departmental undergraduate summer research internship program (assisted in 2013/2014 and organized in 2014/2015)

Received competitive funding from the ACS SEED program to provide research fellowships for economically disadvantaged high school students. I am coordinating all aspects of this project. (2015)

## PRESENTATIONS and PROFESSIONAL ACTIVITIES

### Posters

#### *While at USU*

2015 Hansen Life Sciences Retreat, Logan, UT, September 19, 2015. Invasion Plasmid Antigen C, Purification and Liposome Interactions. Abram Bernard\* and Nicholas E. Dickenson

2015 Hansen Life Sciences Retreat, Logan, UT, September 19, 2015. Probing the effects of lipid phase order on the localization of *Shigella* type three secretion system translocon proteins in artificial membranes. R. Alan Burgess\* and Nicholas E. Dickenson

2015 Hansen Life Sciences Retreat, Logan, UT, September 19, 2015. Structural and functional consequences of an identified Pi-bulge in the *Shigella* type three secretion system protein IpaD. Terry Carson Jessop\* and Nicholas E. Dickenson.

2015 Hansen Life Sciences Retreat, Logan, UT, September 19, 2015. Characterization of the *Shigella flexneri* Type Three Secretion System (T3SS) ATPase Spa47. Jamie L. Kingsford\*, Prashant Kumar, Ronald T. Toth IV, C. Russell Middaugh, Edwin Antony, and Nicholas E. Dickenson.

2015 Hansen Life Sciences Retreat, Logan, UT, September 19, 2015. Unraveling the *Shigella* IpaC/IpgC Complex. Jenna Bouvang\*, Abram Bernard, Crystal Vejar\*, and Nicholas E. Dickenson

2015 USU Undergraduate Research Poster Session, Logan, UT, September 11, 2015. Unraveling the *Shigella* IpaC/IpgC Complex. Jenna Bouvang\*, Abram Bernard, Crystal Vejar, and Nicholas E. Dickenson

2015 USU Undergraduate Research Poster Session, Logan, UT, September 11, 2015. Characterization of the *Shigella flexneri* Type Three Secretion System (T3SS) ATPase Spa47. Jamie L. Kingsford\*, Prashant Kumar, Ronald T. Toth IV, C. Russell Middaugh, Edwin Antony, and Nicholas E. Dickenson.

2015 Proteins Gordon Research Conference, Holderness, NH, June 14-19, 2015. Structural and functional consequences of an identified Pi-bulge in the *Shigella* type three secretion system protein IpaD. Terry Carson Jessop and Nicholas E. Dickenson\*.

2015 USU Office of Research and Graduate Studies Student Research Symposium, Logan, UT, April 9, 2015. Characterization of Alternative Purification Methods of Invasion Plasmid Antigen C. Abram Bernard\* and Nicholas E. Dickenson.

2015 USU Office of Research and Graduate Studies Student Research Symposium, Logan, UT, April 9, 2015. Probing the Effects of Lipid Phase Order on the Localization of Shigella Type Three Secretion System Translocon Proteins in Artificial Membranes. R. Alan Burgess\* and Nicholas E. Dickenson.

2015 USU Office of Research and Graduate Studies Student Research Symposium, Logan, UT, April 9, 2015. Purification and Characterization of *Shigella* Invasion Plasmid Antigen C (IpaC). Shari Duarte\* and Nicholas E. Dickenson.

2015 USU Office of Research and Graduate Studies Student Research Symposium, Logan, UT, April 9, 2015. Effects of *Shigella flexneri* Infection on Major Vault Protein Expression and Localization in HeLa cells. Jenna M. Hawley\* and Nicholas E. Dickenson.

2015 USU Office of Research and Graduate Studies Student Research Symposium, Logan, UT, April 9, 2015. Investigating the role of an identified Pi-bulge in IpaD on Shigella flexneri virulence. Carson Jessop\* and Nicholas E. Dickenson.

2015 Research on Capitol Hill, Logan, UT, January 29, 2015. Purification and Characterization of *Shigella* Invasion Plasmid Antigen C (IpaC). Shari Duarte\* and Nicholas E. Dickenson.

2014 Hansen Life Sciences Retreat, Logan, UT, September 20, 2014. Characterization of Type III Secretion System Tip Proteins. Abram Bernard\* and Nicholas E. Dickenson.

2014 Hansen Life Sciences Retreat, Logan, UT, September 20, 2014. Probing the effects of lipid phase order on the localization of Shigella type III secretion system translocon proteins in artificial membranes. R. Alan Burgess\* and Nicholas E. Dickenson.

2014 Hansen Life Sciences Retreat, Logan, UT, September 20, 2014. Purification and Characterization of *Shigella* Invasion Plasmid Antigen C (IpaC). Shari Duarte\* and Nicholas E. Dickenson.

2014 Hansen Life Sciences Retreat, Logan, UT, September 20, 2014. Effects of *Shigella flexneri* Infection on Major Vault Protein Expression and Localization in HeLa cells. Jenna M. Hawley\* and Nicholas E. Dickenson.

2014 USU Office of Research and Graduate Studies Research Week '14, Logan, UT, April 7-11, 2014. Fluorescence Polarization Provides Insights into the First Steps of Salmonella Type III Secretion System Tip Maturation. Abram Bernard\*, Shari Duarte, and Nicholas E. Dickenson.

2014 USU Office of Research and Graduate Studies Research Week '14, Logan, UT, April 7-11, 2014. Probing the Effects of Lipid Phase Order on the Localization of Shigella Type Three Secretion System Translocon Proteins in Artificial Membranes. R. Alan Burgess\*, Jenna M. Hawley, and Nicholas E. Dickenson.

Asterisk \* Indicates presenting author

Underlined indicates a graduate student author

Double underlined indicates an undergraduate author

Dashed Underline indicates a high school author



**Invited Talks**

*While at USU*

(2016) University of Kansas. April 26, 2016. **Fueling the *Shigella* Type III Secretion System.**

(2015) Brigham Young University-Idaho. November 19, 2015. **Biophysical insights into the interface between the bacterial pathogen *Shigella flexneri* and targeted host cells.**

(2015) Southern Utah University. March 5, 2015. **Molecular insights into bacterial-host cell communication.**

(2014) Boise State University. November 7, 2014. **Biophysical insights into the interface between *Shigella flexneri* and host cell membranes.**

(2014) Chico State University. March 7, 2014. **Biophysical insights into the interface between *Shigella flexneri* and host cell membranes.**

(2014) Southern Illinois University Edwardsville. January 21, 2014. **Invasion Plasmid Antigen B: A Portal of Entry for *Shigella* Type III Effectors.**

(2013) 3<sup>rd</sup> Annual Hansen Life Sciences Retreat, USU. **Biophysical characterization of the *Shigella* spp. Type three secretion apparatus tip complex.**