

# S. Student, PhD

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## QUALIFICATIONS

- Scientist with 6+ years of experience in biophysical characterization and 4+ years in structural biology and formulation.
  - Extensive experience in high-throughput biophysical assay development.
  - Exceptional communication and written skills.
  - Proficient at managing multiple projects and collaborating well with others.
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## INDUSTRY RESEARCH EXPERIENCE

**Scientist, Novartis Vaccines & Diagnostics**, Holly Springs, NC 2013 – Present  
Global Technology Development (Exploratory Vaccines)

**Biochemist, Merck & Co.**, West Point, PA 2007 – 2009  
Bioprocess Analytical Formulation Sciences Dept.

### *Selected Accomplishments*

- Defined an area of open communication between Pre-Clinical Development and Biologics Basic Research serving as the biophysical characterization resource.
- Optimized and developed high throughput characterization techniques aimed at identifying therapeutic proteins with superior chemical and physical stability.
- Characterized formulations that provided long term stability and screened for excipients that provided acceptable cryoprotection during lyophilization.
- Involved in technology transfer from the lead identification stage to pre-clinical development.
- Managed multiple projects on tight deadlines covering diverse areas.
- Considered project specific requirements such as, stability, deliverability, dosing convenience, potency, and efficacy; required for a competitive, desirable, and cost effective treatment.
- Presented data at numerous interdepartmental meetings in effort to improve cross-communication within the company at different levels.
- Determined critical physical conditions affecting subcutaneous delivery of protein solutions resulting in a peer-reviewed publication.
- SOP-coordinator and editor

**Chemical Analyst, Element One, Inc.**, Wilmington, NC 2004 – 2005  
EPA Certified Waste/Drinking Water and Air Dept.

### *Selected Accomplishments*

- Engaged and negotiated with clients to establish long-term relationships aimed at providing efficient, cost effective, confidential, analytical, and consulting services.
  - Conceptualized and developed an EPA certified temperature monitoring system compatible for various experimental conditions and sample storage.
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## EDUCATION

**Ph.D., Biophysics**, University of Virginia, Charlottesville, VA 2013

Dissertation: xxx xxx xxx

**M.S., Chemistry**, University of North Carolina Wilmington 2007

Thesis: xxx xxx xxx

**B.S., Chemistry**, Concentration in biochemistry, Minor in mathematics University of North Carolina Wilmington 2005

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## TECHNICAL EXPERTISE

<b>Formulation/Pre-formulation techniques:</b>	Low volume high-throughput thermal and physical stability pre-screening. Rheometry studies to optimize syringeability through formulation design and TP candidate selection. Lyophilization screens to improve reconstitution times and decrease sample viscosity.
<b>Protein Expression &amp; Purification:</b>	Molecular Cloning (DNA, PCR); Recombinant protein engineering; Site-directed Mutagenesis; FPLC-IEX, SEC; Membrane Protein expression and purification; Virus Like Particle (VLP) generation and purification.
<b>Protein Characterization:</b>	Homonuclear, Multinuclear, and Multidimensional NMR Spectroscopy; Automated electrophoresis; HPLC – SEC/MALS, RP, IEX, HIC; Capillary Isoelectric Focusing (IEF); UV-Vis Spectroscopy; FRET, Steady-state & Stopped flow Fluorescence Spectroscopy; DSC/DSF; ITC; DLS; CD; SPR-Biacore.
<b>Membrane Mimetics:</b>	Preparation of - single supported bilayers (Langmuir Blodgett technique), large and small unilamellar vesicles, nanodiscs, bicelles, and detergent micelles.
<b>Technical Competencies:</b>	Windows, Macintosh, and Linux Red Hat OS Platforms; Bruker (TOPSPIN) and Varian (VnmrJ) NMR Spectrometers; NMRpipe; SPARKY; PyMOL; AKTA (UNICORN) FPLC Systems, Waters HPLC Systems.

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## ACADEMIC RESEARCH EXPERIENCE

**Ph.D. Candidate – Graduate Assistant, University of Virginia**, Charlottesville, VA 2009 – Present  
Principle Investigator: Professor X.

**Project Title:** Structural and Functional Studies of the Internal Fusion Loop of Ebolavirus Glycoprotein 2

*Selected Accomplishments*

- Successfully determined three high-resolution NMR structures of the internal fusion loop peptide from Ebolavirus GP2.
- Established a critical high throughput screening assay to efficiently determine fusion peptide activity.
- Initiated collaborations to obtain biological data and molecular dynamics information to supplement structural and biophysical findings of Ebolavirus fusion machinery.
- Revised and improved protocols for expression, purification, and refolding of the disulfide bonded internal fusion loop, resulting in increased yield of purified proteins.
- Defined stable long term storage conditions for proteins through freeze-thaw and lyophilization stability studies.

**Research Assistant, University of North Carolina Wilmington** 2005 – 2007  
Principle Investigator: Professor X.

**Project Title:** Kinetic Study of Peptide–Membrane Interactions for Antimicrobial Peptides Cecropin A and Magainin-2

*Selected Accomplishments*

- Worked with in-house FORTRAN code programs to globally fit experimental kinetic data with independently determined association and dissociation parameters to describe peptide-liposome interactions.
- Contributed a novel and elegant model describing the actions of Cecropin A and Magainin-2 with synthetic lipid vesicles.
- Successfully wrote and defended a Master's thesis in 2 years while producing 2 peer-reviewed published articles.

**Teaching Assistant, University of North Carolina Wilmington** 2005 – 2007  
General Chemistry Labs 101 and 102

*Selected Accomplishments*

- Customized and facilitated labs for teaching general chemistry techniques and principles to undergraduate students. Worked one-on-one with individuals and in a group setting to ensure that material was well understood by all students.
  - Managed time among teaching and grading responsibilities, course work, and research to ensure students received performance feedback in a time effective manner.
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## LECTURES

**BIOP/PHY 8401** Structural biology of membrane proteins 2012. Structure and function of biological membranes – Examples of membrane protein structure solutions.

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## MENTORING AND LEADERSHIP

<b>Recruiting and Academic Events Coordinator, University of Virginia Biomedical Sciences</b>	<b>2009-Present</b>
Directly involved in student recruiting and orientation events for students interested in studying Biophysics at UVA	
<b>Vice President, Graduate Biosciences Organization</b>	<b>2011-2012</b>
Planned, organized and supervised the 20 <sup>th</sup> annual GBS symposium	
<b>Mentor, Merck &amp; Co. Co-op/internship program</b>	<b>2007-2009</b>
Supervised and guided three undergraduate students working in Merck & Co. labs through company research projects. Assisted with scientific guidance, writing, and presentation skills.	

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## AWARDS AND FUNDING

<b>University of Virginia, Outstanding Student in Biophysics</b>	<b>2013</b>
<b>57<sup>th</sup> Biophysical Society Meeting, Invited Speaker, Platform-Membrane Protein Structure and Function</b>	<b>2013</b>
<b>National Science Foundation, Travel Fellowship Award Molecular Biophysics of Membranes, Snowmass Village, CO</b>	<b>2012</b>
<b>National Institutes of Health, Biophysics Training Grant # 1 111 1111</b>	<b>2010-2012</b>
<b>Biophysics SRAA, Poster Competition Finalist 55<sup>th</sup> Biophysical Society Meeting, Baltimore, MD</b>	<b>2011</b>
<b>Biophysical Society, New and Notable Review</b> Axelsen P.H. A Chaotic Pore Model of Polypeptide Antibiotic Action. <i>Biophys J.</i> 94:1549-1550.	<b>2008</b>
<b>University of North Carolina Wilmington, Undergraduate Research Fellowship</b>	<b>2004</b>

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## PUBLICATIONS

- Student S.**, Larsson, P., Nelson, L.A., Kasson, P.M., White, J.M., Tamm, L.K. Ebola virus Entry Requires a Compact Hydrophobic Fist at the Tip of the Fusion Loop. **2013** Submitted.
- Arvinte, T., Palais, C., Green-Trexler, E., **Student S**, Mach, H., Narashimhan, C., Shameem, M. Aggregation of Biopharmaceuticals in Human Plasma and Human Serum: Implications for Drug Research and Development. *mAbs*. **2013** May/June; 5(3):1-10.
- Smith, E.C., **Student S.**, Tamm, L.K., Creamer, T.P., Dutch, E.D. Role of Sequence and Structure of the Hendra Fusion Protein Fusion Peptide in Membrane Fusion. *J Biol Chem*. **2012** Aug; 287(35):30035-48.
- Student S.**, Harada, E, Liang, B., Delos, S.E., White, J.M., Tamm, L.K. Structure and Function of the Complete Internal Fusion Loop from Ebola virus Glycoprotein 2. *Proc Natl Acad Sci U S A*. **2011** Jul; 108(27):11211-6.
- Mach, H., **Student S.**, Mittal, S., Laloo, A., Kirchmeier, M., Shameem, M. Electrostatic interactions of monoclonal antibodies with subcutaneous tissue, *Ther Deliv*. **2011** Jun; 2(6):727-36.
- Student S.**, Pokorny, A., and Almeida, P.F.F. Magainin 2 Revisited: a Test of the Quantitative Model for the All-or-None Permeabilization of Phospholipid Vesicles. *Biophys J*. **2009** Jan; 96(1):116-31.
- Student S.**, Cavanaugh A., Journigan V., Pokorny A., Almeida P.F.F. A Quantitative Model for the All-or-None Permeabilization of Phospholipid Vesicles by Antimicrobial Peptide Cecropin A. *Biophys J*. **2008** Mar; 94(5):1667-80.

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## PRESENTATIONS

- Speaker, 21<sup>st</sup> Annual Graduate Biosciences Symposium, **2013**. *The Role of Hydrophobic Residues in the Internal Fusion Loop from Ebola virus GP2*.
- Speaker, 57<sup>th</sup> Annual Biophysical Society Meeting, **2013**. *Inhibition of Ebola virus Entry Through Biophysical Identification of Functionally Important Residues in the GP2 Fusion Loop*.
- Speaker, UVA Undergraduate Summer Research Internship Program, **2012**, *How Does the Fusion Loop of Ebola virus Interact with Membranes?*

FASEB Molecular Biophysics of Membranes, **2012**. *Identification of Key Residues Involved in Membrane Disruption by the Ebolavirus Internal Fusion Loop*. 24-Pos

Speaker, UVA Center for Membrane Biology seminar series, **2012**. *Structural and functional studies of the Ebolavirus Internal Fusion Loop*.

Invited Speaker, James Madison University: VABio Student Chapter, **2011**. *Structure and Function of the Ebolavirus Fusion Loop*.

55<sup>th</sup> Annual Biophysical Society Meeting, **2011**. *Structure and Function of the Fusion Loop from Ebolavirus GP2*. 3424-Pos

53<sup>rd</sup> Annual Biophysical Society Meeting, **2009**. *Magainin 2 Revisited: a Test of the Quantitative Model for All-or-None Permeabilization of Phospholipid Vesicles*. 805-Pos

51<sup>st</sup> Annual Biophysical Society Meeting, **2007**. *Study of Dye Efflux Kinetics Induced by Cecropin A*. 333-Pos

14<sup>th</sup> Annual Carolinas Society of Environmental Toxicology and Chemistry Meeting, **2005**. *Assessing the Health of Regional Marinas by Measuring the Lysosomal Stability of Deployed Atlantic Ribbed Mussels, Geukensia demissa*. 10-Pos

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## PATENTS

U.S. Patent # 8188234, 1D05 PCSK9 antagonists - Antagonists of human proprotein convertase subtilisin-kexin type 9, Merck & Co., Inc. issued May 2012

U.S. Patent # 8188233, 1B20 PCSK9 antagonists - Antagonists of human proprotein convertase subtilisin-kexin type 9, Merck & Co., Inc. issued May 2012