# 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.

## 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.

## 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
*Xxx xxxx xxx*

## TECHNICAL EXPERTISE

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| Formulation/Pre-formulation techniques: | Low volume high-throughput thermal and physical stability pre-screening. Rheometry studies to optimize syringeabity through formulation design and TP candidate selection. Lyophilization screens to improve reconstitution times and decrease sample viscosity. |
| Protein Expression & Purification: | 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. |
| Protein Characterization: | 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. |
| Membrane Mimetics: | Preparation of - single supported bilayers (Langmiur Blodgett technique), large and small unilamellar vesicles, nanodiscs, bicelles, and detergent micelles. |
| Technical Competencies: | 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. |

## 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 Mgainin-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.

## LECTURES

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

## MENTORING AND LEADERSHIP

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

## AWARDS AND FUNDING

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

## PUBLICATIONS

Student S., Larsson, P., Nelson, L.A., Kasson, P.M., White, J.M., Tamm, L.K. Ebolavirus 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/Jun; 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 Ebolavirus Glycoprotein 2. *Proc Natl Acad Sci U S A.* 2011 Jul; 108(27):11211-6.

Mach, H., Student S., Mittal, S., Lalloo, 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., Cavenaugh 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.

## PRESENTATIONS

Speaker, 21st Annual Graduate Biosciences Symposium, 2013. *The Role of Hydrophobic Residues in the Internal Fusion Loop from Ebolavirus GP2.*

Speaker, 57th Annual Biophysical Society Meeting, 2013. *Inhibition of Ebolavirus 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 Ebolavirus 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.*

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

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

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

14th 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

## 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