

# CONNELL CUNNINGHAM, JR.

Phone: (540) 458-4854 | Email: [ccunningham@wlu.edu](mailto:ccunningham@wlu.edu)

Address: 204 West Washington Street, Lexington, VA 24450

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## PROFESSIONAL SUMMARY

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- ◆ An educator and former North Carolina Teaching fellow with experience teaching in high school, two -year colleges and four-year colleges.

## EDUCATION

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### **The University of North Carolina at Chapel Hill · Chapel Hill, NC, (2006) *Ph.D. in Chemistry***

*Dissertation: Increasing peptide sequence information from tandem mass spectrometry*

Advisor: Gary L. Glish, Ph.D.

Honors: The University of North Carolina at Chapel Hill Royster Society of Fellows and the Ross and Charlotte Johnson Family Dissertation Fellowship

#### Research Assistant

- ◆ Developed High Amplitude Short Time Excitation using Collision Induced Dissociation (HASTE-CID) for the identification of product ions that appear below the low mass cut-off during CID in a quadrupole ion trap mass analyzer.
- ◆ Extended the use of Iterative Accumulation Multiplexing (IAM) with Thermally Assisted Collision Induced Dissociation (TA-CID) and Thermally Assisted Infrared Multiphoton Photo Dissociation (TA-IRMPD) for the identification of multiple peptide product ions in a quadrupole ion trap mass analyzer.
- ◆ Utilized liquid chromatography mass spectrometry (LC-MS) method for the separation of digested protein samples.
- ◆ Analyzed departmental samples using electrospray ionization and atmospheric pressure chemical ionization using a triple quadrupole ion trap mass spectrometer.

#### Teaching Assistant

- ◆ Instructed and evaluated undergraduate students in Chemistry 41, Chemistry 23, and general chemistry courses.
- ◆ Mentored and instructed undergraduate students in research on infrared multiphoton photo dissociation (IRMPD) of peptides using mass spectrometry and HASTE-CID with heavy gases.
- ◆ Graduate assistant to the UNC Summer Pre-Graduate Research Experience Program, Guided the research of summer students for 10 weeks.

### **The University of North Carolina at Greensboro · Greensboro, NC, (2002) *M.S. in Chemistry***

*Thesis: ESI-MS for the identification and quantitation of bioactive alkaloids in the aerial portions of the endangered medicinal plant golden seal (*Hydrastis canadensis*)*

Advisor: Nadja B. Cech, Ph.D.

- ◆ Developed LC methods for quantitative analysis of alkaloids using quadrupole ion trap mass analyzers.
- ◆ Instructed middle and high school science teachers in the North Carolina Opt-Ed Program.
- ◆ Instructed and evaluated undergraduate students in general chemistry labs.

### **North Carolina Agricultural & Technical State University · Greensboro, NC, (1999) *B.S. in Chemistry, Secondary Education***

- ◆ Summa Cum Laude
- ◆ Honors: North Carolina Teaching Fellows Program

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## PROFESSIONAL PROFILE

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### Visiting Assistant Professor

*Washington and Lee University · Lexington, VA*

*July 2023- Current*

- ◆ Responsible for teaching and evaluating student performance in General Chemistry labs and lectures.
- ◆ Responsible for teaching and evaluating student performance in Spectroscopy labs.

### Chemistry Instructor/ Chemical Hygiene Officer

*Coastal Carolina Community College · Jacksonville, NC*

*January 2016- May 2023*

- ◆ Responsible for teaching and evaluating student performance in General Chemistry labs and lectures
- ◆ Responsible for training the Natural Science Division faculty on chemical safety standards, Chair of the Natural Science Division safety committee
- ◆ Responsible for maintaining the departments Gas Chromatography Mass Spectrometry system
- ◆ Responsible for developing GC-MS projects (retention pond analysis and CBD analysis) for undergraduate research
- ◆ Participates in Faculty Assembly and a member of various sub-committees.
- ◆ Mentor and interim advisor for the Minority Male Success Initiative
- ◆ Participated in and completed professional development activities for various community colleges.

### Adjunct Instructor

*Coastal Carolina Community College · Jacksonville, NC*

*January 2015- December 2015*

*Craven Community College · New Bern, NC*

*January 2015- December 2015*

*Wake Technical Community College · Raleigh, NC*

*January 2015- August 2015*

- ◆ Awarded Coastal Carolina Community College Excellence in Teaching award in 2015

### Chief Science Officer

*Next Glass, Inc. · Wilmington, NC*

*January 2014 – November 2014*

- ◆ Responsible for the company's scientific research and development.
- ◆ Setup the company's laboratory facility and oversaw its daily operation.
- ◆ Oversaw the analysis and quality control of 14,000+ samples with >800 samples analyzed each week.
- ◆ Developed UHPLC-MS methods which created a unique fingerprint for wine and beer.
- ◆ Utilized an AU400 chemical analyzer to check for sugar and alcohol in wine and beer samples.
- ◆ Managed and trained a laboratory technician to perform all sample analysis and instrument analysis.

### Study Director

*Xceleron Inc. · Germantown, MD*

*November 2012 – September 2013*

- ◆ Managed more than 12 bioanalytical projects at one time including client interaction, method development, protocol writing, data collection, data analysis and report writing.
- ◆ Developed and validated methods for analysis by HPLC + accelerator mass spectrometry (AMS) and interpreted results for accuracy.
- ◆ Ensured that all projects were conducted accurately, efficiently, and in accordance to company SOPs, GLP and FDA guidance.
- ◆ Provided guidance and supervision to less experienced staff in areas of wet chemistry, HPLC, LSC, CHN and sample extraction.
- ◆ Worked with business development team and QAU to ensure that the needs of the client were met.

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## **Laboratory Manager**

*Critical Path Services, LLC · Garnet Valley, PA*

*March 2010 – October 2012*

- ◆ Managed the company's analytical facilities and maintaining a GLP compliant lab.
- ◆ Supervised a team of five research scientists and lab technicians. Maintained a safe laboratory work environment through training.
- ◆ Served as study director/principle investigator on various projects for bioanalytical (FDA) and crop protection (EPA) projects.
- ◆ Developed and validated HPLC-MS/MS and GC-MS methods under GLP.
- ◆ Performed various extraction methods (protein crash, SLE, Liquid-Liquid, SPE, etc.) to clean up biological/crop matrices for analysis of various analytes. Matrices include rat serum, rat plasma, rat brain, dog plasma and human plasma. Analytes include natural oils, metabolites and small drug/pharmaceuticals.
- ◆ Created project planning guides for GLP projects, maintained SOPs and protocols for FDA/EPA compliance.
- ◆ Initiated a quantitative proteomics research program to generate new business opportunities.

## **Adjunct Professor**

*West Chester University · West Chester, PA*

*August 2009 – December 2012*

- ◆ Instructed students in general chemistry lab and increased students' understanding of chemistry through use of the Socratic Method.
- ◆ Developed and implemented lesson plans for the chemical information course (library science).
- ◆ Continuously scored well on evaluations from other faculty members and students.

## **Senior Scientist**

*Dow Chemical · Spring House, PA  
(Formally Rohm & Haas Company)*

*June 2006 – February 2010*

- ◆ Collaborated with a team of scientists throughout the company to determine differences in performance for various polymers.
- ◆ Created robust quantitative UPLC-MS/MS methods for trace level detection of small molecules and oligomers.
- ◆ Interpreted mass spectra of large molecules (polymers) using accurate mass analyzers (q-ToF).
- ◆ Developed methods to look for polymer end-capping using base hydrolysis, methylation, GC-ToF, MALDI-ToF and GPC.
- ◆ Developed methods using GPC with fraction collection and MALDI ToF for qualitative analysis of various polymers.
- ◆ Utilized liquid injection, on column injection and headspace for GC-ToF analysis of various compounds.
- ◆ Implemented a workplace exposure monitoring program (WEMP) to monitor OSHA regulated chemical within central analytical support.

## **Chemistry Teacher**

*Guilford County School System · Guilford, NC*

*August 1999 – June 2001*

- ◆ Instructed high school students (10-12 grades) in honors and general chemistry courses, mathematics, and physics.
- ◆ Evaluated students according to the North Carolina Standard Course of Study for Chemistry.

## PUBLICATIONS

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- ◆ Cunningham, C. and Glish, G.L., High Amplitude Short Time Excitation: A Method to Form and Detect Low Mass Product Ions in a Quadrupole Ion Trap Mass Spectrometer, *Journal of the American Society for Mass Spectrometry*, Volume 17, Issue 1, Jan. 2006, Pages 81–84.
- ◆ Adebodun, F., Scott, C.E., Cunningham, C., Bustamante, P.M., Bradshaw, A., Ping, L., and Williams, K.R. Elevated levels of Ca (II) modulate the activity and inhibition of serine proteases: Implication in the mechanism of apoptosis. *Cell Biochem. Funct.* 2000 (18), 59–66.

## PRESENTATIONS

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- ◆ Cunningham, C., Vandavelde, D. Design and Implementation of Practical Qualitative Experiments Involving Gas Chromatography Mass Spectrometry as an Analytical Tool. Presented at Coastal Carolina Community College Faculty Workshops, Jacksonville North Carolina, January 2022.
- ◆ Cunningham, C., Croft, M., Hall, A.R., *et al.* Confirmation of the Selectivity of an LC+AMS Assay by Cross-Validation with LC-MS/MS. Presented at 14th Annual Land O'Lakes Bioanalytical Conference, Madison Wisconsin, 15-18 July 2013.
- ◆ Chen, C., Cunningham, C., and Eble, J.E. A Direct LC/MS/MS Method for Determination of  $\beta$ -Alanine in Human Plasma. Presented at the Society of Toxicology Meeting, Washington DC, March 2011.
- ◆ Cunningham, C., Remes, P.M., Burinsky, D.J., and Glish, G.L. "Fast Collision Induced Dissociation for the Identification of Peptides in a Quadruple Ion Trap Mass Spectrometer", presented at the 53rd ASMS Conference on Mass Spectrometry and Allied Topics, San Antonio, TX, June 2005.
- ◆ Cunningham, C., Ray, K.L., and Glish, G.L., "Iterative Accumulation Multiplexing TA-CID in a Quadrupole Ion Trap", presented at the 52nd ASMS Conference on Mass Spectrometry and Allied Topics, Nashville, TN; May 2004.

## REFERENCES

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- ◆ Available upon request