Leslie Hiatt

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Objective

A position at a predominately undergraduate university requiring a strong analytical chemistry background and experience teaching using student-centered learning.

Education

Vanderbilt University, Nashville, TN

Ph.D., Department of Chemistry

Advisor: Dr. David E. Cliffel

Successfully Defended: December 10, 2010

"Gravimetric Detection of Pathogens and an Electrochemical Study of the Immunological Consequences of Tuberculosis Exposure"

Freed-Hardeman University, Henderson, TN

B.S. Biochemistry

Spring 2006

- Minor: Mathematics
- Graduated *magna cum laude* with Honors

Scientific Skills

Electrochemistry- Amperometry, voltammetry, chronoamperometry, reference electrode fabrication

Cell Culture- Maintained cell lines for research (seeding, splitting, plating, etc.)

Microfluidic design- PDMS fabrication, profilometry, plasma and silanization treatments, clean room techniques, spin-coating, photocurable PDMS

Quartz crystal microbalance (QCM)- Instrument repair, kinetics analysis, software creation, piranha cleaning, self-assembled monolayer formation

National Instruments LabVIEW Software- Interfaced multiple SRS QCMs with one computer and setup electronic control of syringe pumps interfaced with microfluidic systems

Additional techniques- Materials printing, ELISA, FTIR, DLS, UVO cleaner, ^{1}H NMR, LC-MS, MALDI, GC-MS, HPLC, AA and UV-Vis Spectroscopy, SEM, TEM

Software- Microsoft Office 2007, Endnote, Dreamweaver website design, Adobe Suite, ChemBioDraw, SciFinder Scholar, OriginPro Graphing Software

Teaching Experience

Adjunct Faculty

Spring 2011 Lipscomb University, Nashville, TN

- Lectured on Advanced Analytical Chemistry
- Expanded on students previous learning through education focused on Electrochemistry and Forensic Chemistry
- Reinforced learning with reviews and examples from current literature

Adjunct Faculty

Spring 2011 Austin Peay State University, Clarksville, TN

- Instructed four undergraduate labs in the areas of General Chemistry and Chemistry for Non-Science Majors
- Prepared quizzes and pre-lab lessons to improve student understanding of the course objectives
- Encouraged non-science majors to find direct application of the lab work to their current career choices

Weekend Academy at Vanderbilt University Lecturer

February 2011 Vanderbilt University Programs for Talented Youth, Nashville, TN

- Designed an accelerated two-day course for middle school students on the chemistry of microfluidic devices
- Provided students with hands on learning through jell-o and other materials to explore the field of lab-on-a-chip technologies
- Expanded on student interest in global problems by investigating the current methodologies behind disease diagnostics

Vanderbilt Summer Academy Lecturer

Summer 2010 Vanderbilt University Programs for Talented Youth, Nashville, TN

- Utilized discussion based lectures to introduce forensic chemistry to 8th graders
- Assessed students misconceptions about forensic science and prepared activities that could combat these ideas
- Facilitated laboratory experiments to supply a framework and motivation for their daily lessons
- Coordinated group projects to familiarize students with instruments common to forensic chemistry

Teaching Affiliate

Fall 2009 and 2010 Vanderbilt University Center for Teaching, Nashville, TN

- Designed and conducted a teaching workshop for new teaching assistants
- Served as a mentor to these new teaching assistants for their first semester
- Produced a video to highlight student expectations for future workshops

Forensics Teaching Assistant

Spring 2008 Vanderbilt University, Nashville, TN

- Supervised lab sessions focused on forensic science
- Developed methods for improving student scientific writing
- Coordinated field applications with the Tennessee Bureau of Investigation

Vanderbilt Student Volunteers for Science (VSVS)

Spring 2007 Vanderbilt University, Nashville, TN

- Instructed four basic scientific lessons to 5th and 6th grade students at Martha Vaught Middle School and West End Middle School
- Organized and mentored two teams of four undergraduates to teach these lessons
- Set up lessons and coordinated supply acquisition

General Chemistry Teaching Assistant

Fall 2006 Vanderbilt University, Nashville, TN

- Instructed weekly laboratory experiments of approximately 22 students
- Assisted students with data analysis during office hours and study sessions
- Graded written lab reports and exams

Organic Chemistry Teaching Assistant

2004-2006 Freed-Hardeman University, Henderson, TN

- Helped students understand course material through study sessions
- Oversaw weekly laboratory sessions
- Graded lab notebooks

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Research Experience

Research Assistant
2007-Present Vanderbilt University, Nashville, TN
Advisor: Dr. David E. Cliffel

- Designed and implemented a method to detect *Mycobacterium tuberculosis*
- Constructed a microfluidic electrochemical assay for the detection of oxidative burst
- Mentored the research of a high school student, an undergraduate student, and multiple graduate students as they worked in our lab
- Provided training to peers who required usage of the materials printer or quartz crystal microbalance in collaboration with Vanderbilt Institute of Nanoscale Science and Engineering (VINSE)

Lab Assistant
2004-2006 Cancer Research Institute of West TN, Henderson, TN
Advisor: Dr. Jerry Thornthwaite

- Performed DNA analysis using flow cytometry
- Analyzed literature looking for new methods for the prevention of angiogenesis

Research Experience for Undergraduates
Summer 2004 University of Memphis, Memphis, TN
Advisor: Dr. Theodore Burkey

- Performed synthetic organic chemistry in an oxygen-free environment while networking with peers that I would see at future conferences
- Studied organometallic systems through photosubstitution and characterization for ultrafast IR studies for a joint project with National Institute of Standards and Technology Laboratories

Awards

2006-2007 Graduate Assistance in Areas of National Need Fellow, Vanderbilt University

2006 Outstanding Chemistry Graduate, Freed-Hardeman University

2005-2006 Alpha Chi National Honor Society, President, Freed-Hardeman University

2005-2006 Honors Council, Vice President, Freed-Hardeman University

2004-2005 NAIA Academic All-American, Freed-Hardeman University

2003-2005 TranSouth Scholar Athlete, Freed-Hardeman University

2002-2006 Trustee's Academic Scholarship, Freed-Hardeman University

Volunteer Work

Spring 2011 Judged a Science Olympiad at Lipscomb University for middle and high school students

Fall 2010 Coached an elementary-age soccer team

Spring 2009-2010 Judged science fair projects at Head Magnet Middle School

2008-2009 Served on Vanderbilt's chemistry graduate student steering committee to help greet first year students at the department's annual picnic and bring in lecturers for the student-organized annual lectures

Summers 2006 -2009 Coached and prepared students in preparation for a Bible-based quiz bowl

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2007-2009 Taught children's classes at Burns church of Christ

Fall 2006 Served as a mentor to inner city Nashville children working as a tutor through Youth Encouragement Services (YES)

Summer 2006 Travelled to Zambia and taught at a ladies' day as part of a team doing mission work

Professional Affiliations

American Chemical Society (ACS), Electrochemical Society (ECS), and Society for Electroanalytical Chemistry (SEAC)

Conference Presentations

The 61st Annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy
Orlando, FL
National Meeting, Oral Presentation- March 2010
"A Superoxide Dismutase Coated Electrode for the Study of Macrophage Oxidative Burst"

Chemical and Biological Defense Science and Technology Conference
Dallas, TX
National Meeting, Oral Presentation- November 2009
"Rapid Detection of Biological Threat Agents by Using Quartz Crystal Immunosensors"

Southeastern Regional Meeting of the American Chemical Society
Nashville, TN
Regional Meeting, Oral Presentation- November 2008
"Detection Strategies for Mycobacterium Tuberculosis"

The 59th Annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy
New Orleans, LA
National Meeting, Poster Presentation- March 2008
"Quartz Crystal Microbalance Detection of Tuberculosis using Gold-Thiol Chemistry"

Publications in Progress

Scott A. Miller, **Leslie A. Hiatt**, Robert G. Keil, David E. Cliffel, and David W. Wright. (2010) "Nanoparticle Simulant for Influenza Virus." *Anal Bioanal Chem,* **399**, 1021-1030.

Leslie A. Hiatt and David E. Cliffel. "Real time Recognition of mycobacterium Tuberculosis and Lipoarabinomannan using the Quartz Crystal Microbalance." To be submitted to *Sens Actuators, B*

Reese S. Harry, **Leslie A. Hiatt**, Danielle W. Kimmel, Clare K. Carney, Kristin C. Halfpenny, David E. Cliffel and David W. Wright. "Metabolic Impact of 4-Hydroxynonenal on Macrophage Function and Activation." Submitted to *Integr Biol*

Leslie A. Hiatt, Jennifer R. McKenzie, Leila F. Deravi, Reese S. Harry, David W. Wright, and David E. Cliffel. "A printed Superoxide Dismutase Coated Electrode for the Study of Macrophage Oxidative Burst." To be submitted to *Sens Actuators, B*

Leslie A. Hiatt and David E. Cliffel. "Mechanism and Reactivity of a SOD coated electrode in a Non-aqueous Solvent" To be submitted to *Electrochem Comm*

Danielle Kimmel, Mika Meschievitz, **Leslie A. Hiatt**, and David E. Cliffel. "Multianalyte Microphysiometry of Macrophage Oxidative Burst." To be submitted to *Science*

Jennifer R. McKenzie, **Leslie A. Hiatt**, David K. Shaffer, Phillip C. Samson, Dmitri A. Markov, John P. Wikswo, David E. Cliffel. "Development of a Screen-printed Electrode for Real-time

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Monitoring of Cellular Metabolism in a Microfluidic Environment" To be submitted to *Biosens Bioelectron*

Teaching Workshops Attended

Center for Teaching Graduate Student Teaching Event for Professional Development (GradSTEP) 2008- 2011:

2011 GradSTEP participated in sessions focusing on alternative assessment, teaching science to non-science students, and using visual thinking in the classroom

2010 GradSTEP incorporated learning about giving effective presentations as well as working towards an ecological pedagogy

2009 GradSTEP included a session on course design for student learning and a session on assessment and grading

2008 GradSTEP focused on engaging students and using formative assessment to recognize when learning is occurring in the classroom

2007-2008 Led practice teaching sessions as part of Vanderbilt Center for Teaching's (CFT) teaching assistant orientation (TAO) workshop

Proposed Research

An electrochemical study of carotenoids for use in electrochromic devices could be conducted using only a UV-Vis spectrophotometer and a potentiostat. Carotenoids are organic pigments that occur naturally in plants and other photosynthetic organisms that have the potential to meet all of the requirements of an electrochromic device. This research experience works toward characterizing carotenoids and assessing whether they are suitable for incorporation into electrochromic devices. Capturing the electrochromic shift of carotenoids that occurs during energy transfer will create much needed hands-on experience for undergraduates and involve students in the research process.

References

Dr. David Cliffel
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Dr. Grace Zoorob
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