# BRIAN M. CULLUM; Ph.D – Curriculum Vitae

## Experience in Higher Education:

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|---|---|
| 2020 – Present | ***Department Chairperson***, Department of Chemistry & Biochemistry<br>University of Maryland Baltimore County (UMBC) |
| 2018 - Present | ***Professor***, Department of Chemistry & Biochemistry<br>University of Maryland Baltimore County (UMBC) |
| 2015 - 2016 | ***Visiting Scientist***, Sensors and Electron Devices Directorate<br>U.S. Army Research Laboratory (Adelphi Research Center) |
| 2010 - 2015 | ***Graduate Program Director***, Department of Chemistry & Biochemistry<br>University of Maryland Baltimore County (UMBC) |
| 2008 - 2018 | ***Associate Professor***, Department of Chemistry & Biochemistry<br>University of Maryland Baltimore County (UMBC) |
| 2007 - Present | ***Regular Member of the Graduate Faculty***<br>University of Maryland Baltimore County (UMBC) |
| 2002 - 2007 | ***Associate Member of the Graduate Faculty***<br>University of Maryland Baltimore County (UMBC) |
| 2002 – 2008 | ***Assistant Professor***, Department of Chemistry & Biochemistry<br>University of Maryland Baltimore County (UMBC) |

## Professional Preparation:

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|---|---|
| 1999 - 2002 | Oak Ridge National Laboratory (ORNL) Spectroscopy (Postdoctoral Fellow);<br>Research Mentor: *Dr. Tuan Vo-Dinh* |
| 1998 | Univ. of South Carolina, Analytical Chemistry; Ph.D.<br>Thesis Advisor: *Professor S. Michael Angel* |
| 1994 | Frostburg State University, Chemistry; B.A. |
| 1992 | Harford Community College, Chemistry; A.A. |

## Honors/Awards:

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|---|---|
| 2024 | Fellow; Optica (formerly Optical Society of America (OSA)) |
| 2017 | 2017 FACSS Innovation Award |
| 2014 | Fellow; SPIE (The International Society of Photonics and Instrumentation Engineering) |
| 2004 | Eli Lilly Promising Analytical Chemist Award |
| 2004 | UMBC Summer Faculty Fellowship |
| 2003 | Eli Lilly Promising Analytical Chemist Award |
| 2003 | UMBC Summer Faculty Fellowship |
| 2003 | R&D 100 Award; RAMiTS: Raman Integrated Tunable Sensor |
| 2002 | Plenary Lecturer; Analytica Conference (Munich; Germany) |
| 1998 | Bayer Corporation Award for Graduate Research |
| 1998 | Sigma Xi Graduate Research Award |
| 1998 | University of South Carolina Graduate Research Award |

## Patents/Patents Pending:

- B. M. Cullum and H. Li; "Multilayered Surface-Enhanced Raman Scattering (SERS) Substrates," U.S. Patent No. 7,242,470; Issued July, 10, 2007.

- B. M. Cullum, N. Chandrasekharan and M. Hankus; "Surface Enhanced Raman Spectroscopic Nanoimager," U.S. Patent No. 7,256,886; Issued August 14, 2007.

## SERVICE

Professional Activities

***Editorial responsibilities:***

2017 – 2018 Special Guest Editor; Chemosensors (Chemical Imaging issue)
2016 – present Guest Editorial Board Member; Journal of Biomedical Optics (Topic: Sensing)
2013 – present Editorial Board Member; JSM Chemistry
2011 – 2012 Special Guest Editor; Journal of Nanotechnology (SERS issue)
2003 – present Volume Editor; SPIE Proceedings

***National/International conferences chaired:***

- 2025 Advisory Board Member; IEEE International Conference on Microwave, Optical, and Communication Engineering (ICMOCE); Bhubaneswar, India
- 2023 Advisory Board Member; IEEE International Conference on Microwave, Optical, and Communication Engineering (ICMOCE); Bhubaneswar, India
- 2017 - 2020 Program Committee Member; Biomedical Applications & Technology Track, Annual CLEO Laser Science to Photonic Applications Conference
- 2016 - 2020 Program Committee Member; Optical Chemical and Biological Sensors Session, Annual Advanced Photonics Congress (OSA)
- 2009 - Present Conference Chair; Smart Biomedical and Physiological Sensor Technology Conference, Annual SPIE Defense Security and Sensing
- 2004 - 2007 Conference Chair; Smart Medical and Physiological Sensor Technology Conference, Annual SPIE Optics East
- 2003 Conference Chair; Smart Medical and Biomedical Sensor Technology Conference, Annual SPIE Photonics East

***Grant review activities:***

- Technical Advisory Board (TAB) for Edgewood Chemical and Biological Center (ECBC) U.S. Army (2019)
- National Institutes of Justice Grant Review Panel Member
- National Institutes of Justice; ad hoc reviewer (2016)
- Army Research Office; Reviewer
- American Society for Engineering Education/U.S. Department of Defense (U.S. DOD); Reviewer
- NASA; Review Panel Member (Astrobiology Instrumentation Development)
- National Science Foundation; Reviewer and Review Panel Member
- National Institutes for Water Resources; Reviewer
- Biomedical Research Council of Singapore; Reviewer
- Office of Naval Research (ONR); Reviewer
- Air Force Office of Scientific Research (AFOSR); Reviewer
- USDA; Reviewer
- National Institutes of Health; Reviewer

***Consulting activities:***

- NASA Astrobiology Instrumentation Development (2009); Program consultant
- Abell Foundation (2007); Proposal consultant
- NATO Science for Peace Program (2004); Proposal consultant

***Ad Hoc Reviewer for the following journals:***

- PNAS
- Applied Spectroscopy
- Journal of Physical Chemistry
- SPIE Proceedings
- Langmuir
- ACS Nano
- Review of Scientific Instruments
- Analytical Chemistry
- Journal of Biomedical Optics
- Analytica Chimica Acta
- Journal of Raman Spectroscopy
- Biophysical Journal
- Photochemistry and Photobiology
- Nanobiophotonics
- Optics Letters
- Annals of Occupational Hygiene
- Biopolymers
- Chemical Physics Letters
- Optical Engineering
- Optics Express

***Member of the following societies/organizations:***

- 2013 – present Optica (formerly OSA); Member (Fellow since 2024)
- 2012 – present SPIE; Member (Fellow of SPIE since 2014)
- 2002 - present Society for Applied Spectroscopy; Member
- 1998 - 2000 Sigma Xi Scientific Research Society; Associate Member
- 1996 - 1999 South Carolina Academy of Sciences; Member
- 1994 - 1996 American Chemical Society; Member

University Activities

***University committees served on:***

- 2020 – 2025 Member; Academic Planning and Budget Committee
- 2020 – 2023 Member; Academic COVID Planning Committee (ACPC)
- 2017 Faculty Mentor; STEM BUILD Program
- 2012 – 2019 Member; UMBC/UMB Graduate Council
- 2011 – 2015 Faculty Mentor; I-Cubed Program
- 2010 – 2013 Member; Chemistry Biology Interface Program Steering Committee
- 2008 – 2010 Member; Microscopy/Atomic Force Microscopy Facility Committee
- 2008 - 2009 Member; Biophysics Faculty Search Committee
- 2005 Member; Chemistry/Biology Machinist Search Committee
- 2004 Member; Chemistry/Biology Electronics Technician Search Committee
- 2003-2004 Member; Science 100 Instructor Search Committee

***University service:***

- 2014 Judge; Graduate Research Awards
- 2007 Judge; Graduate Research Awards
- 2004 Judge; Graduate Research Awards

Departmental Activities

***Departmental committees served on:***

- 2018 – 2019 **Chair**; Pre-Professoriate Faculty Search Committee
- 2017 – 2018 **Chair**; Analytical Faculty Search Committee
- 2016 – 2017 Member; Analytical/Physical Chemistry Instructor Search Committee
- 2015 – 2020 Member; Graduate Program Progressions Committee
- 2013 – 2014 **Chair**; Analytical Faculty Search Committee
- 2011 – 2012 **Chair**; Inorganic Faculty Search Committee
- 2011 – 2012 **Co-Chair/Director**; Graduate Recruiting/Admissions Committee
- 2010 – 2015 **Chair/Director**; Graduate Program Director/Graduate Progressions Committee

- 2010 – 2011 **Chair**; Analytical Faculty Search Committee
- 2008 – 2010 **Chair** (admissions); Graduate Recruiting/Admissions Committee
- 2008 – 2010 Member; Undergraduate Research Symposium Committee
- 2008 – 2009 Member; Organic Faculty Search Committee
- 2005 – 2010 **Chair;** Graduate Student Recruiting Committee
- 2005 – 2010 Member; Graduate Progression/Admissions Committee
- 2006 - 2007 **Co-Chair**; Inorganic Faculty Search Committee
- 2005 - 2006 Member; Writing in the Discipline Committee
- 2005 – 2013 Member; Mass Spectrometry Facilities Oversight Committee
- 2003 - 2004 Member; Graduate Student Recruiting Committee
- 2002 - 2005 **Co-Chair**; Chemistry Seminar Series Committee

**Research Support/Fellowships:**

***Previous Support:***

2003 "Multiphoton Photoacoustic Spectroscopy: Development of a Novel High-Resolution Subsurface Imaging Technique for Tumor Diagnosis and Margining"; UMBC Summer Faculty Fellowship; Role: PI

2003 – 2004 "Multiphoton Photoacoustic Spectroscopy: Development of a Novel High Resolution Subsurface Imaging Technique for Tumor Diagnosis and Margining"; UMBC SRIS/RAS Grant; Role: PI

2003 – 2004 "Promising Analytical Chemist Award"; Eli Lilly and Company; Role: PI

2004 "Development and Characterization of Fiber Optic Probes for the Real-time Imaging of Chemical Species with Nanometer Spatial Resolution"; UMBC Summer Faculty Fellowship; Role: PI

2004 – 2005 "Development and Characterization of Fiber Optic Probes for the Real-time Imaging of Chemical Species with Nanometer Spatial Resolution"; UMBC SRIS/RAS Grant; Role: PI

2004 – 2005 "Development of Multiphoton Photoacoustic Spectroscopy for Subsurface Tumor Diagnosis and Imaging"; Maryland Technology Development Corporation (MD TEDCO); Role: PI

2004 – 2005 "Development and Evaluation of Novel Implantable Nanosensors for Real-Time Monitoring of Individual Cells and Cellular Signaling"; Defense Advanced Research Projects Agency (DARPA)/Air Force Office of Scientific Research; Role: PI

2004 – 2005 "Promising Analytical Chemist Award"; Eli Lilly and Company; Role: PI

2004 – 2005 "Novel Surface Enhanced Raman Scattering (SERS) Substrates for UV SERS"; ITT Industries; Role: PI

2005 – 2009 "Development and Optimization of Multilayered Surface Enhanced Raman Substrates"; Army Research Office; Role: PI

2006 – 2010 "Multi-Layered Surround SERS Nanosensor Array System for the Rapid, Specific and Multiplexed Detection of Foodborne Bacteria and Toxins"; U.S. Department of Agriculture (CSREES Program); Role: PI

2007 – 2010 "Acquisition of a Confocal Microscope"; National Science Foundation (Major Research Instrumentation Grant); Role: Co-I

2009 – 2010 "Innovation and Commercialization of Chemical Detection Technologies"; Alex Brown Center for Entrepreneurship; Role:Co-PI/PI (Choa)

2010 – 2012 "Center for Bio-mimetic, Bio-Controlled and Biocompatible Nanoscience: (Phase 1) Optical Nanosensors for Pre-Symptomatic Disease Monitoring"; UMBC Research Seed Funding Initiative; Role: PI

2011 – 2012 "Development of a SERS Nanoimager for Robust Biological/Chemical Signature Identification", U.S. Army Research Laboratory/ Maryland Proof of Concept Alliance Fund; Role: PI
2015 – 2016 "Multi-layered SERS and Guided, Localized Photo-acoustic Detection of Chemical Agents", Battelle Scientific Services Program; Role:PI
2017 – 2021 "Optically Induced Channeling of Sound"; U.S. Army Research Laboratory; Role: PI
2022 -2023 "Raman Spectroscopy to Quantify Shock Biomarkers"; Maryland TEDCO Maryland Innovation Initiative (MII); Role: Co-I (PI: Dr. Michael McCurdy/U. MD School of Medicine)
2022 - 2023 "High Enhancement, Low Cost, Large Area SERS Substrates by ALD Deposited Porous Polymeric Filter Networks"- Phase I; U.S. Army SBIR Program; Role: Co-I (PI: Dr. Yimin Hu/Raytum Photonics)
2022 – 2025 "The 2022 Beckman Scholars Program at UMBC"; Arnold and Mabel Beckman Foundation; Role: Co-I

***Current/Pending Support:***

2024 – 2025 "Watching Macrophages Eat: Deuterium Labeled Raman Ultraviolet Mapping of Metabolites (DRUMM) in Fatty Liver Disease"; UMB/UMBC Innovative Collaborative Translational Research (ICTR)/ Accelerated Translational Incubator Pilot (ATIP); Role: Co-PI (PI: Dr. Sui Seng Tee; UMB Dept. of Radiology)
2025 – 2026 "UMBC Center for Precision Aquaculture (UCPA)"; Congressional Earmark; NOAA; Role Co-PI (PI: Dr. Yonathan Zohar; UMBC); pending
2025 – 2030 S-STEM Nano to Macro: Interdisciplinary Life Sciences Scholar Program (N2M)"; National Science Foundation; Role Co-I (PI: Dr. Beatrice Lauman; UMBC College of Natural and Mathematical Sciences); pending

**Ph.D. Students Mentored**

- Honggang Li; Received Ph.D. August 2007, Role: Advisor/Committee Chair (currently a senior scientist at BioTools Inc.)
- Jian Sun; Received Ph.D. August 2010, Role: Advisor/Committee Chair (currently a senior scientist at Dupont Danisco Cellulosic Ethanol)
- Charles Klutse; Received Ph.D. May 2012, Role: Advisor/Committee Chair (currently a senior scientist at Ghana's Atomic Energy Commission)
- Sudhir Dahal; Received Ph.D. December 2014, Role: Advisor/Committee Chair (currently a lead technical scientist for Raman Instrumentation at Thermo Fisher)
- Pietro Strobbia; Received Ph.D. August 2016, Role: Advisor/Committee Chair (currently Assistant Professor of Chemistry at the University of Cincinnati)
- Eric Languirand; Received Ph.D. December 2017, Role: Advisor/Committee Chair (currently a staff scientist at U.S. Army Chemical and Biological Center)
- Daniel Kazal; Received Ph.D. May 2022, Role: Advisor/Committee Chair (currently a staff scientist at Johns Hopkins Applied Physics Laboratory)
- Alex Reardon; Degree expected May 2026, Role: Advisor/Committee Chair
- Emmanuella Duruye; Degree expected May 2027, Role: Advisor/Committee Chair

**M.S. Students Mentored**

- John Kiser; Received M.S. Degree in August 2007, Role: Advisor/Committee Chair (currently STEM lead for Anne Arundel County Public Schools)

- Mikella Hankus; Received M.S. Degree in December 2007, Role: Advisor/Committee Chair (currently a staff scientist at U.S. Army Research Laboratory)
- Tasha Messenger; Received M.S. Degree in December 2008, Role: Advisor/Committee Chair (currently an analyst for U. S. Defense Intelligence Agency)
- Pierre Chabernaud (visiting intern from M.S. program at Universite de Poitiers, France); Role: Research supervisor for 3 months (April – June 2014); graduated M.S. program in May 2015
- Lucie Martin (visiting intern from M.S. program at Universite de Poitiers, France); Role: Research supervisor for 4 months (April – July 2017); graduated M.S. program in May 2018
- Sarah Wirick; Received M.S. Degree in May 2022, Role: Advisor/Committee Chair

**Other graduate student committees served on:**

*Ph.D. student committees*

- Madison Conte; degree expected May 2027, Role: Committee Member
- Nav Phulara; degree expected May 2027, Role: Committee Member
- Kayry Segarra; degree expected May 2025, Role: Committee Member
- Leslie Scheuer; degree expected May 2025, Role: Committee Member
- Giraso Keza Monia Kabandana; Received Degree December 2023, Role: Committee Member
- Curtis Jones; Received Degree December 2023, Role: Committee Member
- Ciara Pitman; Received Degree May 2022, Role: Committee Member
- Rachel Knoublach; Received Degree May 2021, Role: Committee Member
- Mirelis SantosCancel; Received Ph.D. from U. Cinn. February 2019, Role: Committee Member
- Erin Kennedy; Received Degree May 2021, Role: Committee Member
- Alex Winton; Received Ph.D. December 2018, Role: Committee Member
- Christopher Cooper; Received Ph.D. January 2024, Role: Committee Member
- Evgenia Barannikova; Received Degree December 2020, Role: Committee Member
- Scott Riley; Received Ph.D. May 2020, Role: Committee Member
- Brian Szychowski; Received Ph.D. December 2018, Role: Committee Member
- DeLauren McCauley; Received Ph.D. December 2017, Role: Committee Member
- Sarah Wassink-Bass; Received Ph.D. December 2017, Role: Committee Member
- Andrea Gray; Received Ph.D. August 2016, Role: Committee Member
- Florika Maczao; Received Ph.D. May 2016, Role: Committee Member
- Gregory Winter; Received Ph.D. August 2016, Role: Committee Member
- Lauren Schoukroun; Received Ph.D. December 2015, Role: Committee Member
- Liwang Ye (Physics); Received Ph.D. December 2014, Role: Committee Member
- William Ghann; Received Ph.D. December 2014, Role: Committee Member
- Tracy Smith (Biological Sciences); Received Ph.D. August 2014, Role: Committee Member
- Brahmi Shukla; Received Ph.D. May 2013, Role: Committee Member
- Xing Chen (CSEE); Received Ph.D. August 2013, Role: Committee Member
- Jules Guei; Received Ph.D. December 2010, Role: Committee Member
- Margaret Grow; Received Ph.D. August 2012, Role: Committee Member
- Smitha Vokkaliga; Received Ph.D. May 2011, Role: Committee Member
- Niti Shah; Received Ph.D. December 2016, Role: Committee Member
- Jennifer Federoski; Received Ph.D. May 2012, Role: Committee Member
- Hailang Zhang; Received Ph.D. May 2009, Role: Committee Member
- Unmei Pan; Left Program May 2008, Role: Committee Member
- Suma Vavilala; Received Ph.D. May 2010, Role: Committee Member
- Christopher Cowan (Chem Eng.); Received Ph.D. May 2009, Role: Committee Member
- Derek Smith (Chem. Eng.); Received Ph.D. May 2009, Role: Committee Member

- Yu Zhang; Received Ph.D. May 2010, Role: Committee Member
- Sarah Evans; Received Ph.D. May 2009, Role: Committee Member
- Radhakrishnan Balu: Received Ph.D. May 2008, Role: Committee Member
- Swati Modi; Received Ph.D. May 2006, Role: Committee Member
- P. Devin Wigington; Left program December 2004; Role: Committee Member
- Samindhi Wu, Left program May 2008, Role: Committee Member

*M.S. student committees*

- Melissa Davilla-Morris; Received M.S. Degree May 2014, Role: Committee Member
- Ivy Grimm; Received M.S. Degree in December 2008, Role: Committee Member
- Haohao Ke; Received M.S. Degree in May 2008, Role: Committee Member
- Emily Davis; Received M.S. Degree in August 2003, Role: Committee Member

**Undergraduate Research Students Mentored**

- Lauren Skrajewski; REU student (from Clemson University; Summer 18); Role: Research Mentor; Currently a graduate student at Vanderbilt University
- An Ngo; UMBC undergraduate research (Fall 17 – Dec. 18), graduated December 2018 (Major: Chemistry); Role: Research Mentor; Currently employed at the U.S. Army Research Laboratory
- Melyssa Cheung; Summer Undergraduate STEM BUILD Program (from Anne Arundel Community College; Summer 17); Role: Research Mentor; Currently an undergrad at U. MD – College Park
- Zahra Mehrabi; Summer Undergraduate STEM BUILD Program (from Prince Georges Community College; Summer 17); Role: Research Mentor; Currently a pre-med student at U. MD – College Park
- Henry Dorbu; Summer Undergraduate STEM BUILD Program (from Montgomery College; Summer 17); Role: Research Mentor; Currently an undergraduate at Montgomery College
- Briana Taborn; Summer Undergraduate STEM BUILD Program (from Howard Community College; Summer 17); Role: Research Mentor; Currently an undergraduate at NYU
- Curtis Jones; UMBC undergraduate research (Fall 15 – Fall 16), Graduated December 2016 (Major: Chemistry); Role: Research Mentor; Currently R&D Staff at Under Armour
- Brooke Lewis; Summer Undergraduate Research Experience Program (from Alcorn State University; Summer 11); Role: Research Mentor; Currently enrolled in Ph.D. program at Penn State
- Hamsa Gowda; UMBC/HHMI scholar student (Spring 11 – Summer 11), Graduated May 2014 (Major: Chemical Engineering); Role: Research Mentor; Currently enrolled in Biomedical Engineering Graduate Program at UC-Irvine
- Marc Scimonelli; UMBC undergraduate research (Spring 11 – Fall 2012); Graduated May 2013 (Major: Chemical Engineering); Role: Research Mentor; Currently an Industrial Hygienist at Aria Environmental Inc.
- Kojo C. Yeboa; UMBC undergraduate research (Spring 10 – Spring 12), MARC student; Graduated May 2013 (Major: Biochemistry); Role: Research Mentor; Currently a Product Engineer at Conoco Phillips
- Adam Mayer; UMBC undergraduate research (Spring 10 – Spring 13); Graduated May 2013 (Major: Biological Sciences); Role: Research Mentor; Later received M.D. and is currently medical resident at U. Penn.

- Lillian Johnson; UMBC undergraduate research (Summer 10 – Fall 2012); Graduated May 2013 (Major:Chemical and Biochemical Engineering); Role: Research Mentor; Currently Ph.D. student at Stanford University
- Julia Wittkamper; UMBC undergraduate research (Spring 10 – Spring 2012); Graduated May 2012 (Major:Chemistry); Role: Research Mentor; Currently Ph.D. student at Carnegie Mellon University
- Andrew Fales; UMBC undergraduate research (Summer 09 – Spring 2010); Graduated May 2010 (Major: Biochemistry); Role: Research Mentor; Later received Ph.D. at Duke University and is currently postdoc at U.S. FDA
- John Bender; UMBC undergraduate research (Fall 08 – Spring 2010); Graduated May 2010 (Major: Chemistry); Role: Research Mentor; Later received Ph.D. and is currently staff scientist at NIST
- Nicole Whitten; UMBC undergraduate research (Fall 06 – Spring 2009); Graduated May 2009 (Major: Chemistry); Role: Research Mentor; Currently employed at Tiger Optics
- Asmaa Khatib; UMBC undergraduate research (Fall 07 – Fall 08); Graduated May 2010 (Major: Biochemistry & Molecular Biology); Role: Research Mentor
- Jason Kisser; UMBC undergraduate research (Fall 07 – Fall 08); Graduated May 2009 (Major: Biochemistry & Molecular Biology); Role: Research Mentor; Currently enrolled in Ph.D. program in Psychology at UMBC
- Eric Eller; UMBC undergraduate research (Fall 06 – Fall 07); Graduation expected May 2009 (Major: Chemistry); Role: Research Mentor/Academic Advisor
- D. Ryan Kostick; UMBC undergraduate research (Summer 06 & Fall 07); Graduated May 2009 (Major: Chemical Engineering); Role: Research Mentor; Currently a Product Manager at GEA Process Engineering
- Joshua Wilhide; Villa Julie College undergraduate research (Senior Capstone Project; Fall 06); Graduated May 2007; Role: Research Mentor; Currently manager of the Molecular Characterization and Analysis Complex at UMBC
- Daniel Buswell; UMBC undergraduate research (Spring 05 – Spring 06); Graduated May 2006 (Major: Chemical Engineering); Role: Research Mentor; Currently an engineer at Maryland Engineering Services, LLC
- Camille Madison; Summer Undergraduate Research Experience Program (from The University of Rochester; Summer 05 & Summer 06); Role: Research Mentor; Later received M.D. and is currently practicing at UC-Davis Medical Center – Family Medicine
- Cecelia Young; Summer Biomedical Research Training Program (from Virginia Union University; (Summer 2004); Role: Research Mentor
- Ashley Cox; Biomedical Summer Undergraduate Research Experience Program (from Wofford College; Summer 2004); Role: Research Mentor; Currently a physician's assistant
- Gregory Gibson; UMBC undergraduate research (Summer 04 – Spring 06); Graduated May 2006 (Major Chemical Engineering); Role: Research Mentor
- Bilal Chaudhry; UMBC undergraduate research (Fall 03); Graduated May 2005 (Major: Psychology); Role: Research Mentor; Later received M.D. and is currently working with Meritus Health
- Veena Rao; UMBC undergraduate research (Fall 03); Graduated May 2006 (Major: Biological Sciences); Role: Research Mentor ; Later received M.S. in Chemical Engineering from U. MD-College Park and is currently a Faculty Research Assistant at U. MD
- Nicole Villalba Costa; Summer Biomedical Research Training Program (from Universidad Metropolitana; Summer 03); Role: Research Mentor

- Shaan Akbar; UMBC undergraduate research (Spring 04 – Fall 05); Graduated May 2005 (Major: Biological Sciences); Role: Research Mentor; Later enrolled in business school and currently a film production specialist at Discovery Communications
- Donald Parker; UMBC undergraduate research (Fall 03 – Spring 05); Graduated May 2005 (Major: Biological Sciences); Role: Research Mentor; Currently a D.D.S. at Comprehensive Family Dentistry)
- Pranav Patel; UMBC undergraduate research (Fall 03 – Spring 05); Graduated May 2005 (Major: Biological Sciences); Role: Research Mentor; Currently a medical doctor with Katzen Eye Group)
- Ronak Mehta; UMBC undergraduate research (Fall 03 – Fall 04); Graduated May 2005 (Major: Biochemistry & Molecular Biology); Role: Research Mentor
- Mary Habib; UMBC undergraduate research (Fall 02 - Spring 03); Graduated December 2003 (Major: Information Systems – Systems Analysis and Design); Role: Research Mentor
- Soumi Saha; UMBC undergraduate research Fall 02 – Spring 03); accepted to UMB School of Pharmacy in Fall 03 (UMBC Major: Pre-pharmacy); Role: Research Mentor; Currently Director of Pharm. & Reg. Affairs at Academy of Managed Care Pharmacy

**High School Research Students Mentored**

- Saloni Patel; Howard County High School Student (Fall 24/Spring 25): Role: Research Mentor; Currently completing senior year of High School in Howard County Public School System
- Calvin Grove; Howard County High School Student (Fall 24/Spring 25): Role: Research Mentor; Currently completing senior year of High School in Howard County Public School System
- Agnes Liu; Howard County High School Student (Summer 24); Role: Research Mentor; Currently completing senior year of High School in Howard County Public School System
- Julia Purdue; Howard County High Schools Applied Research Internship (Fall 23 – Spring 24); Role: Research Mentor; Currently enrolled at McGill University
- Katie Tulp; Howard County High Schools Applied Research Internship (Fall 17 – Spring 18); Role: Research Mentor
- Nikhil Nair; Howard County High School Student (Summer 17); Role: Research Mentor
- Joanna Lee; Howard County High Schools Applied Research Internship (Fall 14 – Spring 15); Role: Research Mentor; Currently an undergraduate student at UMBC (UMBC Major: Biological Education)

**PUBLICATIONS**

**Peer-Reviewed Works** – ( ) primary author; * - corresponding author

Books (Written/Edited):

1. Cullum, Brian M.; McLamore, Eric S.; Strobbia, Pietro; Editors. Smart Biomedical and Physiological Sensor Technology XXII. Proc. SPIE-Int. Soc. Opt. Eng., 2025; 13481.
2. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XXI. Proc. SPIE-Int. Soc. Opt. Eng., 2024; 13059.
3. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XX. Proc. SPIE-Int. Soc. Opt. Eng., 2023; 12548.
4. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XIX. Proc. SPIE-Int. Soc. Opt. Eng., 2022; 12123.

5. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XVII. Proc. SPIE-Int. Soc. Opt. Eng., 2021; 11757.
6. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XVI. Proc. SPIE-Int. Soc. Opt. Eng., 2019; 11020.
7. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XV. Proc. SPIE-Int. Soc. Opt. Eng., 2018; 10662.
8. Cullum, Brian M.; Kiehl, Douglas; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XIV. Proc. SPIE-Int. Soc. Opt. Eng., 2017; 10216.
9. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XIII. Proc. SPIE-Int. Soc. Opt. Eng., 2016; 9863.
10. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XII. Proc. SPIE-Int. Soc. Opt. Eng., 2015; 9487.
11. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology XI. Proc. SPIE-Int. Soc. Opt. Eng., 2014; 9107.
12. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology X. Proc. SPIE-Int. Soc. Opt. Eng., 2013; 8719.
13. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology IX. Proc. SPIE-Int. Soc. Opt. Eng., 2012; 8367.
14. Cullum, Brian M.; McLamore, Eric S.; Editors. Smart Biomedical and Physiological Sensor Technology VIII. Proc. SPIE-Int. Soc. Opt. Eng., 2011; 8025.
15. Cullum, Brian M.; Porterfield, D. Marshall; Editors. Smart Biomedical and Physiological Sensor Technology VII. Proc. SPIE-Int. Soc. Opt. Eng., 2010; 7674.
16. Cullum, Brian M.; Porterfield, D. Marshall; Editors. Smart Biomedical and Physiological Sensor Technology VI. Proc. SPIE-Int. Soc. Opt. Eng., 2009; 7313.
17. Cullum, Brian M.; Porterfield, D. Marshall; Editors. Smart Biomedical and Physiological Sensor Technology V. Proc. SPIE-Int. Soc. Opt. Eng., 2007; 6759.
18. Cullum, Brian M.; Carter, J. Chance; Editors. Smart Biomedical and Physiological Sensor Technology IV. Proc. SPIE-Int. Soc. Opt. Eng., 2006; 6380.
19. Cullum, Brian M.; Carter, J. Chance; Editors. Smart Biomedical and Physiological Sensor Technology III. Proc. SPIE-Int. Soc. Opt. Eng., 2005; 6007.
20. Cullum, Brian M.; Editor. Smart Biomedical and Physiological Sensor Technology II. Proc. SPIE-Int. Soc. Opt. Eng., 2004; 5588.
21. Cullum, Brian M.; Editor. Smart Biomedical and Physiological Sensor Technology I. Proc. SPIE-Int. Soc. Opt. Eng., 2003; 5261.

Book Chapters:

1. E. Languirand, D. Kazal, S. Lowery and (B. M. Cullum)*, "Nanoscale Optical Biosensors and Biochips for Cellular Diagnostics," in Smart Biosensor Technology; George K. Knopf and Amarjeet S. Bassi (eds.), Boca Raton, CRC Press, 2nd edition, November 2018.
2. (B. M. Cullum)*, "Preparation of Liquid and Solid Samples," in Handbook of Spectroscopy; Gunter Gauglitz and David S. Moore (eds.), Weinheim, Germany, Wiley-VCH Verlag GmbH & Co., Volume 1, 2nd edition, June 2014, pp. 1-14, ISBN 9783527321506.
3. T. Vo-Dinh and (B. M. Cullum)*, "Fluorescence Spectroscopy for Biomedical Diagnostics," in CRC Handbook of Biomedical Photonics; Tuan Vo-Dinh (ed.), Boca Raton, CRC Press, 2nd edition, Volume 2, 2014, ISBN 9781439804445.
4. (C. K. Klutse), B. M. Cullum,* M. K. Gregas, J. P. Scaffidi and T. Vo-Dinh, "Nanosensors for Single-Cell Analyses," in CRC Handbook of Biomedical Photonics; Tuan Vo-Dinh (ed.), Boca Raton, CRC Press, 2nd edition, Volume 3, 2014, ISBN 9781439804445.

5. (D. N. Stratis-Cullum)*, M. E. Farrell, E. Holthoff, D. L. Stokes, B. M. Cullum, J. M. Song, P. M. Kasili, R. Jagannathan, J. Mobley and T. Vo-Dinh, "Spectroscopic Data of Biologically and Medically Relevant Species and Samples," in CRC Handbook of Biomedical Photonics; Tuan Vo-Dinh (ed.), Boca Raton, CRC Press, 2nd edition, Volume 1, 2014, ISBN 9781439804445.
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4. (Meghan Brandt), Nicholas Schmidt, Aria Tauraso, Rachit Sood, Ching Hua Su, Bradley Arnold, Fow-Sen Choa, Brian Cullum, and N. B. Singh "Flux growth of optical sensor zinc selenide crystals", Proc. SPIE – Soc. Opt. Eng., **13059**, 1305905 (2024); doi:10.1117/12.3013178
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96. (B. M. Cullum), J. Mobley, Z. Chi, D. L. Stokes, G. H. Miller and T. Vo-Dinh*, "Development of a Compact Handheld Raman Instrument with No-Moving Parts for Use in Field Analysis," Rev. Sci. Instrum., **71**, p. 1602-1607 (2000).
97. (B. M. Cullum), Z. Chi and T. Vo-Dinh*, "High Temperature Measurements and Instrumentation for Polyaromatic Hydrocarbons (PAHs): a Review," Polycyclic Aromat. Compd., **18**, p. 25-47 (2000).
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100. (B. M. Cullum), S. K. Shealy and S. Michael Angel*, "Fiber-Optic Resonance Enhanced Multiphoton Ionization (REMPI) Probe for the In-Situ Detection of Volatile Organic Vapors," Appl. Spectrosc., **53** (12), p. 1646-1650 (1999).
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104. (B. M. Cullum), and S. M. Angel*, "Development of a Fiber-Optic REMPI Probe for Environmental Contaminants," Proc. SPIE – Soc. Opt. Eng., **3534**, p. 40-48 (1998).
105. (R. B. Nair), B. M. Cullum and C. J. Murphy*, "Optical Properties of $[Ru(phen)_2dppz]^{2+}$ as a Function of Nonaqueous Environment," Inorg. Chem., **36** (6), p. 962-965 (1997).
106. (B. J. Marquardt), B. M. Cullum, T. J. Shaw and S. M. Angel*, "Fiber-Optic Probe for Determining Heavy Metals in Solids Based on Laser-Induced Plasmas," Proc. SPIE – Soc. Opt. Eng., **3105**, p. 203-212 (1997).
107. (K. Sooklal), B. M. Cullum, S. M. Angel, and C. J. Murphy*, "Photophysical Properties of ZnS Nanoclusters with Spatially Localized $Mn^{2+}$," J. Phys. Chem., **100** (10), p. 4551-4555 (1996).

**Non-Peer-Reviewed Works**

Invited Articles for Trade Journals:

1. (B. M. Cullum)*, "Multiphoton Photoacoustic Spectroscopy: A Novel Approach for High Resolution Margining of Brain Tumors," G.I.T. Laboratory Journal, Europe, **10** (6) 33-34.

Conference Proceedings:

1. (B. M. Cullum), and S. M. Angel*, "A New Technique to Study Halogenated Flame Retardant Efficiency," SAMPE, IWGFM-10 Fire Safety of Materials, (May 1998).
2. (B. M. Cullum), and S. M. Angel*, "The Use of Laser Induced Fluorescence for Studying the Efficiency of Halogenated Flame Retardants," 215th National ACS Meeting, Symposium on Combustion of Traditional and Non-Traditional Fuels, (March 1998).

**SELECTED PRESENTATIONS**

**Invited Oral Presentations (National/International Conferences)**

1. (B. M. Cullum)*, "New Methods and Paradigms in Optical Sensing," Royal Society of Chemistry's Sir George Stokes Award Session, SciX (Formerly FACSS) Providence, RI; September 26, 2021.
2. (D. Kazal), E. L. Holthoff and B. M. Cullum*, "Optical Reflection and Waveguiding of Sound in Air," **FACSS Innovation Award Session** (selected as a finalist for the 2017 FACSS Innovation Award), SciX (FACSS), Reno, NV; October 12, 2017.
3. (B. M. Cullum)*, "Chemical Imaging at the Nanoscale," Eastern Analytical Symposium, Somerset, NJ; November 16 – 19, 2009.
4. (B. M. Cullum)*, "Highly Ordered SERS Nanoarrays for Sub-Diffraction Limited, Label-free Chemical Imaging," Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Annual Meeting, Louisville, KY; October 18-22, 2009.
5. (B. M. Cullum)*, "Multiplexed SERS Nanosensors and SERS Nano-imaging Probes for Pathogen Detection," American Chemical Society National Meeting, Washington, D.C.; August 17th, 2009.
6. (B. M. Cullum)*, "Multi-layered SERS Substrate Geometries and Their, Application to Chemical Nano-imaging Probes for Biological Agent Detection," Pittsburgh Conference, New Orleans, LA; March 2, 2008.
7. (B. M. Cullum)*, "Multiplexed SERS Nanosensors for Detection of Bacteria and Pathogens in Complex Matricies," Pittsburgh Conference, Chicago, IL; March 1st, 2007.
8. (B. M. Cullum)*, "Smart Nanosensing for the Detection of Biologicals in Complex Matricies," Pittsburgh Conference, Orlando, FL; March 13th 2006.
9. (B. M. Cullum)*, "Fiber Optic SERS Nanoimaging" Eastern Analytical Symposium, Somerset, NJ; November 15 – 18, 2004.
10. (B. M. Cullum)*, "Nanosensing: Molecular Detection and Monitoring at the Sub-Cellular Level," (Plenary Lecture) Analytica Conference, Munich, Germany; April 23-26, 2002.

## Invited Workshops/Symposia/Seminars

1. (B. M. Cullum)*, THORS (THermally-induced Optical Reflection of Sound): Demonstration, Characterization and Potential Application," Fitzpatrick Institute of Photonics, Duke University, Raleigh/Durham NC; March 8-10, 2020.
2. (P. Strobbia), C. Klutse, H. Lee and B. M. Cullum*, "Multi-layered SERS Substrates for Improved Third Dimensional Electric Field Enhancement", DoD Workshop on Flexible Sensing Platforms (Invited Symposium); Washington University in St., Louis; June 2014.
3. (B. M. Cullum)*, "Development of Novel Imaging Tools for Visualizing Chemical Differences at the Nanoscale and Above," Eli Lilly Seminar Series (Invited Seminar) Eli Lilly and Company; October 9th 2012.
4. (C. K. Klutse) and B. M. Cullum*, "Development and Optimization of SERS Nanosensors for Monitoring Intracellular Events," Optical Devices for In-Vivo Diagnostics Conference (Invited Symposium), U.S. FDA, Washington, D.C.; April 2010.
5. (B. M. Cullum)*, "SERS Chemical Imaging at the Nanoscale," Optical Devices for In-Vivo Diagnostics Conference (Invited Symposium), U.S. FDA, Washington, D.C.; April 6th 2009.
6. (B. M. Cullum)*, "Optical Nanosensing and Chemical Imaging: Diagnostics Tools for Individual Cells and Humans Alike," Optical Devices for In-Vivo Diagnostics Conference (Invited Symposium), U.S. FDA, Gaithersburg, Maryland; May 1st 2007.
7. (B. M. Cullum)*, "Optical Nanosensors and Nanoprobes for Dynamics Cellular Sensing and Sub-Diffraction Limited Chemical Imaging," IEEE Lasers and E-O Society (Invited Symposium); Johns Hopkins Applied Physics Laboratory, Laurel, MD; March 28th 2007.
8. (B. M. Cullum)*, "Optical Nanosensors and Nanoprobes: Development of Tools for the Analysis of Chemical and Biochemical Processes on the Nanoscale," Millersville University Seminar Series (Invited Seminar); Millersville University, Millersville, PA; October 23rd 2006.
9. (B. M. Cullum)*, "Optical Nanosensors for the Monitoring of Cellular Signaling in Individual Living Cells and Non-invasive Optical Diagnostics for Subsurface Tumor Imaging," Stevens Institute Seminar Series (Invited Seminar); Stevens Institute; Hoboken, New Jersey; March 29th 2006.

10. (B. M. Cullum)*, "Optical Nanosensing and Chemical Imaging: Diagnostics Tools for Individual Cells and Humans Alike," Johns Hopkins Applied Physics Laboratory (Invited Seminar); Johns Hopkins Applied Physics Laboratory; Laurel, MD; February 14th 2006.
11. (B. M. Cullum)*, "Optical Nanosensors for the Monitoring of Cellular Signaling in Individual Living Cells and Non-invasive Optical Diagnostics for Subsurface Tumor Imaging," University of South Carolina Seminar Series (Invited Seminar); University of South Carolina; Columbia, South Carolina; January 18th 2006.
12. (B. M. Cullum)*, "Optical Nanosensors for the Monitoring of Cellular Signaling in Individual Living Cells and Non-invasive Optical Diagnostics for Subsurface Tumor Imaging," Food and Drug Administration (FDA) Seminar Series (Invited Seminar); U.S. FDA; Gaithersburg, Maryland; November 18th 2005.
13. (B. M. Cullum)*, "Implantable Nanosensors for Real-Time Monitoring of Cellular Signaling Pathways in Single Living Cells," Cell Signaling Workshop (Invited Workshop) Defense Advanced Research Projects Agency (DARPA); Arlington, Virginia; September 27th, 2005.
14. (B. M. Cullum)*, "Tunable SERS-Active Probes for Multiplexed Chemical and Biological Sensing and Nano-Imaging," SERS Nanoparticles, Nanoparticle Assemblies, and Substrates for Chem/Bio Sensing (Invited Workshop) Defense Advanced Research Projects Agency (DARPA); Redwood City, California; July 29th, 2005.
15. (B. M. Cullum)*, "Development of Optical Nanosensors for the Monitoring of Cellular Signaling and Protein Expression in Individual Living Cells," Eli Lilly Seminar Series (Invited Seminar) Eli Lilly and Company; August 26th 2004.
16. (B. M. Cullum)*, "Development and Evaluation of Novel Implantable Nanosensors for Real-Time Monitoring of Individual Cell and Cellular Signaling," Real Time Monitoring of Signaling Pathways in Biological Cells (Invited Workshop) Defense Advanced Research Projects Agency (DARPA); Arlington, Virginia; April 22, 2003.
17. (B. M. Cullum)*, "Development of Spectroscopic Techniques for the Probing of Individual Cells," Real Time Monitoring of Signaling Pathways in Biological Cells II (Invited Workshop) Defense Advanced Research Projects Agency (DARPA); Pasadena, California; July 23, 2003.
18. (T. Vo-Dinh)*, B. M. Cullum and G. D. Griffin, "Optical Nanosensors for Single-Cell Analysis," Probing Individual Cells: Application to Signaling, Structure and Function (Invited Workshop) National Cancer Institute (NCI); Bethesda, Maryland; March 12-14 2001.
19. (B. M. Cullum), J. S. Bogard, J. Mobley, M. Moscovitch, G. Phillips and T. Vo-Dinh*, "Development of Three Dimensional (3-D) Optical Random Access Memory Materials for Use as Neutron Dosimeters," Radiation Detection Technologies for the National Security Community (Invited Symposium); U.S. DOE (NNSA); Nellis Air Force Base, Las Vegas, Nevada; November 2000.

## Oral Presentations (National/International Conferences)

1. (Leslie Scheurer), Eric Bowman, Lauren Gower, Jakob Peabody, Bradley R. Arnold, Ching Hua-Su, Fow-Sen Choa, Brian M. Cullum and Narsingh B. Singh*, "Raman and Refelction Methods to Evaluate Defects in Sensor Crystals," SPIE Defense + Commercial Sensing, Orlando, FL; April 14, 2025.
2. (Lauren Gower), Eric Bowman, Daniel Gower, Leslie Scheurer, Nithin Tangirala, Ching Hua-Su, Bradley R. Arnold, Fow-Sen Choa, Brian M. Cullum, Narsingh B. Singh*, "Optical Sensing of Point and Line Defects in Fe-doped Bulk ZnSe Crystals," SPIE Defense + Commercial Sensing, Orlando, FL; April 14, 2025.
3. (Narashima S. Prasad), Aria Tauraso, Bradley R. Arnold, Fow-Sen Choa, Brian M. Cullum, Krishna Machuga, Kamdeo D. Mandal and Narsingh Singh*, "Effect of Ionic Valency and Nitration on the Performance of Pervoskites for Dielectric Energy Storage Materials," SPIE Defense + Commercial Sensing, Orlando, FL; April 14, 2025.
4. (Rachit Sood), Abhishek Singh, Krishna S. Machuga, Narasimha Prasad, Ching Hua Su, Josh Valencia, Cynthia Tope, Fow-Sen Choa, Brad Arnold, Brian Cullum, and N. B. Singh*, "Thermal characteristics of multifunctional high Z and high density 2D and 3D crystals", SPIE Defense + Commercial Sensing, Washington, D.C.; April 22, 2024.
5. Himagowri Prasad, (Aria Tauraso), Krishna S. Machuga, Tagide deCarvahlo, Brian Cullum, Fow-Sen Choa, Brad Arnold, K. D. Mandal, and N. B. Singh*, "Phase transition in hydroxyapatites: bone and laser host materials", SPIE Defense + Commercial Sensing, Washington, D.C.; April 22, 2024.

6. (Narasimha Prasad), Amalthea Trobare, Aria Tauraso, Ching-Hua Su, Bradley Arnold, Fow-Sen Choa, Brian Cullum, K. D. Mandal, and N. B. Singh*, "Dielectric energy storage materials for space sensors: effect of processing on the performance", SPIE Defense + Commercial Sensing, Washington, D.C.; April 22, 2024.
7. (Meghan Brandt), Nicholas Schmidt, Aria Tauraso, Rachit Sood, Ching Hua Su, Bradley Arnold, Fow-Sen Choa, Brian Cullum, and N. B. Singh*, "Flux growth of optical sensor zinc selenide crystals", SPIE Defense + Commercial Sensing, Washington, D.C.; April 22, 2024.
8. A. Reardon and (B. M. Cullum)*, "Temporal Dynamics and Spatial Imaging of THermally-induced Optical Reflection of Sound (THORS) Barriers", SPIE Defense + Commercial Sensing, Orlando, FL; May 1, 2023.
9. (M. Brandt), M. Kazmi, N. Prasad, B. R. Arnold, F. S. Choa, B. M. Cullum, C. H. Su, and N. B. Singh*, "Disruptive Chemical Approach to Modify Perovskites for Chemical and Biological Sensors", SPIE Defense + Commercial Sensing, Orlando, FL; May 1, 2023.
10. (B. Setera), I. Emge, C. H. Su, M. Brandt, B.R. Arnold, F. S. Choa, B. M. Cullum and N. B. Singh*, "All Optical Approach to Determine Quality and Performance of Sensor Materials", SPIE Defense + Commercial Sensing, Orlando, FL; May 1, 2023.
11. (N. Prasad), B. Setera, I. Emge, D. Sachs, L. Scheurer, L. A. Kelly, B. R. Arnold, B. M. Cullum, F. S. Choa and N. B. Singh*, "Effect of Processing Parameters on Sensing of Chem-Bio Agents on Surfaces: Contact Angle Based Interactions", SPIE Defense + Commercial Sensing, Orlando, FL; May 1, 2023.
12. D. S. Kazal, A. Reardon and (B. M. Cullum)*, "THermally-induced Optical Reflection of Sound (THORS) in Ambient Air, SPIE Defense + Commercial Sensing, Orlando, FL; April 4, 2022.
13. (D. S. Kazal), E. L. Holthoff and B. M. Cullum, "Acoustic Steering of Audible and Ultrasonic Waves Using Thermally-induced Optical Reflection of Sound (THORS), SPIE Defense + Commercial Sensing, Virtual Conference; April 12, 2021.
14. (D. S. Kazal), E.L. Holthoff and B. M. Cullum*, "Thermally-induced Optical Reflection of Sound (THORS) for Photoacoustic Sensing", SPIE Defense + Commercial Sensing, Baltimore, MD; April 15, 2019.
15. S. Sova, (N. Prasad)*, C. Cooper, L. Kelly, B. R. Arnold, B. M. Cullum, F.-S. Choa and N. B. Singh, "Importance of Lotus Effect on Surface Sensing", SPIE Defense + Commercial Sensing, Baltimore, MD; April 15, 2019.
16. J. McAdams, E. Bowman, B. M. Cullum, B. R. Arnold, L. Kelly, F.-S. Choa and (N. B. Singh)*, "Effect of Processing on Morphology of Hydroxyapatites: Bioactive Glasses and Crystalline Composites", SPIE Defense + Commercial Sensing, Baltimore, MD; April 15, 2019.
17. (N. B. Singh)*, C. H. Su, F.-S. Choa, B. R. Arnold, B. M. Cullum, E. Bowman, K. Mandal and L. Singh, "Bio-inspired Multifunctional Sensors: Nanoengineered Thermochromic and Phase Change Materials", SPIE Defense + Commercial Sensing, Baltimore, MD; April 15, 2019.
18. (D. Kazal), E. L. Holthoff and B. M. Cullum*, "Optical Reflection and Waveguiding of Sound in Air," SciX (formerly FACSS), Reno, NV; October 12, 2017.
19. (M. E. Farrell)*, P. Strobbia, D. A. Sarkes, D. N. Stratis-Cullum, B. M. Cullum and P. M. Pellegrino, "The Development of Army Relevant Peptide-based Surface Enhanced Raman Scattering (SERS) Sensors for Biological Threat Detection" SPIE Defense + Commercial Sensing, Baltimore, MD; April 18, 2016.
20. (E. Languirand) and B. M. Cullum*, "Characterization of Analytical Figures of Merit of a Sub-diffraction Limited Fiber Bundle Array for SERS Imaging" SPIE Defense + Commercial Sensing, Baltimore, MD; April 18, 2016.
21. (P. Strobbia) and B. M. Cullum*, "Multi-layered SERS substrates for Enhanced SERS Sensing" SPIE Defense + Commercial Sensing, Baltimore, MD; April 18, 2016.
22. (P. Strobbia), A. J. Henegar, T. Gougousi and B. M. Cullum*, "Gold-based Multi-layered Probes for Enhanced SERS", SCIX, Providence, RI; October 1, 2015.
23. (E. Languirand) and B. M. Cullum*, "Fiber Bundle Arrays for Wide-field, Dynamic SERS Nanoscopy", SCIX , Providence, RI; September 30, 2015.
24. (E. Languirand), T. Southwick and B. M. Cullum*, "Large Area Super-resolution Chemical Imaging via Rapid Dithering of a Nanoprobe", SPIE Sensing Technology + Applications, Baltimore, MD; April 23rd 2015.
25. (P. Strobbia) and B. M. Cullum*, "Characterization of the Role of Oxide Spacers in Multilayer-enhanced SERS Probes", SPIE Sensing Technology + Applications, Baltimore, MD; April 24, 2015.

26. (S. Dahal) and B. M. Cullum*, "Subsurface Imaging Using Non-Resonant Multiphoton Photoacoustic Spectroscopy", SCIX (FACSS), Reno, NV; October 2, 2014.
27. (E. Languirand), T. Southwick and B. M. Cullum*, "Dynamic Super-resolution Chemical Imaging via Dithering",SCIX (FACSS), Reno, NV; October 1, 2014.
28. (P. Strobbia), C. Klutse and B. M. Cullum*, "Characterization of Multilayer SERS Enhancement Dependence on Spacer Properties in Ultrathin Oxide-based Substrates",SCIX (FACSS), Reno, NV; Sept. 30th, 2014.
29. (E. Languirand) and B. M. Cullum*, "Towards a Portable Ultrahigh Resolution SERS Imager," SPIE Sensing Technology + Applications, Baltimore, MD; May 7th 2014.
30. (P. Strobbia) and B. M. Cullum*, "Characterization of Ultrathin Oxide Based Multilayer SERS Nanoprobes for Intracellular Sensing," SPIE Sensing Technology + Applications, Baltimore, MD; May 8th 2014.
31. (S. Dahal) and B. M. Cullum*, "Characterization of Endogenous Species in Tissues using Non-resonant Multiphoton Photoacoustic Spectroscopy," SPIE Sensing Technology + Applications, Baltimore, MD; May 8th 2014.
32. (P. Strobbia), A. Mayer, C. K. Klutse and B. M. Cullum*, "Evaluation of Multilayer SERS Nanoprobes for Enhanced Intracellular Sensing," SCIX (FACSS), Milwaukee, WI; Sept. 30th, 2013.
33. (S. Dahal) and B. M. Cullum*, "Characterization of NMPPAS for Brain Tumor Margining and Related Biosignature Identification," SCIX (FACSS), Milwaukee, WI; Oct. 1st, 2013.
34. (E. Languirand), J. B. Kiser and B. M. Cullum*, "Portable Ultra-high Resolution, Dynamic SERS Imaging System," SCIX (FACSS), Milwaukee, WI; Oct. 2nd, 2013.
35. (S. Dahal) and B. M. Cullum*, "Evaluation of Endogenous Species Involved in Brain Tumors Using Multiphoton Photoacoustic Spectroscopy," SPIE Defense, Security and Sensing, Baltimore, MD; May 1st 2013.
36. (S. Dahal) and B. M. Cullum*, "Mimicking Brain Tissues by Doping Scatterers into Gelatin Tissue Phantoms and Determination of Chemical Species Responsible for NMPPAS," SPIE Defense, Security and Sensing, Baltimore, MD; April 26th 2012.
37. (C. K. Klutse), A. Mayer and B. M. Cullum*, "SAM Multilayer SERS Substrate Optimization for Intracellular Applications," FACSS Conference, Reno, NV; October 4th 2011.
38. (C. K. Klutse) and B. M. Cullum*, "Optimization of SAM-based Multilayer SERS Substrates for Intracellular Analyses: the Effect of Terminating Functional Groups", SPIE Defense, Security and Sensing, Orlando, FL.; April 28th 2011.
39. (S. Dahal), J. B. Kiser and B. M. Cullum*, "Depth and Resolution Characterization of Two-Photon Photoacoustic Spectroscopy for Non-invasive Subsurface Chemical Diagnostics", SPIE Defense, Security and Sensing, Orlando, FL.; April 28th 2011.
40. (C. K. Klutse), A. Mayer and B. M. Cullum*, "SERS Multilayer Substrate Optimization using SAM Dielectric Spacers," FACSS Conference, Rayleigh/Durham, NC; October 20th 2010.
41. (C. K. Klutse), A. Mayer and B. M. Cullum*, "Development of SAM-based Multi-layer SERS Substrates for Intracellular Analyses", SPIE Defense, Security and Sensing, Orlando, FL.; April 8th 2010.
42. (J. B. Kiser) and B. M. Cullum*, Optical Cross-talk and Surface Characterization of SERS Nanoimaging Bundle Substrates:, SPIE Defense, Security and Sensing, Orlando, FL.; April 8th 2010.
43. (J. Kiser) and B. M. Cullum*, "Evaluation of Cross-talk in Extended Surface SERS Substrates for Sub-diffraction Limited Chemical Imaging," FACSS Conference, Louisville, KY; October 19th 2009.
44. (C. K. Klutse), H. Li and B. M. Cullum*, "The Effect of SAM Dielectric Spacers on Multi-Layer Surface Enhanced Raman Scattering (SERS) Substrates," FACSS Conference, Louisville, KY; October 19th 2009.
45. (J. Sun), M. E. Hankus and B. M. Cullum*, "Optimization and Characterization of a SERS Based Immunomicrowell-array for Multiplexed Detection of Pathogenic Bacteria," FACSS Conference, Louisville, KY; October 19th 2009.
46. (C. K. Klutse), H. Li and B. M. Cullum*, "Optimization of Multilayer Surface-enhanced Raman Scattering (SERS) Immuno-nanosensors via Self-assembled Monolayer Spacers," SPIE Defense, Security and Sensing, Orlando, FL.; April 13-17th 2009.
47. (J. B. Kiser), M. E. Hankus and B. M. Cullum*, "Tunable Fiber Optic Imaging Bundle SERS Substrates," SPIE Defense, Security and Sensing, Orlando, FL.; April 13-17th 2009.

48. (J. Sun), M. E. Hankus and B. M. Cullum*, "SERS-based Immuno-microwell Arrays for Multiplexed Detection of Food-borne Pathogenic Bacteria," SPIE Defense, Security and Sensing, Orlando, FL.; April 13-17th 2009.
49. (N. P. Whitten), D. N. Stratis-Cullum and B. M. Cullum*, "Hybrid SERS/Fluorescence Bionanoprobes for the Rapid Detection of Toxic Materials," FACSS Conference, Reno, NV, October 2008.
50. (J. B. Kiser), M. E. Hankus and B. M. Cullum*, "Tunable Fiber Optic Imaging Bundles for SERS Chemical Imaging Below the Diffraction Limit," FACSS Conference, Reno, NV, October 2008.
51. (J. Sun), M. E. Hankus and B. M. Cullum*, "SERS Immuno-microwell Arrays for Multiplexed Foodborne Pathogenic Bacteria Detection," FACSS Conference, Reno, NV, October 2008.
52. (J. Sun), M. E. Hankus and B. M. Cullum*, "SERS Immuno-microwell Arrays for Multiplexed Foodborne Pathogenic Bacteria Detection," Pittsburgh Conference, New Orleans, March 2008.
53. (J. B. Kiser) and B. M. Cullum*, "A Fiber Optic Probe for Brain Tumor Analysis Using Non-Resonant Multiphoton Photoacoustic Spectroscopy," Pittsburgh Conference, New Orleans, March 2008.
54. (J. B. Kiser), N. Chandrasekharan and B. M. Cullum*, "Determining Two-Photon Absorption Cross Sections via Non-Resonant Multiphoton Photoacoustic Spectroscopy," SPIE Optics East, Boston, September 9-12th 2007.
55. (J. Sun), M. E. Hankus and B. M.Cullum*, "SERS Beacon Microarray for Multiplexed Oligonucleotide Detection," SPIE Optics East, Boston, September 9-12th 2007.
56. (M. E. Hankus) and B. M. Cullum*, "SERS Nanoimaging Probes for Chemical Detection and Imaging of Extracellular Surfaces," SPIE Optics East, Boston, September 9-12th 2007.
57. (J. Sun), H. Li and B. M. Cullum*, "SERS Beacons for Multiplexed Oligonucleotide Detection," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 1st 2007.
58. (M. E. Hankus) and B. M. Cullum*, "Multiplexed Detection and Chemical Imaging Using Novel Surface Enhanced Raman Scattering (SERS)-Based Nanoprobes," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, February 25th 2007.
59. (H. Li), C. E. Baum and B. M. Cullum*, "Novel Gold SERS Substrates with Multilayer Enhancements," SPIE Optics East, Boston, October 3rd 2006.
60. (M. E. Hankus) and B. M. Cullum*, "SERS Probes for Imaging Individual Biochemical Species on the Nanoscale," SPIE Optics East, Boston, October 3rd 2006.
61. (H. Li), C. E. Baum, M. E. Hankus and B. M. Cullum*, "Multilayer Enhanced SERS Active Materials: Fabrication Characterization and Application to Trace Chemical Detection," SPIE Defense and Security Conference, Orlando, April 19th 2006.
62. (J. B. Kiser), D. Buswell and B. M. Cullum*, "Development of a Non-Resonant Multiphoton Photoacoustic Fiber Optic Probe for the Margining of Brain Tumors," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 14th 2006.
63. (M. E. Hankus), G. J. Gibson and B. M. Cullum*, "Surface Enhanced Raman Scattering (SERS) Nanoimaging Probe for Dynamic Chemical Imaging," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 15th 2006.
64. (H. Li), S. Nayak and B. M. Cullum*, "Multilayer Amplified Surface Enhanced Raman Scattering (SERS) Nanosensors for Intracellular Analyses," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 13th 2006.
65. (J. Sun), H. Li, S. Daphnis and B. M. Cullum*, "Development and Characterization of Novel, Multi-layer SERS Substrates," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 12th 2006.
66. (J. B. Kiser), N. Chandrasekharan and B. M. Cullum*, "Sub-surface Brain Tumor Diagnosis Using a Portable NMPPAS-based Fiber Optic Microprobe," SPIE, Boston, October 26th 2005.
67. (H. Li.), C. E. Baum and B. M. Cullum*, "Label-free Detection of Antigens using Implantable SERS Nanosensors," SPIE, Boston, October 25th 2005.
68. (M. E. Hankus), G. J. Gibson and B. M. Cullum*, "Characterization and Optimization of Novel Surface-enhanced Raman Scattering (SERS)-based Nanoimaging Probes for Chemical Imaging," SPIE, Boston, October 25th 2005.

69. (B. M. Cullum*), M. E. Hankus and G. J. Gibson, "Development and Characterization of a Fiber Optic Surface Enhanced Raman Scattering (SERS) Nano-Imaging Probe," FACSS Conference, Quebec City, Canada, October 10th 2005.
70. (B. M. Cullum*), J. B. Kiser and D. Buswell, "Development of a Miniature Fiber Optic Non-Resonant Multi-Photon Photoacaoutic Spectroscopy Probe for Subsurface Tumor Diagnostics," FACSS Conference, Quebec City, Canada, October 10th 2005.
71. (H. Li), J. Sun, T. A. Alexander, S. O. Rosenberg and B. M. Cullum*, " Implantable SERS Nanosensors for Pre-symptomatic Detection of BW Agents, SPIE Defense and Security Conference, Orlando, March 28th 2005.
72. (H. Li) and B. M. Cullum*, "SERS Based Immuno-Nanosensor for Trace Protein Analyses," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 2nd 2005.
73. (M. E. Hankus), G. J. Gibson, N. Chandrasekharan and B. M. Cullum*, "SERS Chemical Imaging Nanoprobe for Application to Biological Systems," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, March 1st 2005.
74. (N. Chandrasekharan), J. B. Kiser and B. M. Cullum*, "Non-Resonant Multi-Photon Photoacoustic Spectroscopy for Subsurface Tumor Diagnostics," Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Orlando, February 28th 2005.
75. (H. Li) and B. M. Cullum*, "Nanosphere-based SERS Immuno-sensors for Protein Analysis," SPIE, Philadelphia, October 25 – 28, 2004.
76. (H. Li) and B. M. Cullum*, "Novel Multilayered SERS Substrates for Trace Chemical and Biochemical Analysis," SPIE, Philadephia, October 25 – 28, 2004.
77. (M. Hankus), N. Chandrasekharan and B. M. Cullum*, "SERS Nano-imaging Sensors for Biological Analysis," SPIE, Philadelphia, October 25 – 28, 2004.
78. (N. Chandrasekharan) and B. M. Cullum*, "Development of a Portable Multiphoton Photo-acoustic Spectroscopy System for Tumor Diagnostics," SPIE, Philadelphia, October 25 – 28, 2004.
79. (N. Chandrasekharan) and B. M. Cullum*, "Development of SERS-Nanoimaging Sensors," Paper # 11900-400, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 7 -12, 2004.
80. (H. Li) and B. M. Cullum*, "Development and Optimization of Nanosphere-based SERS Immuno-sensors," Paper # 14400-300, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 7 -12, 2004.
81. (N. Chandrasekharan) and B. M. Cullum*, "Multi-photon Photoacoustic Spectroscopy for Subsurface Tissue Diagnostics," Paper # 18300-300, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 7 -12, 2004.
82. (H. Li) and B. M. Cullum*, "Novel Multilayered Silver Film SERS Substrates for Trace Analyses," Paper # 18400-600, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 7 - 12, 2004.
83. (D. L. Stokes), B. M. Cullum, R. Lenarduzzi, J. Mobley, B. E. Phifer, S. Singh, A. L. Wintenberg and T. Vo-Dinh*, "An AOTF-Based Instrument for Raman and SERS Detection of Particulate Matter in Air," Paper # 20500-900, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Chicago, March 7 - 12, 2004.
84. (H. Li) and B. M. Cullum*, "Development and Characterization of SERS-based Immuno-Nanosensors for Single Cell Analyses," SPIE, Providence, October 27 – 28, 2003.
85. (N. Chandrasekharan), R. Mehta, S. Saha and B. M. Cullum*, "Development of Multiphoton Photoacoustic Spectroscopy for Non-invasive Tissue Diagnostics," SPIE, Providence, October 27 – 28, 2003.
86. (B. M. Cullum), J. Mobley, D. L. Stokes, L. R. Allain, D. N. Stratis, A. L. Wintenberg, R. A. Maples and T. Vo-Dinh*, "Development of a Portable Raman Spectrometer for Medical Diagnostics," SPIE, San Jose, January 2002.
87. (B. M. Cullum), G. D. Griffin and T. Vo-Dinh*, "Nanosensors: Design and Application to Site-Specific Cellular Analyses," SPIE, San Jose, January 2002.
88. (T. Vo-Dinh)*, B. M. Cullum, J. Mobley and P. M. Kasili, "Multispectral Imaging for Medical Diagnostics," SPIE, San Jose, January 2002.

89. (J. Mobley), B. M. Cullum and T. Vo-Dinh*, "Ultrasound Monitoring of Brain Injury: an Initial Clinical Study," SPIE, San Jose, January 2002.
90. (B. M. Cullum), J. Mobley, A. L. Wintenberg, R. A. Maples, (D. L. Stokes) and T. Vo-Dinh*, "Field-portable AOTF-based Monitor Technology for Environmental Sensing," SPIE, Boston, October 2002.
91. (B. M. Cullum), G. D. Griffin, P. M. Kasili and T. Vo-Dinh*, " Development of Fiber Optic Nanosensors for Cellular Analyses," Paper # 391, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 6, 2001.
92. (Z. Chi), B. M. Cullum and T. Vo-Dinh*, " Development of a Real-Time Fluorescence Detection System for Vapor Polycyclic Aromatic Hydrocarbons at Elevated Temperatures," Paper # 700, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 7, 2001.
93. (B. M. Cullum), J. Mobley, J. Bogard, E. Guernsey, A. N. Mathur and T. Vo-Dinh*, " 3D-Optical Random Access Memory Materials for Use as Energetic Neutron Dosimeters," Paper # 927, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 7, 2001.
94. (D. L. Stokes), B. M. Cullum, J. Mobley and T. Vo-Dinh*, "SERS Detection of Chemicals Using an AOTF-Based Detection System," Paper # 1401, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 9, 2001.
95. (B. M. Cullum), J. Mobley, J. S. Bogard, M. Moscovitch, G. W. Phillips and T. Vo-Dinh*, "Detection of Neutrons Using a Novel Three-Dimensional Optical Random Access Memory (3-D ORAM) Technology," SPIE International Symposium on Industrial and Environmental Monitors and Biosensors, Environmental Monitoring and Remediation Techniques Session, October 2000.
96. (B. M. Cullum), J. Mobley, J. S. Bogard and T. Vo-Dinh*, "Three-Dimensional (3-D) Optical Random Access Memory Materials as Neutron Dosimeters," Paper # 111, presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Nashville, TN, September, 2000.
97. (B. M. Cullum), G. D. Griffin, L. R. Allain and T. Vo-Dinh*, "Antibody-Based Fiber-Optic Nanoprobes for Intracellular Measurements," Paper # 426, presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Nashville, TN, September, 2000.
98. (J. Mobley), B. M. Cullum and T. Vo-Dinh*, "Photoacoustic Method for the Simultaneous Acquisition of Optical and Ultrasonic Spectra," Paper # 671, presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Nashville, TN, September, 2000.
99. (R. C. Chinni), B. M. Cullum, S. K. Shealy and S. M. Angel*, "Fiber-Optic Resonant-Enhanced Multiphoton Ionization (REMPI) Probe for Analyses of Volatile Organic Compounds," Paper # 15, presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Nashville, TN, September, 2000.
100. (B. M. Cullum), T. Vo-Dinh*, M. Panjehpour and B. F. Overholt, "Advanced FluorescenceTechniques for *in-vivo* Cancer Diagnosis," Tennessee 2000 Biomedical Engineering Conference, Knoxville, TN March 30, 2000.
101. (B. M. Cullum), J. Mobley, Z. Chi, D. L. Stokes and T. Vo-Dinh*, "Compact, Portable AOTF-Based Raman Instrument for Chemical Analyses," Paper # 1148, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 16, 2000.
102. (B. M. Cullum), G. D. Griffin and T. Vo-Dinh*, "Fiber Optic Nanosensors for Intracellular Analysis," Paper # 1150, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 16, 2000.
103. (B. M. Cullum), J. Mobley, J. S. Bogard, M. Moscovitch and T. Vo-Dinh*, "Development of Instrumental ORAM System for Radiation Dosimetry," SPIE International Symposium on Industrial and Environmental Monitors and Biosensors, Environmental Monitoring and Remediation Techniques Session, October 1999.
104. (T. Vo-Dinh)*, G. H. Miller, J. Mobley, B. M. Cullum and C. A. DiMarzio, "Development of Methods and Instrumentation for Spectral Imaging," SPIE International Symposium on Industrial and Environmental Monitors and Biosensors, Environmental Monitoring and Remediation Techniques Session, October 1999.
105. (S. J. Glenn), B. M. Cullum, S. K. Shealy and S. M. Angel*, "Lifetime Imaging with Optical Fibers," SPIE International Symposium on Industrial and Environmental Monitors and Biosensors, Environmental Monitoring and Remediation Techniques Session, October 1999.

106. (B. M. Cullum) and S. M. Angel*, "Development of a Fiber-Optic REMPI Probe for Environmental Contaminants," presented at SPIE International Symposium on Industrial and Environmental Monitors and Biosensors, Environmental Monitoring and Remediation Techniques Session, Boston, MA, November 1998.
107. (B. M. Cullum), S. J. Glenn, and S. M. Angel*, "Fluorescence Lifetime Imaging Using Dual Laser Pulses and a Non-gated CCD," presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Austin, TX, October, 1998.
108. (B. M. Cullum), S. K. Shealy, and S. M. Angel*, "Fiber-Optic REMPI Probe for Monitoring Environmental Contaminants," presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Austin, TX, October, 1998.
109. (B. M. Cullum) and S. M. Angel*, " New Technique to Study Halogenated Flame Retardant Efficiency," Presented at the 43rd International SAMPE Symposium and Exhibition, Anaheim, CA, May, 1998.
110. (B. M. Cullum) and S. M. Angel*, "The Use of Laser-Induced Fluorescence for Studying the Efficiency of Halogenated Flame Retardants," 215th National Meeting of the ACS, Dallas, TX, March, 1996.
111. (B. M. Cullum) and S. M. Angel*, "A Novel Fluorescence Lifetime Imaging Technique," South Carolina Academy of Sciences meeting (SCAS), Columbia, SC, March 20, 1998.
112. (B. M. Cullum), B. J. Marquardt and S. M. Angel*, "Spectroscopic Insights into the Mechanism of Brominated Flame Retardation," Paper # 1193, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 5, 1998.
113. (B. J. Marquardt), B. M. Cullum, and S. M. Angel*, "Fiber-Optic LIBS/RAMAN Imaging Probe for In-Situ Elemental Microanalysis," Paper # 942, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, New Orleans, LA March 5, 1998.
114. (B. M. Cullum), P. K. Khulbe, B. J. Marquardt and S. M. Angel*, "Spectrally and Temporally Resolved Laser Induced Fluorescence (LIF) Provides Insight into the Mechanism of Flame Retardation," Paper #279, presented at Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), Providence, R.I.; October, 1997.
115. (B. J. Marquardt), B. M. Cullum and S. M. Angel*, "Fiber-Optic Probe for Determining Heavy Metals in Solids Based on Laser-Induced Plasmas," Paper #3105-40, Envirosense 1997; Munich, Germany, June 18, 1997.
116. (B. M. Cullum), B. J. Marquardt and S. M. Angel*, "Spectrally and Temporally Resolved LIF for the Measurement of Radical Species in Flames," presented at the South Carolina Academy of Sciences meeting (SCAS), Columbia, SC, April 11, 1997.
117. (B. J. Marquardt), B. M. Cullum and S. M. Angel*, "Spatial Profiling of Laser-Induced Plasmas for the Purpose of Optimizing LIBS as an Analytical Technique," presented at the South Carolina Academy of Sciences meeting (SCAS), Columbia, SC, April 11, 1997.
118. (B. M. Cullum), B. J. Marquardt and S. M. Angel*, "Laser Ablation as a Technique for the Introduction of Solid Polymer Samples into a Flame," Paper #795, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy, Atlanta, GA; March 19, 1997.

## Selected Poster Presentations (National/International Conferences)

1. (B. Lewis), S. Dahal and B.M. Cullum*, "Multi-photon Photoacoustic Spectroscopy for Sub-surface Tissue Analyses," Annual Biomedical Research Conference for Minority Students (ABRCMS), St. Louis, Nov. 2011.
2. (T. N. Messenger), J. B. Kiser and B.M. Cullum*, "Crossed Beam Thermal Lens Spectroscopy for Standoff Detection of Chemical Species," FACSS Conference, Reno, NV, September 24th 2008. Received the SAS outstanding student presentation award.
3. (H. Li) and B.M. Cullum*, "Multilayer Enhanced Gold Film Over Nano-Structured SERS Substrates for Extended Shelf-Life and Sensitivity," FACSS Conference, Orlando, September 24th 2006. Received the SAS outstanding student presentation award.
4. (H. Li), J. Sun, and B. M. Cullum*, "Development and Characterization of Multilayer Enhanced SERS Immuno-Nanosensors," FACSS Conference; Quebec City, Canada, October 13th 2005.

**Oral Presentations (Local/University Conferences)**

1. (B. Tabor), H. Dorbu, Z. Meharbi, M. Cheung and B.M. Cullum*, "Multi-photon Photoacoustic Spectroscopy for Sub-surface Tissue Analyses," UMBC Summer Undergraduate Research Fest, UMBC, Aug. 2017.
2. (B. Lewis), S. Dahal and B.M. Cullum*, "Multi-photon Photoacoustic Spectroscopy for Sub-surface Tissue Analyses," UMBC Summer Undergraduate Research Fest, UMBC, Aug. 2011
3. (C. Madison), J. Kiser and B. M. Cullum*, "Spectral Measurements of Molecular Dyes and Cellular Biochemicals Using Non-Resonant Multiphoton Photoacoustic Spectroscopy (NMPPAS)," UMBC Undergraduate Research Fest, August 9th 2006.
4. (B. M. Cullum)*, "Optical Nanosensors and Nanoprobes for Dynamic Cellular Sensing and Sub-diffraction Limited Chemical Imaging," UMBC Physics Department Seminar Series, April 19th 2006.
5. (B.M. Cullum)*, "Optical Nanosensors for the Monitoring of Cellular Signaling in Individual Living Cells," UMBC Computer Science and Electrical Engineering Department Seminar Series, February 10, 2006.
6. (B. M. Cullum)*, "Optical Nanosensing: Real-time Visualization of Cellular Signaling at the Molecular Level," UMBC Biological Sciences Departmental Seminar Series, April 20th 2005.
7. (C. Young), J. Kiser and B. M. Cullum*, "Fiber Optic NMPPAS Probe for In-Vivo Tumor Diagnosis," NIDDK Undergraduate Research Conference at UMBC, August 12, 2004.
8. (H. Li) and B. M. Cullum*, "Development and Optimization of SERS-Based Immuno-Nanosensors for Protein Analyses," UMBC Graduate Research Conference, Baltimore, April 23, 2004. Received 2nd Place Award for Presentation.

**Poster Presentations (Local/University Conferences)**

1. (A. Mayer), C.K. Klutse and B. M. Cullum*, "The Development of Optimized SERS Nanosensors for Intracellular Analyses," Undergraduate Research and Creative Achievement Day," UMBC April 25, 2012.
2. (K. Yeboa), J. B. Kiser and B. M. Cullum*, "Chemical Imaging Using Surface Enhanced Raman Scattering Nano-imaging Gold Probes," Undergraduate Research and Creative Achievement Day," UMBC April 25, 2012.
3. (K. Yeboa), J. B. Kiser and B. M. Cullum*, "Cross-Talk Detection in Surface-enhanced Raman Scattering Nano-imaging Probes," Undergraduate Research and Creative Achievement Day," UMBC, April 27, 2011.
4. (J. Wittkamper), C. K. Klutse and B. M. Cullum*, "Optimization of Metal Film on Nanostructured SERS Substrates," Undergraduate Research and Creative Achievement Day," UMBC, April 27, 2011.
5. (B. Lewis), S. Dahal and B.M. Cullum*, "Multi-photon Photoacoustic Spectroscopy for Sub-surface Tissue Analyses," UMBC Undergraduate Research Fest, August 2011.
6. (K. Yeboa), J.B. Kiser and B. M. Cullum*, "Cross-talk Detection in Surface-enhanced Raman Scattering Nano-imaging Probes" McNair Scholars Poster Presentation, Pennsylvania State University, Summer 2011.
7. (K. Yeboa), J. B. Kiser and B.M. Cullum*, "Cross-talk Detection in Surface-enhanced Raman Scattering Nano-imaging Probes" Undergraduate Research and Creative Achievement Day, UMBC, 2010.
8. (H. Li) and B. M. Cullum*, "Intracellular SERS Nanosensors for the Monitoring of Cellular Response," A Look Ahead X, University of Maryland Baltimore County, Baltimore, November 1st 2006.
9. (M. E. Hankus), J. A. Wilhide and B. M. Cullum*, "Dynamic Biochemical Detection and Imaging Employing Surface-Enhanced Raman Scattering (SERS)-Based Nanoprobes," A Look Ahead X, University of Maryland Baltimore County, Baltimore, November 1st 2006.
10. (H. Li) and B. M. Cullum*, "Development and Characterization of Multilayer Enhanced SERS Immuno-Nanosensors," A Look Ahead IX, University of Maryland Baltimore County, Baltimore, November 15th 2005.
11. (M. E. Hankus), G. J. Gibson and B. M. Cullum*, "Surface Enhanced Raman Scattering (SERS)-Nanoimaging Probe for Dynamic Molecular Level Imaging," A Look Ahead IX, University of Maryland Baltimore County, Baltimore, November 15th 2005.
12. (C. B. Madison), N. Chandrasekharan, J. B. Kiser and B. M. Cullum*, "Two-photon Excitation Spectra of Molecular Fluorophores Using Nonresonant Multiphoton Photoacoustic Spectroscopy (NMPPAS)," Eighth Annual Summer Undergrad. Research Fest, Baltimore, August 10th 2005.
13. (G. J. Gibson), M. E. Hankus, N. Chandrasekharan and B. M. Cullum*, "Development of Nano-Imaging Probes for Cellular Analysis," Presentation to on Undergrad. Research to the Maryland State Legislature, Annapolis, March 2005.

14. (N. Chandrasekharan), J. B. Kiser and B. M. Cullum*, "Development of a Micro-Fiber Optic Probe for Subsurface Tumor Diagnostics," A Look Ahead VIII, University of Maryland Baltimore County, Baltimore, November 17th 2004.
15. (H. Li.), J. Sun and B. M. Cullum*, "SERS-based Nanosensors for Protein Analyses at the Cellular Level," A Look Ahead VIII, University of Maryland Baltimore County, Baltimore, November 17th 2004.
16. (G. J. Gibson), M. E. Hankus, N. Chandrasekharan and B. M. Cullum*, "Nanoscale Fiberoptic Probes for Real-Time Chemical Imaging," UMBC Undergrad. Research Symposium, Baltimore, September 2004.
17. (Ashley Cox), N. Chandrasekharan and B. M. Cullum*, "Detection and Diagnosis of Brain Tumors via NMPPAS," UMBC Summer Undergrad. Research Fest, Baltimore, August 10, 2004.
18. (H. Li), P. Patel and B. M. Cullum*, "Development and Characterization of SERS-based Immuno-Nanosensors for Single Cell Analyses," A Look Ahead VII, University of Maryland Baltimore County, Baltimore, November 12, 2003.
19. (N. Chandrasekharan), R. Mehta and B. M. Cullum*, "Multiphoton Photacoustic Spectroscopy for Tissue Diagnostics," A Look Ahead VII, University of Maryland Baltimore County, Baltimore, November 12, 2003.
20. (P. Patel), H. Li and B. M. Cullum*, "Development and Optimization of SERS Immuno-Nanosensors for Monitoring Protein Expression in Individual Living Cells," UMBC Undergrad. Research Symposium, Baltimore, November 1, 2003.
21. (R. Mehta), N. Chandrasekharan, V. Rao and B. M. Cullum*, "Multi-Photon Photoacoustic Spectroscopy for Non-Invasive Tissue Diagnosis," UMBC Undergrad. Research Symposium, Baltimore, November 1, 2003. Received 2nd Place Award for Poster.
22. (D. Parker), M. Habib and B. M. Cullum*, "Development of Silica Nanosphere Sensors for the Detection of Intracellular Calcium Levels in Living Cells," UMBC Undergrad. Research Symposium, Baltimore, November 1, 2003.
23. (N. A. V. Costa), H. Li and B. M. Cullum*, "Development of Novel Immuno-SERS Sensors," UMBC Summer Undergrad. Research Fest, Baltimore, August 6, 2003.