

Bridget D. Hines, Ph.D.

(Maiden Surname: Dolash)

West Virginia University

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RESEARCH INTERESTS

- Nanomaterials as platforms for diagnosis and therapeutics.
- Use of nanomaterials for the delivery of nucleic acids for detection and therapeutic purposes.
 - Molecular recognition elements for detection of biological agents.
 - Anti-tumor drug development.

RESEARCH EXPERIENCE

Postdoctoral Research

2009 - Present

West Virginia University, Department of Biology, WVNano Initiative

Advisor: Letha J. Sooter, Ph.D.

- Design sequences for optimal attachment of molecular recognition elements.
- Investigate the effect of DNA hybridization on carbon nanotube optical spectra.
- Development of MRE/carbon nanotube based chemical and biological detection systems.
- Develop MREs for purification and separation of carbon nanotube chiralities.

Graduate Research Assistant

2003 - 2009

Purdue University, Department of Medicinal Chemistry and Molecular Pharmacology, Birck

Nanotechnology Center

Advisor: Donald E. Bergstrom, Ph.D.

Investigation of carbon nanotube/DNA assemblies

- Investigated the covalent cross-linking of DNA to carbon nanotubes.
- Characterized DNA-associated single-walled carbon nanotubes.
- Investigated hybridization properties of DNA-associated carbon nanotubes.
- Studied cellular translocation of DNA-associated carbon nanotubes.
- Studied cellular effects of siRNA hybridized to DNA-associated carbon nanotubes.

Investigation of linker modified CpG oligonucleotides

- Designed novel nuclease stable linker modified CpG oligonucleotides.
- Toll-like receptor pathway activation in RAW 264.7 cells by real-time PCR.

Summer Undergraduate Research Assistant

2002

The Ohio State University, Department of Chemistry

Advisor: Sheldon G. Shore, Ph.D.

Summer Undergraduate Research Assistant

2001

Northern Illinois University, Department of Chemistry & Biochemistry

Advisor: Narayan S. Hosmane, Ph.D.

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EDUCATION

- | | |
|---|------|
| Purdue University
<i>West Lafayette, IN</i>
Ph.D. in Medicinal Chemistry and Molecular Pharmacology | 2009 |
| Clarke College
<i>Dubuque, IA</i>
Bachelor of Science in Chemistry, Minors in Biology and Philosophy | 2003 |

TOOLS/SKILLS

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| <ul style="list-style-type: none">• Spectroscopic Methodology<ul style="list-style-type: none">· UV-Visible· Fluorescence· Near-IR· Raman· NMR• Fluorescence Microscopy• Mammalian Cell Culture• DNA purification- electrophoresis• PCR, real-time PCR | <ul style="list-style-type: none">• Scientific/Technical Writing• Grant Proposal Writing• ChemDraw• EndNote• Microsoft Office Suite |
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TEACHING EXPERIENCES

- | | |
|--|---------------|
| Lead Teaching Assistant
<i>Purdue University</i>
Biological Chemistry II | 2004, 2006 |
| Laboratory Teaching Assistant
<i>Purdue University</i>
MCMP Integrated Laboratories I, II | 2003-04, 2006 |
| Teaching Assistant
<i>Purdue University</i>
Biological Chemistry I | 2003 |

ACTIVITIES

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| President and Secretary
<i>Purdue University, Birck Nanotechnology Center</i>
Nanotechnology Student Advisory Council | 2006-2007 |
| Tour Guide
<i>Purdue University, Birck Nanotechnology Center</i>
MCMP Integrated Laboratories I, II | 2006-2007 |
| President
<i>Clarke College</i>
Chem Club | 2001-2003 |

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PUBLICATIONS

- Dolash, B. D., Lahiji, R. R., Zemlyanov, D., Drachev, V., Reifenberger, R., and Bergstrom, D. E. Sonication creates covalent cross-linking between DNA and single-walled carbon nanotubes. (Manuscript Submitted)
- Dolash, B. D. and Bergstrom, D. E. Progress and Road Blocks in the Development of Carbon Nanotubes as Cellular Carriers for Nucleic Acids. Invited review for book series "Biomedical Nanotechnology" (In Press, Fall 2009).
- Lahiji, R. R., Dolash, B. D., McDonald, J., Zemlyanov, D., Bergstrom, D. E., Reifenberger, R. Electrodeposition study of ODN:SWCNT hybrids on gold substrates. *Physica Status Solidi*, **2008**, 205, 1408-1411.
- Lahiji, R. R., Dolash, B. D., Bergstrom, D. E., Reifenberger, R. Oligodeoxyribonucleotide association with single-walled carbon nanotubes studied by SPM. *Small*, **2007**, 3, 1912-1920.
- Spielvogel, B. F., Rana, G., Vyakaranam, K., Grelck, K., Dicke, K. E., Dolash, B. D., Li, S. J., Zheng, C., Maguire, J. A., Takagaki, M., Hosmane, N. S. A novel approach to the syntheses of functionalized, water-soluble icosahedral carboranyl anions. Crystal structure of methyl N-[(trimethylamineboryl)carbonyl]-L- tyrosinate: A synthon for novel carboranylpeptides. *Collection of Czechoslovak Chemical Communications*, **2002**, 67, 1095-1108.

PRESENTATIONS

- Bridget D. Dolash, Roya R. Lahiji, Dmitry Y. Zemlyanov, Ronald Reifenberger, and Donald E. Bergstrom. *DNA-Associated Single-walled Carbon Nanotubes as a Platform for Drug Delivery*. Poster presented at Nanotech 2008 by NSTI in Boston, Massachusetts (June 2008).
- Donald E. Bergstrom, Bridget D. Hines, Dmitry Y. Zemlyanov, Roya L. Lahiji, Dmitri N. Zakharov, Ronald Reifenberger. *Carbon Nanotubes as Nucleic Acid Carriers*. Oral presentation by Donald E. Bergstrom at BioNano Technology & Pharmaceuticals- A glimpse into the future in Hyderabad, India (March 2008).
- Bridget D. Hines, Roya R. Lahiji, Dmitry Zemlyanov, Ronald Reifenberger and Donald E. Bergstrom. *DNA-Associated Single-Walled Carbon Nanotubes: A Free Radical Study and Platform for Multivalent Drug Delivery*. Poster presented at Purdue Cancer Center Retreat, West Lafayette, Indiana (September 2007).
- Roya R. Lahiji, Bridget D. Dolash, Dmitry Zemlyanov, Donald E. Bergstrom, Ronald Reifenberger. SPM studies of SWCNTs decorated by Oligodeoxyribonucleotides. Poster presented by Roya Lahiji at Trends in Nanotechnology 2007, San Sebastian, Spain (September 2007).
- Bridget D. Hines, Roya R. Lahiji, Dmitry Zemlyanov, Ronald Reifenberger and Donald E. Bergstrom. *Association of Oligodeoxyribonucleotides to Single-walled Carbon Nanotubes: A Free Radical Study*. Poster presented at Nanotech 2007 by NSTI in Santa Clara, California (May 2007).
- Bridget D. Hines, Roya R. Lahiji, Ronald Reifenberger and Donald E. Bergstrom. *DNA-Associated Single-walled Carbon Nanotubes: A Free Radcial Study*. Poster presented at Purdue University Chapter of Sigma Xi Graduate Student Research Awards Competition at Purdue University in West Lafayette, Indiana (February 2007).