

GRADUATE EDUCATION

WVNano Initiative Seminar in Nanoscience



Graduate students in the Bridge and Cancer Nanotechnology STEM fellowship programs participate in the WVNano seminar program.

The unifying subject matter of the seminar is nanoscale science and engineering with an overarching objective to enable students to effectively collaborate in an interdisciplinary research and development environment. Students from very diverse disciplines including chemistry, physics, engineering, pharmacy, biochemistry and immunology participate in the seminar series which is designed to convey an understanding of the barriers to successfully conducting interdisciplinary research and how to break them down. Roughly half of the class meetings are devoted to 'the business of research' including how to write grant proposals, intellectual property protection, technology transfer, and the societal and ethical considerations associated with the advancement of science.



The remainder of the seminar programs are student driven with students providing presentations of their research or of recent advances in nanoscience. The capstone experience of the seminar is for interdisciplinary teams, of their own selection, to develop a research proposal in nanobioscience.

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CONTACT:
 Phyllis Barnhart, Associate Director for Education and Outreach
 Phone: 304-293-6667
 Fax: 304-293-6213
 E-mail: phyllis.barnhart@mail.wvu.edu

Lisa Holland, Associate Professor
 Phone: 304-293-3435 ext. 6431
 Email: lisa.holland@mail.wvu.edu

wvnano.wvu.edu

WVNANO

886 Chestnut Ridge Road Phone: 304-293-8281
 PO Box 6223 Fax: 304-293-6213
 Morgantown, WV 26506 E-mail: wvnano@mail.wvu.edu

Dr. David Lederman — Interim Director
 Phone: 304-293-3422 ext. 1494 304-293-8281
 Phyllis Barnhart — Assoc. Director, Education & Outreach
 Phone: 304-293-6667

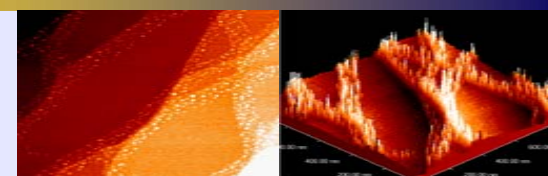
BUILDING THE FUTURE OF WEST VIRGINA ONE IDEA AT A TIME

WVNANO GRADUATE EDUCATION

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ABOUT WVNANO GRADUATE EDUCATION



THE INITIATIVE

The WVNano Initiative is the WV's focal point for discovery and innovation in nanoscale science, engineering and education (NSEE).

WVNano's central objective is to advance the research environment and diversify West Virginia's economic base through cultivation and growth of research in targeted NSE areas. The Initiative's research builds on and connects our core strengths in the bio-nano-info triad.

Our technical efforts target coordinated discovery in materials, devices, and biomolecular systems to advance molecular recognition and transport device innovation of societal impact in security, health, energy, and environmental applications.

THE RESEARCH

Integrative Research Groups. Our groups are formed around the recognition and transport building blocks necessary for integrated molecular recognition systems:

- Electronic Molecular Recognition and Transduction
- Photonic Molecular Recognition and Transduction
- Nano/microfluidic Transport
- Nanokinematic Transport

Groups couple our strengths in electronic and photonic materials and devices as well as molecular biology, proteomics, and microfluidics.

THE PROGRAMS

Cancer Nanotechnology STEM Graduate Education Training Program

The Cancer Nanotechnology STEM Graduate Education Training Program is an example of the type of interdisciplinary experience WVNano is working to create. This graduate training program in Cancer Nanotechnology fosters collaborative research between the basic and clinical research faculty of the Mary Babb Randolph Cancer Center in conjunction with WVNano. The goals of this program are two-fold:

1. To foster basic and translational research training opportunities that focus upon identifying novel molecular signatures in cancer cells that may be detected by, or targeted with, nanotechnology applications.
2. To create a programmatic bridge between science and education, targeting the way students and faculty think by requiring them to work in a multidisciplinary environment where the boundaries between disciplines dissolve.

The training program supports the stipends of 13 graduate students who participate in collaborative research projects between MBRCC cancer research and WVNano scientists. Students in the program represent the departments of Chemistry, Physics, Computer Science and Electrical Engineering, Basic Pharmaceutical Sciences, Immunology and Toxicology, and Physiology. These departments span all three WVU campuses (Eberly College of Arts and Science, College of Engineering and Mineral Resources, and the Health Sciences Center). This program positions graduate student trainees to pursue a career in cancer research or nanobiotechnology, emphasizing the development and use of nanoscale devices to detect and treat cancer.

WVNano Graduate Bridge Program

This program seeks to broaden participation of minorities, women, persons with disabilities, and first generation college students in pursuing careers in STEM education and research with a particular emphasis in nanoscale science and engineering fields. The program provides up to \$5,000 per student with a total of 20 awards available and targets underrepresented populations and highly qualified students. The awards are for students accepted for doctoral study from either the BS or MS level. Upon demonstration of exemplary progress, the awards may be renewed for a second year. Students agree to:

1. Participate in a bridge program designed to facilitate transition into graduate programs within STEM disciplines during the first year (elements of the bridge program available upon request)
2. Attend the WVNano Seminar Series
3. Obtain exposure to research through summer participation in a research project
4. Attend regularly scheduled advising/mentoring meetings with a WVNano or interim department advisor
5. Complete surveys and provide annual updated demographic and educational data while enrolled in the PhD program.

Graduate Emphasis in Nanotechnology

Course work and requirements:

- Nanoscience Seminar Series (2 semesters, 1 cr each)
- Intro to Nanoscale Science & Engineering (3 cr)
- Approved Nanorelated Coursework (3cr)
- Nanofabrication Training
- Presentation at Professional Meeting
- Written Report of Nanotechnology Research Aspects