COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
SUSTAINABLE BIOMATERIALS
VIRGINIA TECH

Ph.D. Assistantship Available!

BIO-INSPIRED DESIGN OF BIODEGRADABLE POLYETHYLENE-LIKE PLASTICS

Start Date: August, 2026

Research Project Description:

Polyethylene (PE) makes up 40% of all plastic film, most of which is unrecyclable, highlighting the need for biodegradable alternatives. A surprising natural model of biodegradable PE-like plastic film exists in Colletes bees, which build nests from a polyester chemically similar to PE but which disintegrates rapidly in the soil. This project will investigate the nest's degradation mechanism and apply it to the design of biodegradable polyethylene-like plastics. Specific project scope will be determined based on candidate expereince and interest.

What's Expected:

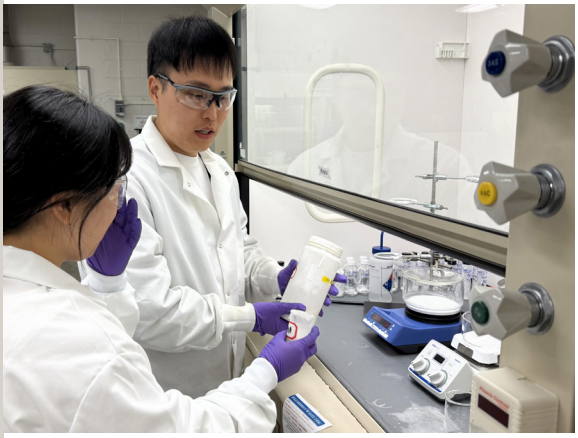
The selected graduate student will pursue their graduate degree through the Department of Sustainable Biomaterials.

Responsibilities Include:

- Conducting scientific research independently
- Presenting research at scientific conferences

Funding:

Graduate Assistantships will provide a $33,588 annual stipend in addition to fully covering Virginia Tech tuition.



Required Qualifications:

- B.S. in Chemistry, Polymer Science, Materials Science, Chemical Engineering, or a related discipline
- Must be accepted into the Ph.D. program within the SBIO Dept.
- Must have completed the TOEFL and the GRE with acceptable scores, and must have a GPA of at least 3.4

Preferred Qualifications:

- Experience with scientific research and data analysis
- Already be accepted into the MACR program at Virginia Tech
- Good writing, communication, and interpersonal skills
- Experience with polymer synthesis or other wet lab chemistry

SBIO Department graduates are successful in securing careers in public and private research organizations and universities, and large sectors of the business world. We provide educational and research opportunities in the areas of sustainable biomaterials, spanning the range from nanotechnology and the basic science of wood and other renewable materials, through processing, manufacturing, marketing, & management in various biomaterials industries.

WANT TO KNOW MORE?

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