

FACULTY RESEARCH INTERESTS
DEPARTMENT OF BIOLOGICAL SCIENCES
Virginia Polytechnic Institute and State University
URL: <http://www.biology.vt.edu/research.htm>

ANDREWS, ROBIN M. 4088 Derring 231-5728 randrews@vt.edu

Major Field of Interest: Physiological ecology and evolutionary biology of reptiles and their embryos.
Current Research: 1) Evolution of viviparity (live-bearing); 2) Effect of incubation temperature during development on phenotypes of hatchlings; and 3) Embryonic diapause in chameleons.

BANERJEE, DIYA 2034 Derring 231-0787 dbanerjee@vt.edu

Major Field of Interest: The genetic control of cell fate specification during animal development.
Current Research: 1) Identifying and characterizing the genes that regulate the correct timing of cell fate decisions during larval development in *C. elegans*; 2) Characterizing how circadian genes regulate animal development; 3) Characterizing how circadian genes and developmental timing genes are involved in cancer formation.

BELDEN, LISA K. 4092C Derring 231-2505 belden@vt.edu

Major Field of Interest: Organismal Biology/Ecology
Current Research: Research in the Belden lab is focused on general aspects of amphibian ecology, physiology and behavior, and also on understanding ongoing worldwide declines in amphibian populations. Our current emphasis is on investigating the role of environmental stress in regulating disease outbreaks in amphibian populations.

BENFIELD, E.F. 4070B Derring 231-5802 benfield@vt.edu

Major Field of Interest: Stream Ecology
Current Research: 1) Historical and contemporary effects of landscape disturbance on biodiversity and ecosystem processes in southern Appalachian streams; 2) Stream/riparian zone interactions.

BUIKEMA, ARTHUR 1024B Derring 231-5180 buik@vt.edu

Major Field of Interest: Teaching Strategies and Effectiveness of Instruction
Current Research: Teaching Strategies and Effectiveness of Instruction in Biology

CHERRY, DON 2006B Derring 231-6766 dcherry@vt.edu

Major Field of Interest: Aquatic Ecology and Ecotoxicology, Emphasizing Fish, Benthic Macroinvertebrate and Bivalve Communities
Current Research: 1) Impact of power production discharges (thermal, chlorine, coal ash, toxic elements) upon the structure and function of biota in aquatic systems (reservoirs, rivers, streams and swamps); 2) Fate and effects of Zebra mussel and Asiatic clam control from oxidizing and nonoxidizing biocides; 3) Acute and chronic bioassays of toxic effluents and sediment; 4) Restoration ecology of watersheds disrupted by abandoned mined land discharges and soil erosion; 5) Ecotoxicological evaluation of active coal mining effluents discharged into streams and rivers.

CIMINI, DANIELA 5036 Derring 231-3922 cimini@vt.edu

Major Field of Interest: Mitotic chromosome segregation and aneuploidy origin as a consequence of inaccurate chromosome segregation in somatic cells. We use a combination of live-cell imaging, quantitative microscopy, and protein inhibition to dissect the mitotic process and to identify the cellular mechanisms responsible for accurate chromosome segregation.
Website: <http://www.biology.vt.edu/faculty/Cimini/>

COWLES, JOE 2011 Derring 231-8928 cowlesjr@vt.edu

Major Field of Interest: Plant Physiology
Current Research: 1) Nodule development and nitrogen fixation in legumes; 2) Regulation of DNA synthesis in higher plants.

KUHN, JEFFREY R. 2031 Derring 231-0782 jrkuhn@vt.edu
Major Field of Interest: Biophysics and control of actin-based eukaryotic cell motility
Current Research: 1) Measurement of actin binding protein kinetics from light microscopic observations of individual binding/unbinding events; 2) In vitro reconstitution of a model “leading cell edge” from purified proteins; 3) Development of novel light microscopy and image analysis techniques to observe motility in vitro and in vivo; 4) Isolation and characterization of individual motile cells from *C. elegans* (worm) larvae.

LI, LIWU 206 Fralin Biotechnology Center 231-1433 lwli@vt.edu
Major Field of Interest: Molecular and Cellular Regulation of Innate Immunity and Inflammation
Current Research: 1) Molecular signaling pathways controlling innate immunity activation; 2) The involvement of innate immunity in cellular migration and phagocytosis; 3) Innate immunity and the pathogenesis of human diseases such as cancer and atherosclerosis.
Website: <http://www.biology.vt.edu/faculty/li/>, http://www.sbes.vt.edu/faculty/li_liwu.htm

LIBSCOMB, MARY V. 4106 Derring 231-9072 lipscomb@vt.edu
Major Field of Interest: Plant Ecology, Plant Conservation

MCNABB, F.M. ANNE 5038 Derring 231-6118 happy@vt.edu
Major Field of Interest: Developmental Endocrinology and Endocrine Disruption
Current Research: 1) Endocrine disruption by chemical pollutants, endocrine toxicology; 2) Development of thyroid function, thyroid receptors, thyroid hormone activation.

MELVILLE, STEVE 4038 Derring 231-1441 melville@v.edu
Major Field of Interest: Bacterial Pathogenesis
Current Research: 1) The interactions of the host immune system with the anaerobic bacterial pathogen *Clostridium perfringens*. Specifically, the molecular mechanisms that allow the bacteria to avoid being killed by phagocytic cells of the immune system, macrophages and neutrophils; 2) The molecular regulation of toxin synthesis by *C. perfringens*, especially the enterotoxin that is responsible for food poisoning outbreaks; 3) The mechanism of pili-dependent gliding motility in *C. perfringens*.
Website: <http://www.biol.vt.edu/faculty/melville/>

MOORE, IGNACIO T. 4092B Derring 231-2112 itmoore@vt.edu
Major Field of Interest: Behavioral Endocrinology, Physiological Ecology, & Behavioral Ecology
Current Research: I am interested in physiological and behavioral adaptations to unique environments. Two primary areas of interest include: 1) Behavioral endocrinology, physiology and ecology of tropical birds; 2) Interactions between stress and reproduction in reptiles and amphibians.

NILSEN, ERIK T. 3002 Derring 231-5674 enilsen@vt.edu
Major Field of Interest: Physiological Ecology of Higher Plants
Current Research: 1) Mechanisms of tree seedling inhibition by *Rhododendron* species; 2) Vascular adaptation of *Rhododendron* species to drought and freeze-thaw cycles; 3) Ecology of invasive species; 4) Evolution of adaptive traits in *Rhododendron* species; 5) Adaptive significance of leaf anatomical characters in Malaysian *Rhododendron* species (*Vireya*).

OPELL, BRENT D. 2104 Derring 231-7445 bopell@vt.edu
Major Field of Interest: Spider Systematic and Evolution
Current Research: 1) Design, function and evolution of spider prey capture threads; 2) Molecular and morphological systematics of spiders.
Website: <http://www.biol.vt.edu/faculty/opell/index.htm>

PHILLIPS, JOHN B. 4100 Derring 231-1484 jphillip@vt.edu
Major Fields of Interest: Neuroethology, Sensory Ecology
Current Research: 1) Involvement of specialized photoreception mechanisms in detection of the earth’s magnetic field; 2) Polarized light and ultraviolet light vision in vertebrates; 3) Sensory basis of the vertebrate navigational “map”; 4) Visual system involvement in foraging behavior, microhabitat selection and mate choice; 5) Coevolution of color signals and chromatic processing mechanisms.
Website: <http://www.biol.vt.edu/faculty/phillips/index.htm>

VALETT, H. MAURICE 1020A Derring 231-2065 mvalett@vt.edu
Major Fields of Interest: Ecosystem Ecology and Biogeochemistry, Nutrient Retention on Lotic Ecosystems, Groundwater-Surface Water Exchange: Implications for Ecosystem Function, Floodplain-River Interactions.

VOGELAAR, NANCY 5094 Derring 231-2093 nancyv@vt.edu
Major Field of Interest: Structural Biology
Current Research: I crystallize various proteins and protein complexes and work to determine their structures using x-ray diffraction. The structures of DNA and RNA can also be studied with this technique.

WALKER, RICHARD A. 5016B Derring 231-3803 rawalker@vt.edu
Major Field of Interest:
Current Research: 1) Microtubule-Associated Motor Proteins; 2) Microtubule Assembly Dynamics; 3) The Visible Cell.

WALTERS, JEFF 4081 Derring 231-3847 jrwalt@vt.edu
Major Field of Interest: Behavioral Ecology, Conservation Biology
Current Research: 1) Evolution of cooperative breeding in birds; 2) Ecological basis of sensitivity to habitat fragmentation; 3) Evolution of social behavior and life history in birds and primates; 4) Dispersal behavior; 5) Conservation of endangered birds.

WEBSTER, JACKSON R. 1000 Derring 231-8941 jwebster@vt.edu
Major Field of Interest: Stream Ecology, Ecosystem Ecology, Ecological Modeling
Current Research: 1) Organic matter dynamics in streams; 2) Nitrogen and phosphorus in streams; 3) Stream ecosystem response to disturbance; 4) River-floodplain interaction.

WINKEL, BRENDA 409 Latham Hall 231-3013 winkel@vt.edu
Major Field of Interest: Intracellular organization of metabolic pathways
Current Research: 1) Characterization of the architecture and localization of the Arabidopsis flavonoid enzyme complex. Approaches used include classical molecular biology, biochemistry, and cell biological techniques as well as emerging technologies including FRET, small angle neutron scattering, surface plasmon resonance, and TAP tagging; 2) Development of novel multimetallic complexes for use as anticancer agents, in collaboration with the Brewer Laboratory in the Department of Chemistry. Note: There are unlikely to be any new openings for undergraduate researchers in the Winkel lab during the 2006-2007 academic year.

YANG, ZHAOMIN 4001 Derring 231-1350 zmyang@vt.edu
Major Field of Interest: Microbial genetics, molecular biology, signal transduction, prokaryotic development, biofilm formation and surface motility, type IV pili (Tfp), pathogenesis and vaccine.
Current Research: The ability of a microbe (pathogenic or otherwise) to sense and respond to environmental changes is central to whatever it does including its survival and proliferation. Current research in the lab largely focuses on deciphering how Tfp can function as physical sensors for the presence of other cells and how a signal transduction pathway can regulate the production/biogenesis of a polysaccharide cell surface structure. We mostly use Myxococcus xanthus, a gliding and developmental bacterium, as the model organism for our research. Techniques used in the lab include those of microbial genetics, molecular biology, advanced microscopy, biochemistry and computational biology.