

## UVa BME LABS GUIDE for Undergraduate Students. Last Updated 9/7/2005.

<b>Director</b>	Acton, Scott acton@virginia.edu (434) 982-2003	<b>Lab</b> VIVA: Virginia Image and Video Analysis Thornton E-309	<b>Students/Yr</b> 2 per year
<b>Student Contact</b>	Rob Janiczek rlj5n@virginia.edu	<b>Current Needs</b> Talk to Dr. Acton.	<b>Hours/Wk</b> Summer: 20-30 hours/week. Academic
<b>Projects</b>	Tracking cells, classifying MR images, analyzing imagery. Recommended that students take ECE 323/324 or equivalent.		
<b>Research</b>	Biomedical image analysis, image processing. <a href="http://viva.ee.virginia.edu">http://viva.ee.virginia.edu</a> .		
<b>Director</b>	Allaire, Paul E. pea@virginia.edu 434 924-6209	<b>Lab</b> Virginia Artificial Heart Lab MEC 317	<b>Students/Yr</b> 1-2 per year
<b>Student Contact</b>	Amy Throckmorton & Sonna Patel alt2c@virginia.edu & sonna@virginia.edu	<b>Current Needs</b> Have an initial talk w/ Dr. Alaire & then attend some meetings.	<b>Hours/Wk</b> Enough to do a senior thesis.
<b>Projects</b>	Conduct flow tests on prototype pumps.		
<b>Research</b>	Heart assist pumps and cardiovascular modeling.		
<b>Director</b>	Berr, Stuart sb4b@virginia.edu 434 924-5096	<b>Lab</b> Small Animal MRI Lab MR4, Room 1192	<b>Students/Yr</b> 2 per year
<b>Student Contact</b>	Scott Coven slc6c@virginia.edu	<b>Current Needs</b> Talk to Dr. Berr.	<b>Hours/Wk</b> 10 hours/week.
<b>Projects</b>	Develop high resolution MR imaging techniques for phenotyping mice.		
<b>Research</b>	Cardiovascular and cancer research in mice. In vivo magnetic resonance, bioluminescence, and fluorescence imaging.		
<b>Director</b>	Blackman, Brett R. bblackman@virginia.edu 434 924-8080	<b>Lab</b> Vascular Mechanobiology Lab MR5, Room 2226	<b>Students/Yr</b> 1-2 summer, 2/semester during year
<b>Student Contact</b>	Brad Gelfand bgelfand@virginia.edu	<b>Current Needs</b> Contact me by email- bblackman@virginia.edu.	<b>Hours/Wk</b> 10 hours/week.
<b>Projects</b>	Projects range from measuring the biological and molecular responses of vascular cells in culture to developing imaging analysis algorithms to track cellular movements in response to mechanical forces.		
<b>Research</b>	The lab is interested in understanding how mechanical forces generated throughout the cardiovascular system regulate vascular function and the biological response of cells that comprise blood vessels. This research is applicable to our basic understanding of the development of human vascular diseases and vascular tissue engineering constructs. Website: <a href="http://bme.virginia.edu/people/faculty/blackman/">http://bme.virginia.edu/people/faculty/blackman/</a>		
<b>Director</b>	Botchwey, Edward eab6e@virginia.edu 434 243-9846	<b>Lab</b> Musculo-Skeletal Tissue Engineering MR5 2231	<b>Students/Yr</b> 10 hours/week
<b>Student Contact</b>	Kristen Wieghaus kaw9h@virginia.edu	<b>Current Needs</b> Contact by email or visit lab.	<b>Hours/Wk</b> 1-2 students/semester.
<b>Projects</b>	Small molecule inducers of angiogenesis for tissue engineering. Adult stem cells for tissue engineering cell therapy. Bioreactors/porous scaffold technology for tissue engineering.		
<b>Research</b>	Bone Tissue Engineering		
			<b>Paid, Volunteer, or For Credit?</b> Paid (sometimes), volunteer or for credit.
			<b>Paid, Volunteer, or For Credit?</b> Usually senior thesis projects (unpaid).
			<b>Paid, Volunteer, or For Credit?</b> Mostly volunteer or for credit. Occasional paid position.
			<b>Paid, Volunteer, or For Credit?</b> Volunteer or for credit. Possible to be paid during
			<b>Paid, Volunteer, or For Credit?</b> Volunteer or For Credit only.

<b>Director</b>	Brookeman, James R. jrb5m@virginia.edu      434 982-3152	<b>Lab</b> Magnetic Resonance Research Facility MR4, Room 1190	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b>
<b>Student Contact</b>		<b>Current Needs</b> Contact Dr. Brookeman.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, and for credit.
<b>Projects</b>	Assisting with research in MR imaging and hyperpolarized noble gas studies of the lungs.		
<b>Research</b>	Medical Imaging. 2- & 3-dimensional MR image acquisition for diagnosis and specialized radiofrequency coils for improved imaging used in surgery. Hyperpolarized Noble Gas MR. Website: <a href="http://imaging.med.virginia.edu/hyperpolarized/index.htm">imaging.med.virginia.edu/hyperpolarized/index.htm</a>		
<b>Director</b>	Crandall, Jeff & Kent, Rich rkw3c@virginia.edu      434 296-7288	<b>Lab</b> Automobile Safety Lab 1011 Linden Ave (Belmont area of Ch'ville)	<b>Students/Yr</b> 2-3 per year <b>Hours/Wk</b>
<b>Student Contact</b>	Karin Rafaels / Steve Stacy rafaels@virginia.edu / sstacey@virginia.edu	<b>Current Needs</b> Contact Rich Kent or Jeff Crandall.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, and for credit.
<b>Projects</b>	Development of constitutive models for biological materials, development of injury criteria/thresholds, assessment of crash test dummies, design of test apparatus/methods. Note: Lab is off-grounds, about 2-3 miles from the Rotunda.		
<b>Research</b>	Biomechanics, Injury Biomechanics, Trauma Prevention, Automobile Safety. <a href="http://auto-safety.mech.virginia.edu">http://auto-safety.mech.virginia.edu</a>		
<b>Director</b>	Duling, Brian R. brd@virginia.edu      434 924-9040 / 243-9943	<b>Lab</b> Duling Lab MR4, 6051	<b>Students/Yr</b> 1 per year <b>Hours/Wk</b> Depends on skill level & devotion.
<b>Student Contact</b>	None	<b>Current Needs</b> Call or e-mail Dr. Duling.	<b>Paid, Volunteer, or For Credit?</b> Volunteer or for credit. Pay is a possibility.
<b>Projects</b>	We use a variety of tools & techniques to investigate the endothelium of blood vessels. Students might investigate the molecules bound to the endothelial cell surface or develop a new method for measuring the dimensions in blood vessels. Interested students can look at blood vessels as they contract and respond to stimuli that occur in everyday life.		
<b>Research</b>	The endothelium - cell surfaces and communication. Molecular biology allows us to find out what molecules are being made by the endothelium and what regulates them.		
<b>Director</b>	Epstein, Fred H. fhe6b@virginia.edu      434 982-0563	<b>Lab</b> Epstein Lab MR4 1175	<b>Students/Yr</b> 1 per year <b>Hours/Wk</b> 4 hours/week.
<b>Student Contact</b>	Moriel Vansburger mv6v@virginia.edu	<b>Current Needs</b> Contact Dr. Epstein.	<b>Paid, Volunteer, or For Credit?</b> Usually volunteer or for credit.
<b>Projects</b>	Develop Matlab software for image analysis.		
<b>Research</b>	Use of MRI to image myocardial function and perfusion.		
<b>Director</b>	French, Brent A. bf4g@virginia.edu      434 924-5728	<b>Lab</b> Molecular Bioengineering Laboratory MR5, Room 1219	<b>Students/Yr</b> 1 per year <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Ankit Tejani atejani@virginia.edu	<b>Current Needs</b> Contact by email: <a href="mailto:bf4g@virginia.edu">bf4g@virginia.edu</a> .	<b>Paid, Volunteer, or For Credit?</b> Mostly volunteer or for credit.
<b>Projects</b>	Depends largely on student's aptitude, experience, and inclination. Projects range from studying gene expression at the mRNA and protein levels to studying cardiac function with magnetic resonance imaging.		
<b>Research</b>	Roles of oxidative stress and inflammation in myocardial infarction and left ventricular remodeling.		

<b>Director</b>	Gillies, George T. gtg@virginia.edu 434 924-7634	<b>Lab</b> Bio/Thermal Fluids Lab MEC 105D	<b>Students/Yr</b> 3 per year <b>Hours/Wk</b> Minimum of 4-6 hours/week.
<b>Student Contact</b>	Ann Schillinger (undergrad) as7as@virginia.edu	<b>Current Needs</b> See Dr. Gillies.	<b>Paid, Volunteer, or For Credit?</b> Volunteer and For credit only.
<b>Projects</b>	Testing the performance of neurocatheters using gelatin materials that approximate brain tumors.		
<b>Research</b>	Developing new ways to treat brain tumors and other CNS diseases.		
<b>Director</b>	Guilford, William H. drbill@virginia.edu 434 243-2740	<b>Lab</b> Molecular Biomechanics Laboratory MR5, Room 1213	<b>Students/Yr</b> 2 per year <b>Hours/Wk</b> 2 afternoons/week minimum.
<b>Student Contact</b>	Bin Guo or Vijay Rao bg3u@virginia.edu or vsr3b@virginia.edu	<b>Current Needs</b> Projects are continually evolving. Contact Dr. Guilford.	<b>Paid, Volunteer, or For Credit?</b> Volunteer or for credit. Possible to be paid, but only
<b>Projects</b>	Projects range from the molecular basis of heart and neural diseases, to the development of computer algorithms for tracking images of single molecules.		
<b>Research</b>	The molecular basis of muscle contraction and cell adhesion, and its relationship to cardiovascular disease.		
<b>Director</b>	Helm, Gregory A. gah9r@virginia.edu 434 924-1642	<b>Lab</b> Molecular Neurosurgery Laboratory Cobb Hall	<b>Students/Yr</b> 2-3 <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>		<b>Current Needs</b>	<b>Paid, Volunteer, or For Credit?</b> Usually volunteer or for credit
<b>Projects</b>	To be determined depending on interest. Looking for people who are genuinely interested and enthusiastic about the lab's work. Need to be able to spend at least 10 hrs/wk in lab.		
<b>Research</b>	Gene therapy/Tissue Engineering for Neurosurgical Disorders. In vivo Molecular Imaging		
<b>Director</b>	Helmke, Brian P. helmke@virginia.edu 434 924-1726	<b>Lab</b> Cellular Mechanotransduction MR5, Room 1207	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Rosie Mott or Christina Haden rm3v@virginia.edu or cvh2k@virginia.edu	<b>Current Needs</b> Contact Dr. Helmke.	<b>Paid, Volunteer, or For Credit?</b> Depends: mostly volunteer or for credit.
<b>Projects</b>	Recent undergraduate projects include imaging nitric oxide production inside endothelial cells, imaging structural deformation inside cells during "tickling" with a micropipette, creating micropatterned surfaces to control cell adhesion, and investigating how white blood cell migration across the endothelium depends on cell structure.		
<b>Research</b>	Our lab is investigating how cells sense mechanical forces. In particular, we're interested in how endothelial cells lining the blood vessels sense changes in frictional shear stress due to blood flow. This has important clinical implications since endothelial dysfunction plays a crucial role in the development of arterial diseases such as atherosclerosis. We are developing innovative tools to investigate cell mechanics and control cell behavior, including high-resolution microscopy, 4-D image analysis, and nanotechnology.		
<b>Director</b>	Horwitz, Rick horwitz@virginia.edu 434-243-6812	<b>Lab</b> Cell Adhesion and Migration Jordan Hall, Room 3226	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b> 10 hours/week
<b>Student Contact</b>	Colin Choi ckchoi@virginia.edu	<b>Current Needs</b> Contact Dr. Claire Brown, cmb8t@virginia.edu	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit
<b>Projects</b>	Digital image analysis, adhesion turnover assays, implementation of computational image analysis tools. Depending on applicant possibility of live cell imaging, tissue culture, and transfection protocols.		
<b>Research</b>	The lab studies cell migration and is interested in the mechanisms that control cell movement via cell-substrate adhesion formation, turnover and disassembly. The project will apply imaging techniques to further understand the spatial and temporal distribution, dynamics and regulation of these processes during cell migration.		

<b>Director</b>	Hossack, John hossack@virginia.edu 434 243-5866	<b>Lab</b> Biomedical Ultrasound Laboratory MR5, Room 2219	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Matt Eames eames@virginia.edu	<b>Current Needs</b> www.faculty.virginia.edu/hossack/ & then contact Dr. Hossack	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, or for credit.
<b>Projects</b>	Involve supporting some component of one of the active research projects listed below. Projects are best suited to those interested in imaging/mathematical modeling. Some projects are available that involve assisting in the collection of clinical imaging data and analyzing it. There are openings in mouse heart imaging.		
<b>Research</b>	Various projects: quantitative 3D ultrasound imaging of mouse heart chambers, quantification of perfusion in mouse heart after myocardial infarction, breast and prostate cancer detection using ultrasound-based measurements of elasticity, transducer modeling and design. Simulating the image formation process, finite element simulation of transducers (emphasis on high signal bandwidth transducers). Collaborations with mouse researchers, Radiology and CV Division.		
<b>Director</b>	Kim, Yong I. yik@virginia.edu 434 924-2786	<b>Lab</b> Kim Lab MR5, Room 2215	<b>Students/Yr</b> 3 to 4 per year <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Nah Youn Lee (undergrad) nyl5x@virginia.edu	<b>Current Needs</b> Visit my lab or contact me (924-2786, yik@virginia.edu).	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit.
<b>Projects</b>	Each prospective student will undertake an independent project supervised by Dr. Kim. Typical projects have 3 phases: 1) learning and mastering the experimental techniques; 2) execution of actual experiments and acquisition of the data; 3) analysis and evaluation of the data acquired and preparation of a manuscript for publication in refereed journals.		
<b>Research</b>	The major approach taken is to define the bioelectric dysfunction(s) characterising particular neurological disorders and determine the cellular and molecular basis of the pathogenesis of the disease. Current research: 1) development /characterization of an autoimmune animal model of a neuromuscular junction disorder; (2) testing the therapeutic efficacy of newly synthesized drugs regulating the bioelectrical function of voltage-dependent calcium channels. Employ patch-clamp and intracellular recording techniques to assess the functional status of ion channels and neuromuscular transmission.		
<b>Director</b>	Knight-Scott, Jack jack_knight-scott@virginia. 434 243-6321	<b>Lab</b> Cognitive MR Analysis Lab MR5, Room 2232	<b>Students/Yr</b> 2 per year <b>Hours/Wk</b> 5-6 hours/week.
<b>Student Contact</b>	Andrea Dunham / Dattesh Shangbag sad5b@virginia.edu / dattesh@virginia.edu	<b>Current Needs</b> Contact Dr. Knight-Scott.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer and for credit.
<b>Projects</b>	Analysis of spectroscopy data. Collecting data using MRI system. All students should have some programming experience.		
<b>Research</b>	Diagnosis & study of neurological disorders/diseases using MR applications. In vivo detection and quantification of extracellular matrix of the brain. Neuroprotective effects of hormone replacement therapy in Multiple Sclerosis. Glucose-dependent memory enhancement in Alzheimer's patients.		
<b>Director</b>	Laurencin, Cato ctl3f@virginia.edu 434 924-1930 (MR5 Lab	<b>Lab</b> Laurencin Lab MR5 Room 2203, 2237	<b>Students/Yr</b> 2 during summer; 1-2 during year. <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Michelle Kofron mdk8g@virginia.edu	<b>Current Needs</b> Talk to Dr. Laurencin or a post doc in his lab.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, or for-credit.
<b>Projects</b>	Osteoblast culture in bioreactors, biocompatibility of novel polymers, electrospinning nanofibers.		
<b>Research</b>	Musculoskeletal Tissues. Dr. Laurencin's postdocs: Joseph Freeman (jfreeman@virginia.edu), Lakshmi Nair (Assistant Prof, nair@virginia.edu), Xiaojun Yu (xy5m@virginia.edu), Yusef Khan (Assistant prof, mykhan@virginia.edu). <i>Advice from Dr. Freeman: Once you decide what field you would like to work in, ask a professor in that field for a summer research position.</i>		
<b>Director</b>	Lawrence, Michael B. mlawrence@virginia.edu 434 982-4269	<b>Lab</b> Adhesion Mechanics/Membrane Immunobiology MR5, Room 2111	<b>Students/Yr</b> 2 per year <b>Hours/Wk</b> 5 hours/week (one good afternoon).
<b>Student Contact</b>	Tony Ham ash4h@virginia.edu	<b>Current Needs</b> Contact Dr. Lawrence.	<b>Paid, Volunteer, or For Credit?</b> Paid (summer only), volunteer or for credit.
<b>Projects</b>	Students choose a project based on their interests and current lab needs. Examples of previous undergraduate projects include the design of microbubbles and peptide-presenting hydrogels with possible applications to targeted drug delivery. There are additional opportunities in modeling cell and microbead rolling and investigating the relationship between molecular structure		
<b>Research</b>	Role of shear stress in inflammation. Cell recruitment to sites of tissue injury. Targeted drug delivery. Progenitor cell homing.		

<b>Director</b>	Ley, Klaus klausley@virginia.edu 434 243-9966	<b>Lab</b> Ley Lab MR5, Room 1013	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b> 10 hours/week.
<b>Student Contact</b>	Dane Dunson dmd8e@virginia.edu	<b>Current Needs</b> Will work with the student to match interests with projects.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit.
<b>Projects</b>	PCR. Website development. Bioinformatics projects. Wet lab work. Transgenic mice. Cell culture. Flow cytometry.		
<b>Research</b>	Atherosclerosis. Inflammation: cytokines, chemokines. Biomechanics of leukocyte adhesion. Inflammatory bowel disease. Rheology. Bioinformatics.		
<b>Director</b>	Meyer, Craig H. cmeyer@virginia.edu 434 243-9495	<b>Lab</b> Cardiac Imaging Lab MR5, Room 2228	<b>Students/Yr</b> 1-2 per year <b>Hours/Wk</b> 5-10 hours/week.
<b>Student Contact</b>	Chris Sica cts9v@virginia.edu	<b>Current Needs</b> Contact Dr. Meyer.	<b>Paid, Volunteer, or For Credit?</b> Mostly volunteer or for credit.
<b>Projects</b>	One technique we are studying is real-time interactive imaging, which allows images of the beating heart to be acquired, displayed and controlled in real-time.		
<b>Research</b>	Non invasive coronary angiography and coronary vessel wall imaging. Developing novel rapid MRI techniques.		
<b>Director</b>	Papin, Jason papin@virginia.edu	<b>Lab</b> Computational Systems Bioengineering Lab MR5 2041	<b>Students/Yr</b> 1-2 <b>Hours/Wk</b> As many as able and willing.
<b>Student Contact</b>	Erwin Gianchandani epg5g@virginia.edu	<b>Current Needs</b> Motivated students. Email Dr. Papin.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, or for credit.
<b>Projects</b>	See lab webpage on BME website.		
<b>Research</b>	Computational systems biology, bioinformatics, signal transduction networks.		
<b>Director</b>	Peirce, Shayn M. speirce@virginia.edu 434 243-5795	<b>Lab</b> Peirce Lab MR5 2228	<b>Students/Yr</b> 1-2 during year; 2 during summer <b>Hours/Wk</b> 5-20 hours/week, depending on project.
<b>Student Contact</b>	Alex Baily amb3gq@virginia.edu	<b>Current Needs</b> Call or email.	<b>Paid, Volunteer, or For Credit?</b> Paid (one part-time position), volunteer, or for-credit / sr.
<b>Projects</b>	Tissue engineering, cell culture, and assisting with small animal surgeries. Immunohistochemistry benchtop work (staining tissues with antibodies). Image analysis and data acquisition on tissues. Computational modeling of tissue patterning events. Lab technician work.		
<b>Research</b>	Tissue Patterning, Stem Cells in Microvascular Growth, Computational Modeling of Complex Biological Systems. <i>Advice from Dr. Peirce: Don't wait to get started. I recommend looking for a project (or lab experience) in your first or second year, but it's never too late to start! Pick a lab that you are really interested in...do your research to figure out what scientific projects (or questions) are really interesting to you. If you commit to working in a lab, make sure that you have the time to spend there and do your best work!</i>		
<b>Director</b>	Price, Richard rprice@virginia.edu 434 924-0020	<b>Lab</b> Angiogenesis Lab MR5, Room 2216	<b>Students/Yr</b> 1-3 per year <b>Hours/Wk</b> 4-10 hours/week.
<b>Student Contact</b>	Meghan Nickerson mnm4m@virginia.edu	<b>Current Needs</b> Contact Dr. Price by email.	<b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit.
<b>Projects</b>	Section and stain tissues for blood vessel growth, analyze microvessel networks for angiogenesis in a variety of tissues, assist graduate students / postdocs with animal surgeries, construct fluid dynamic computational models of exercise trained skeletal muscle circulation.		
<b>Research</b>	Mechanisms of microvascular network patterning during angiogenesis; guidance of capillary sprouting by extracellular matrix; use of ultrasound-microbubble interactions for targeted stimulation of arteriogenesis; microvascular remodeling in exercise trained muscle; tissue engineered angiogenesis scaffolds.		

<b>Director</b>	Reed, Michael reed@virginia.edu      434 924 6309	<b>Lab</b> Microsystems Technology Laboratory Thornton E216	<b>Students/Yr</b> 1 - 2 per year. <b>Hours/Wk</b> <b>Paid, Volunteer, or For Credit?</b> Paid, volunteer, or for credit (senior thesis work).
<b>Student Contact</b>	Charles Molhoek ccm4f@virginia.edu	<b>Current Needs</b> See STS Senior thesis topic database website.	
<b>Projects</b>	Sensor microfabrication, characterization and testing. Nanofabrication.		
<b>Research</b>	Making small things.		
<b>Director</b>	Schwartz, Martin maschwartz@virginia.edu    (434) 243-4813	<b>Lab</b> Integrins and Signal Transduction MR5, G213 (ground floor of MR5)	<b>Students/Yr</b> 1 per year <b>Hours/Wk</b> 10 hours/week. <b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit.
<b>Student Contact</b>	Matthew Coyner mrc7y@virginia.edu	<b>Current Needs</b> Contact Dr. Schwartz.	
<b>Projects</b>	Possible projects range from assays of signaling events in response to fluid shear stress and mechanical strain, development of new devices for applying forces to cells, development of substrata with defined physical and chemical properties, assays of gene expression in response to defined substrata and mechanical stimuli.		
<b>Research</b>	Integrin signaling: basic mechanisms and relevance to mechanotransduction, tissue engineering, cancer and cell motility.		
<b>Director</b>	Skalak, Thomas C. tskalak@virginia.edu      434 924-0270	<b>Lab</b> Microvascular Biomechanics Lab MR5 2214	<b>Students/Yr</b> 1-3 per year <b>Hours/Wk</b> 10 hours/week. <b>Paid, Volunteer, or For Credit?</b> Paid, volunteer and for credit.
<b>Student Contact</b>	Liz Logsdon eal9m@virginia.edu	<b>Current Needs</b> Ongoing recruitment, if there is a good match of person and project.	
<b>Projects</b>	Learn immunohistochemical labeling of tissue specimens; collect data on vessel architecture and function using video microscopy & image processing; develop computational automata simulations of tissue assembly, micropatterning of proteins on surfaces to study smooth muscle cell differentiation in response to stress; assist a graduate student in an advanced project involving surgery & blood flow measurements.		
<b>Research</b>	Microvascular Remodeling and Adaptation, Biomechanics of circulation, Magnetic field effects on circulation, Computer simulation of hemodynamics and tissue assembly processes, including blood vessel pattern formation.		
<b>Director</b>	Walker, William F. bwalker@virginia.edu      434 924-9950	<b>Lab</b> Medical Ultrasonic Imaging Lab MR5, Room 2225	<b>Students/Yr</b> 2 or more <b>Hours/Wk</b> 10 hours/week. <b>Paid, Volunteer, or For Credit?</b> Paid, volunteer and for Credit.
<b>Student Contact</b>	Mary Santy mks3k@virginia.edu	<b>Current Needs</b> Visit <a href="http://hobbes.ee.virginia.edu/ultra">http://hobbes.ee.virginia.edu/ultra</a> , then contact Dr. Walker or	
<b>Projects</b>	Our lab is involved in a broad variety of constantly evolving projects. Projects are selected to meet lab needs and student interests/skills. Recent undergrad projects: "Design & Characterization of a Phantom Eye to be used in Ultrasonic Imaging," "Measurement & Calibration of the Acoustic Output from an Ultrasonic Imaging System," "Design Tradeoffs in 2D Ultrasound Arrays: Implementation & Impact", "Radiation Force Analysis of Thrombosis."		
<b>Research</b>	In a broad sense we use sound in the ultrasonic frequencies to gain new, clinically valuable information about human tissues and physiology. We apply physics, mathematics, computer simulations, and the life sciences, as well as Biomedical, Electrical, and Mechanical Engineering to gain insight and develop new solutions to clinical problems. We often collaborate with colleagues in industry to develop custom tools on state of the art clinical instruments.		
<b>Director</b>	Williams, Mark B. mbw7a@virginia.edu      434 982-4422	<b>Lab</b> Detector Lab MR4 Room 1174	<b>Students/Yr</b> 3 - 5 per year <b>Hours/Wk</b> 10 hours/week. <b>Paid, Volunteer, or For Credit?</b> Paid, volunteer or for credit
<b>Student Contact</b>	Priya Raghunathan pr7n@virginia.edu	<b>Current Needs</b> Contact Dr. Williams.	
<b>Projects</b>	Detector development and characterization, data acquisition and image analysis, software development, design and implementation of studies using both phantoms and patient volunteers.		
<b>Research</b>	Development of x-ray and gamma ray based medical imaging systems.		