

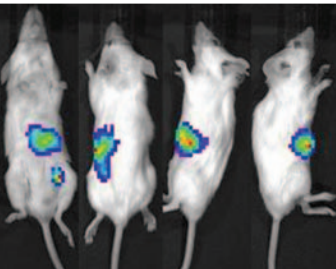
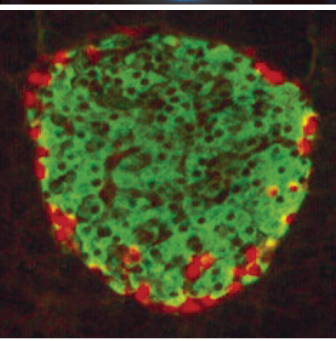
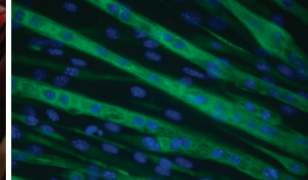
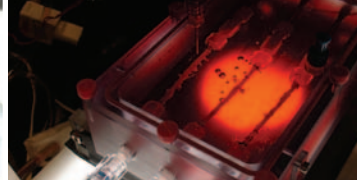
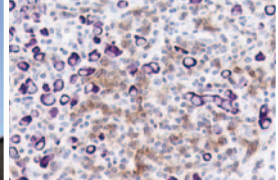
# Advanced Residency Training at Stanford

*Sanjiv Sam Gambhir, MD, PhD*  
*Program Director*



STANFORD  
UNIVERSITY

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Program Director

### Program Overview

Today's competitive environment demands rigorous scientific training for young academicians. The Advanced Residency Training at Stanford (ARTS) Program offers this high level of knowledge and intense training to physician-scientists. The program offers the opportunity to combine clinical training with advanced research training to complete a PhD graduate degree. ARTS is designed for physicians committed to careers combining basic science/translational research with residency or fellowship training. The goal is to foster development of physicians with comprehensive scientific training.

The ARTS Program begins with one or more years of postgraduate clinical training, followed by research training in a graduate program in Stanford University's Schools of Medicine, Engineering, or Humanities and Sciences. Residents/fellows admitted to the program complete clinical training toward board certification in internal medicine, its subspecialties (cardiovascular medicine, hematology, immunology and rheumatology, infectious diseases, nephrology, oncology, pulmonary and critical care medicine), surgical disciplines (neurosurgery, obstetrics and gynecology, surgery and urology), or non-surgical disciplines (neurology, pediatrics, psychiatry, radiation oncology and radiology).

Stanford University is recognized as one of the world's leading research and teaching institutions. Stanford is particularly noted for its openness to interdisciplinary research across its schools and departments, as well as its laboratories, institutes and research centers providing a unique borderless educational environment. This further promotes collaborations and translational research, where the goal is to safely expedite the process of bringing new discoveries and inventions from research laboratories to patients. The research opportunities at Stanford are endless, and the diverse community of scholars offers its students a remarkable opportunity for a comprehensive graduate training experience.

### Advisory Committee

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Department of Obstetrics and Gynecology

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Donald E. and Delia B. Baxter Professor  
Department of Microbiology and Immunology  
Director, Baxter Laboratory in Genetic  
Pharmacology

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Associate Professor

Departments of Medicine (Oncology)  
and Pathology

**Sanjiv Sam Gambhir, MD, PhD**

Professor

Departments of Radiology and Bioengineering  
Director, Molecular Imaging Program  
at Stanford  
Chief, Division of Nuclear Medicine  
ARTS Program Director

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Chair, Department of Radiology

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Chair, Department of Radiation Oncology

**Thomas Krummel, MD, FACS**

Emile Holman Professor of Surgery  
Chair, Department of Surgery

Susan B. Ford Surgeon-in-Chief at Lucile  
Packard Children's Hospital

**Ronald Levy, MD**

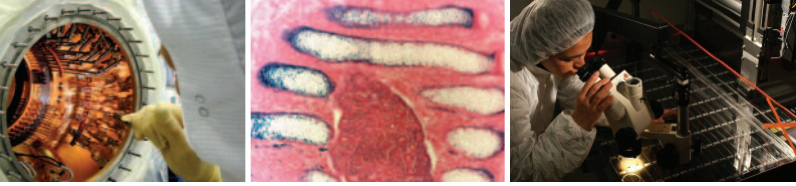
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of Medicine

Department of Medicine (Oncology)  
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Senior Associate Dean for Research in the  
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Service Chief, Neonatology

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Assistant Professor  
Departments of Radiology and Medicine (Cardiovascular)

**Paul Yock, MD**

Martha Meier Weiland Professor of Medicine and  
Bioengineering  
Departments of Medicine (Cardiovascular) and Bioengineering  
Director, Program in Biodesign

## PhD Programs

### SCHOOL OF MEDICINE

**Biochemistry**

<http://biochemistry.stanford.edu/>

**Biological Sciences**

<http://www.stanford.edu/dept/biology/>

**Biomedical Informatics**

<http://bmi.stanford.edu/>

**Biophysics**

<http://med.stanford.edu/biophysics/>

**Cancer Biology**

<http://med.stanford.edu/biosciences/cancer.html>

**Chemical and Systems Biology**

<http://casb.stanford.edu/>

**Developmental Biology**

<http://devbio.stanford.edu/>

**Genetics**

<http://genetics.stanford.edu/>

**Immunology**

<http://immunol.stanford.edu/>

**Microbiology and Immunology**

<http://cmgm.stanford.edu/micro/>

**Molecular and Cellular Physiology**

<http://mcp.stanford.edu/>

**Neurosciences**

<http://neuroscience.stanford.edu/>

**Structural Biology**

<http://med.stanford.edu/school/structuralbio/>

### SCHOOL OF ENGINEERING

**Bioengineering**

<http://bioengineering.stanford.edu/>

**Chemical Engineering**

<http://chemeng.stanford.edu/>

**Electrical Engineering**

<http://ee.stanford.edu/>

**Management Science and Engineering**

<http://www.stanford.edu/dept/MSandE/>

**Materials Science and Engineering**

<http://mse.stanford.edu/>

### SCHOOL OF HUMANITIES AND SCIENCES

**Applied Physics**

<http://www.stanford.edu/dept/app-physics/>

**Chemistry**

<http://www.stanford.edu/dept/chemistry/>

### OTHER Ph.D. PROGRAMS

<http://gradadmissions.stanford.edu/degreeprograms/programs.html>

## Participating Stanford Residency Programs

**Department of Medicine**

<http://medicine.stanford.edu/>

**Department of Neurology & Neurological Sciences**

<http://neurology.stanford.edu/>

**Department of Neurosurgery**

<http://med.stanford.edu/neurosurgery/>

**Department of Obstetrics and Gynecology**

<http://obgyn.stanford.edu/>

**Department of Pediatrics**

<http://pediatrics.stanford.edu/>

**Department of Psychiatry**

<http://psychiatry.stanford.edu/>

**Department of Radiation Oncology**

<http://radonc.stanford.edu/>

**Department of Radiology**

<http://radiology.stanford.edu/>

**Department of Surgery**

<http://surgery.stanford.edu/>

**Department of Urology**

<http://urology.stanford.edu/>

## Eligibility

The program is designed for those candidates at the Stanford University Medical Center who are in a residency or fellowship program. Individuals who have an MD degree and have completed one or more years of postgraduate clinical training are eligible to apply. Candidates may apply at any time during residency/fellowship.

Applications are accepted throughout the year. Acceptance to the ARTS program does not guarantee admission to a Stanford Graduate Program. Applications must be submitted separately to the Graduate Admission Office.

Applicants to the ARTS program will be evaluated based on five criteria:

1. Academic Achievement
2. Clinical Performance
3. Research Experience
4. Personal Statement
5. Three Letters of Recommendation

## Stipends & Tuition

Stipends commensurate with clinical training (up to PGY V maximum) and full tuition costs are provided throughout the graduate research years, which is typically 4 - 5 years.

## Application

Applicants should send:

1. Personal Statement: Summarize your research accomplishments. Indicate the research areas you wish to pursue in the ARTS program. Discuss the basis of your interest and the role you expect research to have in your long-term career. Describe your plan of study in research (please include possible mentors, research departments, if known)
2. Curriculum Vitae
3. Personal Statement
4. Copies of Transcripts: Undergraduate, Graduate, Medical
5. Copies of Exam Scores: GRE, MCAT, USMLE, or other applicable scores
6. Reprints of Publications (if any): Copies are acceptable

**Incomplete applications will not be reviewed. Interviews are scheduled by invitation only.**

## Send All Application Materials To

**Sofia Gonzales**

ARTS Program  
Stanford University Medical Center  
300 Pasteur Drive, Room H0101  
Stanford, CA 94305-5281

Tel: (650) 724-9139  
Fax: (650) 497-8149  
Email: sofias@stanford.edu

## For More Information

<http://med.stanford.edu/arts/>

## Resources & Facilities

### ADVANCED MATERIALS FACILITIES

Support for collaborative research programs on advanced materials. Facilities include scanning electron microscope and scanning probe microscopy.

[http://www.stanford.edu/group/glam/lab\\_fac.html](http://www.stanford.edu/group/glam/lab_fac.html)

### BIOFILM LABORATORY

Campus wide research facility for studies on microbial biofilms, housing an upright Zeiss LSM 510 confocal microscope. Upright scanhead and water immersion objectives allow imaging of films without removal from growing media.

<http://www.stanford.edu/group/biofilm/>

### BIOINFORMATICS RESOURCE CENTER

Computer resources for biomedical research at Stanford.

<http://cmgm.stanford.edu/>

### BIO-X PROGRAM

The Stanford University Bio-X program supports, organizes, and facilitates interdisciplinary research connected to biology and medicine. Ideas and methods embodied in engineering, computer science, physics, chemistry, and other fields are being brought to bear upon important challenges in bioscience. In turn, bioscience creates new opportunities in other fields. Significant discoveries and creative inventions are accelerated through formation of new collaborative teams.

<http://biox.stanford.edu/>

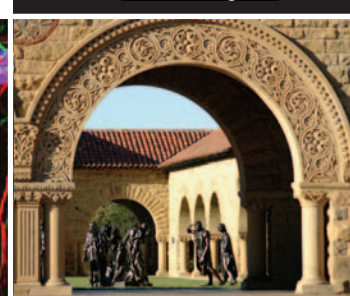
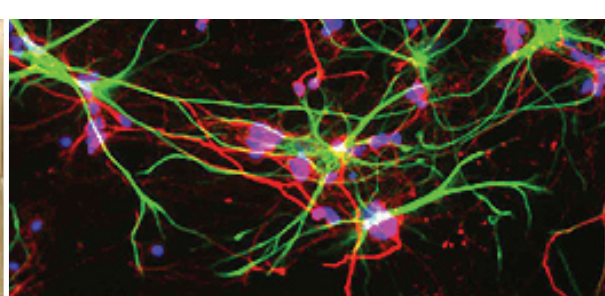
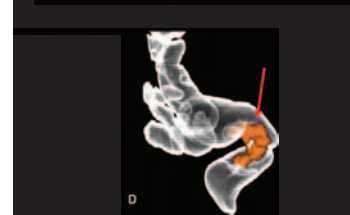
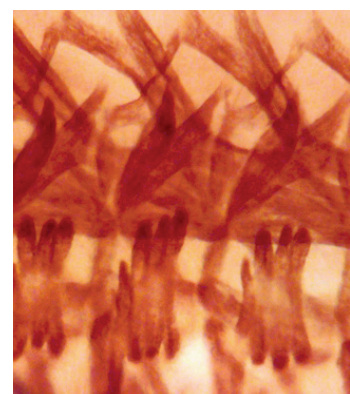
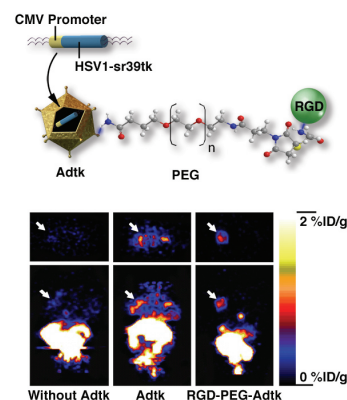
### CELL SCIENCES IMAGING FACILITY

Electron microscopy preparation and imaging services: advanced fluorescence and electron microscopy imaging, including confocal microscopy, 2-photon live cell imaging, deconvolution wide field microscopy, transmission and scanning electron microscopy.

<http://taltos.stanford.edu/>

### CENTER FOR MAGNETIC NANOTECHNOLOGY

The mission of the Center is to stimulate research at Stanford in the area of magnetic nanotechnology, magnetic sensing, and information storage materials, to facilitate collaboration between Stanford scientists and their industrial colleagues, to train well-rounded and highly skilled graduate students, and to develop curricular offerings in the relevant subjects. The





center also operates: Nanomagnetism Facility (Manager: Dr. Robert Wilson, [RobertJWilson@stanford.edu](mailto:RobertJWilson@stanford.edu)) and Magnetism Forum: annual reviews, workshops, short courses, and conferences on magnetism-based technologies including nanotechnology and information storage.  
[http://www.stanford.edu/group/nanomag\\_center/](http://www.stanford.edu/group/nanomag_center/)

#### **COGNITIVE NEUROSCIENCE FACILITY**

Center provides state-of-the-art scientific tools for researchers at Stanford studying human cognitive neuroscience – how the brain supports perception, cognition, emotion, and action, and how these brain-behavior relations are disrupted in neurological and psychiatric diseases.  
<http://www-psych.stanford.edu/~cogneuro/>

#### **DEPARTMENT OF SURGERY FACScan CENTER**

Flow Cytometry: three fluorescence detectors to read emission spectra from a variety of dyes, including FITC, PE, CY5, propidium iodide, and others.  
<http://www.stanford.edu/group/TIL/FACScan.htm>

#### **FUNCTIONAL GENOMICS FACILITY**

High quality gene expression microarrays: production support and analysis, bioinformatic support. Products and services include: human and mouse microarrays, grade “C” human and mouse microarrays, poly-l-lysine coated glass, custom array printing, Agilent scan, array hybridization, Biomek FX, Biomek FX programming, hybridization course, and Axon scan.  
<http://microarray.org/sfgf/>

#### **GENERAL CLINICAL RESEARCH CENTER (GCRC)**

The Stanford General Clinical Research Center (GCRC) is the major clinical research facility for Stanford University School of Medicine. With patient care units in Stanford University Hospital and Lucile Packard Children’s Hospital, the center plays a crucial role in the school’s bench-to-bedside research mission.  
<http://med.stanford.edu/gcrc/>

#### **HIGH RESOLUTION ELECTRON MICROSCOPE FACILITY FOR BIOMEDICAL SCIENCES**

Assists the Biomedical research community in the study of a broad range of problems concerning cell function and disease that require imaging at nanometer spatial resolution using an FEI Technai G3 (Polaris) electron microscope. Also provided are specimen preparation equip-

ment, sample quality for tomography assessment using conventional electron microscopes, technical assistance with data collection, training and assistance in the use of EM3D software, and consultation for experimental design and data analysis.  
<http://em.stanford.edu/>

#### **HIGH-THROUGHPUT BIOSCIENCE CENTER (HTBC)**

Fully automated high-throughput screening (HTS) and high content screening of compound, genomic cDNA, and genomic siRNA libraries. Consultation and assistance for assay development, design, and analysis and for instrumentation training. Access to microplate based liquid handling equipment (SciClone ALH3000, Plate Washers, Reagent/Cells Dispensers), for plate replication, reformatting, reagent/cell dispensing and washing. Access to microplate based detection equipment (AnalystGT, Flexstation and Luminometer) for fluorescence (FP, HTRF, FI, FLIPR), luminescence, and absorbance reads. Access to automated microplate imaging equipment with the Axon ImageExpress.  
<http://htbc.stanford.edu/>

#### **LUCAS CENTER FOR MAGNETIC RESONANCE SPECTROSCOPY AND IMAGING**

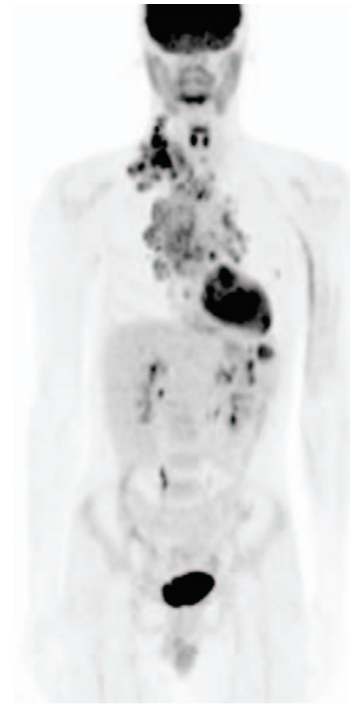
Apply magnetic resonance (MR) technology to fundamental physiologic and patho-physiologic studies involving animals and humans. Advance MR technology to improve health and patient care. Provide educational opportunities in MR to researchers, clinicians, and students. Serve the academic and industrial community. Whole Body Imaging for humans and animals. Equipment includes: Signa 1.5 Tesla, 2 Tesla upgraded to 4.7 Tesla, Fluoro Suite, and Horizon 3 Tesla.  
<http://rsl.stanford.edu/lucas/>

#### **MAGNETIC RESONANCE LABORATORY**

Stanford University Mass Spectrometry (SUMS) offers state-of-the-art, user friendly MS resources on campus to support researchers at Stanford and beyond. Capabilities include routine analysis such as LC-MS/MS protein identification, mass determination of small molecules and biopolymers, LC-MS, MSn, and high-resolution MS, as well as custom proteomics, biomarker, and quantitation projects.  
<http://smrl.stanford.edu/homepage.html>

#### **MOLECULAR IMAGING PROGRAM AT STANFORD (MIPS)**

The Molecular Imaging Program at Stanford (MIPS) was established as an inter-disciplinary





program to bring together scientists and physicians who share a common interest in developing and using state-of-the-art imaging technology and developing molecular imaging assays for studying intact biological systems. A multimodality approach using imaging technologies such as positron emission tomography (PET), single photon emission computed tomography (SPECT), digital autoradiography, magnetic resonance imaging (MRI), magnetic resonance spectroscopy (MRS), optical bioluminescence, optical fluorescence, and ultrasound are all technologies under active development and investigation.

<http://mips.stanford.edu/>

#### **PROTEIN AND NUCLEIC ACID (PAN) FACILITY**

Multifaceted biotechnology support for basic science research: DNA sequencing and oligo synthesis; protein sequencing and peptide synthesis; protein digestion and HPLC analysis and mapping; mass spectrometry; capillary electrophoresis; and microarray for gene expression analysis.

<http://cmgm.stanford.edu/pan/>

#### **PROTEOMIC & INTEGRATIVE RESEARCH FACILITY**

Based in the Department of Pathology at the Stanford University School of Medicine, the facility provides a fee for service component to support the needs of the Stanford research community. In addition, the facility has a mandate to promote research through collaborative projects spanning both basic and clinical research efforts at Stanford. Services offered encompass standard protein/peptide identification, identification of protein complex components, identification of proteins in lysates, etc. Services are provided in a packaged format and include sample preparation, protein separation methods, and mass spectrometry analysis. The approach is designed to meet the specific needs of the researcher, so discussion prior to sample submission is required to insure efficient workflow and optimal quality results.

<http://spir.stanford.edu/>

#### **STANFORD CENTER FOR INNOVATION IN IN-VIVO IMAGING**

The Stanford Center for Innovation in In-Vivo Imaging (Sci<sup>3</sup>) is a small animal imaging facility that allows non-invasive studies on animals such as mice and rats. In addition to instruments routinely used in the clinic, such as ultrasound, microCT, microPET, microSPECT/CT and MRI (each optimized for animal research), the

facility also has instruments to investigate bio-distribution of molecular imaging probes such as fluorescent and bioluminescent proteins in these animals. In addition, full computer support and data archiving is provided to investigators.

<http://sci3.stanford.edu/index.html>

#### **STANFORD NANOFABRICATION FACILITY (SNF)**

SNF serves academic, industrial, and governmental researchers across the U.S. in areas ranging from optics, MEMS, biology, and chemistry, to traditional electronics device fabrication and process characterization. The SNF is a 10,000 sq.ft. class 100 cleanroom facility that provides researchers with effective and efficient access to advanced nanofabrication equipment and expertise. The SNF is a member of the 13-university National Nanotechnology Infrastructure Network (NNIN) funded by NSF and user fees to provide nanotechnology resources to users across the country. The SNF welcomes researchers from any discipline who wish to explore the uses of nanofabrication technology in their work.

<http://snf.stanford.edu/>

#### **TISSUE BANK (PATHOLOGY TISSUE BANK)**

Service to Stanford researchers by facilitating the collection, storage, distribution, and study of human tissues. Services and products include: frozen tissue pickup, tissue banking, histologic staining, and pathological review of slides.

<http://tissuebank.stanford.edu/>

#### **TRANSGENIC MOUSE RESEARCH FACILITY**

Mouse models for genes of interest: transgenic mouse production; targeted ES cell clone production; chimeric mouse production; sperm cryopreservation; in vitro fertilization.

<http://med.stanford.edu/transgenic/>



#### **ARTS Program**

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300 Pasteur Drive, Room H0101  
Stanford, CA 94305-5281

Tel: (650) 724-9139

Fax: (650) 498-5047

Email: [sofias@stanford.edu](mailto:sofias@stanford.edu)

**For More Information**

<http://med.stanford.edu/arts/>



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