

**“The best preparation for tomorrow  
is to do today’s work superbly well.”**  
Sir William Osler (1849–1919)



## Research Pathway

The Combined Residency  
and Research Track

### Centers of Research

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| 3 | Cardeza Foundation for Hematologic Research<br>Director: Paul Bray, MD  |
| 4 | The Center for Translational Medicine<br>Director: Walter Koch, PhD   |
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| 6 | Endocrinology, Diabetes and Metabolic Diseases<br>Director: Barry Goldstein, MD, PhD                            |
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## Program and Application Procedure



**Gregory C. Kane, MD**  
Program Director  
Internal Medicine  
Residency

Applicants interested in the Research Pathway or Combined Residency and Research at Thomas Jefferson University Hospital must apply for admission to the Residency Program, as all applicants, through the Electronic Residency Application Service (ERAS). At the time of scheduling an interview it is requested that applicants indicate their interest in the Research Pathway to facilitate planning for their interview day.

The goal of the Internal Medicine Residency training program at Thomas Jefferson University Hospital is superior training in Internal Medicine. For trainees with a specific interest in Basic Science Investigation and careers as Physician-Scientists we offer entry to this exciting track to facilitate a research career.

While early notification of an applicant's interest is ideally anticipated, acceptance into the Research will only occur during the PGY1 year. Acceptance is based upon scientific background and clinical skill. During the PGY1 year coordination with a research mentor and acceptance into a research training and subspecialty program will occur. The trainee will complete their Internal Medicine training at the end of the PGY2 year and then enter a subspecialty program beginning with the PGY3 year for a minimum of three years of research training with 80% commitment (meeting all ABIM research pathway requirements). The usual duration of the pathway is 6 years.

Of course, the resident must be rated at satisfactory on all clinical rotations and in all aspects of Internal Medicine for both their PGY1 and PGY2 years of training. The clinical training in the subspecialty ranges from 12-24 months, depending on their area of specialty. Additional information can be obtained from the ABIM website under the heading "ABIM Research Pathway."

We are excited to offer this opportunity for trainees with a serious commitment to basic science investigation and the creation of new knowledge during an academic career. Jefferson provides a variety of outstanding research centers, which can serve as the focus for the trainees' careers. If you have any questions, please contact me directly.

## Program Introduction

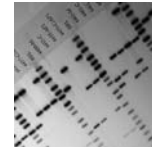


**Arthur M. Feldman, MD, PhD**  
Magee Professor  
and Chairman  
Department of  
Medicine

Academic medicine faces many challenges, not the least of which is trying to train the next generation of academic practitioners in the increasingly complex facets of basic and clinical research. Thus, to facilitate the ability of residents interested in basic or clinical science research to complete both clinical and research training in a reasonable length of time, we have initiated a Research Pathway. As described in this brochure, this research pathway allows the interested resident applicant to pursue both clinical training, subspecialty training and research training in a compressed format here at The Jefferson Medical College. Our ability to provide this unique program is supported by: outstanding basic research training opportunities in the new Center for Translational Medicine, the Center for Human Virology, the Cardeza Center for Hematologic Research, the Division of Rheumatology, and the Kimmel Cancer Center; and sophisticated clinical research training in the Division of Clinical Pharmacology and the Center for Health Policy Research. The future of American Medicine lies in our ability to effectively and adequately train the next generation of practitioners and investigators. We believe that this new program will help us fulfill our mission of providing outstanding educational opportunities in both clinical medicine and research and will be of great interest to those with a background and interest in developing an academic career.

## Medical Oncology Department Kimmel Cancer Center at Jefferson

Interim Department Chair: Neal Flomenberg, MD



Oncology represents one of the areas of medical investigation in which bench to bedside translational research has been most rapid and intensive over the last 2 decades. Insights into the genetics and pathophysiologic mechanisms which underlie neoplastic transformation have increasingly allowed the development of targeted anti-neoplastic agents, and similar insights into the complications of cancer therapy have helped to improve patient safety and decrease morbidity.

The Department of Medical Oncology is a part of the Kimmel Cancer Center at Jefferson, a National Cancer Institute designated Cancer Center recognized for its excellence in cancer research. A variety of research activities are ongoing in the Department including investigations into the molecular genetics underlying both familial and sporadic cancers, development of novel approaches to cancer immunotherapy and efforts to reduce graft versus host disease and accelerate immunologic recovery after allogeneic marrow or peripheral blood stem cell transplantation. Department members also actively collaborate with a variety of cancer investigators in both clinical and basic departments within the cancer center regarding the pathogenesis and evolution of neoplastic transformation and development of novel therapeutics. The Department has a track record of helping to generate novel concepts for therapeutic intervention and helping to move these into in vitro testing, subsequently into preclinical development, and ultimately into FDA sponsored clinical trials. A variety of patents have been issued to Department members for these activities or are currently under review. Research opportunities thus range from the most basic to the most clinical aspects of cancer biology and medicine with projects tailored as appropriate for masters, PhD, or MD/PhD students, research fellows, or research associates.

The Department of Medical Oncology, while recently administratively separated from the Department of Medicine, remains intimately intertwined with the Department of Medicine in its patient care, research and teaching activities.

## Endocrinology, Diabetes and Metabolic Diseases

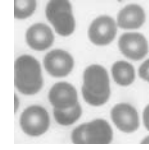
Director: Barry Goldstein, MD, PhD



The research interests of the Division focus on the pathophysiology and manifestations of insulin resistance in Type 2 diabetes, especially the influence of obesity, and the mechanisms of LDL retention in vascular cells in the pathogenesis of atherosclerosis. In basic research the major projects include: regulation of the insulin signaling pathway by protein-tyrosine phosphatases and reactive oxygen species, metabolic and vascular effects of the adipose tissue-secreted plasma protein adiponectin, cellular and molecular mechanisms of LDL recognition and uptake into vascular cells. Major clinical projects are also underway in prevention of Type 2 diabetes (NIH-supported Diabetes Prevention Program; DPP), a variety of diabetes therapeutics and prevention of complications. Additional clinical studies are conducted related to thyroid and growth hormones, therapeutics for erectile dysfunction and osteoporosis. The Division also actively participates in collaborative projects with other Departments involving the development of infusion systems for insulin delivery, glucose sensor devices, coronary artery disease in diabetes and strategies to improve the viability of transplanted islets.

## Cardeza Foundation for Hematologic Research

Director: Paul F. Bray, MD



The Cardeza and the Division of Hematology at Jefferson Medical College pursues a broad range of basic and translational/clinical research. Current faculty continue to look forward to accepting trainees committed to careers in academic Hematology research.

Current research opportunities encompass the cell biology, molecular biology and physiology of hemostasis and thrombosis. Ongoing studies include:

- 1) genomic and microarray approaches to identifying genes regulating platelet reactivity and their subsequent characterization,
- 2) gender and hormonal effects on thrombosis and bleeding,
- 3) investigations into the pathophysiology of immune-mediated platelet destruction and heparin-induced thrombocytopenia/thrombosis and
- 4) the role of human antibodies in thrombosis and autoimmunity. Other areas of research include the molecular mechanisms of blood cell formation and differentiation, including
- 5) the role of adhesion molecules and their associated proteins in the regulation of growth and apoptosis of hematologic cells,
- 6) the regulation of the expression of globin genes during human erythropoiesis and
- 7) studies of the molecular mechanisms underlying the regulatory pathways of hypoxia-inducible factors.

## The Center for Translational Medicine

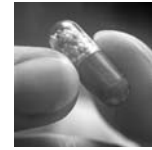
Director: Walter Koch, PhD



This new program within the Department of Medicine occupies the 3rd and 4th floors of the College Building and focuses on innovative approaches for patient care and research with ideas and technologies going in both directions of the “bench to bedside” paradigm. The Center will initially focus on cardiovascular research but in its ongoing faculty recruitment efforts, will broaden its research enterprise into additional areas, all of which will synergize with other Divisions within the Department of Medicine. The goals of the Center are to create a unique footprint within the Jefferson environment that will both spur and foster research that is truly translational, encompassing both clinical and basic science and the culture novel interfaces between the two. Current expertise in the Center includes programs in functional genomics, gene and cell therapy, animal models of human disease and clinical research projects. In addition, there are several laboratories using genetically engineered mouse models to broaden understanding of cardiovascular diseases and potential new molecular therapies. As an example of ongoing work in the Center, there is a major project involving developing methods and targets for viral-mediated intracoronary delivery to treat heart failure using large animal models.

## Clinical Pharmacology Department

Chairman: Scott Waldman, MD, PhD



Thomas Jefferson University offers one of only nine accredited NIH-sponsored training program in clinical pharmacology. This program combines didactic training in basic and clinical pharmacology and research methodologies, with hands-on experience in laboratory research and human clinical trials. The program integrates training in the methodologies, concepts, and approaches of hypothesis-driven basic and clinical research to produce investigators who can establish nationally competitive translational research programs that bridge the gap between the laboratory and the patient. In addition to active basic science laboratories specializing in signal transduction and translational medicine, the division houses a 16-bed clinical research unit, where trainee fellows oversee Phase I clinical trials. Ongoing clinical studies span the range of therapeutic areas, with a large number of intra- and extramural collaborative projects. The program can be tailored to the trainee’s professional interests and can lead to a Masters Degree in Pharmacology emphasizing clinical pharmacology or human investigation. Upon completing their training, fellows will be eligible to sit for the board examination in Clinical Pharmacology. Trainees are qualified for positions in academic clinical pharmacology divisions, other academic departments, the pharmaceutical industry, and the FDA or other regulatory agencies.