

# FELLOWSHIPS IN ENDOCRINOLOGY AND METABOLISM

DEPARTMENT OF INTERNAL MEDICINE  
UNIVERSITY OF VIRGINIA HEALTH SCIENCES CENTER  
CHARLOTTESVILLE, VIRGINIA

ENDOCRINOLOGY AND METABOLISM FELLOWSHIP PROGRAM  
University of Virginia  
Charlottesville, VA 22908  
Department of Internal Medicine  
Division of Endocrinology and Metabolism

The Endocrinology and Metabolism Training Program provides intensive clinical and research training for physicians who have completed a residency in Internal Medicine. The program fulfills the requirements for subspecialty certification in Endocrinology and Metabolism by the American Board of Internal Medicine. We are approved for four fellows to be accepted into our program each academic year. Applications are accepted through ERAS with interviews being completed by February or March. Beginning in 2007, decisions will be made using the NRMP for the endocrinology subspecialty programs, to allow all applicants an equal opportunity to travel to Charlottesville. Visiting rotations for Internal Medicine residents from other programs to spend time with the division are encouraged.

The major purpose of the program is to prepare physicians for a career in academic endocrinology. Within the current academic environment in the United States, there is a range of career paths with varying distributions of effort in scientific investigation, clinical and education-related activities. It is the intent of our program to provide a firm grounding in the basic fundamentals of endocrine research and clinical practice, an approach that should prove useful to the future clinician, educator and investigator alike. The standard fellowship experience encompasses three years. Depending on the fellow's interest and research project(s), about 25-50% of his/her time is spent in clinical endocrine rotations and the remainder in research training. Many of our fellows have not trained at The University of Virginia for either medical school or their residencies. With that in mind, at the outset of the first year of fellowship, we have all fellows meet with the full menu of potential research mentors before selecting an area of investigation. During the first year of training, the fellows will complete approximately 80% of their clinical rotations including time on the consultative service as well as in the ambulatory setting. The remainder of clinical training is completed during the second year of fellowship. Fellows participate in a broad range of endocrine clinics, including general endocrinology, diabetes mellitus, metabolic bone disease, thyroid, reproduction/infertility, pituitary diseases, pediatrics and joint clinics staffed by cardiovascular/endocrinology, nephrology/endocrinology and obstetrics/endocrinology. Moreover, options for additional experiences in conjunction with radiology and nuclear medicine are available.

Salary support for our fellows comes from three general sources. First year fellows are often supported by funds provided for clinical patient care, provided by the hospital. Thereafter,

fellows are either supported by institutional training grants (from the National Institute of Health) or individual grants obtained by the fellows. That is, all fellows are expected to submit an entry-level grant application (e.g. NRSA) during their second year of training either to the National Institute of Health or other equivalent institution. In addition to providing their own salary support, it is the opinion of the division that training in grant writing is a critical component of the fellowship experience. Our fellows pursue basic research, clinical research or a combination of the two and have been highly successful in their effort toward obtaining extramural support. In the event that a fellow's grant(s) were not funded, the division is fully committed to support ALL fellows for the duration of their training. Fellows are expected to present their results at regional and national meetings and to submit their work for publication in peer-reviewed journals.

In summary, the Division of Endocrinology at The University of Virginia is looking to attract highly motivated, bright, energetic individuals with a broad range of prior experiences in medicine. Applicants must be both interested in scientific study and qualified for writing national and statewide grants and similar proposals. Those physicians who do come to train with us will receive the finest educational experience available and will develop into outstanding endocrinologists.

## FACILITIES

### Research

1. Laboratory: The division's faculty utilizes over 25,000 square feet of modern laboratory research space at the Gerald Aurbach Research Building (devoted entirely to the Division of Endocrinology) and at the Medical School. This includes offices, research laboratories, computer facilities and animal facilities.
2. Clinical Research: A 10-bed General Clinical Research Unit with excellent core and computer laboratories, nutritional, and nursing support, sponsored by the National Institutes of Health, is used extensively by members of the division for various clinical research projects at the University of Virginia Medical School.
3. Diabetes Center: This supports basic and clinical diabetes-related research through excellent core laboratory facilities.
4. Cancer Center: The NCI funded center was initiated in 1987 and offers excellent core laboratory facilities and support for new investigators. The endocrine program is one of seven, which constitute the center.
5. Center for the Study of Reproduction: This NIH funded center was recently renewed through the year 2004. Core facilities in cell and molecular biology, in situ hybridization and hormone measurements are available. Support for fellows and young investigators is available.

### Clinical Overview:

The University of Virginia is a major academic health center and its School of Medicine ranks among the finest medical schools in the nation. It is unique among state supported schools in that more than 30% of its medical students come from outside Virginia. It is an important biomedical research center, which ranks in the top 20% of U.S. institutions in funded NIH grant applications. The Department of Internal Medicine has more than 175 full time faculty. Many of the Department's programs are considered among the finest in the country and enjoy international reputations. Perhaps even more importantly, the faculty is committed to the teaching and training of residents in both the inpatient and outpatient settings. Fellows training in endocrinology and metabolism at the University of Virginia enjoy an excellent patient mix. As a tertiary care referral center, the University Hospital cares for patients from an extensive geographic area ranging from western Virginia to West Virginia and Tennessee and as far south as North Carolina. Moreover, the Division of Endocrinology, the Department of Neurosurgery and the Department of Radiation Therapy (Gamma Knife Center) have international reputations in pituitary disease, routinely drawing

patients from all parts of the globe including the Middle-East, Europe and Asia. Fellows are exposed to all major disease entities. Outpatient visits, including those to the emergency room, also continue to increase substantially and now represent greater than 170,000 annually to the Department of Medicine Facilities.

1. UVA Medical Center: This component of the School of Medicine is located adjacent to the University grounds. It consists of a 700-bed full service general teaching hospital (hospital opened 1989), several modern research buildings, an outstanding biomedical library, and a Cancer Center. All patient care is directed by our housestaff and fellows. There are no private patients within the University Hospital. All ward services are staffed by University of Virginia faculty. Fellows do not rotate to other hospitals/clinics for training. At The University Hospital, complete biochemistry laboratories and hormone assays are available 24 hours per day. The hospital has facilities for karyotyping through the Chromosome Laboratory. The Department of Radiology provides MRI, CT, ultrasound, DXA and radiologic imaging services that can conduct studies for all types of endocrine diseases including inferior petrosal sinus and adrenal vein sampling. The hospital supports a dietary/nutritional service and a full metabolic kitchen is available in the General Clinical Research Center. There is a fully staffed surgical pathology laboratory for the interpretation of surgical and cytological specimens, including immunohistologic studies. Cytological interpretation of thyroid aspirations is available within two hours and fellows review these specimens with the Department of Pathology staff. Nuclear Medicine provides all routine nucleotide imaging methods including radioiodine thyroid ablation, adrenal and parathyroid scanning as well as MIBG and technicium pyrophosphate bone scans. Podiatric medicine provides care to patients at the University of Virginia on two half-day sessions per week. Again, these are general endocrine practices with a wide array of clinical syndromes. There, full time support staff including receptionists, nurses and technicians are also readily available.

2. Neuroendocrine Service: This combined endocrine and neurosurgery service performs 150 – 250 transphenoidal pituitary operations per year. Additional gamma knife radio surgery is used to treat 50 plus pituitary patients per year.

3. Diabetes Outreach Program: This program trains physicians, nurses, and nutritionists new methods of the treatment of diabetes at sites throughout Virginia.

4. Coordinated care programs with general surgery for all thyroid, parathyroid and adrenal procedures.

5. The division maintains its own thyroid and ovarian ultrasound units, as well as a DXA scanner.

6. The majority of ovulation induction is performed through the division. Fellows are fully versed in this aspect of clinical care by completion of their training.

7. Metabolic bone disease. The division has a number of world-class faculty with expertise in scientific investigation and clinical care of the patient with metabolic bone disease. Faculty are actively conducting research regarding the interactions of the bone microenvironment and cancer metastases and the clinical care mission then includes a wide array of patients in this field.

#### DIVISION ACTIVITIES

1. Consultation Service: The fellows have primary responsibility for the inpatient consultation patient service. This includes the usual activities of performing initial workup, presentations, daily follow-up and being a liaison between attending physicians and house-staff. We have two fellows on the consultative rotation at all times, affording the opportunity to alternate call and weekend coverage. The typical census includes 12-15 patients per day and 3-5 new consultations per day.

2. Outpatient Clinics: The Endocrinology and Metabolism division has full responsibility for management of several outpatient clinics. All clinical faculty within the division have practices at which fellows participate in patient care. Fellows rotate through clinics quarterly, except with their longitudinal care clinic. The latter is held weekly throughout their training. In the longitudinal clinic, fellows maintain their own roster of patients and are supervised by the same faculty throughout the three years of training. The Division of Endocrinology and Metabolism has the majority of its ambulatory operation in the 415 Ray C. Hunt Drive building in the Fontaine Research Park. There, 18 examining rooms are dedicated to patient care. We have a team of six nurses and receptionists to facilitate patient visits. On-site ultrasound of the thyroid, ovaries and uterus is provided. Cytology services are readily available within 10 minutes from 8 a.m. through 6 p.m., Monday through Friday. Three clinics are staffed by members of the division at the Northridge facility located approximately 2 miles west of the main hospital complex. One clinic is held at the Women's Mid-life Center and includes general endocrinology with an emphasis toward osteoporosis, hormone replacement therapy and benign breast disease. That facility with 10 examining rooms provides care for peri- and postmenopausal women and has a fully staffed reception/scheduling operation, three full-time nurses, one nurse practitioner, one nurse educator, a part-time nutritionist and a part-time physical therapist. In addition, mammography, a DXA scanner, radiology and ultrasound are available within a very short distance of the clinic. The other two clinics are held on the second floor of the Northridge facility, in the Department's subspecialty suites. One of these clinics is a joint practice involving both Cardiology and Endocrinology with a focus on dyslipidemias in patients with diabetes mellitus.

3. The division supervises a large, active multidisciplinary Diabetes Care Program encompassing outpatient units, as well as a variety of patient education programs with participating diabetes nurse practitioners, nurse educators, dietitians, behavioral medical specialists, a podiatrist, and physicians.

4. Weekly division-scheduled conferences include: Endocrine and Metabolism Grand Rounds; Endocrine Case Conference; Endocrine Research Seminar; monthly thyroid conference, journal club and numerous clinical and basic conferences throughout the Medical Center. In addition, there is a weekly Diabetes Center seminar series and a monthly pituitary conference in which clinical, neuropathology and imaging questions are discussed. At least once a month, outside speakers visit the division of Endocrinology and Metabolism.

## STAFF

Full-time faculty and their primary research interests:

Jerry L. Nadler, M.D., Kenneth R. Crispell Professor of Medicine;  
Chief, Division of Endocrinology and Metabolism  
*Renin-angiotensin system, diabetes, hypertension, magnesium metabolism. Regulation of aldosterone synthesis, angiotensin system, mechanisms of vascular complication of diabetes.*

Stacey Anderson, M.D., Assistant Professor of Medicine  
*Continuous glucose monitors, accuracy and applications. Artificial pancreas project (Boris Kovatchev, PI)*

Eugene J. Barrett, M.D., Ph.D., Madge Jones Professor of Medicine and Pediatrics; Director, University of Virginia Diabetes Center  
*Clinical and cellular investigations of the mechanisms of insulin action on carbohydrate and protein metabolism in liver and muscle. Applications of biophysical techniques to studies of intermediary metabolism.*

Sue Brown, M.D., Assistant Professor of Medicine  
*Metabolic bone disease and factors related to the development of osteoporosis. Clinical studies in lactation-related bone density*

*changes.*

Robert M. Carey, M.D., David A. Harrison III Distinguished Professor of Medicine  
*Hormonal control of blood pressure; fluid and electrolyte balance; clinical hypertension; reninangiotensin aldosterone system; renal dopaminergic system; models of experimental hypertension; vasopressin; catecholamines.*

John Chirgwin, Ph.D. Professor of Medicine  
*Growth factors and osteoblasts/osteoclast function. Breast and prostate cancer metastases to bone.*

Gregory Clines, M.D., Assistant Professor of Medicine  
*Regulation of osteoblast function in bone metastasis, cystic fibrosis and normal bone remodeling.*

Alan C. Dalkin, M.D., Professor of Medicine,  
Associate Chair for Clinical Affairs, Department of Medicine  
Vice Chief, Division of Endocrinology and Metabolism  
Program Director, Endocrine Fellowship Training Program  
Director, Endocrine Clinic  
Metabolic bone disease and factors related to the development of osteoporosis.

Richard N. Day, Ph.D., Associate Professor of Medicine  
*Activator and repressor regulation of gene transcription. Protein/protein interactions in the regulation of gene expression.*

Christine Eagleson M.D., Assistant Professor of Medicine  
*Polycystic ovary syndrome*

William S. Evans, M.D., Professor of Medicine; Coordinator, Division of Endocrinology and Metabolism  
Clinical Affairs  
*Reproductive neuroendocrinology; hypothalamic-pituitary disease; gonadal disease, regulation of gonadotropin secretion.*

Bruce Gaylinn, Ph.D., Assistant Professor of Medicine  
*Pituitary hormone receptor biochemistry.*

Theresa A. Guise, M.D., Professor of Medicine; Gerald D. Aurbach Professor in Endocrinology  
*Growth factors and molecular mechanism of bone metastases. Growth factors and cytokines in normal bone remodeling.*

Daniel J. Haisenleder, Ph.D., Assistant Professor of Medicine  
*Regulation of prolactin and gonadotropin subunit gene expression.*

John B. Hanks, M.D., C. Bruce Morton Professor; Chief, General Surgery

Michael L. Johnson, Ph.D., Professor of Pharmacology and Medicine  
*Mathematical biophysics; molecular mechanism of cooperative interaction; biothermodynamics.*

Susanna R. Keller, M.D., Assistant Professor of Medicine and Cell Biology  
*Insulin-regulated membrane proteins and their physiological function, insulin-regulated membrane trafficking and insulin signaling.*

Susan Kirk, M.D., Associate Professor of Medicine and OB/GYN  
Diabetes in pregnancy. Placental growth hormone action.

Zhenqi Liu, M.D., Assistant Professor of Medicine  
Insulin action, insulin resistance and cardiovascular complications of Diabetes.

John C. Marshall, M.D., Ph.D., Arthur and Margaret Ebbert Professor of Medical Science;  
Director, Center for Research in Reproduction, GnRH regulation of gonadotropin subunit gene expression.

Anthony L. McCall, M.D., Ph.D., James M. Moss Professor in Diabetes and Internal Medicine;  
*Diabetes Mellitus, clinical care paths in diabetes. Cardiovascular risk management, hypoglycemia and hyperglycemic effects on brain function, hypertension and diabetes.*

Christopher McCartney, M.D., Assistant Professor of Medicine

Raghavendra Mirmira, M.D., Ph.D., Associate Professor of Medicine and Pharmacology;  
*Diabetes Mellitus, islet cells physiology, stem cell differentiation.*

Suzanne M. Moenter, Ph.D., Professor of Medicine  
*Mechanisms underlying episodic gonadotropin-releasing hormone (GnRH) secretion, development of GnRH neurons.*

Craig Nunemaker, Ph.D., Assistant Professor of Medicine  
Director, Cell and Islet Isolation Core Facility  
Diabetes, pancreatic islet physiology, causes and mechanisms of islet dysfunction.

Richard A. Santen, M.D., Professor of Medicine;  
*Mechanism controlled estrogen synthesis and sensitivity in breast cancer.*

Margaret A. Shupnik, Ph.D., Professor of Medicine  
*Molecular biology; control of glycoprotein hormone gene transcription mechanism of estrogen and hypothalamic feedback on gene expression.*

Corinne M. Silva, Ph.D., Assistant Professor of Medicine  
*The molecular mechanisms of growth hormone action; signal transduction by the growth hormone receptor in particular and cytokine receptor in general; growth hormone effects in the immune system.*

Helmy M. Siragy, M.D., Professor of Medicine  
*Endocrine hypertension; renin-angiotensin system; fluid and electrolyte balance; adrenal disorders.*

Michael O. Thoner, M.B., D.Sc., F.R.C.P., F.A.C.P., Henry B. Mulholland Professor of Medicine;  
*Hypothalamic-pituitary disease; neuropharmacology; pituitary cell tissue culture; effects of hypothalamic regulatory hormones; basic and clinical studies on regulation of growth hormone secretion; growth hormone releasing hormone; growth hormone releasing peptide; decline of GH secretion with age.*

Mary Lee Vance, M.D., Professor of Medicine and Neurosurgery  
*Hypothalamic-pituitary disease; control of growth hormone secretion; growth hormone releasing hormone, growth hormone releasing peptide; metabolic effects of growth hormone.*

For further inquiries and application, please contact:

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