**Division Details**

**Division Data Summary**

**Research and Training Details**

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**Clinical Activities and Training**

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**Significant Accomplishments**

**Etiologic Approach to the Classification of Diabetes**

In 1997 the American Diabetes Association presented a framework for the classification of the types of diabetes based on etiology. To date, no one has attempted to operationalize these definitions. To achieve this goal, the SEARCH for Diabetes in Youth Study assessed clinical and biochemical data from 2,291 participants attempting to define diabetes type by etiology. Four main categories were established: autoimmune plus insulin sensitive; autoimmune plus insulin resistant; non-autoimmune insulin sensitive; non-autoimmune insulin resistant. This classification offers researchers and clinicians a practical application of the ADA diagnostic criteria and identifies groups of youth in whom further research studies are required to define their type of diabetes.

**Racial Differences in Arterial Stiffness among Youth with Diabetes**

Adult studies demonstrate African-Americans with type 2 diabetes (T2D) have an increased risk to develop stroke and myocardial infarction compared to Caucasians. Whether similar racial disparities exist in adolescents to suggest African-American youth with T2D are at increased risk to develop early cardiovascular (CV) complications from T2D is not known. To answer this question, a team led by Amy Shah, MD, recruited 215 youth with T2D (55 percent African-American, 65 percent female) in a cross-sectional study and measured arterial stiffness, a known precursor atherosclerosis. They found compared to age and BMI matched Caucasians, African-Americans adolescents with T2D had increased arterial stiffness. Additionally, the investigators demonstrated the CV risk factors that were associated with arterial stiffness differed among the two race groups. In Caucasians, blood pressure appeared to be the largest risk factor contributing to arterial stiffness while in African-Americans age was the largest contributor. Other important risk factors that differed
among groups were lipids and T2D duration. These findings suggest that race-specific risk factor modification approaches should be considered to limit future CV complications associated with T2D.

**Regulation of Human Placental Development**

Little is known about the transcription factors (TFs) and signaling molecules that are critical for the differentiation of placenta stem cells (cytotrophoblast cells (CTB)) to mature syncytiotrophoblast cells (STB). These cells, which form the outer layer of placenta villi, are responsible for most functions of the mature placenta, including the synthesis and secretion of hormones and growth factors that modulate fetal growth and development and the transport of nutrients and gases between the maternal and fetal circulations. Recent studies by Stuart Handwerger, MD, and colleagues have demonstrated that the TFs TFAP2A, NR2F2 and FOXF1 are critical for the differentiation of human CTB to a STB phenotype. Binding sites for the TFs were detected on the promoter regions of many genes induced during CTB differentiation; and overexpression of the TFs with lentiviruses expressing shRNAs for the factors attenuated CTB differentiation. Immunohistochemical analysis of human placenta sections from normal and pathologic pregnancies have so far demonstrated that TFs induced the expression of many of the up-regulated genes. Moreover, silencing of the genes for the three TFs with lentiviruses expressing shRNAs for the factors attenuated CTB differentiation. Immunohistochemical analysis of human placenta sections from normal and pathologic pregnancies have so far demonstrated that AP-2\(\alpha\) expression is suppressed in mild preeclampsia (PE), diabetes, hypertension and fetal growth retardation and increased in severe PE. Studies with NR2F2 and FOXF1 are in progress. Taken together, these studies provide important new insights into the pathophysiology of abnormal placenta development.

**Division Publications**


Faculty, Staff, and Trainees

Faculty Members

Stuart Handwerger, MD, Professor
  Leadership Professor of Cancer and Cell Biology
  Research Interests Growth and thyroid disorders; perinatal endocrinology

Philippe Backeljauw, MD, Professor
  Leadership Director, Cincinnati Turner Syndrome Center
  Research Interests Growth disorders; disorders of bone and calcium metabolism; Turner Syndrome

Nancy Crimmins, MD, Assistant Professor
  Research Interests Diabetes; obesity

Lawrence M Dolan, MD, Professor
  Leadership Division Director, Robert and Mary Shoemaker Professor of Pediatrics
  Research Interests Diabetes mellitus; non-insulin dependent diabetes; sexual development disorders; growth disorders; disorders of the thyroid; goiters; hypoglycemia

Deborah Elder, MD, Assistant Professor
  Research Interests Diabetes; growth disorders; precocious puberty; calcium disorders

Jonathan Katz, PhD, Associate Professor
  Leadership Director, Diabetes Research Center

David J Klein, MD, PhD, Associate Professor
  Research Interests Diabetes mellitus; intensive diabetes management programs; early detection of renal disease; effects of diabetes mellitus on renal proteoglycan synthesis

Susan Rose, MD, Professor
  Research Interests Hypothalamic pituitary function; thyroid disorders; disorders of growth or puberty; endocrine function in cancer survivors; endocrine function after head injury

Meilan Rutter, MD, Assistant Professor
  Research Interests Calcium disorders; endocrine function in childhood cancer survivors; endocrine function in muscular dystrophy

Peggy Stenger, DO, Assistant Professor
  Research Interests Growth disorders; disorders of sexual development; pubertal disorders; disorders of the thyroid; goiter

Nana-Hawa Yayah Jones, MD, Assistant Professor
  Research Interests Adherence/compliance in type 1 diabetes

Iris Gutmark-Little, MD, Assistant Professor
  Research Interests Airway and great vessel disorders in Turner syndrome

Sarah Lawson, MD, Assistant Professor
  Research Interests Turner syndrome; Septo-optic dysplasia; endocrine abnormalities related to oncology and its treatments

Amy Shah, MD, Assistant Professor
**Research Interests**  Type 2 diabetes; pre-diabetes; insulin resistance; obesity; lipid disorders

**Joint Appointment Faculty Members**
Jessica Woo, PhD, Assistant Professor (Epidemiology)

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**Division Collaboration**

- **Reproductive Sciences**  » S.K. Dey, MD and Sanjoy Das, PhD
  - Research

- **Neonatology & Pulmonary Biology**  » Cindy Bachurski, PhD, Jeffrey Whitsett, MD, and Alexander Lange, PhD
  - Research

- **Biomedical Informatics**  » Bruce Aronow, PhD and Anil Jegga, MS, DVM
  - Research

- **Pathology**  » Jerzy Stanek, MD, PhD and Rachel Sheridan, PhD
  - Research

- **Molecular and Developmental Biology**  » James Wells, PhD
  - Research

- **Healthworks; Preventive Cardiology; Gastroenterology**  » Holly Ippisch, MD, Robert Siegel, MD, and Stavra Xanthakos, MD, MS
  - Center for Better Health and Nutrition clinical collaboration

- **Center for Adherance in Psychiatry**  » Denny Drotar, PhD and Korey Hood, PhD
  - Research

- **Pulmonary**  » Gary McPhail, MD
  - Impaired Fasting Glucose and Indeterminant Glucose Tolerance in a Cystic Fibrosis Population (Two and Four Year Clinical Outcomes)
  - Blood Glucose Monitoring in the hospitalized patient with Cystic Fibrosis - Validation of the expert opinion using Continuous Glucose Monitoring

- **Solid Organ Transplantation**  » John Bucuvalas, MD
  - Screening and Management of Diabetes in youths with solid organ transplantation

- **Adolescent Medicine**  » Jennifer Hillman, MD, MS
  - Diagnosis, screening for comorbidities and management of Polycystic Ovarian Syndrome across three disciplines within an academic hospital

- **General Pediatrics**  » Maria Britto, MD, MPH
  - Research

- **ICU**  » Derek Wheeler, MD
  - Research

- **Pharmacy**  » Anne Lesko, PharmD and Shannon Saldana, PharmD, MS, BCPP
  - Research

- **Adolescent Gyn, Urology, Genetics**  » Lesley Breech, MD, Curtis Sheldon, MD, Shumyle Alam, MD, Pramod Reddy, MD, and Howard Saal, MD
Clinical collaboration - Disorders of Sexual Development Clinic

(Cincinnati Disorders of Sex Development Center)

**Gastroenterology** » Lee Denson, MD
Study of the effects of growth hormone on patients with Crohn's disease

**Emergency Medicine** » Mike Gittelman, MD and Wendy Pomerantz, MD
Injury prevention project (RWJ sponsored) in an obesity prevention project in an area experiencing health disparities

**Psychiatry** » Michael Sorter, MD and Mary Matias-Akhtar, MD
Project to see if Metformin given at the initiation of anti-psychotic treatment can prevent weight accretion, which occurs commonly in children on these agents

**Rheumatology** » Hermine Brunner, MD
NIH funded grant of Triptorelin therapy in lupus patients

**Hematology Oncology** » Richard Harris, MD, Stella Davies, MD, Parinda Mehta, MD, and Karen Burns, MD
Funded study of oxadrolone therapy in children with Fanconi Anemia

Research, database, and multicenter care of patients with Fanconi Anemia and other bone marrow failure syndromes

**Mayerson Center** » Kathi Makoroff, MD
Pfizer funded study shaken infants

**Physical Medicine and Rehabilitation** » Linda Michaud, MD
Pfizer funded study of endocrine function after traumatic brain injury

**Neurology** » Brenda Wong, MD and James Collins, MD
IGF-I therapy and muscle function in Duchenne Muscular Dystrophy research study

Research, database and interdisciplinary team care of patients with Duchenne Muscular Dystrophy

**Cardiology** » Elaine Urbina, MD, Thomas Kimball, MD, and John Morrison, PhD
Clinical management protocol for cardiac disease in Turner syndrome
The epidemiology of peripheral cardiovascular disease in youth with a specific emphasis on the role of obesity, insulin resistance and diabetes
The epidemiology of central (heart) cardiovascular disease in youth with a specific emphasis on the role of obesity, insulin resistance and diabetes
The ability of pre-teen variables to predict the development of obesity, insulin resistance, diabetes and cardiovascular disease

**Epidemiology and Biostatistics** » Lisa Martin, PhD, Jane Khoury, PhD, Jessica Woo, PhD, and Heidi Sucharew, PhD
Contribution of genetics to obesity in adolescents
The effect of maternal type 1 diabetes on adolescents and young adult offspring with a focus on obesity and carbohydrate metabolism
Creation of clinical database for the Comprehensive Weight Management Center

Contribution to collaborative research in Duchenne Muscular Dystrophy

**Psychology and Behavioral Medicine** - Scott Powers, PhD
Eating behaviors in individuals 16 years of age with type 1 diabetes

**Surgery** - Thomas Inge, MD, PhD
Bariatric surgery in youth: safety, efficacy, and effect on carbohydrate and cardiovascular outcomes

International Hypothalamic Obesity Registry

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**Grants, Contracts, and Industry Agreements**

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| Current Year Direct Receipts | $149,455 |
| Total | $1,370,086 |