RESEARCH AT THE ROOT

The pursuit that drives us

On the cover

DAVID SPARLING, M.D., Ph.D.

There's a lot of support that goes into developing new treatments, and you need patients. Our patients have been signing up left and right, and that's really a credit to the great staff we have. Because, if they didn't have confidence enough, if our patients didn't think that we were providing the best care, or if we weren't plugged into the great, next up-and-coming treatment, they'd have a hard time trusting us. **Maintaining that trust is a really important thing.** Having type 1 diabetes as a child is tough. You're growing up with an illness that your friends don't have. Maybe you don't even tell your friends that you have it, so having the trust of that kid and their parents is vital. Being able to say we're part of the research that's going on, we're part of the next, best clinical care that's coming out next month, next year—that's a really amazing opportunity. It engenders hope, and a lot of times, that's what our kids really need—a little bit of hope that things are going to continue to improve.

HAROLD HAMM DIABETES CENTER AT THE UNIVERSITY OF OKLAHOMA

RESEARCH AT THE ROOT

The pursuit that drives us

THE CHALLENGE

One in 11 Americans today suffers from diabetes. A new person is diagnosed every 19 seconds in the United States. The risk of death for adults with diabetes is 50 percent higher than for those without the disease. Diabetes is the nation's seventh leading cause of death and can be a direct cause of heart disease and stroke, the leading and fifth leading causes of death, respectively. It is a leading cause of kidney failure, nontraumatic lower–limb amputations, and blindness. The number of Americans diagnosed with diabetes increased almost fourfold, from 5.5 million in 1980 to 21 million in 2014. An additional 8.1 million Americans are estimated to have diabetes, but are not yet diagnosed.

Despite the grim picture painted by these statistics, we are not powerless against diabetes. Harold Hamm Diabetes Center (HHDC) works to reduce these trends by advancing research, translating it into better treatment options, and offering programs to prevent diabetes.

Research is indeed at the root of our enterprise. This report elucidates the ways HHDC answers the call for progress against the pandemic of diabetes and its complications.

SOURCE: Centers for Disease Control and Prevention

THE SETTING

Oklahoma presents a particularly strong case for diabetes research. Our population is more than 13 percent Native American and has a growing Latino component—two groups with an elevated risk for diabetes. Educational attainment in Oklahoma is significantly lower than the national average. Our poverty rate—particularly among children—is higher, and our median income is lower. We have more uninsured residents and fewer primary care physicians, especially in our rural areas. Access to healthy, fresh foods is low, and physical inactivity is high. Simply put, Oklahoma needs help. There is abundant opportunity for a robust diabetes center to make a real impact on this community.

The University of Oklahoma's Health Sciences Center (OUHSC) is one of only four comprehensive academic health centers in the nation. OUHSC provides HHDC a unique and ideal foundation for multidisciplinary, collaborative, team–based research, clinical care, and prevention programs. A diabetes center must be equipped to address the multidimensional aspects of diabetes in individuals and communities to produce the advances so desperately needed. More than 157,000 square feet in capital facilities are dedicated to HHDC, with opportunities for further expansion. Faculty are supported by 15 endowed chairs ranging from $1 million to $3 million each.

Oklahoma City is the home of HHDC's basic research enterprise. We conduct clinical research in Oklahoma City, Tulsa, and at partner sites across the state.

SOURCE: Oklahoma State Department of Health

OUR HISTORY IN RESEARCH LEADERSHIP

Early on, OUHSC received international recognition for its work in the field of diabetes, creating a unique foundation for HHDC to build upon. As early as the late 1950s, OUHSC researcher **Dr. Kelly West** began the work that led to his becoming the first person to systematically study the mechanisms, natural history, and diagnostic criteria used to identify diabetes. Today, he is internationally regarded as the "father of diabetes epidemiology." The most prestigious award in diabetes epidemiology, given by the American Diabetes Association, is named in his honor. In the 1960s, **Dr. Paul Kimmelstiel** came to OUHSC to carry on his groundbreaking work in diabetes and kidney disease, resulting in the identification of Kimmelstiel–Wilson syndrome, a kidney condition associated with diabetes. In the 1970s, **Dr. James Galvin** joined OUHSC and pioneered innovative techniques for educating young children about diabetes and the importance of healthy lifestyles in preventing the disease. In the 1990s, **Dr. Kenneth Copeland** came to OUHSC and greatly expanded the pediatric diabetes program, which has led the way in researching prenatal and childhood causes of diabetes, as well as establishing treatment guidelines for type 2 diabetes in children. In the 2000s, the university recruited **Dr. Timothy Lyons** to increase the focus of OUHSC's endocrinology programs on adult diabetes research and clinical care.

above
HHDC's lead benefactor, Harold Hamm (left), with OU President David Boren (right), at the announcement establishing the Hamm Prize (2012)

below
A portion of the OUHSC campus today

KEY AREAS OF INVESTIGATION

HHDC research programs today span diverse disciplines and focus on examining the causes and complications of diabetes to help identify better or new prevention strategies, treatments, and ultimately a cure for diabetes.

Our primary areas of research interest include:

Causes and prevention of diabetic complications | Many people with diabetes develop other life–altering, and often fatal, diseases directly caused by diabetes, including heart disease, kidney failure, and diabetic eye disease. Several of the center's basic research groups examine what causes these devastating diabetes complications, and how to prevent them.

Diabetes–related blindness and vision decline | HHDC has a particular strength in examining the causes and prevention of diabetic complications related to blindness and vision decline. New therapies and techniques are being tested and developed that have the potential of stopping diabetes–related blindness and vision loss. One study is developing a therapeutic treatment for diabetes–related eye diseases, while another is focusing on promoting early detection through a newly developed retina–screening device.

Fetal and childhood origins of obesity and diabetes | The development of many adult diseases, including adult–onset type 2 diabetes, can be influenced by factors present before birth, while a child is still in their mother's womb, as well as throughout early childhood years. Several NIH grants are underway at HHDC examining the increased risk of infants born to mothers with diabetes, and the mechanisms involved in the development of type 2 diabetes in these infants later in life. The goal of these studies is to define the pathways that lead to this phenomenon—knowledge that will help result in the development of preventative measures.

Genetic causes of diabetes | Several NIH grants are examining how genetics influence the potential of individuals to develop type 2 diabetes. Additional studies are exploring why and how children whose parents have diabetes are genetically predisposed to developing type 2 diabetes.

KEVIN SHORT, Ph.D.

"What really encouraged me to get involved and participate in [Harold Hamm Diabetes Center's] growth was the idea of getting in on the ground floor of something that had an upward trajectory. There are other diabetes centers around the world that are more established, but here in Oklahoma, because of the disproportionate burden of diabetes in the state population, **there's really an opportunity to do some unique and groundbreaking work.** I also like the fact that the center provides seed grants, and travel grants, and so forth, so that the people who are here have that opportunity to test out their ideas.

Diabetes in Native Americans | Obesity and type 2 diabetes affect Native Americans disproportionately when compared to all other ethnic groups, with almost half eventually developing diabetes and related complications. Several NIH studies have resulted from collaborative partnerships with tribal nations across the state, aimed at better understanding the relationship between Native Americans and the high incidence of diabetes.

Role of physical activity in diabetes development and management | An important contributing factor to the development of diabetes is the trend towards a more sedentary lifestyle. Several studies at HHDC involve measuring how adults and children respond to a variety of exercise programs and dietary changes, as well as the development of incentives and strategies to encourage physical activity.

Additional areas of research interest include:

- Metabolomics
- Diabetes management in young adults transitioning from pediatric to adult care
- Type 2 diabetes prevention and intervention strategies

CURRENT MAJOR RESEARCH PROJECTS

CoBRE/IDeA: Mentoring Diabetes Research in Oklahoma | The center is training the next generation of diabetes researchers through its NIH–funded Institutional Development Award (IDeA) led by **Dr. Jian–xing (Jay) Ma**, which is known as a Center of Biomedical Research Excellence (CoBRE) grant. This CoBRE grant, *Mentoring Diabetes Research in Oklahoma*, has provided more than $23 million in funding for diabetes studies. By providing junior researchers funding to initiate their work, it has an immense impact spurring new research, as researchers funded by the CoBRE are awarded additional large, outside grants. In the past nine years of its funding, the CoBRE has incubated ten junior scientists in diabetes research to become independently NIH–grant–funded. These CoBRE–supported scientists have 14 NIH grants between them. In addition, the CoBRE has recruited two diabetes researchers into Oklahoma. The CoBRE has also provided funding to develop and support three major core facilities to assist diabetes researchers, which are described on page 9.

TODAY Study | HHDC is pioneering the treatment of children diagnosed with type 2 diabetes. Once a disease seen almost exclusively in adults, type 2 diabetes diagnoses are now made in children at increasingly high rates. Because a child with type 2 diabetes was virtually unheard of twenty years ago, consistent guidelines for treatment had yet to be established. To solve this problem, a national multicenter NIH clinical study, known as *Treatment Options for Type 2 Diabetes in Youth* (TODAY) study, initiated more than a decade ago. HHDC's **Dr. Kenneth C. Copeland** served as the national co–chair for the study, and our center enrolled more patients than any other site in the nation, thanks in large part to participation from Oklahoma's Native American tribes. The study resulted in the release of universally recommended guidelines for treatment. To continue to explore the best care options, the study, now led by **Dr. Steven Chernausek**, was recently renewed for another five years, making it one of the longest running diabetes research projects at OUHSC.

Translational Research | HHDC encourages and supports clinicians to perform diabetes translational research, enhancing collaboration between clinicians and basic diabetes researchers. HHDC's **Dr. Jeanie Tryggestad** conducts pediatric translational research under her Mentored Patient–Oriented Research Career Development Award (K23) from NIH. She is mentored by **Drs. Steven Chernausek** and **Jian–xing Ma**.

Pediatric Metabolic Research Program | With support from the Children's Hospital Foundation, HHDC is engaged in many studies that examine the causes of diabetes as early as fetal development and throughout adulthood. Six faculty members led by program director **Dr. Steven Chernausek** are currently engaged in projects on the fetal and childhood origins of obesity and metabolic diseases, the benefits of physical activity in improving the health of children, and metabolic disease in Native American youth.

above
HHDC's pediatric research laboratories are adjacent to our pediatric clinic on the fourth floor of the OU Children's Physicians tower in Oklahoma City.

RESEARCH FUNDING AND SUPPORT

HHDC researchers and clinician scientists have brought in more than $100 million in **outside grant funding** over the last decade from agencies such as the NIH, Oklahoma Center for the Advancement of Science and Technology, American Diabetes Association (ADA), Juvenile Diabetes Research Foundation (JDRF), American Heart Association (AHA), and International Retinal Research Foundation. Active diabetes research grants have averaged approximately $12 million annually since 2012.

Our center has also directly funded diabetes projects and programs in Oklahoma. Allocations from **private philanthropy** to our research grant programs from 2015 to 2017 totaled nearly $1.3 million. HHDC has awarded seed grants providing start–up funding for research projects; training grants for master's– and doctoral–level students to enhance their training in diabetes and related fields; travel stipends to promote collaboration with other institutions; and equipment grants that give the center's members access to the most advanced, up–to–date technological innovations to further their work.

HHDC also serves to establish and centralize **shared resources** for diabetes researchers, including core facilities, equipment, personnel, capital facilities, and symposia. HHDC occupies approximately 25,000 square feet of bench laboratory space, exclusive of animal facilities, with additional space available as needed. Three core facilities to facilitate diabetes research have been developed through the NIH–funded *Mentoring Diabetes Research in Oklahoma* CoBRE grant.

- Diabetic Animal Core
- Histology, Image Acquisition and Image Analysis Core
- Diabetic Human Sample Repository

Other core facilities on the OUHSC campus include the Laboratory for Molecular Biology and Cytometry Research; Biostatistics, Epidemiology, and Research Design Core; the College of Pharmacy Research Imaging Facility; BSL2 Rodent Barrier Facility; Mass Spectrometry and Proteomics, DNA Sequencing and Genomics, and Flow Cytometry and Imaging facilities.

STEVEN CHERNAUSEK, M.D.

"As the patient care program gets better, it contributes to the research environment. It attracts people who are creative. It attracts people who are doing trials with different treatments for diabetes, people who are really on the cutting edge of advancing technology. **You have creative individuals who might see different ways to do things. You need that all over the place, not just the coasts.** Life is different in Oklahoma than Boston or New York City or L.A. It's very likely, if you're seeing a Harold Hamm physician as your caregiver, that they're also involved in cutting–edge research. A lot of people, even some of our colleagues in pediatrics, don't realize that. We have an outstanding group of clinical investigators, endocrinologists, and diabetologists here that really are as good as any place, honestly. They're as good as any place.

I've been in Oklahoma City for 10 years; I live right downtown. You should see how much the place has changed for the better. **Now is an opportunity to keep our foot on the accelerator.** This is a time when I think we can make some real progress, especially as it relates to the diabetes center. Continuing to grow the programs and clinical medicine to get the right research components going here. Developing the younger people. It's very important to expand our capacity.

NOW IS AN OPPORTUNITY TO KEEP OUR FOOT ON THE ACCELERATOR.

CORE RESEARCH FACULTY

Madona Azar, M.D., M.P.H.

ASSOCIATE PROFESSOR AND FELLOWSHIP DIRECTOR

PAUL H. AND DORIS EATON TRAVIS CHAIR IN ENDOCRINOLOGY | ENDOCRINOLOGY AND DIABETES

INTERIM DIRECTOR OF ADULT CLINICAL PROGRAMS | HAROLD HAMM DIABETES CENTER

Her research interests include diabetes in pregnancy, epidemiology, vitamin D deficiencies, and diabetes complications.

Joni Beck, Pharm.D., C.D.E., B.C.–A.D.M.

CLINICAL ASSOCIATE PROFESSOR AND CLINICAL PROGRAMS DIRECTOR

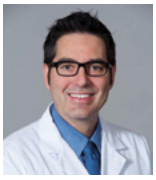
PEDIATRIC DIABETES/ENDOCRINOLOGY

Research interests include multidisciplinary diabetes patient management, assessing educational needs of families with diabetes, and reimbursement of non–physician diabetes services.

Steven D. Chernausek, M.D.

PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

His research interests include the hormonal control of growth and the metabolic effect of fetal growth retardation. His group is also studying epigenetic factors in diabetes.



Michael Elliott, Ph.D.

ASSOCIATE PROFESSOR | OPHTHALMOLOGY

He is studying regulation of the blood–retinal barrier and novel modulators of ocular inflammatory responses in diabetic retinopathy.

David Fields, Ph.D.

ASSOCIATE PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

His research is to understand the role of modifiable gravid maternal factors (e.g. diet, physical activity, diabetes, obesity and mode of feeding) on the development of their offspring's fat and lean mass in the first month of life and the subsequent influence on future disease risk in childhood, adolescence and adulthood.

Willard Freeman, Ph.D.

ASSOCIATE PROFESSOR | PHYSIOLOGY

His research interests include mitochondrial dysfunction in microvascular complications of diabetes.

Randle Gallucci, Ph.D.

PROFESSOR | PHARMACEUTICAL SCIENCES

His research areas include IL6 signaling and its role in diabetes wound healing delay.

Minu George, M.D.

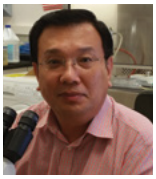
ASSOCIATE PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

His research interests include the prevention of obesity in childhood, metabolic syndrome, and diabetes mellitus types 1 and 2.

Qing Guo, M.D., Ph.D.

PROFESSOR | PHYSIOLOGY

His lab is studying pathogenesis of retinal fibrosis in diabetic nephropathy and identifying therapeutic targets.



David Jelley, M.D.

HILLE CHAIR IN DIABETES | OU SCHOOL OF COMMUNITY MEDICINE–TULSA

SENIOR DEPUTY DIRECTOR | HAROLD HAMM DIABETES CENTER

His research focuses on management of children with type 1 diabetes, and works with TrialNet and the Type 1 Diabetes Exchange.

Shaoning Jiang, Ph.D.

ASSISTANT PROFESSOR OF RESEARCH | PEDIATRIC DIABETES/ENDOCRINOLOGY

Her research interests include DNA methylation and miRNAs in epigenetic regulation of metabolic disorders.

Dimitrios Karamichos, Ph.D.

ASSOCIATE PROFESSOR | OPHTHALMOLOGY

His research interests include diabetic corneal complications. Specifically, he is studying diabetes–induced corneal nerve fiber degeneration and loss of sensitivity.

David Kem, M.D.

GEORGE LYNN CROSS RESEARCH PROFESSOR

REGENTS PROFESSOR OF MEDICINE | ENDOCRINOLOGY AND DIABETES

His research is directed toward identifying the mechanism by which hyperglycemia may lead to 1) desensitization of the heart and 2) desensitization of receptors in blood vessels.

Yun Le, Ph.D.

HAROLD HAMM CHAIR IN DIABETES RESEARCH

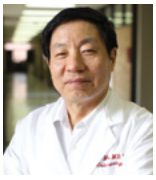
ASSOCIATE PROFESSOR OF MEDICINE | ENDOCRINOLOGY AND DIABETES

His research interests include breakdown of the blood–retina barrier and alteration and degeneration of retinal neurons in diabetic retinopathy using conditional gene knockout mice.

Jonea Lim, M.D.

ASSISTANT PROFESSOR | ENDOCRINOLOGY AND DIABETES

Research interests include Phase III clinical trials for diabetes and pituitary disorders.



Jian–xing Ma, M.D., Ph.D.

DIRECTOR OF RESEARCH PROGRAMS | HAROLD HAMM DIABETES CENTER

LAUREATE PROFESSOR AND CHAIRMAN | PHYSIOLOGY

His research interests include pathogenesis of diabetic microvascular complications such as diabetic retinopathy and nephropathy. Specifically, he is studying the roles of dysregulation of Wnt signaling and PPAR pathways in diabetes complications.

Gennadiy Moiseyev, Ph.D.

ASSISTANT PROFESSOR OF RESEARCH | ENDOCRINOLOGY AND DIABETES

His research interests include deficient vitamin A metabolism in visual impairment in diabetic retinopathy.

Ann L. Olson, Ph.D.

PROFESSOR | BIOCHEMISTRY/MOLECULAR BIOLOGY

The major research focus is insulin action and GLUT4 function in adipose tissue and muscle. Specifically, her lab is studying the molecular mechanisms that underlie GLUT4 transcriptional control, and gene regulation in adipose tissue.

Raju Rajala, Ph.D.

PROFESSOR | OPHTHALMOLOGY

His research interests include function and regulation of insulin receptors and insulin signaling proteins in the retina.

Dharambir K. Sanghera, Ph.D.

PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

Her research focuses on the interplay between environmental and genetic factors involved in type 2 diabetes, obesity, and cardiovascular disease pathogenesis.

Kevin Short, Ph.D.

ASSOCIATE PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

His research is to identify the most effective lifestyle approaches to prevent or reverse the cardiometabolic risk in children and young adults.

Susan Sisson, Ph.D.

ASSOCIATE PROFESSOR | NUTRITIONAL SCIENCES

Her research interests include the influence of the physical and social environment on food consumption and physical activity behaviors and the impact of sedentary lifestyle on chronic diseases such as obesity.

David Sparling, M.D., Ph.D.

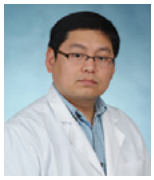
ASSISTANT PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

His research focuses on both diagnosis and management of children with type 1 diabetes as the site PI for TrialNet and the Type 1 Diabetes Exchange, as well as examining the role of adipocytes in inflammation.

Yusuke Takahashi, Ph.D.

ASSISTANT PROFESSOR OF RESEARCH | ENDOCRINOLOGY AND DIABETES

He is studying the role of miRNAs in pathogenesis of retinal inflammation and neovascularization in diabetic retinopathy.



Jeanie Tryggestad, M.D.

ASSISTANT PROFESSOR | PEDIATRIC DIABETES/ENDOCRINOLOGY

Her research interests include microRNAs in obesity, type 2 diabetes (especially in Native American populations), and vascular function in obesity and type 2 diabetes.

Weidong Wang, Ph.D.

ASSISTANT PROFESSOR OF MEDICINE | ENDOCRINOLOGY AND DIABETES

One of his research areas is to generate pancreatic beta cells from humans induced pluripotent stem cells and develop an autologous cell–based therapy to replenish insulin–producing β–cells for the purpose of treating T1DM.

Jian Xu, Ph.D.

ASSISTANT PROFESSOR OF MEDICINE | ENDOCRINOLOGY AND DIABETES

His research interests include endothelial dysfunction in diabetes, specifically, mechanisms underlying the endothelial regulation of metabolic disorders, focusing on the role of the ubiquitin–proteasome system in diabetes.

Xichun Yu, M.D., Ph.D.

ASSOCIATE PROFESSOR OF RESEARCH | ENDOCRINOLOGY AND DIABETES

He is studying GRK2 and proteasome dysregulation in myocardial ischemia and altered autonomic signaling in diabetic cardiomyopathy.

IMAGE NOT AVAILABLE

Xin Zhang, Ph.D.

PROFESSOR | PHYSIOLOGY

His research interests include dysregulated adhesion molecules in impaired podocyte adhesion and podocyte injury in diabetic nephropathy.

THE HAMM PRIZE

HHDC promotes advances in the field of diabetes internationally through its awarding of the $250,000 Harold Hamm International Prize for Biomedical Research in Diabetes, the largest diabetes research award in the world. Many refer to the Hamm Prize as the "Nobel Prize in diabetes" for recognizing significant advances toward a cure for diabetes.

The Hamm Prize is awarded biennially to an individual, research team, or institution who has either demonstrated lifelong contributions to the field or realized a singular advance. Each Prize cycle includes an open nominations process. Prize laureates are selected by an international jury of leading diabetes scientists, convened by HHDC in the spring of every odd–numbered year. HHDC honors each laureate with a reception at the American Diabetes Association Scientific Sessions, held in a major city, and with an invitation to present the **Hamm Lecture** in Oklahoma City. The Prize is officially conferred at HHDC's **Connect+Cure Gala**.

HAMM PRIZE LAUREATES

2013

Peter H. Bennett, M.B., Ch.B., F.R.C.P., F.F.P.H.

NIDDK/NIH

2015

C. Ronald Kahn, M.D.

Joslin/Harvard

2017

Ralph A. DeFronzo, M.D.

University of Texas
Health Science Center

Held biennially in the fall, HHDC's Connect+Cure Gala is among Oklahoma's largest events benefiting the health sciences. Billed as "a celebration of progress toward a cure for diabetes," the occasion attracts nearly 1,000 of Oklahoma's most influential people and features a nationally known guest emcee and topflight entertainment. Our 2017 gala netted $311,000 in philanthropic support.

Connect+Cure Gala


Bennett

Bennett


Kahn


DeFronzo

RESEARCH EVENTS

HHDC Research Symposium | A day of scientific talks and posters presented by faculty, students, and visiting keynote speakers. Held annually in the fall.

Hamm Lecture in Diabetes Research | A presentation by the current laureate of the Hamm Prize. Held biennially (odd–numbered years) in the fall.

HHDC Symposium | This day of lectures features distinguished members of the Selection Jury for the Hamm Prize. Held biennially (odd–numbered years) in the spring.

HHDC Lecture Series | Visiting experts from across the globe are invited to present talks on the OU Health Sciences Center campus.

HHDC Metabolic Research Conference | A series of lectures with local and outside invited presenters in a grand rounds format to facilitate interaction between basic, translational, and clinical researchers. Held twice per month (excepting summers).

Henry Turner Lecture | Established to honor Henry Turner, an OUHSC researcher known for identifying Turner Syndrome, a chromosomal condition that increases the likelihood of developing diabetes.

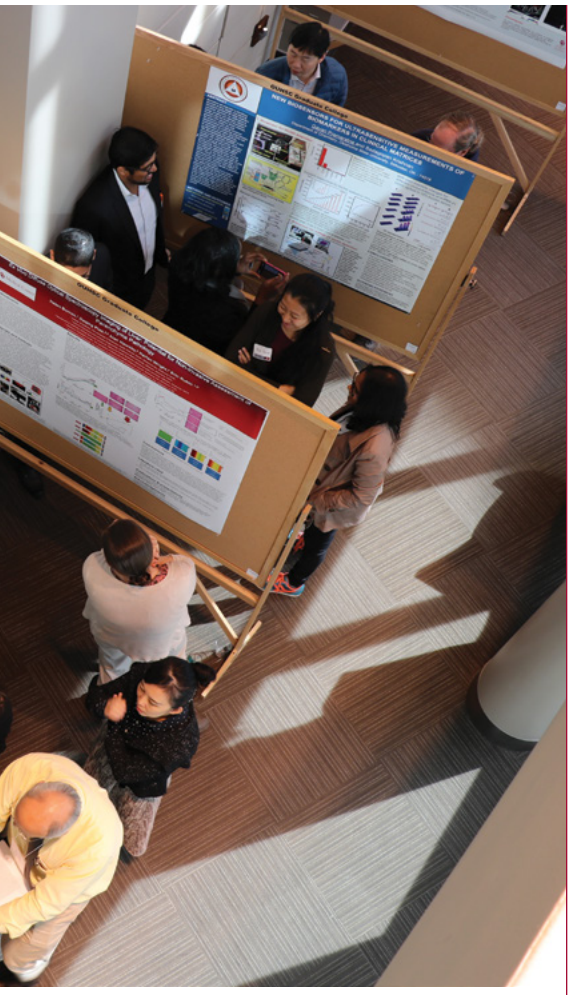
Kelly West Lecture | Named in honor of OUHSC researcher Kelly West, recognized internationally as the "father of diabetes epidemiology."

VISITING PROFESSORSHIPS

Jack and Evelyn Trachtenberg Visiting Professorship
Established by a gift from the Larry and Mary Trachtenberg family

Macy Nigh Whitener Visiting Professorship | Established through a gift from Oklahoma governor and first lady George and Donna Nigh, named for their granddaughter who has diabetes

Kenneth C. Copeland Visiting Professorship | Named to honor Kenneth Copeland, who served as the director of HHDC–Children's, vice chair of OUHSC's Department of Pediatrics, and chief of the Section of Pediatric Diabetes and Endocrinology



above
Poster presentations are an annual highlight of our Research Symposium and provide junior researchers with valuable feedback on their work.

left
OUHSC Physiology researcher Dr. Zhongjie Sun presents a talk on pancreatic beta cell function at our 2017 Research Symposium.

CLINICAL TRIALS

HHDC conducts clinical trials for all ages of participants in Oklahoma City, Tulsa, and at partner sites across Oklahoma. Studies range from original investigations within HHDC, to national NIH studies, to international pharmaceutical trials at various phases. Volunteer recruitment is mostly decentralized to meet the needs of the study at hand and the population desired. Our flagship building houses a large Adult Clinical Trials suite on its ground floor. We actively invite patients and other adults in the community to join a volunteer registry, which our personnel uses to recruit participants based on eligibility metrics. Most of our pediatric clinical trials emanate from our Pediatric Metabolic Research Program adjacent to our children's clinic and pediatric laboratories. Patients are recruited primarily though our pediatric clinic in Oklahoma City as well as partner sites across the state. We are members of the Type 1 Diabetes Exchange and the Pediatric Diabetes Consortium.

A relatively new clinical study of particular note is our **Wavelengths** program. Wavelengths eases the transition from pediatric to adult care for young adult patients (15–25) with diabetes. The program coordinates clinical care, educates families, and provides for peer interactions. The data collected in Wavelengths provides valuable insight that could lead to better diabetes self–management and support of young adults with diabetes.

OUHSC is in the process of developing a Clinical Research Unit leveraging the Oklahoma Clinical and Translational Science Institute to provide institutional support and oversight of clinical trials, which will include help with diabetes clinical trial studies.

RESEARCH AT THE ROOT

HHDC's mission has "research at the root," but it is also comprehensive of patient care, diabetes prevention in the community, and professional education. We aspire to excellence in each of these areas.

Patient Care | In our adult clinic (Oklahoma City), board–certified endocrinologists lead a multidisciplinary team that includes certified diabetes educators, nurse practitioners, medical device training specialists, dietitians, and a podiatrist. HHDC has two pediatric diabetes and endocrinology clinical practices, one in Oklahoma City and one in Tulsa, caring for children and adolescents. Our pediatric team provides multidisciplinary care in the same areas of the adult practice, with an added behavioral health component staffed by a psychologist and licensed clinical social worker. This team also operates **Camp Blue Hawk**, an annual residential summer camp for children ages 9–16 with type 1 diabetes. Our clinical care network provides referrals for behavioral health, eye care, dental care, and bariatric surgery, among other services, as part of a closely managed diabetes care plan individualized to each patient. HHDC clinicians also provide outpatient care specifically to Native American partners at several tribal nation clinics throughout the state.

Diabetes Prevention | The National Diabetes Prevention Program, managed by the Centers for Disease Control and Prevention, is a curriculum proven to cut adults' type 2 diabetes risk by more than half. HHDC's program is fully certified by the CDC, and we offer it to Oklahoma City metro–area residents at a discount, thanks to targeted philanthropic support. The center employs a full–time healthy lifestyles coach and certified diabetes educator to lead the program. Additionally, HHDC promotes diabetes risk awareness through a campaign called "It's All About Love." The campaign currently centers on the Oklahoma State Fair held annually in September, but it is expanding into a year–round effort.

above
Camp Blue Hawk staff are medical professionals and trainees. Here, a counselor assists a camper with glucose tracking and carb counting at mealtime.

MITALI TALSANIA, M.D.

I truly believe I'm living my dream career. The Hamm Center has supported me throughout my research. I presented at the American Diabetes Association Scientific Sessions last year; the diabetes center supported me with a travel grant. I'm just thankful. I dream about expanding what we do, and I think we're going in the right direction.

Professional Education | The Harold Hamm Diabetes Care Summit, held annually in the fall, is the Oklahoma region's premier continuing–education conference for diabetes. The Summit is among the region's largest healthcare conferences generally, attracting some 300 physicians, nurses, dietitians, diabetes educators, and other professionals from Oklahoma and beyond. The Summit's curriculum explores the latest clinical guidelines and best practices, with updated clinical approaches for diabetes patient management and interprofessional strategies for diabetes self–care and education. Our 2018 Summit was co–sponsored by the American Diabetes Association. HHDC's other lectures and symposia also attract a range of biomedical professionals from the community.

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