According to recent report by the World Health Organization, it is estimated that diabetes affects 422 million adults worldwide today\(^1\). The American Diabetes Association reports that of those 422 million, over 29 million are from the United States\(^2\). Samuel Dagogo-Jack, MD, professor of medicine and director of the Division of Endocrinology, Diabetes and Metabolism, and director of the Clinical Research Center at the University of Tennessee Health Science Center (UTHSC) has devoted his career to diabetes research. Recently, the A.C. Mullins Endowed Chair in Translational Research completed his term as president of the American Diabetes Association. To mark his legacy, Dr. Dagogo-Jack recently published a new book titled, “Diabetes Mellitus in Developing Countries and Underserved Communities.”

Dr. Dagogo-Jack served as editor of the book which was published by Springer and released in late fall. The chapter on “Diabetes in Ethnic Minorities and Immigrant Populations in Western Europe” was co-authored by Helmut Steinberg, MD, professor in the Division of Endocrinology, Diabetes and Metabolism at UTHSC in collaboration with Oliver Razum, dr. med, professor at Bielefeld University in Germany.

The book pulls together leading experts from all over the world and is adapted to every region. It addresses the growing global diabetes epidemic, specifically focusing on developing countries and underserved communities who are projected to experience the steepest increase of diabetes diagnoses in the next few decades. Additionally, it also sheds light on underserved populations in developed countries who experience disparities in diabetes prevention, quality of care, and outcomes.

“My goal in putting the new book together was to mobilize diabetes leaders and experts from every inhabited continent of the world to craft authoritative chapters on diabetes that could guide care of patients and future research,” said Dr. Dagogo-Jack. “The book is helpful to health policy leaders, clinicians, and basic and clinical researchers worldwide.”

The 14-chapter book looks at classification, pathophysiology, genomics, diagnosis, non-pharmacological and medical management, and prevention from a global standpoint. It also focuses on novel directions for future diabetes research, care, and prevention as well as increasing awareness, increasing self-management skills and health literacy, and reducing the barriers to access of care for the underserved and minority communities.

“With nearly 300 million people worldwide suffering from prediabetes, we hope this book will provide insight and education to those who are fighting to stop this disease,” said Dr. Dagogo-Jack.\(^3\) “Memphis serves both the underprivileged and minority communities. UTHSC provides many resources to those doing diabetes work and research in the city. Our ongoing clinical trials are nationally recognized and sponsored by several prestigious benefactors.”

UTHSC’s Division of Endocrinology, Diabetes and Metabolism has multiple ongoing clinical research initiatives in diabetes detection, management, and prevention as well as pre-diabetes. Dr. Dagogo-Jack is confident that this newly published book will help UTHSC researchers in Memphis and beyond, including clinicians and health policy leaders, better address the wide-spread diabetes issues facing every community around the world.

For more information on Dr. Dagogo-Jack’s book, please visit Springer’s website.

References:
During his first two months as Dean of UTHSC's College of Medicine in Chattanooga (UTCOMC) and Senior Vice President of Erlanger Health System, R. Bruce Shack, MD, has spent his time fleshing out a strategic plan of success for the institution. He comes to Chattanooga after serving over 40 years at Vanderbilt University. Dr. Shack explains, “the opportunity to do something totally different at the end of my academic career and all the opportunities for improvement at UTHSC incited me.”

One of Dean Shack's first goals: improve the infrastructure of the campus to help guide new and exceptional health services for the region. He's been hard at work fostering relationships between the different departments at Chattanooga and nurturing the clinical research partnerships between UTHSC and Erlanger.

“We’re trying to increase our footprint as it relates to both medical students and resident education as well as faculty development,” Dean Shack said. “Erlanger is the main teaching hospital here in Chattanooga. Therefore, the relationship UT has with them is critical to the mission of the university- to educate residents, promote research, and provide excellent patient care.”

Dr. Shack has future plans to acquire an Associate Dean for Research at UTCOMC to help carry on this mission as well as oversee all research initiatives. He states that the opportunity for different departments to partner together on various research projects “is ripe in Chattanooga” but there has been no one to oversee and coordinate this effort. “I am hopeful that once I get that person identified, recruited, and put in position that we can begin to better coordinate our research efforts here on this Chattanooga campus.”

Among his long-term goals for UTCOMC is to develop a first and second year program for students. Currently, the campus provides training for junior and senior medical students, as well as residency and fellowship programs. Bringing basic clinical research programs to the Chattanooga campus “will be beneficial to UTCOMC, Erlanger, and the undergraduate school, UT Chattanooga,” Dean Shack said. “It will grow our program and make us more competitive to incoming medical students and faculty as well.”

Another long-term goal is developing successful a recruitment partnership with Erlanger with the ultimate goal being that new hospital staff will hold dual positions as clinicians at Erlanger as well as teaching or research positions within UTCOMC.

“Not all the clinicians Erlanger recruits will be interested or certified to also become a part of the UTCOMC family, but some may be,” said Dean Shack. “It will be those individuals that will help drive UTCOMC’s teaching and research missions forward while also supporting the exceptional clinical care efforts that Erlanger continually strives to provide its patients.”

When asked about his favorite part of being UTCOMC Dean thus far, Dr. Shack says “it’s been an exciting challenge to take on a new role and responsibility in Chattanooga.” Reminiscing on his past professional experiences, he notes that previously he was just in charge of a smaller department and program at Vanderbilt but now he has the responsibility of looking out for a whole medical school.

“It’s really me challenging myself and that’s what makes it fun for me,” Dr. Shack said. “I’m learning a lot of stuff that I never thought I would need to know and it’s been fun. My hope is that I will continue to see the goals that I’ve laid out come to fruition.”
The First Physical Activity Almanac, a collection of 133 country profiles documenting the global burden of physical inactivity on non-communicable diseases (NCDs) among low, middle, and high income countries was released in November 2016 by the Global Observatory for Physical Activity (GoPA!). The publication of the Almanac, of which I was fortunate enough to contribute to its development and release, coincided with the sixth International Congress on Physical Activity and Public Health held in Bangkok, Thailand November 15-20, 2016.

Over recent decades, physical inactivity has reached pandemic proportions in high, middle, and low-income countries. It is estimated that 5.3 million people worldwide die every year due to physical inactivity. Physical inactivity is responsible for six percent of coronary heart disease deaths, seven percent of type 2 diabetes deaths, and 10% of all breast and colon cancer deaths. Physical inactivity also increases the risk of high blood pressure, stroke, metabolic syndrome, depression and falls, whereas increased physical activity leads to improved bone health, body composition, functional health, cardiorespiratory and muscular fitness and cognitive function.

In the Lancet Physical Activity Series launched in 2012, using data from 122 countries, it was estimated that only 31.1% of the world’s adult population is physically inactive with physical inactivity reportedly being higher among women compared with men, and increasing in prevalence with increasing age. This ignited a call for global action and led to the creation of the Global Observatory for Physical Activity (GoPA!).

GoPA! consists of a global team of physical activity scientists and public health practitioners who have analyzed and assembled global data on the topic of physical activity and health with a mission of reporting worldwide physical activity surveillance, research, and policies dedicated to helping to reduce the global burden of NCDs caused by physical inactivity. GoPA! is a council of the International Society of Physical Activity and Health (ISPAH).

Data from the Observatory is intended to help countries determine their physical activity and public health needs and to initiate or improve standardized data collection, surveillance systems, policy development, research, health burden statistics, program development, and systematic evaluation of physical activity interventions. The data assembled by GoPA! can be used by government agencies, researchers, physical activity and health advocates, and interested citizens to improve population levels of physical activity.

To help understand the barriers and potential facilitators for increasing the prevalence of health-related physical activity, GoPA! has assembled a number of these indicators for each country into what is known as a “Country Card.” The collection of Country Cards is what constitutes the 1st Physical Activity Almanac. Each Country Card lists key information including: sociodemographic; economic; physical activity prevalence and inactivity health burden and related mortality; details about a national physical activity plan and physical activity surveillance; and physical activity research. The primary application the Almanac is to help translate global physical activity information into meaningful public health action and policy directed towards the prevention and control of key NCDs.

To read the full GoPA! 1st Physical Activity Almanac.

-Gregory W. Heath, PhD
Professor of Medicine & Research Director, UT-COMC

References:
From Student Researcher to Assistant Professor

Emily Martin, PhD, Assistant Professor of Medicine, began her career at The University of Tennessee Medical Center as an undergraduate student in 2009. At that time, she was a volunteer researcher with the Molecular Imaging and Translational Research Program which sparked her interests in research as a career. Dr. Martin has always been interested in science, but had planned to pursue a career as a physician. After spending time in the lab at UTMC, it was clear that research as a full-time career was something she wanted to pursue.

“In this environment, I watched scientists not only work together, but also think together,” Dr. Martin said. “The ideas and opinions of everyone in the group were considered valuable, and in that room, the passion for research was tangible. It lured me in, and I have been hooked ever since.”

After completing her undergraduate studies, Dr. Martin enrolled in the Comparative and Experimental Medicine Graduate program and worked in the Amyloidosis and Cancer Theranostics Program under the direction of Jonathan Wall, PhD. Her dissertation—“Characterization and development of amyloid-reactive peptides as tracers for quantitative molecular imaging”—was completed in 2014.

Upon completion of her PhD, Dr. Martin joined the medical center as an assistant professor in the Department of Medicine working in Dr. Wall’s laboratory. As a new faculty member, in addition to her ongoing research, she focused on areas of the program in which she could make the biggest impact. Despite UTMC having a world-renowned amyloidosis program, Dr. Martin noticed the lack of patient support in the Knoxville area. This led her to attend a patient support group at Duke to see if it was something she could bring to Knoxville.

“Until that day at Duke, I had never actually met a patient with this horrible disease,” Dr. Martin said. “When I was able to physically speak to and listen to those afflicted by the disease I have spent years studying, I was incredibly inspired.”

Dr. Martin was able to jumpstart a patient support group in Knoxville with the help of Charlotte Haffner, Director of the Amyloidosis Foundation. The first patient support group in Knoxville was hosted in June 2016 and was quickly followed by a second meeting in October 2016 due to the success of the first. Internationally renowned speakers in amyloidosis research as well as patients and family members were in attendance. Dr. Martin is already planning future meetings in Knoxville.

Dr. Martin also identified a research opportunity that could potentially impact amyloidosis patients, and the Amyloidosis Foundation awarded a prestigious $50,000 junior research grant known as the Donald C. Brockman Memorial Research Grant, in support of her proposal. Dr. Martin’s project will evaluate a novel test for identifying patients who have multiple myeloma, or a similar disease, who are at risk of developing light chain (LC) amyloidosis—a deadly disease for which new treatments may be available in the near future. Early detection of amyloidosis is key to improved survival. She will study light chain proteins, isolated from patients’ urine, for their ability to make amyloid fibrils. She believes this simple test that will identify LC proteins that have a tendency to form amyloid deposits before symptoms of the disease appear in patients.

The grant is given in memory of one of the co-founders of the Amyloidosis Foundation who passed away in 2004 after being diagnosed with amyloidosis. His disease progressed from a different initial diagnosis, but once his amyloid was detected, it was too late. His story inspired the focus for Dr. Martin’s project, and she hopes her research will be able to make a difference for these patients by enabling them to be diagnosed and treated earlier.
9th Annual UTHSC Postdoctoral Research Day

Postdoctoral Research Day, hosted on December 8, 2016, is designed to showcase the outstanding research and activities by UTHSC’s postdoctoral fellows and their faculty mentors. The event is organized to include both oral and poster presentations that represent each academic discipline across UTHSC’s campus.

This year’s Postdoc Research Day featured presentations from over 30 postdoctoral fellows and faculty mentors. Vice Chancellor for Research Steven R. Goodman, PhD, served as the keynote speaker at the event. Following Dr. Goodman’s address, three participating Postdoctoral students from each of the following categories were announced as this year’s award winners: Oral Presentation, Poster Presentation, and Winter Travel Award ($1,000 each).

Oral Presentations:
- Erin Stephenson- “Chronic high dietary sucrose consumption increases energy expenditure independent of physical activity or body weight in mice”, Michael P. Thompson- “Hospital Electronic Record Adaption and Pay-for-Performance Penalties”, and Qusai Al Abdallah- “Components of the Aspergillus fumigatus Ras Post-translational modification pathway regulate conidial viability, hyphal growth, and virulence”

Poster Presentations:

Winter Travel Awards:
- Hilaire Barch, Ruhi Mahajan, and Korah Pushpamangalam

Himman Student Research Symposium Completes 22nd Year

The Himman Student Research Symposium was held October 28-30, 2016 at the Peabody Hotel in Memphis. The Symposium featured oral and poster presentations of research projects by dental students and graduate trainees from 53 dental schools in 30 states, the District of Columbia, and 5 Canadian provinces. It is designed to reward and encourage student efforts in research, and support the research and educational programs of faculty research mentors and research administrators.

The event was sponsored by the UT College of Dentistry and co-sponsored by the Himman Dental Society. It was also supported in part by grants from the National Institute for Dental and Craniofacial Research (NIDCR), the ADEAGies Foundation, the Procter & Gamble Company, the UT College of Dentistry Alumni Association, and the Tennessee Dental Association Foundation. Keynote speakers included Dr. Richard W. Valachovic, President and CEO of the American Dental Education Association and Dr. Lynn Mertens King, Chief of Research Training and Career Development Branch of the NIDCR.

Eight awards were given for the most outstanding student presentations, four in clinical research and four in basic science research, in addition to an award from the National Students Research Group (NSRG) of the American Association for Dental Research (AADR) during the Symposium.

This year the NSRG award to second-year dental student Taylor Enochs of UTHSC (pictured above in center). Her project explored the feasibility of using slot preparations in Typodont plastic teeth to evaluate shrinkage stress associated with polymerization of a variety of resin-based composites used in restorative dentistry.
Making healthy lifestyle changes can affect your health today and in the future. UTHSC’s Department of Preventive Medicine is home to faculty who conduct interdisciplinary research focused on improving the health of populations. With most New Year’s resolutions centered around healthy lifestyle changes, we’ve highlighted three of the department’s active Memphis-based research grants that focus on healthy behavior changes.

**Fit & Quit study:**

Although the health benefits of smoking cessation outweigh the negative impact of weight gain, ideally there would be intervention “packages” that would not require one to choose between smoking cessation and nontrivial weight gain. The goal of the 12 month long Fit & Quit project is to determine whether two promising, but intensive methods of reducing the amount of weight gained after quitting smoking: 1) an intervention focused on making small changes each day in eating and number of steps taken and 2) a weight loss intervention in order to counteract the weight likely to be gained by quitting smoking. These interventions will be compared to a less intensive condition that receives a weight management book prior to smoking cessation. All three conditions receive a behavioral intervention focused on how to quit smoking and 6 months of Chantix™ medication.

In the summer of 2017, Rebecca Krukowski, PhD, (pictured left) will start the recruitment process looking for 400 Memphis-area individuals to participate in the Fit & Quit study. Starting this month, she will be recruiting participants for focus groups and interviews to assist with finalizing the program materials. Interested individuals can learn more about the study by emailing fitquit@uthsc.edu or calling 901-448-3174.

**Planning A Change Easily (PACE) research study:**

Approximately 90% of current smokers say they are not ready to quit in the next 30 days, but would consider making a quit attempt in the next year. The goal of the Planning A Change Easily (PACE) research study is to help smokers who are not ready to quit “move down the path” toward making a quit attempt. This study is actively recruiting adult smokers nationwide. Eligible participants must smoke at least 5 cigarettes per day and have a telephone. In this study Robert C. Klesges, PhD, MS, BA, AA, (pictured center) will compare the effectiveness of four different forms of cognitive behavioral therapy for smokers who are not ready to quit: 1) Standard of Care, where participants receive information on the health consequences of smoking; 2) Motivational Interviewing, where participants define their own goals and motivations to quit; 3) Rate Reduction, where participants attempt to reduce their intake so that a future quit attempt is easier; and 4) Combination of Motivational Interviewing and Rate Reduction interventions. All study procedures take place over the phone, and participants are compensated for each study call. Results from this study will help develop better interventions for smokers not yet ready to make a change. For details visit http://www.pacestudy.org or call 1-844-680-PACE.

**Look AHEAD Extension study:**

The Look AHEAD (Action for Health in Diabetes) study, which started in 2000, enrolled over 5,000 overweight or obese volunteers with type 2 diabetes. The study was formed to determine if Intensive Lifestyle Intervention (ILI) centered around weight loss through increased physical activity and healthy eating can improve the lives of older individuals with type 2 diabetes over time as they age. In 2012, the trial part stopped but continued as an observational study through 2016, showing that an Intensive Lifestyle Intervention that resulted in weight loss and increased physical activity could decreased blood pressure, decreased blood sugar levels, and decreased cholesterol levels. The study also showed that the intensive lifestyle intervention improved quality of life, improved incontinence, decreased sleep apnea, and that long-term weight loss is possible for people with type 2 diabetes. Karen C. Johnson, MD, MPH, (pictured right) and co-investigator Helmut Steinberg, MD, recently received a $2.3 million grant to pick up on where the previous study left off and continue through 2021. The Look AHEAD Extension Study will follow the same cohort from the previous study to answer the question do intensive lifestyle interventions successfully decrease mortality rates or age related issues such as frailty. According to Dr. Johnson, the outlook is positive.
New Changes in the Animal Care and Use Program—
What You Will See in 2017

At a time of increasing competition for grant funding, it essential now, more than ever before, that investigators at UTHSC are provided with an outstanding research infrastructure that will enhance their productivity and accelerate the pace of research. One vitally important component to the success of the UTHSC research enterprise is the Institutional Animal Care and Use Program. The totality of this Program includes both the Laboratory Animal Care Unit (LACU), whose goal is to provide investigators with the essential resources to develop, maintain and advance their animal-related research needs; and the Institutional Animal Care and Use Committee (IACUC), who assumes responsibility for the review and oversight of the humane use of animals in all missions of the university.

To ensure that investigators receive the highest quality service, LACU has been undergoing a complete reorganization of its staffing, as well as a re-derivation of standard operating procedures and policies. A hallmark of the reorganization is the requirement for all husbandry staff to have a minimum level of American Association for Laboratory Animals Science (AALAS) certification appropriate for their position, either at the time of hire, or to obtain the required certification within a specified timeframe. Training toward these industry standard certifications is currently ongoing. The new organization of the LACU also included the creation and hire of a Training/Quality Assurance Coordinator. The position is responsible for the ongoing development, implementation, assessment and oversight of both initial and continued staff training, as well as facility quality assurance. These enhancements to our lab animal program, in conjunction with UTHSC finalizing the purchase of the TriMetis vivarium in the coming months, will enable the Office of Research to provide investigators with a high-quality Lab Animal Program, well into the future.

The IACUC has also been undergoing significant organizational and procedural changes directed toward decreasing the time to IACUC approval, and streamlining the submission and review process, for both new animal

use protocols and amendments to existing activities. All newly proposed activities (including triennial renewals) are now required to undergo mandatory pre-review, prior to submission in ACAP (see Policy: Animal Use Protocol Submission and Review). In the revised process, assigned reviewers and subject matter experts (e.g., veterinarians and biosafety) interact collaboratively with investigators to facilitate protocol development, thereby reducing errors. Additional enhancements also include the implementation of two IACUC meetings per month, and the added use of Designated Member Review or DMR. The shift to two meetings per month, in conjunction with mandatory pre-review, essentially establishes a rolling review process. Further, for eligible protocols, the DMR process (i.e., two assigned reviewers who act on behalf of the committee) enable the IACUC to review and approve protocols outside a normally scheduled meeting and, thus, at a faster pace than those requiring Full Committee Review. Finally, in order to reduce regulatory burden on both investigators and committee members, the IACUC is now taking full advantage of federal regulatory rules that permit the administrative review of specified “significant change to animal activities”, thereby accelerating the amendment approval process for the lion’s share of activities (see Policy: Amendments to Approved Protocol).

Coming soon in 2017: New streamlined online submission forms!

–Steven L. Youngentob, PhD
Senior Associate Vice Chancellor for Research
Tropical rainforests exist close to the equator and receive 60 to 160 inches of rain per year. The temperature ranges from 70° to 85° F, creating a warm and humid climate. This in turn leads a diverse microbiome with 40 to 75% of biotic species found in rainforests. This unique environment houses half of the world’s animal and plant species. We have been hard at work for the last 18 months creating a rich rainforest-like environment for UTHSC researchers. What steps have we taken to create this environment?

We started by seeding the clouds with the highly successful CORNET Awards; then provided a vision and architectural plan with the Operational Strategic Plan for Research; and improved the infrastructure by creating a business plan model for research cores and improving LACU function while streamlining IACUC proposal review (see Steve Youngntob’s article in this Rainmaker edition). We created an Office of Research Development to alert you to grant opportunities, and a Research Office of Marketing and Communication that gets out the word on your research accomplishments and educates through Hot Topics and other mechanisms.

Now I will announce two new steps towards building the Tropical Rainforest Environment for Research. We have opened an Office of Scientific Writing. We hired a very accomplished Director for this office, Dr. Richard Redfearn (pictured right). Richard has a PhD in Chemistry from Duke University, with background in Organic and Biochemistry; and served as a Faculty member at Rhodes College before refocusing his career on assisting faculty on writing successful grants. Most recently, Richard served as Grant Training Manager at the University of Arkansas. Dr. Redfearn has written a large number of scientific articles and grant applications, and is a member of the Grants Professional Association, and the National Organization of Research Development Professionals. At UTHSC Richard will assist faculty, postdoctoral fellows and students in the writing of successful research grants and scientific manuscripts. The Office of Scientific Writing will assist the research community at our Memphis, Nashville, Chattanooga, and Knoxville campuses. We are pleased to welcome Richard to our Office of Research Team.

My second announcement is the purchase of InfoReady Review by our Office of Research Development. InfoReady Review will be used for Limited Submission grants (i.e., opportunities that require an internal, pre-application selection process because of funding agency limitations on the number of applications accepted from a single area or institution). It will also be utilized for Intramural Funding opportunities, including CORNET Awards, Bridge Funding and New Grant Support. Questions regarding InfoReady should be directed to Lisa Youngntob our Director of the Office of Research Development. Next month we will also be rolling out Elsevier’s Pure for your use, on targeted funding opportunities. More on this later.

The Vice Chancellor for Research and the Office of Research have put major effort into creating a Rainforest-like experience for our investigators. We will continue doing so in 2017 with major announcements on the horizon. Look for the Rainbow. Our goal is your success.

-Steven R. Goodman, PhD
Vice Chancellor for Research