Under the patronage of the Custodian of the Two Holy Mosques
King Abdullah Bin Abdulaziz

مدينة الملك عبدالعزيز
للعلوم والتقنية KACST

The Saudi International Conference for Medical Technology 2013

September 29 - 30, 2013

Conference Hall - Building 36 - KACST Headquarters
King Abdullah Road - Riyadh, Saudi Arabia



INTRODUCTORY BROCHURE

The Saudi International Conference for Medical Technology 2013

Under the patronage of the Custodian of the Two Holy Mosques, King Abdullah bin Abdul Aziz, KACST is organizing The Saudi International Conference for Medical Technology, on the 29 - 30 of September corresponding to the 23 – 24 Thul-Qi'dah 1434...

This Saudi International Conference for Medical Technology will focus this year on metabolic syndrome, which includes obesity, diabetes and cardiovascular diseases.

The global epidemic of obesity and diabetes and their consequential burden both on a nation's health and economy, is alarming to healthcare providers in the Kingdom, and around the world. In Saudi Arabia around 400 out of the 700 mortality rate per 100,000 of the population, are of cardiovascular origin. ''Diabesity'' (obesity and diabetes), is intimately linked to cardiovascular diseases and the compound burden of these diseases to Saudi health providers is expected to escalate to staggering levels. Reducing the prevalence of these diseases in Saudi Arabia is of paramount importance to the general population and policy makers alike.

This conference will highlight the latest metabolic syndrome diagnostic and therapeutic technologies, in order to increase the awareness of the regions professionals and decision makers about the technologies that are new to the market, and are now available.

The Saudi International Conference for Medical Technology 2013 will be held on the 29 - 30 of September corresponding to the 23 – 24 Thul-Qi'dah 1434 at the Conference Hall - Building 36, KACST Headquarters, King Abdullah Road, Riyadh.

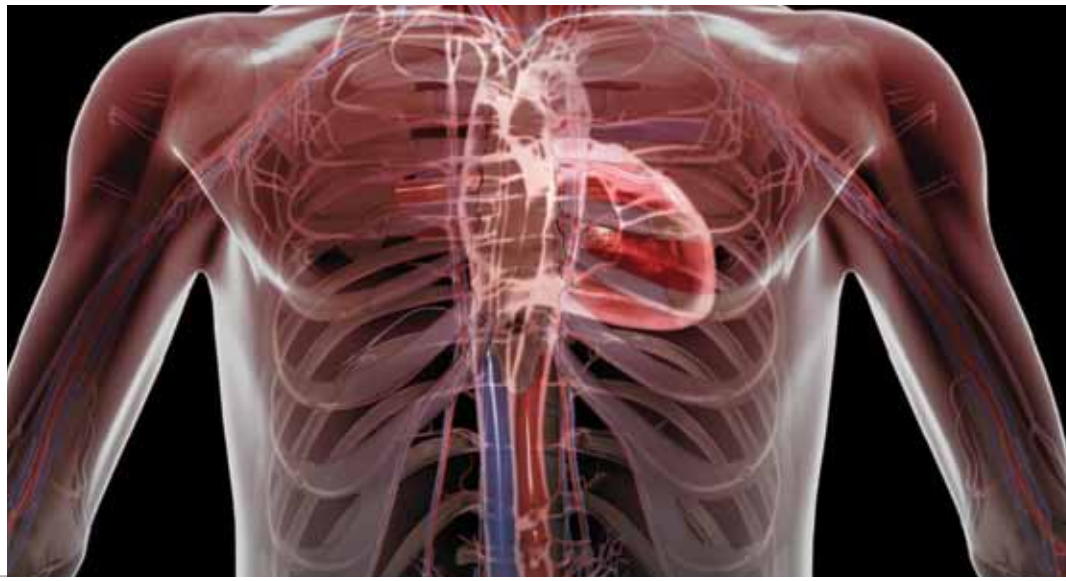
New insights into the three c's of metabolic syndrome – cause, course and cure of disease...

The conference will explore new tools for diagnosing and treating obesity, diabetes and cardiovascular diseases...

'Diabesity' is used to refer to the intimate link between obesity and diabetes...

Collectively the financial burden of metabolic syndrome diseases is costing the Saudi economy billions of Riyals every year...

The Saudi International Conference for Medical Technology will provide a platform for discussing the latest diagnostic and therapeutic technologies, new clinical trials, and new insights into the three Cs, cause, course and cure of disease, focusing on non-communicable diseases as defined by the National Medical and Health Research Strategic Priorities (NMHRSP). Because of the wider scope of the NMHRSP, this conference will focus on the diseases associated with metabolic syndrome, which are ''Diabesity'' (obesity-diabetes) and cardiovascular diseases.



The conference will focus on three main tracks:

1 Diabetes

Diabetes rates in the Kingdom are soaring, largely due to poor diet, high consumption of sugar, lack of exercise and high levels of smoking. Globally the economic burden of this disease is expected to rise to $243-411 billion in the next 15 years, draining away resources from other needs. Currently it is estimated that each diabetic patient in Saudi Arabia costs the government $800 per month. This conference will be an opportunity for leaders and decision makers to move towards limiting the spread of the disease and reducing this financial burden on the Saudi economy.

2 Obesity

Around 50% of the Saudi population is estimated to be obese. The World Health Organization estimates that 2.8 million adults die every year due to obesity or overweight related causes. Obesity contributes considerably as an additional burden of disease to diabetes, cancer and cardiovascular diseases. In Saudi Arabia the problem is worse among women than men, with more females being at risk of obesity. What is even more alarming is that the diabetic population is becoming younger, and the number of children with Type 2 diabetes, linked with obesity, is rapidly rising.

3 Cardiovascular diseases

Cardiovascular diseases account for 25% of all deaths in Saudi Arabia, around 80,000. Globally Cardiovascular diseases contribute to around 60% of the diabetes mortality rate. It is argued that improved early detection and better care of diabetics will have immense effect on the burden of disease. This conference will bring together scientists and industry to discuss the latest technologies in diagnosis and treatment of CVD.

Target attendees...

The objective of the conference is to gather the leaders, decision makers, and contributors to the development of the Kingdom's healthcare and medical sector, in order to inform them of the latest developments, and diagnostic and therapeutic tools with syndrome diseases.

The target attendees for the conference will be:

- **Healthcare providers**
- **Government and healthcare decision makers**
- **Government and healthcare policy makers**
- **Suppliers of healthcare equipment and technology**
- **Researchers**
- **Medical students and lecturers**
- **Interested members of the public**

Obesity is a ticking time bomb - the consequences of this disease on the Saudi population could be devastating...

KACST is funding joint research centres for obesity and diabetes at King Saud University, and 20 new diabetes centres have been opened around the Kingdom…

There are more than twenty new diabetes centres in the Kingdom together with heart and obesity centres at national universities and tertiary care hospitals....

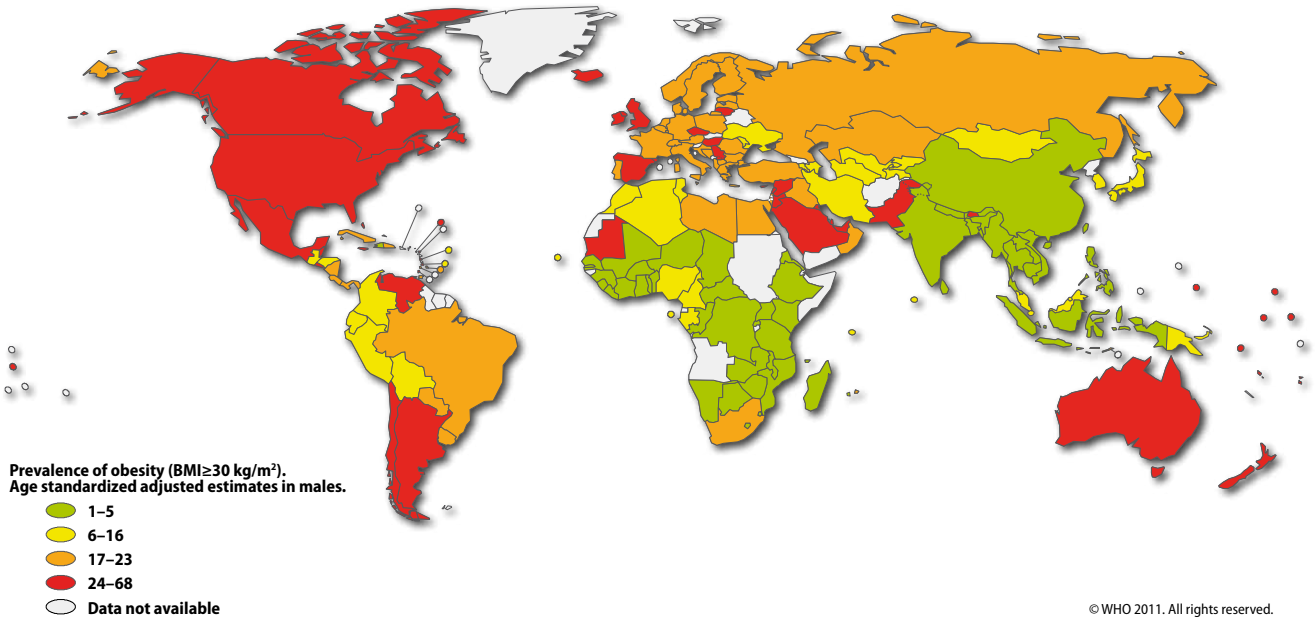
Saudi Arabia has one of the highest mortality rates from cardiovascular diseases in the world...

Obesity is a growing problem world over, particularly in Saudi Arabia. The Kingdom's growth in fast food options has lead to an increased calorie intake from foods that are high in fat, salt and sugars, and low in vitamins, minerals and micronutrients. This, along with the sedentary lifestyle that is common in the Kingdom, is leading directly to increased body weight and a population with a huge problem.

Obesity is the common denominator for both diabetes and cardiovascular diseases. Central obesity, aberrant lipid metabolism, raised blood pressure and raised fasting plasma glucose, collectively described as metabolic syndrome, are major risks for developing obesity, diabetes and cardiovascular diseases. Many permeations of the above have also been defined by WHO, NCEP, AHA and EGIR to describe a human time bomb in the making with unimaginable consequences and a huge burden of disease if effective actions do not ensue, now.

The World Health Organization estimates that worldwide, 44% of the diabetes burden, 23% of the ischaemic heart disease burden and between 7% and 41% of certain cancer burdens are attributable to overweight and obesity.

Figure 38 World map showing the prevalence of obesity * in males (ages 20+, age standardized) (*6*). (*BMI≥30 kg/m²)



Some nations have taken drastic approaches to tackling the problem. Japan for instance, where 13 million of the population suffer from metabolic syndrome, is introducing "flab checks" where the employer is held responsible for bringing down its employees waistlines. This kind of approach may seem unsocial and draconian, but it is expected to pay dividends in the nation's general healthcare and well being. Collective actions are needed and multinational-awareness campaigns are paramount.

There are a number of institutions within the Kingdom where research in metabolic syndrome, diabetes, obesity and cardiovascular diseases is actively pursued. Multidisciplinary approaches have yielded good dividends in term of knowledge and public awareness. Research into the aetiology of the diseases and the use of nutrigenomics has been very informative. Although still in its infancy, nutrigenomics is already making its impact on public health. Synthetic food products are checked through metabolomics and lipidomics with interesting results.

There are more than twenty new diabetes centres in the Kingdom together with heart and obesity centres at national universities and tertiary care hospitals. A huge research initiative is focused on cardiovascular, diabetes and obesity with RFP (through science and technology units within universities and research institutions) sent twice a year and active research core facilities are being established nationwide.

The Saudi International Conference for Medial Technology will attempt to tackle this nationwide healthcare burden, highlight collective actions, and come up with recommendations endorsed by WHO and other national and international regulatory bodies. Diabesity is an international problem.

The Conference will also address dietary risk factors and their impact on the development of metabolic syndrome. It will highlight the effect of in utero exposure to maternal dietary load and the risk of development of disease in adulthood. The conference will bring together researchers and industry delegates to highlight the molecular mechanism of disease, potential novel biomarkers and possible therapeutic targets. In addition, an increased demand for identifying GMO products will drive demand for PCR assay testing competency within KSA. This presents a great opportunity for innovation within PCR assay testing, particularly innovations with the unique capabilities of the KACST solution.

The Saudi National Diabetes Registry – King Saud University / King Faisal Specialist Hospital and Research Center...

The Saudi National Diabetes Registry has been established with the primary objective of keeping records and a database of diagnosed Saudi diabetics living in the Kingdom. Currently 130,000 Saudi diabetic patients are listed on the national registry...

The National Diabetes Registry allows Saudi scientists to effectively manage and track diabetes patients in the Kingdom...

University Diabetes Centre at King Saud University

Diabetes is now being recognized as a public health problem of potentially enormous proportions.

Effective prevention and control measures are urgently needed to:

- Target modifiable risk factors for diabetes such as obesity and physical inactivity.
- Improve the treatment and management of diabetes.
- Delay or prevent debilitating complications.

The Saudi National Diabetes Registry is a database containing records of Saudi citizens diagnosed as being diabetic, who are currently undergoing treatment and whose physicians have consented to have their records included.

The registry includes the following:

- Demographic data
- Clinical details
- Management types and availability
- Medical file management
- Cost of the disease

Scope:

Registration of a patient is determined by:

- Saudi nationality - use of Saudi national identity card number
- Diagnosed with diabetes
- Consenting data collection.

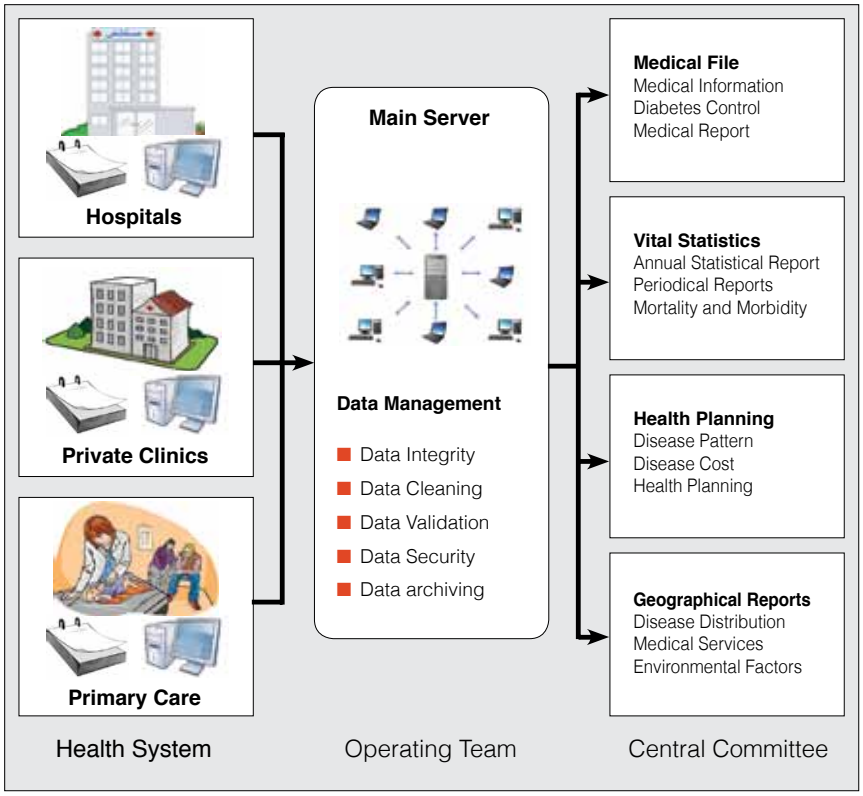
Information is collected from:

- Medical records.
- Direct interview.

Registry Software:

The national diabetes registry program is using a relational database on Microsoft Internet Information Server (IIS) to store and manage the registry data. This database is residing on a secure dedicated server for the National Diabetes Registry. The applications can be accessed through the Internet. Users can log-in data from their respective hospital or health centre without any fear of their data being access by another hospital. This is possible due to the segregation of data between various hospitals.

Data collection in Diabetes Registry



National registry end products

Disease Reports

The Diabetes Registry will produce periodical and annual reports of the extent of the disease, complications and method of treatment.

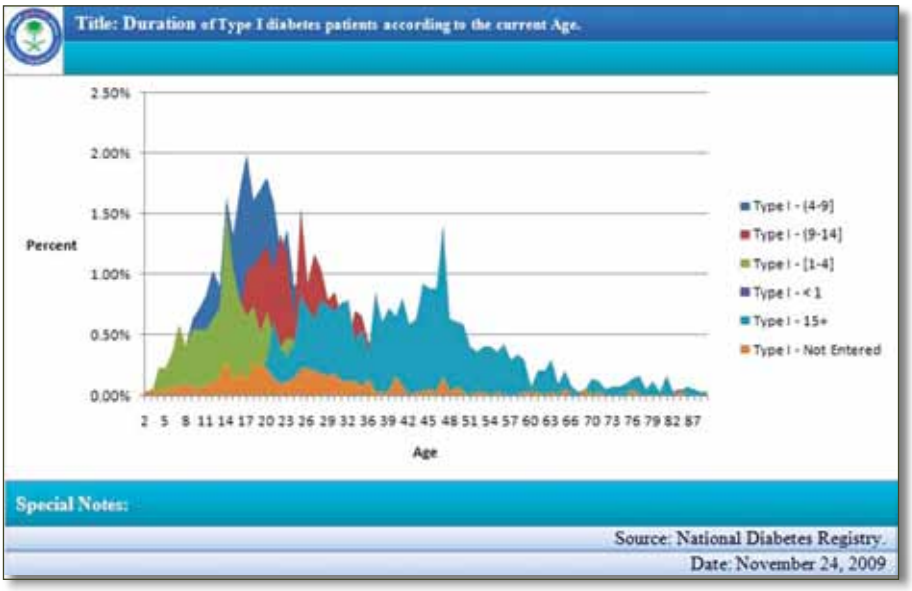
As shown in the following table/chart 1:

Patient's Body Mass Index grouped by Gender

As of 1/29/2006

Body Mass Index	Male	Female	Total
Underweight (Less than 25.0)	2481 (22)%	1039 (10)%	3520 (16.03)%
Normal (25.0 - 27.0)	1477 (13)%	665 (6)%	2142 (9.75)%
Overweight (27.1 - 30.0)	2043 (18)%	1390 (13)%	3433 (15.63)%
Obese (30.1 - 35.0)	1869 (17)%	2554 (24)%	4423 (20.14)%
Morbid Obesity (35.1 +)	776 (7)%	2480 (23)%	3256 (14.83)%
No BMI recorded	2475 (22)%	2709 (25)%	5184 (23.61)%
Total	11121 (51)%	10837 (49)%	21958 (100)%

As shown in the following table/chart 2:



Geographical atlas

The Diabetes Registry will provide an annual atlas of the disease at the Kingdom level which will provide unlimited information in the form of geographical maps about different diabetes types, complications, associated diseases, related mortality, drugs, medical facilities and risk factors.

Disease impact assessment

The registry will serve as a tool through which assessment of following impacts will be possible:

1. Social impact
2. Cultural impact
3. Medical impact
4. Financial impact

The Saudi National Diabetes Registry is a great resource in determining the prevalence rate of the disease in the country and to control it.

So far, 130.000 Saudi diabetic patients are registered to our Registry.

More than 25% of adults over 30 in Saudi Arabia have 'Diabesity'...

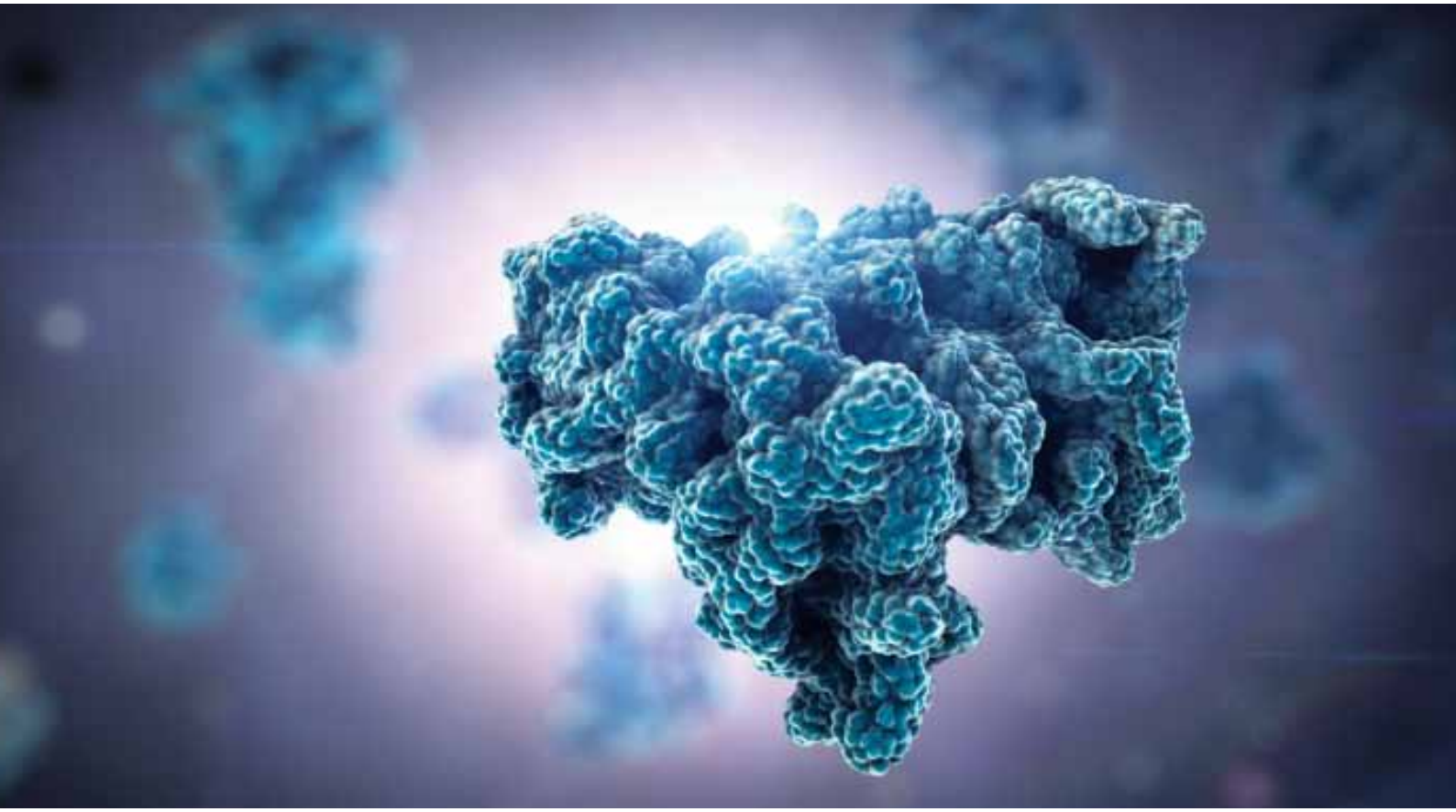
A unique therapy to treat diabetic ulcers and two patents related to diabetic wound dressing and glucose biosensing, are just some of the pioneering initiatives developed at KACST...

Diabetic foot or leg ulcers will affect nearly half a million Saudi's in their lifetime and can result in amputations...

Key initiatives include...

Unique wound management therapy developed for diabetic patients

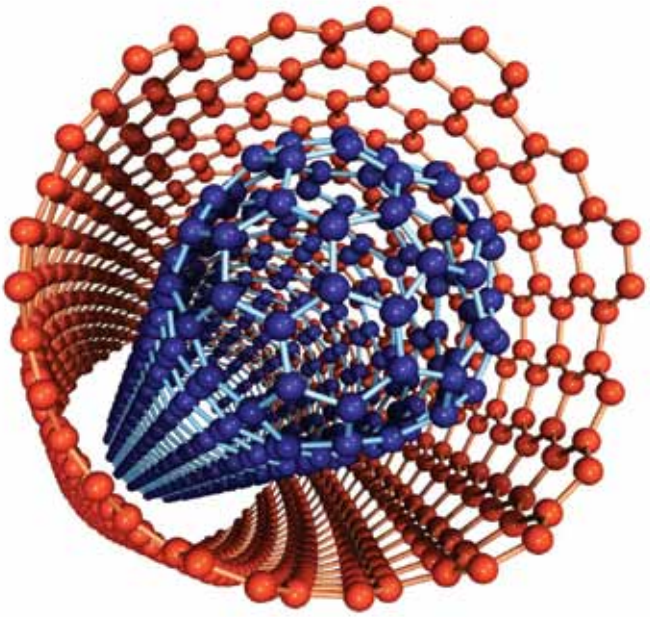
Diabetes is a huge health problem in Saudi Arabia. The Kingdom has one of the highest rates in the world. It results in lost work days, restricted activity days, mortality, and permanent disability, all of which pose a threat to the Kingdom's future economic development. Diabetic foot or leg ulcers will affect nearly half a million Saudi residents in their lifetime. If not treated effectively, ulcers can be crippling, resulting in limb amputation or even death. One common therapy, chemical hydro gels, may not be effective due to the emergence of drug resistant bacteria, deterioration of living cells, and long wound cleaning times. To be effective, a therapy must be inexpensive, readily available and reliable. In response to this emerging epidemic, researchers at KACST have developed a natural, low cost, and highly effective treatment for wound management, that could have a significant impact on the health of the Kingdom's growing diabetic population. The treatment is called Maggot Debridement Therapy (MDT). Lucilia sericata larvae (green bottle fly maggots) have a natural appetite for necrotic tissue, but ignore healthy tissue. When applied to diabetic ulcers, they quickly eat the rotting tissue and leave the healthy areas. This therapy has been found to clean wounds more effectively than other therapies, and works in days rather than the months that other therapies take.



Saudi scientists, have developed two important ideas related to the analysis and treatment of diabetes, which have been patented.

A novel wound dressing using chitosan-silver nanoparticles.

Research scientists have patented a novel wound dressing based on a unique type of chitosan-silver nanoparticles. Existing chitosan-silver wound dressing products have the risk of silver particles getting into the wound. In this product, this problem has been overcome by incorporating the silver into to the organic structure of chitosan using series of chemical reactions and nanotechnology techniques. Removing the dressing will not leave any silver molecules behind. This protects the wound from silver toxicity at the same time retaining its antimicrobial activity.



Carbon nanotubes based glucose sensor:

This is an innovative reagent-less glucose biosensing technique using multi-walled carbon nanotubes based glucose sensors. Multi-walled carbon nanotubes are used in order to increase the surface area for enzyme immobilization. The carbon nanotubes also act as ultra microelectrodes. This gives an excellent signal to noise ratio. This glucose sensor is devoid of any interference from the substances found in blood. It covers the entire pathophysiological range of glucose levels.

The Obesity Research Center and the Saudi Bio-bank play a key role in aiding Saudi scientists to study the main diseases affecting the Kingdom's population.

The ORC aims to enrich the field of clinically-oriented scientific research in the Kingdom by sharing the knowledge and expertise of world-renowned experts who hold a common interest in the fight against obesity...

The ORC is the first specialized national center for the comprehensive study of obesity and its related disorders...

The Obesity Research Center's objective is to execute a multidisciplinary research program on obesity, to support state-of-the art education and training on research, and to increase public awareness of the problem. It has sophisticated highly-equipped research laboratories and has established strong scientific collaboration with national and international universities and distinguished scientists.

Key Features of the ORC

The State-of-the-Art Proteomic Facility:

Thanks to the recent development of highly sensitive mass spectrometric equipment and difference in gel 2 dimensional electrophoresis (DIGE) technology, proteomic analysis tools have been proved very useful for new biomarker characterization in a growing list of chronic diseases, with just a few works in obesity field. Therefore, a state of-the-art proteomic facility was established at the ORC, and these innovative analytical technologies are being implemented for the characterization and quantification of key biomolecules in adipose tissues and biological fluids of obese patients. This valuable research facility allows the transfer of recent technology and training of Saudis on the appropriate use of such sophisticated equipment.

Cell Culture Laboratory:

Despite extensive studies, molecular events and pathological changes in obesity are far from being completely understood. Several research projects for defining the molecular basis of obesity and its related disorders are currently taking place and showing promising results. Interestingly, a novel biomarker for obesity, the orsomucoid molecule, was recently identified by the ORC in collaboration with a Korean group. Active research projects are now running to use this new marker for better diagnosis of obesity and as a potential target for new therapeutics for the prevention of obesity related complications.

Public Awareness and Community Service:

The ORC has developed a health education plan to increase public awareness about obesity and its effective preventive measures. The aim is to emphasize the importance of lifestyle modifications, for the prevention and treatment of obesity. This is accomplished through organization and participation in public workshops, lectures and seminars; distribution of educational materials; launching of public awareness campaigns, exhibitions and competitions about obesity in the mass media, and through the regularly-updated ORC website (www.obesitycenter.edu.sa).

The Saudi Bio-bank

The goal of the Saudi Bio-bank is to increase the quality of patient care and accelerate the impact of research on such care. It will implement the highest standards of biological banking to provide outstanding clinical, medical, demographic and analytic data through the use of broad consent forms.

The Saudi Bio-bank's objective is to implement the highest standards of biological banking in order to build genomic/ proteomics databases in the Kingdom, which will increase the quality of healthcare by creating a link between lifestyle, environmental factors and clinical practice.

It will include:

1. Buffy coat
2. Serum
3. Urine
4. Tissues
5. Cell Lines

Currently there are two main studies planned for the bio-bank. The first is a family based study with an expected sample of 100,000 people of all ages, comprised of 20,000-25,000 families, who will be examined or interactions in a range of common late onset diseases. The second will be to create a disease specific bio-bank where samples of people affected by certain diseases such as cancer, diabetes, and hypertension, will be collected from the specialized clinics of the National Guard Health Affairs in Riyadh.

Specific objectives of the bio-bank

1. To encourage the donation of samples.
2. To educate the public about the advancements that could come from the study of biological materials.
3. To enable the bio-repository community to collaborate on implementing best practices and promising approaches.
4. To enable the quantification of disease incidences in various populations and sub-populations.
5. To promote the understanding of natural histories and risk factors for these diseases including genome-environment interactions.
6. To accelerate the discovery and development of new diagnostics and therapeutics.

Cutting edge and competitive health technology research, are vital for the Kingdom to ensure the well being of its people and its future prosperity.

The KACST Advanced Medical and Health Research Program is dedicated to researching the major issues affecting the health of the Saudi population and developing solutions to them. The major research thrusts are focused on non-communicable diseases, communicable diseases, genetics, cell therapy, disabilities and environmental health...

The Kingdom's research endeavours include the use of databases to document and identify disease trends and epidemiology, and wet laboratory experiments to identify new mechanisms of disease as they exists within the general populous...

The KACST Advanced Medical and Health Research Program has the following mission, vision, and goals:

Mission

To promote research in the medical and health sciences in order to further health and well being in Saudi Arabia.

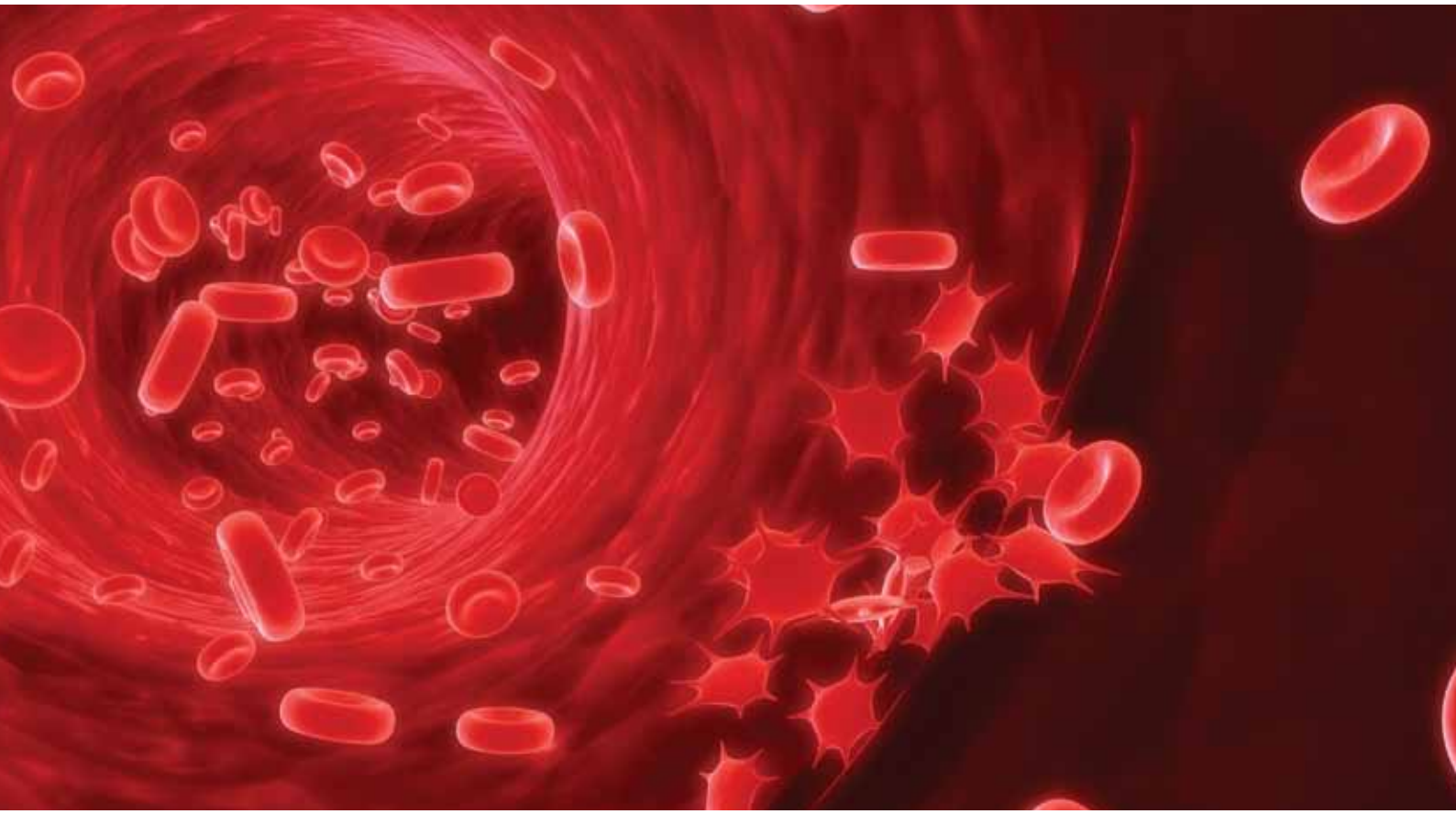
Vision

To advance the health and wellbeing of people in Saudi Arabia by developing the requisite national manpower, expertise, and infrastructure for sustainable, high quality, cutting-edge, and competitive research; by fostering and facilitating the performance of novel, interdisciplinary and collaborative research; and by effectively communicating to both policy makers and the public, findings of research and significance of promotion of health, prevention of disease and delivery of healthcare.

Goals

1. Development and retention of national manpower and expertise in medical and health science research.

A possible mechanism to attain this goal may be the use of grants and contract funding to support career development for researchers engaged in individual, institutional, or multi-centre, translational or clinical research. Such funding may also be used to provide grant support for senior, well established researchers, to allow for protected time devoted to research and mentoring and for young investigators to receive appropriate mentoring and training. These proposed methods mirror the longstanding practice of the NIH in the US.



Developing new diagnostic tools and treatments will help reduce the economic burden that healthcare places on the Kingdom's economy...

2. Development of infrastructure for sustainable, cutting-edge and competitive research in the medical and health sciences.

This goal can be achieved by the creation of a National Center of Health Statistics. This national center will collect, analyse and disseminate data pertaining to health statistics and burden of disease.

3. Facilitate the performance of novel, competitively funded and high quality research in the medical and health sciences.

This goal can be realized by the establishment of centers of excellence dealing with the defined burden of disease highlighted previously. Priority centres may include a National Center for Diabetes, National Center for Cardiovascular Disease, National Center for Asthma, National Center for Cancer, National Center for Communicable Diseases, and National Center for Neurodegenerative Diseases. These centers will perform intramural research in specified disciplines and will extramurally fund research at nationally recognized universities, research centres, medical centers, teaching hospitals, and other qualified organizations engaged in biomedical research or health sciences.

4. Effective communication of research findings and significance of those findings to policy-makers and the public.

This goal can be achieved through a designated corporate affairs unit within the proposed National Council for Medical and Health Sciences Research. The unit may provide administrative support services that include human resources, financial and facilities management, security and procurement, transportation, and liaison with various governmental and private external entities.

The Saudi International Medical Technology Conference is organized by King Abdulaziz City for Science and Technology

The Saudi International Conference for Medical Technology is a chance for experts and world leaders in this field to meet, share best practices, and review evolving technologies...

King Abdulaziz City for Science and Technology (KACST)...

مدينة الملك عبدالعزيز للعلوم والتقنية KACST

King Abdulaziz City for Science and Technology (KACST) is both the Saudi Arabian National Science Agency and its national R&D laboratories. KACST plays a key role in science and technology policy making, related data collection, funding of external research, and other related services such as scientific publishing and managing the patent office. Main Responsibilities include: proposing a national policy for the development of science and technology and relevant strategies; supporting scientific research and technology development; conducting applied research advising government; fostering national innovation and technology transfer between research institutes and the industry; fostering international cooperation in science and technology.

For more information and online registration, please visit the conference website:

www.kacstmed.org

www.kacst.edu.sa