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ALLIANCE TO STRENGTHEN NATIONAL GENOMIC MEDICINE

KAIMRC and King Abdulaziz University collaborate to achieve more effective diagnoses and customized treatments.



specific research projects related to genetics and personalized medicine to develop treatments based on patients' genetic makeup. They also plan to build specialized reference laboratories in the country to boost local expertise, cut analysis costs, and ultimately achieve self-sufficiency in this field.

According to Haoudi, the agreement "aims to encourage cooperation, research, and training exchange between professionals from both centres in areas of mutual interest."



KAIMRC has joined forces with King Abdulaziz University's Center of Excellence in Genomic Medicine Research to enhance national capabilities and capacities in genomic medicine. A memorandum of understanding has been signed.

Genomic medicine is the scientific field that accesses genetic information for more effective diagnoses and tailor-made treatments.

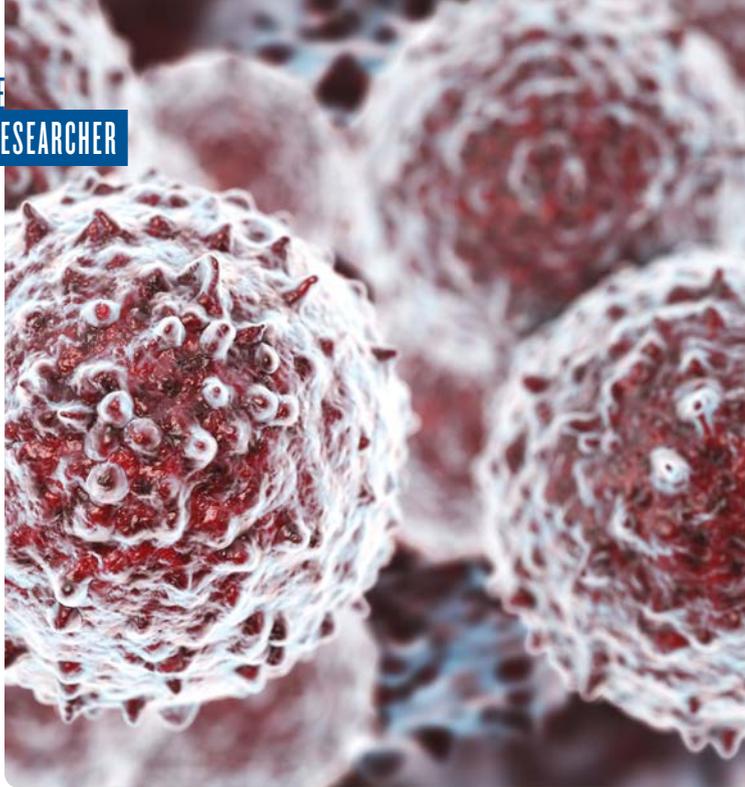
The collaboration comes as KAIMRC solidifies its foundation in biomedical and clinical research. "We will now focus on strategic partnerships in a number of key areas,"

including genomic medicine, says Abdelali Haoudi, head of KAIMRC's strategy and business development.

The agreement with KAU "aims to produce tangible outcomes and impact human health through genomic medicine," says Haoudi. The initiative is considered a part of the national drive towards firming up a knowledge-based economy in line with Saudi Arabia's Vision 2030.

Through continuous cooperative efforts and extensive exchanges of scientific and clinical expertise, the partners have agreed to promote





GIVING THE CELLS OF LIFE

KAIMRC celebrates stem cell giving

Stem cell donors were awarded the King Abdulaziz Medal of the Third Order at a ceremony held in their honor at KAIMRC recently. The medals were presented by Prince Khalid bin Abdulaziz bin Ayyaf, minister of the National Guard.

During the event, Prince Khalid thanked the donors, saying that giving, of all kinds, is an intrinsic value in Islam. “Our aim is to promote this value, and to honour and celebrate donors,” he said. He added that KAIMRC is an incubator and developer of many innovations and technologies that have the potential to improve the lives of Saudis.

“The Saudi Stem Cells Donor Registry found a donor for my three-month-old child,” said the father of an infant with haemophagocytic lymphohistiocytosis, a life-threatening immunodeficiency. The father had all but lost hope in finding a donor when none of his family members were found to be good matches for his son.

“The Saudi Stem Cells Donor Registry found a donor for my three-month-old child.”

The executive director of the Saudi Stem Cells Donor Registry, Mohsen Al-zahrani, said that almost 60,000 people have added their details to the registry following several nation-wide campaigns aimed to create awareness about the importance of stem cell donation.

He added that the registry is a member of Bone Marrow Donors Worldwide, an international organization that includes 72 stem cell donor registries from 52 countries, and 47 cord blood banks from 32 countries.

The main goal of the Saudi Stem Cells Donor registry is to help find donors for patients requiring stem cell transplants for the treatment of some intractable diseases, he said.

The registry includes a stem cell bank that uses state-of-the-art technology and is operated by specialist Saudi researchers and technicians, added KAIMRC’s executive director, Ahmed Alaskar.



KOREAN COLLABORATION TO BOLSTER CAPACITY FOR CLINICAL TRIALS

KAIMRC and KoNECT join hands to build clinical trial infrastructure.

KAIMRC’s push to become Saudi Arabia’s national hub for clinical research and innovation has been boosted by a new partnership with the Korea National Enterprise for Clinical Trials (KoNECT). Established in 2007, KoNECT helped put South Korea on the global map for industry-sponsored drug studies.

Under the terms of the agreement, KAIMRC and KoNECT will collaborate to build clinical trial infrastructure in Saudi Arabia and to jointly run biomedical research studies.

As recently as the early 2000s, there were only a few dozen drug trials in South Korea each year. It barely registered among the major world players when it came to pharmaceutical innovation. But through a series of regulatory reforms and strategic investments in initiatives like KoNECT, the country established itself as a go-to destination in Asia for drug companies and other trial sponsors. Now, South Korea hosts well over 600 trials annually, and ranks sixth in the world in the number of interventional trials.

Saudi Arabia now hopes to emulate that success in the Gulf region. KAIMRC aims to train more clinical investigators, build the information technology resources needed to run trials and store data, develop appropriate oversight structures, and draft an implementation plan for becoming a national coordinator for clinical trials. The expertise and know-how provided by the collaboration with KoNECT should help KAIMRC achieve those goals.

“KAIMRC and KoNECT will jointly develop national capacities and capabilities for clinical trials in KSA.”

PROVIDING LEADERSHIP IN HEALTHCARE DELIVERY

CEO Bandar Al Knawy edits a book on reliable healthcare



The book demonstrates how strong leadership can ensure reliable standards of patient care and explains how excellence can be achieved.

Healthcare delivery is rapidly transforming around the world. A new book edited by Bandar Al Knawy, president of King Saud bin Abdulaziz University for Health Sciences and the chief executive officer of the Ministry of National Guard—Health Affairs (MNG-HA), aims to mentor healthcare managers on building and sustaining a trustworthy and reliable system.

A strong proponent of high-quality care and patient safety, Al Knawy laid the foundation for the Medication Safety Programme in Saudi Arabia as well as many patient safety initiatives at the MNG-HA. The book, *Leading Reliable Healthcare*, demonstrates how strong leadership can ensure reliable standards of patient care and explains how excellence can be achieved.

Many books have addressed the principles that govern high reliability organizations: “those that achieve outstanding levels of safety and performance despite operating in high-risk environments,” writes Al Knawy. In contrast, this book offers complementary hands-on knowledge through informative and detailed descriptions to balance theory and practice. These real-life examples include a picture of how Canadian provincial governments prepare their healthcare workforce for clinical practice and an account of how the management of King Abdulaziz Medical City in Riyadh responded to a MERS outbreak in its emergency department.

In the foreword, Johns Hopkins Medicine CEO Paul Rothman describes the book’s “insightful, practical perspectives from experts around the globe who have pioneered innovations in medical practice and clinical operations in the name of providing consistently excellent care.” To ensure a global take on healthcare management, Al Knawy handpicked the book’s contributors, who are practicing healthcare managers, based on their diverse approaches, practices and experiences.



A CLEAN ROOM FOR A HOME-GROWN INDUSTRY

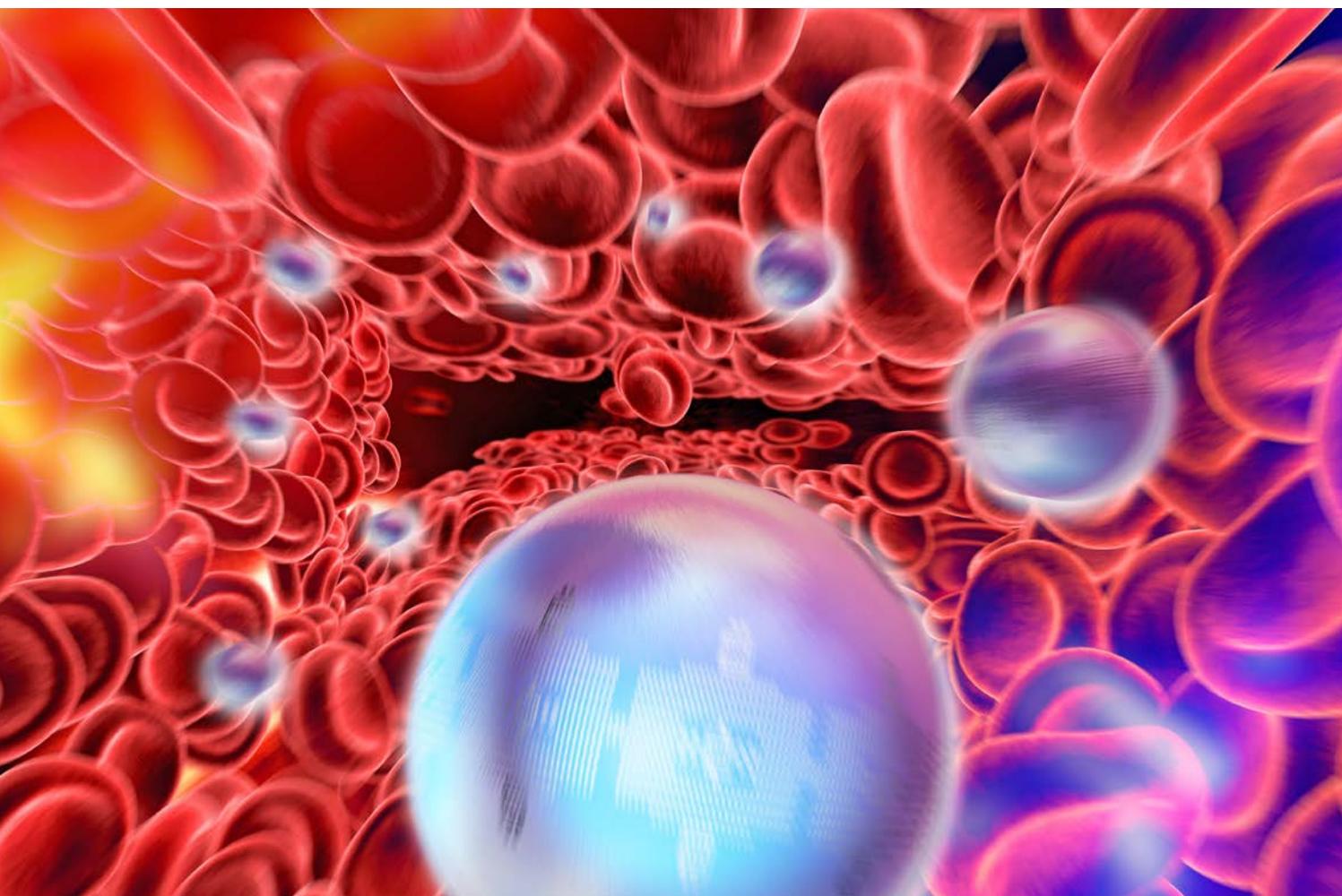
KAIMRC has launched a clean room facility within its biotechnology park, reaching an important milestone in reducing Saudi Arabia’s reliance on imported life science products.

The facility is the culmination of a partnership between the Ministry of the National Guard—Health Affairs and the US company UFC Biotech.

Manufacturing and distributing viable pharmaceuticals and biologically relevant equipment hinges on clean, safe, and uncontaminated products. KAIMRC’s clean room is expected to meet these needs by providing a controlled manufacturing environment with low levels of pollutants, such as dust, aerosol particles, airborne microbes, and chemical vapours.

KAIMRC REPRESENTED AT NANOMED2018

KAIMRC's Khalid M. Abu-Salah speaks at the International Conference on Nanotechnology in Medicine in Manchester



PASEKA/SCIENCE PHOTO LIBRARY/BRAND X PICTURES/GETTY IMAGES

KAIMRC's Khalid M. Abu-Salah has participated in the Fifth International Conference on Nanotechnology in Medicine (NanoMED 2018), held in Manchester, UK from June 26-28, serving as a member of the scientific and organizing committee and a keynote speaker.

His lecture at the conference was titled "DNA-based Nanobiosensors as an Emerging Platform for Detection of Disease" and focused on the detection of infectious diseases, genetic diseases, cancer and markers of immunodeficiency-related diseases, in addition to DNA-based cellular bioimaging.

Abu-Salah is a professor of biochemistry and

nanobiotechnology at (KAIMRC) and one of the main cofounders of the King Abdullah Institute for Nanotechnology (KAIN) at King Saud University. His research interests include development of laboratory nanodiagnostic and treatment of the Middle East Respiratory Syndrome (MERS) employing nanotechnology approaches. "My latest research project at KAIMRC aims at developing novel and rapid aptameric-based nanodiagnostic assay for the corona virus, which causes MERS," says Abu-Salah. He has also published various papers and filed several patents in the fields of nanobiosensors and nanosystems for drug delivery. He received his PhD from the University of Leeds in 1978 and

has been a fellow of the Institute of Biomedical Sciences in the UK since 1993.

The conference included sessions on nanotechnology in tissue engineering, enzyme responsive tissue scaffolds, guiding stem cell differentiation and nanoscale tissue scaffolds. It also discussed the use of nanotechnology in diagnosis and imaging as well as drug delivery, including targeted drug delivery and nanovehicle delivery systems. Around 20 keynote speakers participated in the different activities of the conference and selected papers presented at the NanoMED 2018 conference were published in the Journal of Interdisciplinary Nanomedicine and Functional Nanostructures.



PHASE I TRIALS UNIT BRINGS FIRST-IN-HUMAN STUDIES TO SAUDI ARABIA

KAIMRC set to transform clinical trials in the kingdom

No country has been as hard hit by Middle East Respiratory Syndrome (MERS) as Saudi Arabia. Yet, when GeneOne Life Science set out to test the safety and efficacy of its candidate vaccine against the MERS coronavirus, the Korean biotech company — like other developers of experimental MERS medicines — launched its initial study in the United States.

It may have wanted to run the study in the epicenter of the MERS epidemic, but the fact is that Saudi Arabia, despite representing 60 percent of the pharmaceutical market in the Gulf region, has not had the infrastructure for these types of first-in-human clinical studies.

In a national first, KAIMRC has opened a new clinical translational unit dedicated to running phase I trials in Saudi Arabia with its affiliated hospitals. One of the first studies planned will focus on a novel MERS vaccine developed by KAIMRC's Naif Khalaf Alharbi in collaboration with researchers at the University of Oxford. Another will trial a stem cell-based therapy developed by KAIMRC's Mohamed Abumaree for inflammatory diseases such as atherosclerosis.

Phase I studies are distinct among clinical trials because they involve drugs or vaccines that have never been taken by humans before. The study subjects, who are often healthy volunteers, are unlikely to derive any medical benefit from taking part. That makes it difficult to find people willing to enroll in phase I studies; more so than it is for later-phase trials, which can draw from populations of critically ill patients in need

of novel treatment options.

“The idea of volunteering oneself to test a new drug is new to the society,” says Badr Aljohani, a clinical pharmacologist who is leading the new unit. “It’s challenging and it has to be approached carefully.”

Participants in phase I studies are often paid for their time and the risks incurred, but it’s critical, says Aljohani, that these financial incentives do not cross a line and become coercive. “Our goal,” he says, “is to succeed in patient recruitment by building an interactive community of healthy volunteers and making friends with other research institutions.”

Conducting phase I studies in Saudi Arabia is imperative for ensuring that drugs and vaccines of national importance are safe and effective in the local population. These trials are designed to determine whether there are any side effects associated with increasing doses. It is possible that a dose that raises no red flags in American or European study subjects may prove toxic for Saudis, given their unique genetic makeup.

Alharbi, the lead scientist on the MERS vaccine study, points to another benefit of running the phase I trial domestically. “It will prepare the scientific team, the community, and the regulators,” he says, “and smooth the way for testing this vaccine in a phase II trial in this country in the near future.”

Currently, Saudi Arabia hosts around 0.2 percentage of the world’s clinical trials, and of that tiny fraction only 1 in 20 are phase I studies. The new KAIMRC unit will boost those numbers.



AL AHSA ANIMAL FACILITY BRINGS NEW OPPORTUNITIES

A new state-of-the-art animal facility at KAIMRC’s Al Ahsa Eastern branch will support research involving the use of laboratory animals.

“The rodent vivariums located in Jeddah, Riyadh, and Al Ahsa will provide a comprehensive platform for researchers in three distinct and geographically distant regions of the country,” says Abderrezak Bouchama, head of KAIMRC’s department of experimental medicine.

The Al Ahsa facility was designed according to international standards to ensure the health, safety, and humane care of research animals. It will be managed by veterinarians and animal technicians who have completed their training at Monash University in Australia.

The vivarium can hold up to 18,000 rodents, and will foster basic and translational research. Investigators will receive training and education about the humane and ethical handling, care, and use of the animals. This will increase laboratory animal use for research and, consequently, enhance high-quality scientific output. A KAIMRC committee will implement an institution-wide policy addressing animal care and use.

JOINT CENTER TO BUILD BIOMEDICAL RESEARCH CAPACITY

KACST, KAIMRC and Harvard-affiliated BWH collaborate on new center.

Seven years after King Abdulaziz City for Science and Technology (KACST) joined forces with the Massachusetts Institute of Technology in the US to create a new centre devoted to the study of complex engineering systems, it has once again partnered with a world-class institution from the Boston area, enlisting KAIMRC in the collaboration.

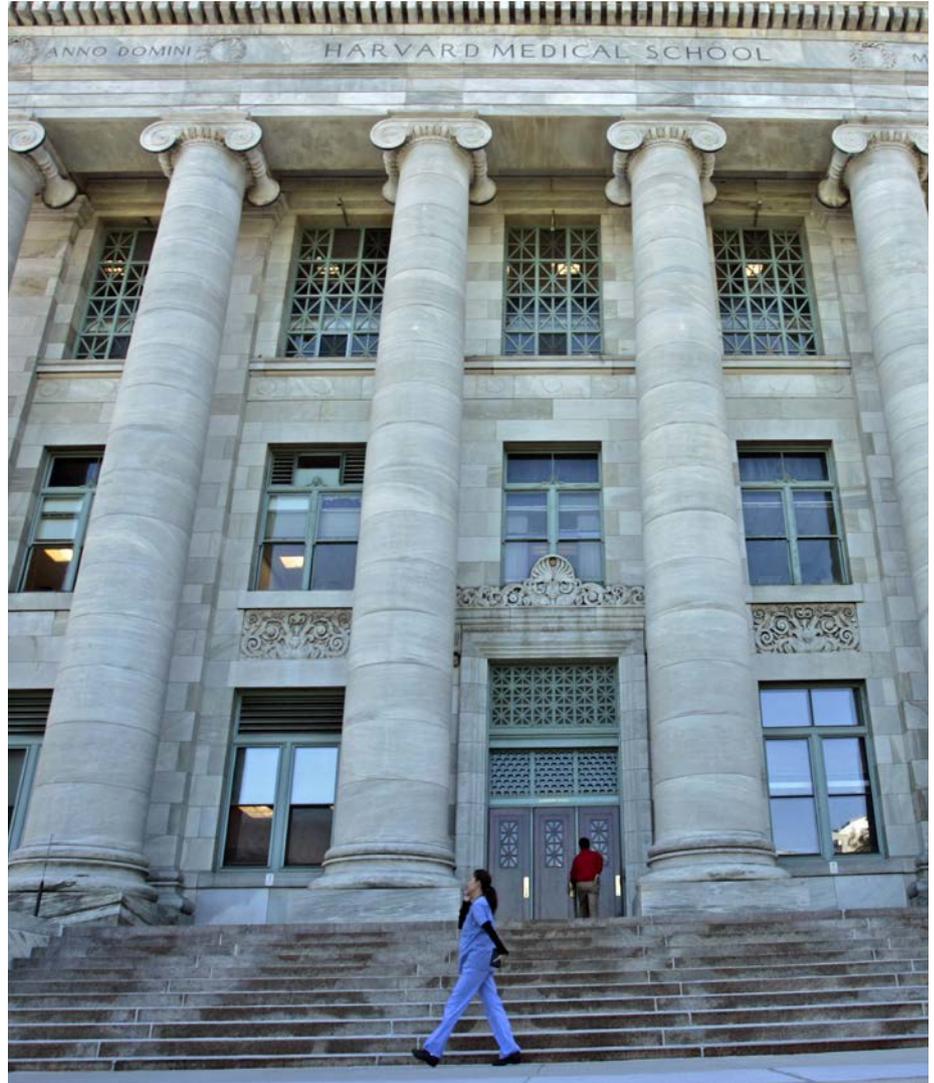
The new Center of Excellence in Biomedicine (CEBM) unites researchers from KACST, KAIMRC and the Harvard Medical School-affiliated Brigham and Women's Hospital (BWH) to focus on research in nanomedicine, neurodegeneration and stem cells.

"Our main goal is to train and collaborate with the next generation of Saudi scientists," says Harvard-BWH cancer biologist, Khalid Shah, who co-directs the CEBM alongside KACST nanomedicine researcher, Ali Alhasan. "This effort is synergistic of the expertise on both sides," adds Jeff Karp, a bioengineer at Harvard-BWH. The Saudi partners are "emerging leaders," he says, "which is very exciting."

Previous joint centres established by KACST with international partners had focused on everything from petrochemicals and advanced manufacturing to green nanotechnology and aeronautics. In the life sciences, KACST launched a joint Center of Excellence for Genomics with the Chinese Academy of Sciences, a collaboration focused solely on plants and pests of agricultural significance.

The CEBM is the first in the Joint Centers of Excellence Program — part of the kingdom's national strategy to create a knowledge-based economy — that is aimed squarely at technology of medical importance. The centre held a kick-off symposium last September in Boston and a second workshop in February at KAIMRC in Riyadh.

At the February event, faculty members from Harvard-BWH and their postdoctoral fellows outlined the scope of the planned research projects and presented preliminary data gathered to date.



KEVIN GALVIN / ALAMY STOCK PHOTO

"Our main goal is to train and collaborate with the next generation of Saudi scientists."

One project — led by KAIMRC geneticists Manal Alaamery and Salam Massadeh, together with Harvard-BWH neuroimmunologist Francisco Quintana — is investigating how gene variants identified by the Saudi Human Genome Program contribute to multiple scler-

osis and other neurodegenerative diseases.

Another project, led by Khalid Shah and KACST scientist Mohannad Alfalltah, is engineering stem cells to treat cancer and neurological disorders, while a third, led by Jeff Karp and KACST scientists Ali Alhasan and Abdulaaziz Almaliki, is using nanotechnology to treat liver and lung diseases.

As part of the collaboration, six graduate students from KAIMRC and KACST will spend time as visiting research fellows in Boston.



KAROLINSKA'S PROFESSOR WEDELL VISITS IN APRIL

Nobel Committee's Anna Wedell visits KAIMRC.

Anna Wedell, professor of medical genetics at the Karolinska Institute in Sweden, who also presides over the Nobel Committee for Physiology or Medicine, visited KAIMRC in April to meet its faculty and staff. "This visit adds to the existing exchange between KAIMRC and the Karolinska Institute and helped strengthen our on-going collaborations," says Abdelali Haoudi, head of KAIMRC's strategy and business development.

Wedell shared her expertise in medical genetics and genomics, a strategic focus area in KAIMRC's research and development agenda. "She also learned about our capabilities and capacities in this fast-growing area of medical research," says Haoudi.

Over three days, Wedell discussed common areas of interest with clinical experts in genetics and genomics at King Abdulaziz Medical City. She was also the keynote speaker at an in-house symposium about precision medicine, an emerging disease management approach that could soon produce new therapeutics for the treatment of rare diseases.

She was a guest speaker at the CEO Leadership Forum for Healthcare, a forum organised by Bandar Al Knawy, the CEO of the Ministry of National Guard Health Affairs. Open to all scientists, clinicians, faculty, and senior executives from the healthcare sector as well as research and development administrators, the event tackled critical issues and new developments in genomic medicine.

STRATEGIC MOVE AGAINST GENETIC AND RARE DISORDERS

KAIMRC dedicates a new program to genetic and rare diseases.



BRAIN LIGHT / ALAMY STOCK PHOTO

KAIMRC is stepping up its fight against genetic and rare diseases. Deputy executive director Majid Alfadhel unveiled a new program dedicated to this cause at a recent strategy workshop.

The program is one of the centre's priority research areas, along with cardiovascular diseases and metabolic disorders, neurological disorders, cancers, and infectious diseases.

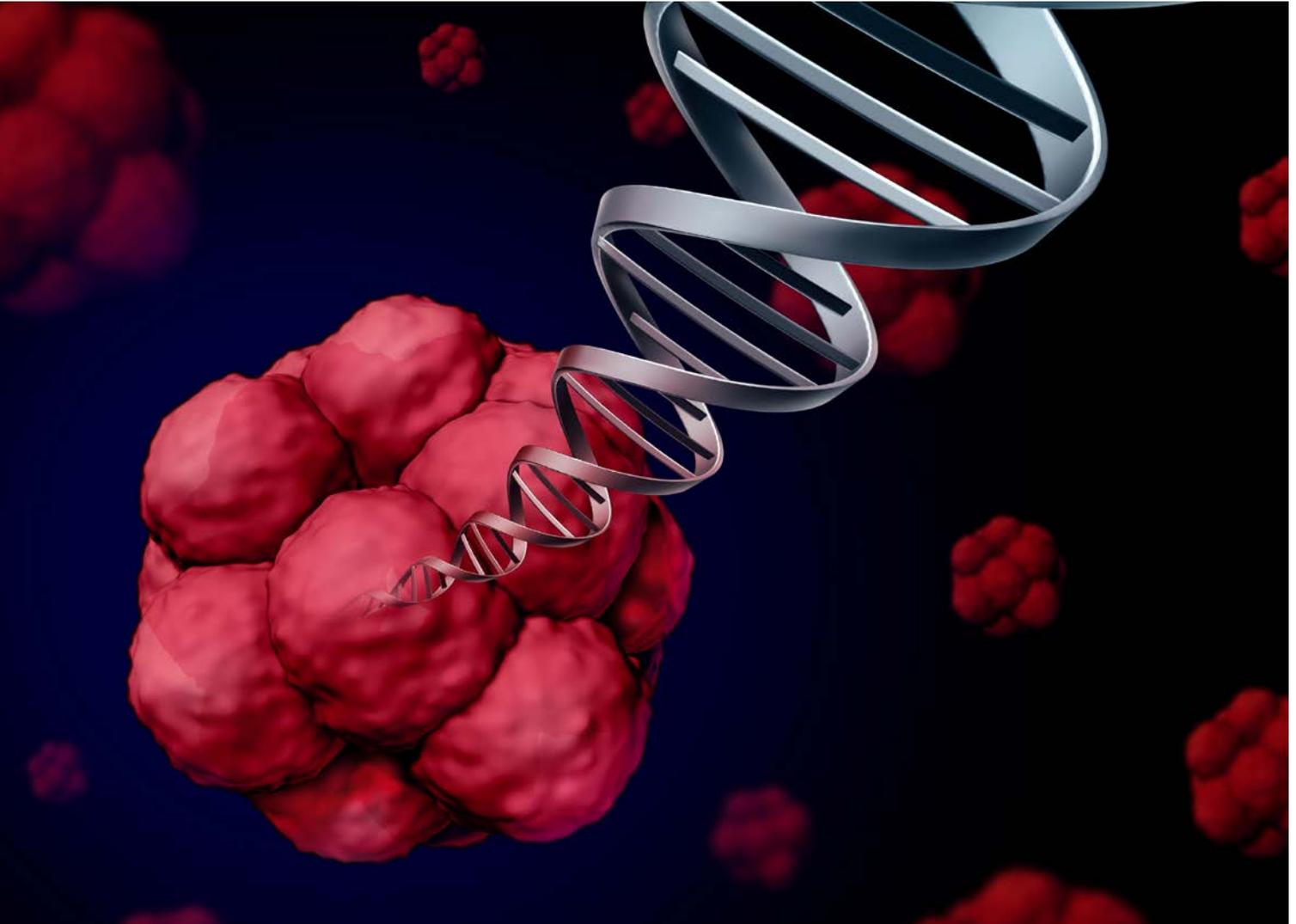
Rare diseases are conditions that affect a very small proportion of a population and are often genetic in origin. There could be as many as 7,000 rare diseases, collectively affecting millions of people worldwide. In Saudi Arabia, consanguineous marriages and large family sizes are common, increasing the prevalence of inherited genetic and rare disorders. This makes the Saudi population an ideal model in diagnostic and functional studies.

Alfadhel, who formerly headed the genetics division at King Abdullah Specialist Children Hospital and the Ministry of National Guard–Health Affairs' Newborn Screening Program, outlined the program objectives, including the identification of target diseases, finding disease mechanisms, and developing new diagnostic platforms and therapeutic approaches. The program will investigate disorders through diagnostic, functional, and animal model studies. Researchers will build on their expertise in metabolomics and proteomics to understand these diseases at the molecular level and eventually develop therapeutics, such as stem cell therapies. KAIMRC's research-enabling platforms and core facilities will underpin the new program.

There could be as many as 7,000 rare diseases, collectively affecting millions of people worldwide.

KAIMRC HOSTS STEM CELLS FORUM

The fourth Stem Cell and Cellular Therapy Conference was held last October.



BRAIN LIGHT / ALAMY STOCK PHOTO

For the fourth time since 2012, KAIMRC hosted the Stem Cell and Cellular Therapy Conference from October 21 to 25. Held under the auspices of the CEO of the Ministry of National Guard-Health Affairs, Bandar Ben Al Knawy, the conference included 30 papers from local and international researchers.

Experts on stem cells from KSA, the U.S., Britain, France, Sweden, Italy, Australia and New Zealand participated in the conference.

The conference kicked off with a stem cells workshop held at the King Saud bin Abdulaziz University for Health Sciences at the Ministry of National Guard. Throughout the five days, participants shed light on KAIMRC's latest

researches in the field of cancer, diabetes and cardiac and contagious diseases treatment. The conference also featured the latest developments on the international arena in the various fields of stem cells and cellular research, and related clinical applications. It also included various theoretical and practical sessions on topics like isolation and characterization of stem cells from the human placenta, inducing stem cells, tissue engineering and umbilical cord blood.

Mohamed Abo El Marei, head of the scientific committee, said that the main objective of the workshop is to train future researchers and scholars and develop their skills to bridge the gap between theory and practice. Participants

The conference included 30 papers from local and international researchers.

were also granted 24 hours of scientific training, accredited by the Saudi Commission for Health Specialties.

So far, KAIMRC has transplanted 200 cells through its program for transplanting stem cells in children and adults. "The Saudi stem cell donation center is meant to attract potential donors from Arab countries. We have had 5,000 donors so far," said Ahmed Al-Askar, Executive Director of KAIMRC.