



مركز أبحاث مؤسسة الجليلة
Al Jalila Foundation Research Centre



Engage • Train • Research

**Unlocking
Medical Solutions,
Transforming Lives**



We may not live for hundreds of years, but the products of our creativity can leave a legacy long after we are gone.

His Highness Sheikh Mohammed Bin Rashid Al Maktoum
Vice-President and Prime Minister of the UAE and Ruler of Dubai





**A visionary science hub
in the heart of Dubai, serving humanity**

Converting our ambitions into an everyday reality

Al Jalila Foundation is a global philanthropic organisation dedicated to transforming lives through medical treatment, education and research. We aim to position the city of Dubai and the United Arab Emirates as a platform for global medical innovation – research is an integral part of our strategy.

Our work at Al Jalila Foundation Research Center supports the UAE Vision 2021 where research and innovation are at the core. Our hope is that it will be the catalyst for ensuring a thriving biomedical research culture.

Scientists around the world continue to search for answers into the causes, prevention and treatment of diseases affecting mankind. We share a vision – to see a world devoid of cancer, cardiovascular disease, diabetes, obesity or mental illness – and an obligation to safeguard the health of our children, and children’s children.

Our investment in medical research reaffirms our commitment to embed research and innovation in the fabric of the nation’s long-term healthcare strategy. Medical research has the potential to save lives and our efforts today will pave the way for advancements in medicine, giving hope to many.

Research is a life-long commitment and a responsibility we take seriously. A responsibility to our founder who has entrusted us with his vision. Responsibility to our donors who have empowered us to fulfill our mission. And responsibility to the people we serve: be it a hopeful patient, an aspiring student or a pioneering scientist.

We will work diligently to drive the national dialogue around the importance of medical research, and inspire medical breakthroughs, to improve lives in the United Arab Emirates and beyond.

HE Dr Raja Easa Al Gurg
Chairperson of the Board of Directors
Al Jalila Foundation



Local origins, global vision

It is hard to believe that less than a century ago, we did not have cures for diseases like tuberculosis. It seemed impossible to imagine that entire continents could kick out epidemics like polio.

In the same vein, some of today's biggest medical challenges may seem to have no solution in sight. Al Jalila Foundation believes that where there is life, there is hope, and where there is a will, there is a way. We have the 'will', now it is time to find the 'way'.

Over the years medical discoveries have translated into improved treatment protocols and therapies. And, with each new breakthrough, a new sense of hope emerges.

Advances in medical research are critical to the nation's prosperity and longevity. We, at Al Jalila Foundation, are proud to support Al Jalila Foundation Research Centre because today's investments in medical research will go a long way to ensuring better treatment options for future generations – giving hope to countless patients and their families.

It is our belief that the benefits of our work will extend regionally and internationally because hope has no borders. With the support of our partners, the United Arab Emirates will lead the way and usher in a new era of medical progress through innovations in healthcare delivery, medical education and research.

Through Al Jalila Foundation Research Centre we hope to inspire medical advancements that will benefit future generations and realise our vision to be at the forefront of global medical innovation.

Dr Abdulkareem Sultan Al Olama
Chief Executive Officer
Member of the Board of Directors
Al Jalila Foundation



**Unravelling the mysteries
of diseases affecting mankind**

Welcome Note

I am immensely grateful to His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, for championing innovation and research, and for establishing Al Jalila Foundation, a global philanthropic organisation dedicated to developing medical research in the UAE. It's a dream come true!

Research provides a portal to discovering new knowledge, advancing medical breakthroughs, and propelling economic development. Medical research is one of the bedrock of Al Jalila Foundation and to support its vision Al Jalila Foundation Research Centre was established to develop Dubai and the UAE into a regional hub for medical research.

Al Jalila Foundation Research Centre ensures that funding schemes are propagated effectively, applications for funding are peer-reviewed rigorously, funded projects are monitored appropriately, completed projects are assessed fairly and results disseminated to the wider community. Our ultimate goal is to ensure that research findings generated by our funds can be translated into improved healthcare delivery. We are confident that our work will contribute to promoting better health outcomes and improving quality of life.

Our priority is to create opportunities to increase innovative and impactful research in the UAE to support our vision. Whilst still in our infancy, until 2015, we have supported 33 projects and funded 4 international fellowships. We have invested over AED 9 million in research studies covering a number of themes and topics. Our research is focused on cutting-edge translational research with the intent of confronting and mitigating some of the most challenging diseases in the UAE today. Through our research mission, we seek to identify causes of disease and to build on basic and clinical research findings to develop innovative prevention and treatment strategies.

We are proud of the quality of research we have sponsored and inspired by the capabilities, achievements and innovativeness of our grant recipients. It gives me immense pride to present Al Jalila Foundation Research Centre Portfolio; here you will find all the information on our grant recipients and an overview of their research projects. As I write, we are in the middle of the 2016 research grant cycle and we hope to bring many more research projects to fruition as we continue to expand our research portfolio.

May I take this opportunity to thank AJF Board of Trustees, Board of Directors, International Scientific Advisors and the Scientific Advisory Committee for their continued support and foresight. And, of course, special recognition to each one of our grant recipients for their unwavering commitment to biomedical research.

Professor Sehamuddin Galadari
Chief Executive Officer
Al Jalila Foundation Research Centre



**Pioneering the present
Healing the future**

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A unique opportunity to champion
the future of medicine

Overview of Our Grants 2014 & 2015



AED 9M invested in local research



109 grant applications received



100+ reviewers from **28** countries



33 grants awarded



13 nationalities



12 institutions



4 Emirates



31 publications in international journals



56 presentations at international conferences



66 research training completed








3 PhD Thesis

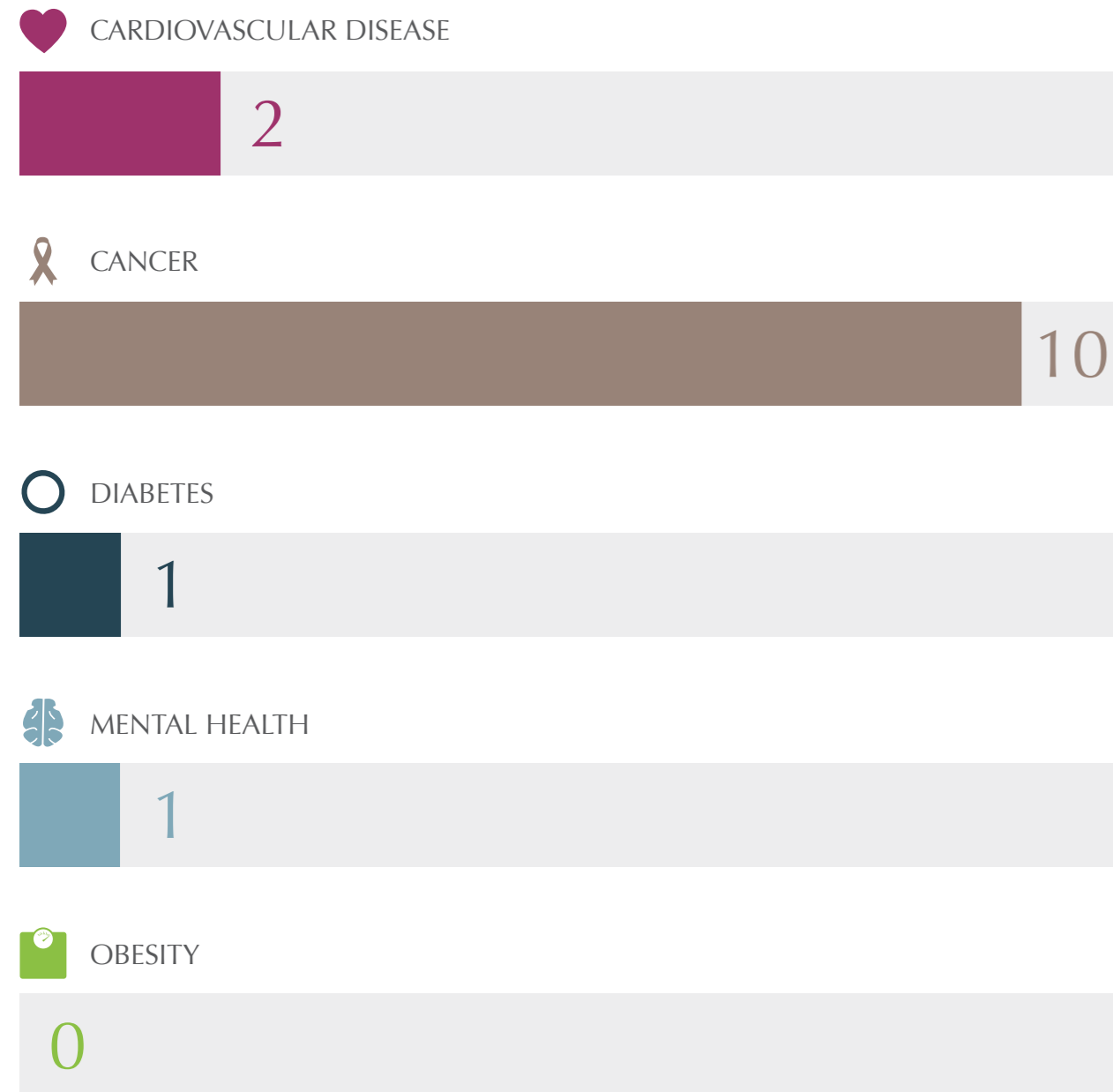


Bringing together brilliant minds
to discover solutions

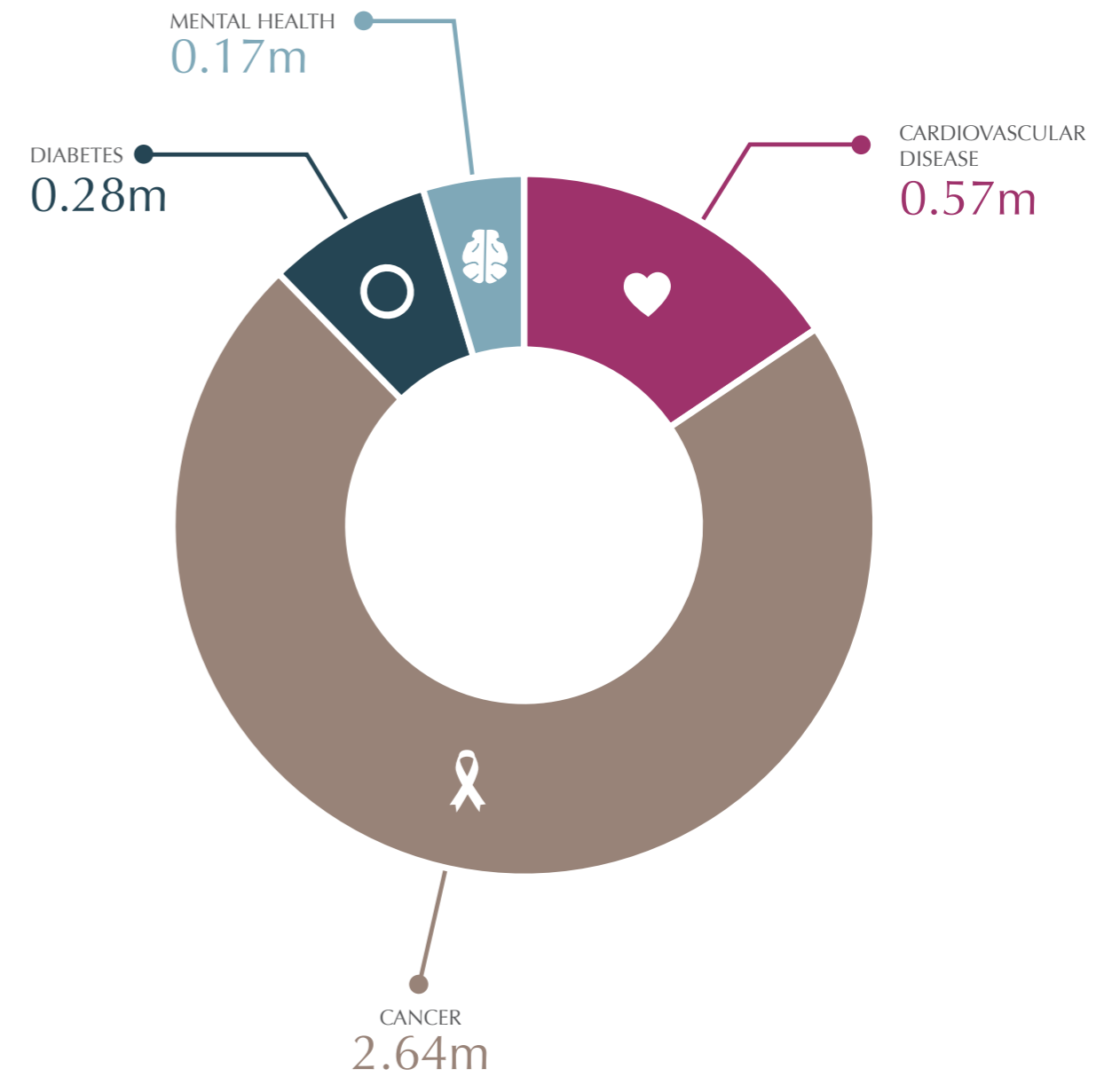
Total Grants Funded by Theme

		Number	AED (m)
	CARDIOVASCULAR DISEASE	3	0.84
	CANCER	18	4.72
	DIABETES	5	1.37
	MENTAL HEALTH	4	0.55
	OBESITY	3	0.78
Total		33	8.26

Our Grants Funded by Theme 2014



Our Grants Funded by Value 2014 (in AED)





Dr Chih-Wen Ni
 BS, MS, PhD
 Assistant Professor
 Department of Biomedical Engineering
 Khalifa University for Science, Technology and Research



Research Theme
 Cardiovascular Disease and Cancer

Project Title
 The mechanism of vascular remodeling by blood flow in zebrafish.

Vascular remodeling plays a key role in the progression of several diseases, including cancer and cardiovascular disease. A better understanding of the mechanism at the molecular level is critical to the development of efficient treatment. The team has previously investigated the profiles of gene expression in response to different flow patterns; however, the knowledge of the role of each specific gene is still unknown. For this study, the approach will include editing the zebrafish genome to create a mutant zebrafish, which will silence specific genes of interest. By studying zebrafish with the loss-of-function in a given gene, the team will determine the unique function of the gene and identify the related mechanisms which underline the process of vascular remodeling.



Dr Anas Alazzam
 BSs, MSc, PhD
 Assistant Professor
 Department of Mechanical Engineering
 Khalifa University for Science, Technology and Research



Research Theme
 Cancer

Project Title
 Hybrid lab on a chip for liquid biopsy (HLOC-LB).

Circulating tumor cells (CTCs) cause secondary cancers through metastasis, and their identification indicates either the potential for, or existence of, metastasis. Phenotypic and genotypic characterization of CTCs also provides information regarding tumor biology, tumor cell dissemination, and drug sensitivity. CTC-based detection of metastasis is non-invasive, cheaper and less stressful to patients. However, existing micro-devices for the detection of CTCs have two challenges, random spatial distribution of cells and overlap in diameter range of CTCs with that of leukocytes. This study will propose a novel micro-device that initially arranges cells in a single file and later separates CTCs from a mixture of similar sized cells, leading to improved capture efficiency and purity.



Dr Nicolas Christoforou
 PhD
 Assistant Professor
 Department of Biomedical Engineering
 Khalifa University for Science, Technology and Research



Research Theme
 Cardiovascular Disease and Cancer

Project Title
 Determining the cardio-proactive and regenerative effect of mesenchymal stem cell-secreted protein cytokines using engineered cardiac biosynthetic tissues.

Generating a transgenic, inducible, and immune-compatible cell source and combining it with a biocompatible and biomimetic hydrogel which allows increased cell retention, long-term engraftment and improved cell viability, will produce a significant innovation in the field of cardiac cell-based therapy. This study will examine the temporal therapeutic capacity of genetically engineered human mesenchyme stem cells in the 3-D biometric and biocompatible scaffold. Specifically, the study will examine cell survival, proliferation, and distribution within the 3-D construct and measure the construct's macro-scale mechano-characteristics. The results of the study will lead to the minimization of the inflammatory response, while delivering an immunocompatible cell type, capable of activating a regenerative effect, which in turn can achieve functional cardiac recovery.



Dr Jeremy Teo
 BE, ME, PhD
 Assistant Professor
 Department of Mechanical Engineering
 Khalifa University for Science, Technology and Research



Research Theme
 Cancer

Project Title
 Microenvironmental suppression effect on T-lymphocyte functional aggression against cancer cells.

T-cell therapy is the most specific form of treatment against cancer, involving using and training the immune cells of patients to kill their own cancer cells. However, the location of the tumor, or its environment, has been suspected to reduce the effectiveness of this approach. The study will gain insights into the mechanisms of tumor environment and T-cell interaction and address the current challenges and issues related to T-cell therapy. The approach will deconstruct and rebuild the tumor environment and introduce T-cells to determine their immune function characteristics. A range of biological experiments such as microscopy, laboratory test kits for T-cell secreted proteins, and marking of T-cell surface proteins will be used.



Dr Raafat El-Awady
 BSc, MSc, PhD
 Associate Professor
 Department of Pharmacology
 College of Pharmacy
 University of Sharjah



Research Theme
 Cancer

Project Title
 Effect of tumor microRNA secretome before and after cancer chemotherapy on heart and skeletal muscle morphology and function.

The dysfunction of vital normal organs in cancer patients is a consequence of the release of signals from the cancer cells, either spontaneously or as a result of treatment with anticancer agents, which may travel through the blood stream and affect the function of the organs. The development of agents that may limit this harmful signaling from cancer cells to normal organs will improve the quality of life of cancer patients and allow for more effective use of anticancer drugs with minimal negative effects. This research will provide the foundation of compound design to protect organs indirectly affected by the cancer secretome. The approach will combine investigation of miRNA from exosomes secreted by cancer cell lines, testing the effects of these miRNA on engineered heart and skeletal muscle models and designing suitable antagonists to block the effects of miRNA.



Professor Sehamuddin Galadari
 BSc (Hon), PhD, DIC, FRSPH, FRSB
 Professor of Biochemistry and Molecular Cell Biology
 College of Medicine and Health Sciences
 United Arab Emirates University



Research Theme
 Cancer

Project Title
 Elucidating the molecular signaling mechanism(s) of autophagy mediated tumor suppression by curcumin in human malignant glioma.

Drugs targeting autophagy are promising in the management of malignant gliomas, which have been proven to be less resistant to therapies that induce autophagy than those that induce apoptosis. This study will research the use of the naturally occurring phenolic compound curcumin; derived from the root of the spice turmeric. The aim is to provide a basis for the reactivation of tumor suppression, and design novel therapeutic approaches to combat malignant gliomas. In particular, to target the tumor-suppressive property of autophagy for the treatment of malignant glioma cells using curcumin as a pro-autophagic drug. The results of the study will assist in the development of future curcumin-based therapeutic strategies for the management of human malignant glioma. Currently, the median survival duration of patients with malignant gliomas is only 9-12 months.



Dr Justin Thomas
 BSc, MSc, PhD, PG Cert.
 Associate Professor
 Department of Psychology
 Zayed University



Research Theme
 Mental Health

Project Title
 Waterpipe tobacco smoking among university students in the UAE: understanding behavior, psychosocial correlates and the effects of health warnings using a discrete choice experiment.

In the UAE, regulation of water pipe tobacco smoking (WTS) is inadequate in at least four areas: pricing, characterizing flavors, youth-use restrictions, and health warnings. Additionally, very little is presently known about the psychosocial correlates of WTS use, particularly exclusive WTS use (the use of WTS whilst refraining from smoking cigarettes). This study utilizes an internet-based survey of university students to shed light on unanswered questions such as the relationship between smoking and depressive symptoms and the idea of WTS as a gateway to other nicotine delivery modes. Such explorations can help further inform and improve health promotion in the UAE.



Dr Hany Omar
 BSc, MSc, FPGEC, PhD
 Assistant Professor
 Department of Pharmacology
 College of Pharmacy
 University of Sharjah



Research Theme
 Cancer

Project Title
 OSU-2S Combinatorial approach, the next level in tackling cancer cell survival.

The study will examine the possibility of employing the success of OSU-25 as an anticancer agent to develop more potent derivatives and utilizing the ability of OSU-25 to target cancer cell survival to synergize the action of the classical anticancer agents. The study expects to promote the performance of basic interdisciplinary research for better treatment of cancer in the UAE, provide safer and more effective alternative antitumor agents to minimize drug toxicity, locate novel alternative therapies for the treatment of cancer with high efficacy and minimal side effects, and provide an alternative to traditional anticancer protocols. Different chemical and biological approaches will be utilized to achieve results.



Dr Ali Trabolsi
BS, MS, PhD
Assistant Professor
Department of Chemistry
New York University Abu Dhabi



Research Theme
Cancer

Project Title
Toward theranostic nanoparticles: an innovative approach to cancer therapy and diagnosis.

In 2012, cancer was the third leading cause of death in the UAE, indicated in 13.9% of all deaths. While primary chemotherapy treatments do destroy malignant cells, they also kill healthy cells and cause serious side-effects. This study will develop new types of nanoparticles that maximize the effectiveness of chemo-therapeutic drugs – and minimize their side-effects – by directly targeting cancer cells. The nanoparticles will also act as magnetic resonance imaging agents for monitoring disease progression. The approach will involve combining the magnetic properties of iron-oxide nanoparticles with the ability of cucurbituril, an organic macrocycle, to encapsulate an anti-cancer drug, Cisplatin. This results of the study will reduce required drug doses, resulting in decreased treatment costs, improved drug effectiveness, and dramatically increased patient survival rates.



Professor Thomas Adrian
MSc, PhD MRCPATH, FRCPath
Department of Physiology
College of Medicine and Health Sciences
United Arab Emirates University



Research Theme
Cancer

Project Title
Studies on the transcriptome of patients with cancer cachexia.

Cachexia is weight loss and wasting that occurs in patients with cancer. Although it is a major cause of death and debility, little is known about why or how it occurs. By understanding the mechanisms of cachexia, methods can be designed to prevent it. The study will confirm findings used in a state-of-the-art technique called Next Generation Sequencing to investigate the entire transcriptome in muscle and fat tissues from cancer patients with and without cachexia. Some of the findings were novel and a few confirmed changes that had been speculated from clinical data. Some genes that were speculated to be involved in cachexia were proven not to be. This study will use other laboratory methods to investigate the expression of genes and proteins.



Professor Kadayam Gomathi
BSc(Hon), MSc, PhD
Department of Biochemistry
Gulf Medical University



Research Theme
Diabetes

Project Title
Serum pregnancy-associated plasma protein-A as a predictor for risk of gestational diabetes mellitus among pregnant women in the UAE.

The UAE suffers from a high prevalence of GDM, associated with poor outcomes for both mother and fetus. Identifying pregnant women at risk for GDM and taking appropriate measures can reduce the risks. This study will research the association of PAPP-A levels in the first trimester of pregnancy with the subsequent development of gestational diabetes, providing important information regarding the utility of PAPP-A as a risk factor to predict future gestational diabetes. An analytical approach will be followed, whereby women in the 11th-13th week of pregnancy will be enrolled in the study, blood specimens will be collected and fasting plasma glucose, HbA1c, serum PAPP-A, and beta hCG levels will be measured. Known diabetes mellitus patients and women with other obstetric complications will be excluded from the sample. At 24 to 28 weeks the women will be screened for gestational diabetes.



Dr Wael Rabeih
BS, MS, PhD
Assistant Professor
Department of Practice Chemistry
New York University Abu Dhabi



Research Theme
Cancer

Project Title
Mitochondrial dissociation effect on human hexokinase 2 and its role in tumor progression.

Cancer is the second cause of death in the UAE, with heart, lung, and colorectal cancers being the most common. Hexokinase 2 (HK2), an enzyme found only in cancer cells, facilitates the consumption of glucose to provide energy and metabolites to support cellular growth. This study will assist in the development of cancer therapeutics that are safe and have minimum or no side effects by contributing to an in-depth understanding of enzyme's catalytic mechanisms and how they accelerate chemical reactions. The approach will include experiments in X-ray structural determination of HK2 proteins, thermodynamic and kinetic stability of mitochondrial bound and cytosolic forms of HK2, and thermal inactivation of HK2 at physiological temperature.



Dr Wael Hassan
 MD, MSc, PhD Associate Professor
 Department of Medical Lab Science
 College of Health Sciences
 University of Sharjah



Research Theme

Cancer

Project Title

Molecular determinants of induction of breast and colon cancer by common environmental toxins.

The rising incidence of breast and colon cancer over the last 50 years, and the higher incidence in urban compared to rural areas, suggest a relationship to the increased use of toxic chemicals in our environment. Studies supply evidence that external hormone-like materials contaminate our food and drink. Cancer develops as a result of molecular changes leading to the accumulation of mutations within the cell. The study will examine the molecular changes resulting from exposure to toxic chemicals. Utilizing an experimental approach, the study will grow normal, premalignant, and cancer cells in the lab and expose them to chemicals. The relationship between the molecular background of the cells and malignant capacity after exposure will then be analyzed.



Professor Amr Amin
 BSc, MSc, PhD
 Department of Biology
 College of Science
 United Arab Emirates University



Research Theme

Cancer

Project Title

The therapeutic effect of crocin against hepatocellular carcinoma: a preclinical study.

There is currently only one treatment for liver cancer, a leading cause of cancer-related death worldwide. This study will unravel the mechanisms of crocin extracted from saffron, both in vitro and in vivo, to modulate HCC-associated oxidative stress, study the role of crocin in regulating HCC-associated apoptosis and inflammation, and assess the anticancer effects of crocin in combination with clinically used drugs. Earlier research by the same team has shown that saffron's crude extract prevents liver cancer, both in vitro and in vivo. The team is now interested in addressing whether or not crocin can not only prevent, but also treat, live cancer in animals, as well as in human liver cancer cells.

Our Fellowship 2014



Dr Shehab Al Ansari
 Resident, Internal Medicine/Cardiology
 Cleveland Clinic Foundation, Ohio, USA



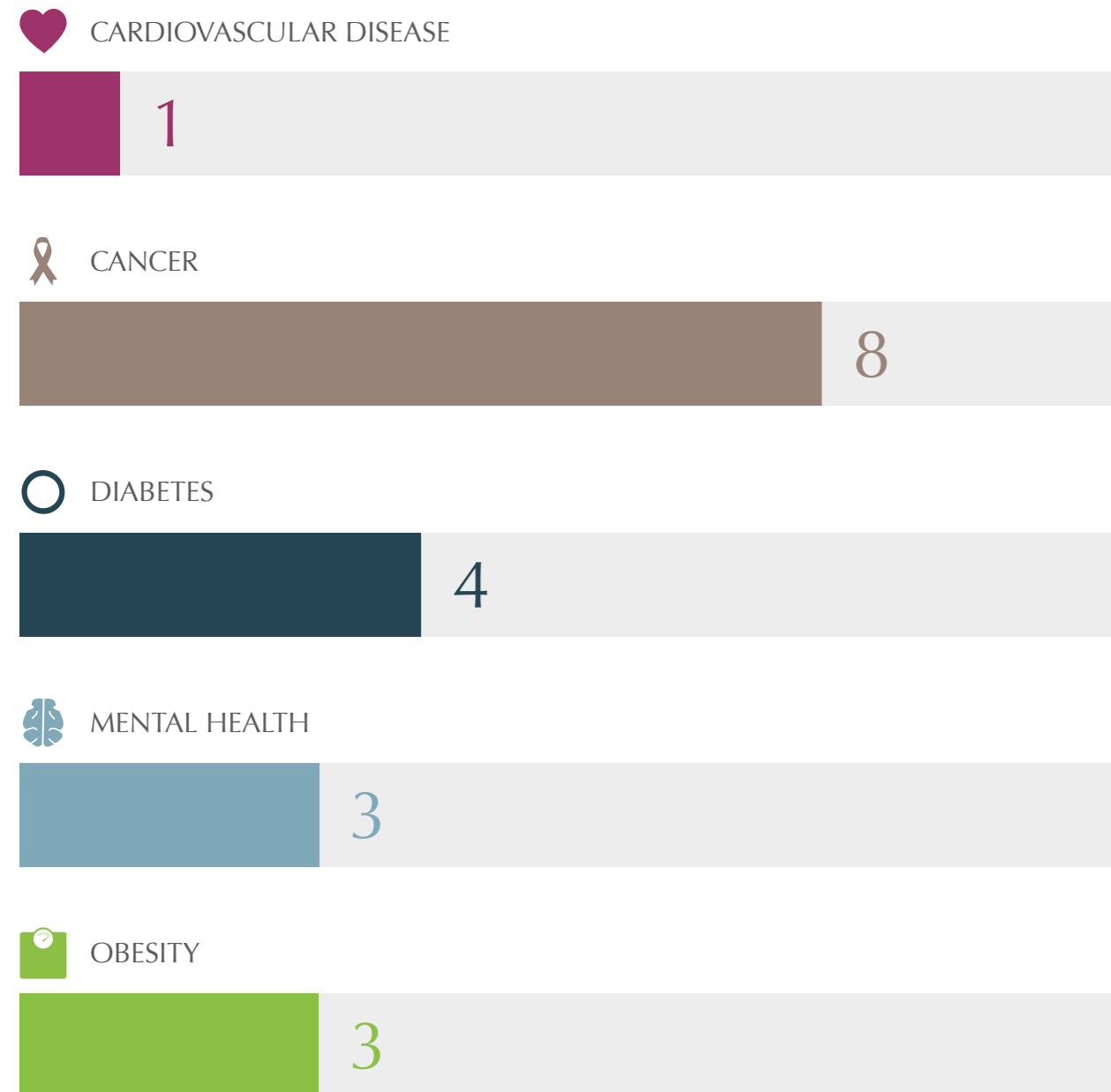
Fellowship Theme

Cardiovascular Disease

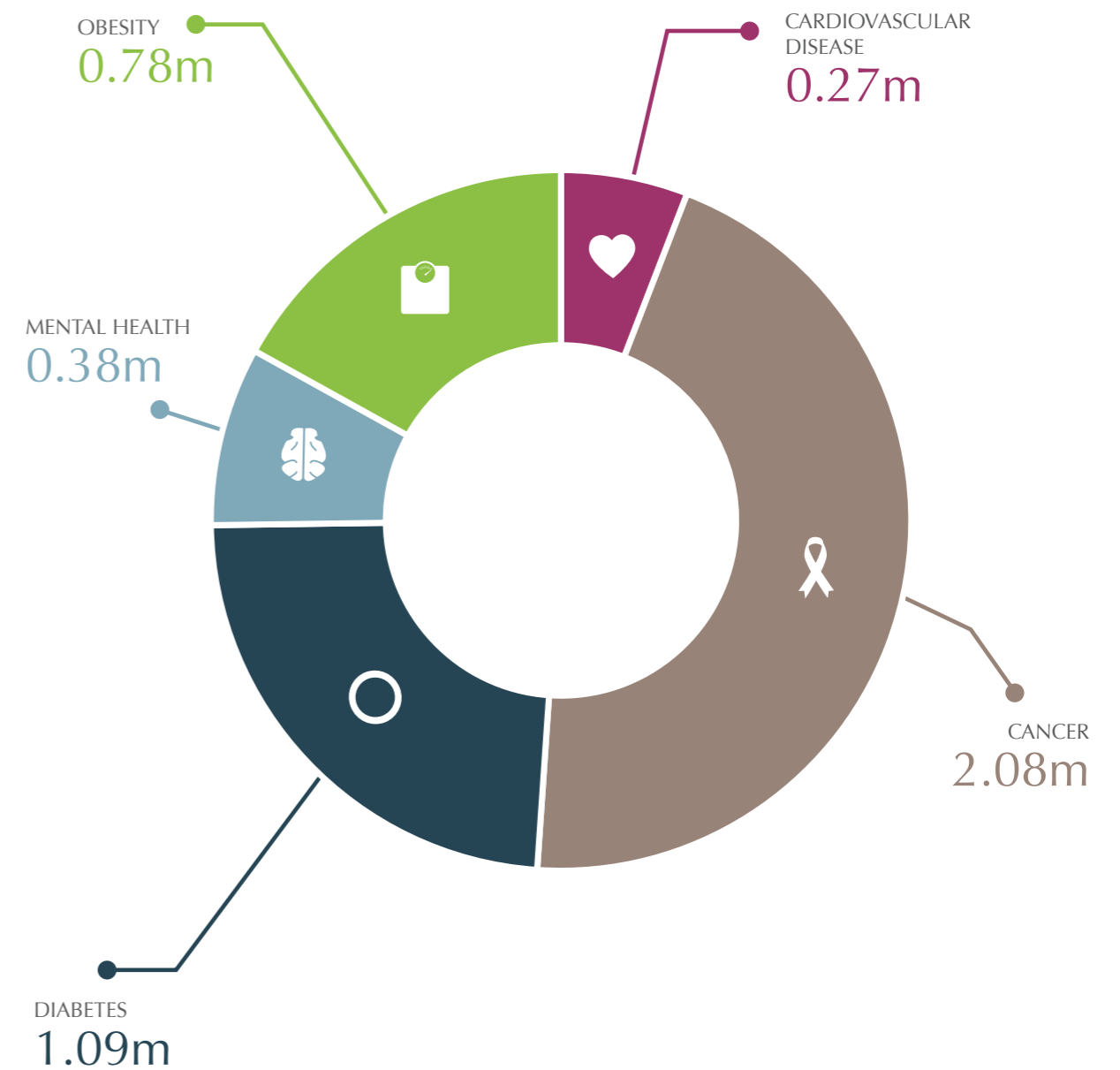
Dr Shehab Al Ansari graduated from The Royal College of Surgeons in Ireland with First Class Honors. He then completed a Diploma in Transthoracic Echocardiography from the Medical University of Vienna, Austria.

With our support, Dr Shehab undertook a one-year research fellowship in the Department of Cardiovascular Medicine, Cleveland Clinic Foundation, Ohio, USA. The main focus area of Dr Shehab's research is aortic Stenosis, also known as the silent killer, the third most common cardiovascular disease in adults.

Our Grants Funded by Theme 2015



Our Grants Funded by Value 2015 (in AED)





Dr Starling David

BSc, MSc, M. Phil, PhD
Assistant Professor
Department of Anatomy
College of Medicine and Health Sciences
United Arab Emirates University



Research Theme

Diabetes and Obesity

Project Title

A novel method to evaluate the role of 5-mC RNA methylation in type 2 diabetes and obesity.

Metabolic diseases are a global epidemic, accounting for more than 60% of deaths around the world; 19.2% of the population in the UAE has type 2 diabetes. The study will identify the changes in early life which lead to diseases such as type 2 diabetes in the adult, contributing in the long run to the development of biomarkers for metabolic diseases. It will establish a new method to verify and quantitate whether 5-mC RNA methylation is involved in the genes of insulin signaling pathways. Specifically, the study will assess 5-mC RNA methylation in the genes, insulin, Akt, adaptor protein containing pleckstrin homology domain, phosphotyrosine binding domain, and leucine zipper domain using the Sequenom MassARRAY EpiTYPER System. The physiological relevance of 5-mC RNA methylation in diabetic and obese rats will then be verified.



Dr Hadia Radwan

BSc, MSc, PhD
Assistant Professor
Department of Clinical Nutrition & Dietetics
College of Health Sciences
University of Sharjah



Research Theme

Cardiovascular Disease, Diabetes and Obesity

Project Title

Impact of feeding patterns on adiposity and cardiometabolic markers in baby and mother: a prospective cohort study.

The UAE is facing a high incidence of obesity, chronic diseases, and suboptimal infant feeding practices. Early identification of preventive markers of cardio-metabolic risk factors in breast milk is important for the development of early intervention strategies to optimize individual and communal health care. This study will follow a prospective cohort approach; two hundred and fifty mother-infant pairs will be followed for two years. A representative sample of mothers will be interviewed and followed up at one week postpartum and at 2, 6, 12, and 24 months of the infant's age. The resulting etiological, descriptive, and surveillance information about early risk factors for disease will inform research, policy, programs, and practice.



Dr Suryani Lukman

BSc, PhD
Assistant Professor
Department of Applied mathematics and Science
Khalifa University for Science, Technology and Research



Research Theme

Cancer, Obesity and Mental Health

Project Title

Exhaustive structural analysis of Rab subfamily proteins and identification of their novel binding pockets for drug discovery.

Dysfunctional Rab proteins, associated with a number of human diseases including cancers, neuronal dysfunctions, and obesity, are potential drug targets. This study will use both computational and experimental approaches to research the common and unique features of Rab proteins, the druggable pockets on the structures of specific Rab proteins that can be targeted with minimal side effects, and the chemical compounds that can bind to dysfunctional Rab proteins and restore normal functions. The research will provide an essential understanding of therapeutic drug design targeting Rab proteins, especially in the earliest stages of the drug discovery pipeline, the target and lead identification stages, considered prerequisites for novel and more effective drug discovery.



Dr Nabeel Al-Yateem

BSc, MSc, PhD
Assistant Professor
Department of Nursing
College of Health Sciences
University of Sharjah



Research Theme

Mental Health

Project Title

Assessing mental health literacy in healthcare professionals working with children and adolescents with chronic illnesses.

Reports indicate a persistence of stigma towards those with mental illnesses in the UAE and the underdevelopment of the country's mental health services. Children and adolescents suffering from chronic illnesses are at a higher risk of developing co-morbid mental health problems such as anxiety and depression. The study will inform future initiatives to support healthcare professionals by informing the development of courses and curricula that will improve their mental health literacy and skills to provide the psychological development of children and adolescents. The approach will consist of a survey conducted with a large sample of healthcare professionals working with children and young people with chronic illnesses in the UAE.



Dr Fatheya Alawadi & Dr Mohammed Hassanein

Consultants
Department of Endocrine
Dubai Hospital
Dubai Health Authority



Research Theme
Diabetes

Project Title
Reducing diabetes complications in high-risk groups during Ramadan.

Due to their level of control or other factors such as treatment with insulin, pregnancy, or renal impairment, many diabetics are considered too high risk to fast in Ramadan. However, many insist on fasting despite medical advice to the contrary. The exact level of risk is not well-studied and is mostly based on consensus of opinion. Better understanding of the glucose fluctuations of these groups is paramount in consolidating the advice given to people with similar conditions and in identifying the possible treatment strategies to minimize risks. The approach will include analyzing the data of people with diabetes who are on different therapies to identify those considered as high risk and not achieving the HbA1c treatment targets, conducting observational studies during Ramadan for people with high-risk diabetes who insist on fasting, and analyzing the collected data post-Ramadan.



Dr Ammar Albanna
MD, FRCPC
Child and Adolescent Psychiatrist
Al Jalila Children's Specialty Hospital



Research Theme
Mental Health

Project Title
A prospective study of UAE children with autism spectrum disorder.

There is an urgent need to better understand the unique genetic causes of Autism Spectrum Disorder (ASD) in the UAE, as well as the pattern of treatment sought by parents of children with ASD. The study will pave the way for future comprehensive studies that will eventually assist in identifying the genetic underpinning of ASD which will have significant implications, including prevention, healthcare systems planning, and individualized treatment. The research will enhance understanding of genetic, clinical and socio-demographic variables associated with ASD in the UAE, inform about current treatment patterns, and eventually help implement strategies that improve access to evidence-based effective treatments. The approach will include using standardized diagnostic methods to comprehensively assess and follow up children with ASD.



Dr Shaheenah Dawood
MBBCh, FRCP(Glasgow), FACP, MPH
Department of Medical Oncology
Mediclinic City Hospital
Dubai Healthcare City



Research Theme
Cancer

Project Title
Integrated multi-level 'omic' analysis of primary medical therapy in non-metastatic breast cancer.

Emerging technology will empower precise, personalized treatment for non-metastatic breast cancer patients by defining their molecular pathology and integrating these with therapeutic strategies. By integrating multiple levels of molecular aberration in breast cancer, an improved understanding of the pathways leading to its development as well as the sensitivity and resistance to therapeutics will lead to improvements in survival. This should significantly improve the cost effectiveness of anti-cancer treatment as well as minimize toxicity and ineffective treatments. The approach will consist of an international, collaborative, translational research program in breast cancer to define the molecular aberrations at multiple levels and undertake inter-ethnic comparison, as well as an integrated bio-informatics approach to define pathways leading to breast sensitivity and resistance to treatment.



Dr Mohammad Qasaimeh
BSc, MSc, PhD
Assistant Professor
Division of Engineering
New York University Abu Dhabi



Research Theme
Cancer

Project Title
A novel high-throughput microdevice for prostate cancer liquid biopsies.

Cancer is the leading cause of death in the UAE, and prostate cancer is the fourth most widespread form of the disease. Late diagnosis of prostate cancer is generally incurable; however, if diagnosed early, the chances of survival are considerable higher. There are no diagnostic protocols that can capture the symptoms of prostate cancer at early stages. The study will develop a highly specific, non-invasive technique that can be used to perform liquid biopsy, detect prostate cancer at early stages, and monitor cancer progression. The approach will include antibody-antigen interaction of prostate circulating tumor cells (CTCs) with hollow glass beads, which will subsequently decrease the density of the particles. The formed complexes will remain at the upper streamlines of the microfluidic flow and exit through the collection outlet. All other blood cells will settle to the bottom of the chamber to be extracted through the waste outlet.



Dr Habiba Alsafar

BSc, MSc, PhD
Assistant Professor
Department of Biomedical Engineering
Khalifa University of Science, Technology and Research



Research Theme

Cancer

Project Title

Improved hla matching for bone marrow transplantation using next generation sequencing technology.

The human MHC on chromosome 6 contains genes that encode immune function. These genes must be matched when considering a donor of hematopoietic stem cells for treatment of cancer patients who require bone marrow transplantation. The survival of patients following bone marrow transplantation is reliant on precise MHC haplotype matching. To date, we have limited data on the MHC structure of the UAE population. The study will result in histocompatibility matching that will improve graft outcome and diagnostic assays for autoimmune disorders. The characterization of MHC will be performed using state-of-the art Next Generation Sequencing.



Professor Taleb AlTel

BSc, MSc, PhD
Department of Medicinal Chemistry
College of Pharmacy and Sharjah Institute for Medical Research
University of Sharjah



Research Theme

Cancer

Project Title

Targeting breast and prostate cancer: design and synthesis of novel and privileged polycyclic pyrido [1, 2-a] quinolinones, benzopyranes and benzoxepines motifs.

The prevalence of hormone-dependent malignancies (breast and prostate cancers) is increasing worldwide, and resistance to existing hormonal-based therapy is a limiting factor for successful therapy. Phenotypic screening has been shown to be the most effective approach for discovering novel therapeutic agents with new modes of action. The study aims to develop compound libraries that may overcome the resistance to conventional hormonal therapy based on similar compounds recently entered into clinical trials. The study will be executed using the translational hierocracy of a multidisciplinary iterative drug design approach that spans pharmacology and medicinal chemistry.



Dr Ahmed El-Serafi

MBBCh, MSc, PhD, MD
Assistant Professor
Department of Basic Medical Sciences
College of Medicine and Sharjah Institute for Medical Research
University of Sharjah



Research Theme

Obesity

Project Title

Characterization of an in vitro three dimensional cell culture system for adipogenesis as a model for anti-obesity drugs testing.

The study will establish a 3-D model of adipose tissue to study the effect of the lipolytic agents sodium deoxycholate and/or phosphatidylcholine on the development of the fat model and identify the molecular changes associated with cell differentiation towards the adipogenic lineage. The research will allow for the understanding of the effects of these drugs on early vs. late intervention and for the characterization of the genes and miRNA which have a regulatory role on adipogenesis. It can be a platform for synthesizing fat for reconstructive surgeries in patients with burns or mastectomies, as well as reveal new target genes, help in the better understanding of fat formation, and suggest new therapeutic targets for obesity management, prevention of cardiovascular events, management of metabolic syndrome and the prevention of the progression and complications of diabetes.



Dr Dima Abdelmannan

MBBCh, FRCP (Glasgow), FRCP (London), FRCP (Edinburg)
Consultant Endocrinologist
Associate Clinical Dean, Dubai Medical College
Dubai Health Authority



Research Theme

Diabetes

Project Title

Development of a simple test for the assessment of future type 2 diabetes mellitus risk in subjects with normal glucose tolerance.

Type 2 diabetes has reached an epidemic proportion in Arab countries including the UAE, where approximately 20% of the adult population has the disease. Prevention of the development of type 2 diabetes mellitus will have enormous impact, not only on public health, but also on health care expenditure. Moderate weight loss and pharmacotherapy can significantly prevent/delay diabetes onset in high-risk individuals, meaning that identification of subjects at high risk for future type 2 diabetes mellitus is essential for every diabetes prevention program. The study will examine the ability of a single administration of dexamethasone in subjects with normal glucose tolerance to determine their future type 2 diabetes mellitus diabetes risk. This simple test will provide a useful tool to be utilized in clinical practice to identify subjects at increased risk for type 2 diabetes mellitus at the NGT stage.



Dr Naoufal Werghi

PhD
Associate Professor
Department of Electrical and Computer Engineering
Khalifa University of Science, Technology and Research



Research Theme
Cancer

Project Title
Automatic polyp detection in endoscopy videos.

Colorectal cancer is one of the most prevalent cancers in the world. The early detection of abnormalities in the colorectal tracts is a crucial element in the prevention of the development of this type of cancer. However, some of these abnormalities are difficult to detect. The study will address some of the limitations of current detection techniques, such as long processing time, low accuracy, and limited validation set by using a system that can detect mild and moderate polyps and which can be deployed in a real or interactive time frame. The study will include performing an extensive comparative study aiming at finding the best image features to be used in polyp detection and exploiting video frame sequencing in polyp detection.



Dr Farah Benyettou

BS, MS, PhD
Research Scientist
Department of Chemistry
New York University Abu Dhabi



Research Theme
Cancer

Project Title
Liposomes and iron-oxide nanoparticles: nanosized vesicles for combined therapies for breast cancer.

In 2014, 39 female deaths caused by breast cancer were reported in the UAE. The study promises a new tool for simultaneous diagnosis and combined chemo and thermal therapies for permanent remission by understanding the parameters that govern the chemistry of nanoparticles. Breast cancer tumors tend to be accessible and localized and nanoparticles tend to naturally accumulate when injected into the bloodstream. The approach will include using therapeutic magnetic nanoparticles that travel directly to the tumor when injected into the bloodstream and destroy it without damaging healthy tissues, thus avoiding the systemic toxicity usually associated with chemotherapy. Progress of treatment will be monitored using magnetic resonance imaging.



Dr Azhar Abu Ali

BA, MA, PhD
Senior Clinical Psychologist
Clinical Support Department
Latifa Hospital
Dubai Health Authority



Research Theme
Mental Health

Project Title
The psychological journey of caregiving and pediatric chronic illness in the UAE.

Parents play an integral role in the life of a child who is suffering from a pediatric medical and/or psychological condition. The emotional absence of a parent due to their levels of psychological distress can impact treatment adherence and even prognosis. This study will explore the psychological experience of mothers and fathers who are caring for a child with a chronic pediatric condition and its impact on familial functioning and adjustment. A comparison between the levels of trauma and stress of fathers versus mothers will also be examined. Relevant psychosocial factors will be assessed to highlight potential contributions of contextual factors ranging from age, educational level, income, to type and severity of pediatric illness. This study will promote mental health research in the UAE, and may also improve mental health service delivery and health outcomes.



Dr Manal Awad

BDS, MSc, PhD
Associate Professor
College of Dental Medicine
University of Sharjah



Research Theme
Diabetes

Project Title
Oral health related quality of life among type 2 diabetic arab patients in the UAE.

The UAE has one of the highest prevalence of type 2 diabetes worldwide, with almost 24% of the population being diabetic. Diabetic patients suffer from severe oral health problems that can lead to loss of teeth and affect their ability to eat. The assessment of the effect of these problems on diabetic Arab patients is important for the development of tailored healthcare interventions. A controlled cross-sectional study will be conducted to assess oral health related to quality of life for Arab type 2 diabetic patients compared to non-diabetic patients. Clinical examinations will be conducted to assess the extent of oral health problems in both groups.



Professor Riad Bayoumi

MBBS, PhD, MRCPATH, FRCPath
Professor of Basic Medical Sciences
Department of Education
Mohamed Bin Rashid University of Medicine and Health Sciences



Research Theme

Diabetes

Project Title

Gestational diabetes: a novel model for investigating the genetic and environmental components of type 2 diabetes mellitus: a proof of principle.

The team's hypothesis is that diabetes during pregnancy is a sub-set of the adult type of diabetes. To explain the mechanism of the disease process, they will compare and contrast the genetic and lifestyle effects on the genome in both types of diabetes to identify the gene variants that make women susceptible to diabetes during pregnancy, locate common susceptibility gene variants for both diabetes of adults and diabetes in women during pregnancy, and determine the effects of lifestyle on the genome of a diabetic. If the team's hypothesis is correct, results of this research will provide another model for investigation of the mechanism of the disease.



Professor Tim McGloughlin

BEng, MEng Sc, PhD
Department of Biomedical Engineering
Khalifa University of Science, Technology and Research



Research Theme

Cardiovascular Disease

Project Title

Enhanced imaging techniques for identification of calcification in abdominal aortic aneurysm.

An aneurysm is defined as a localized balloon-like expansion of an artery and is typified by having a diameter of 1.5 times that of the normal artery. Varying degrees of calcification have been found in most abdominal aortic aneurysm (AAA) wall tissue and it has been found to correlate with an increase in AAA rupture risk. This work aims to improve the diagnostic prediction of rupture using advanced imaging to detect and characterize calcification in AAAs. Numerical models will be generated which will include the calcification parameters and enable improved prediction of AAA rupture.



Professor Ghaleb Hussein

BSc. MSc. PhD
Assistant Professor
Department of Chemical Engineering
American University of Sharjah



Research Theme

Cancer

Project Title

Acoustically activated release of targeted nanocarriers for breast cancer treatment.

Current practice in chemotherapy requires the use of high drug doses to increase its effectiveness on tumors, which also results in detrimental side effects on healthy cells. These side-effects significantly decrease the quality of life of the patient and result in life-threatening conditions. The project aims to prepare an ultrasound triggered, targeted drug delivery system for breast cancer treatment. The research will investigate the ability of the system to increase the effectiveness of chemotherapeutic agents on tumor cells and to decrease their side effects on healthy cells. Liposomes modified with an estrone group and preloaded with a chemotherapeutic agent will be introduced into tumor cells and engulfed. Ultrasonic waves will be focused on the cells, breaking open the liposome and releasing the drug.

Our Fellowships 2015



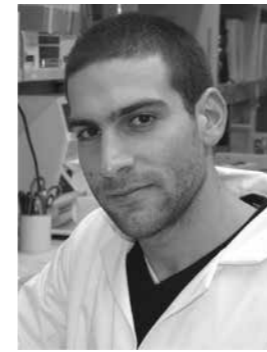
Ms Hiba Alblooshi
PhD Student
Center for Biotechnology
Khalifa University for Science, Technology and Research

Fellowship Theme
Diabetes



Ms Hiba Al Balooshi completed her Diploma (2009) and Masters (2011) in Forensic Sciences from the University of Western Australia, where she is currently undertaking her PhD. She has also obtained a Bachelor of Science in 2008 from the University of Melbourne.

Ms Hiba undertook her Fellowship at the Institute of Genetic Medicine in Newcastle University under the supervision of Professor Heather Cordell, a worldwide expert in genetic statistics. There she conducted a Genome Wide Association Study (GWAS) to identify genes associated with substance abuse disorder in the Emirati population.



Dr Ajan Al Zaki
Graduate School
School of Medicine and Health Sciences
George Washington University

Fellowship Theme
Cancer



Dr Ajan Al Zaki graduated from Purdue University in 2008 and completed his PhD in 2014 from University of Pennsylvania. Currently, Dr Ajan is studying for the Doctor of Medicine at George Washington University.

Dr Ajan spend his Fellowship at the University of Pennsylvania under the supervision of Professor Andrew Tsouraks, an expert in the field of nanomedicine and targeted therapeutics for treating cancer. The group was successful in synthesizing new nanotherapeutics to be used for cancer imaging and cancer therapy.

Institutions Funded

- 1 Al Jalila Children's Specialty Hospital
- 2 American University of Sharjah
- 3 Dubai Hospital
- 4 Gulf Medical University Ajman
- 5 Khalifa University of Science, Technology and Research
- 6 Latifa Hospital
- 7 Mediclinic City Hospital
- 8 Mohamed Bin Rashid University of Medicine and Health Sciences
- 9 New York University of Abu Dhabi
- 10 Sharjah University
- 11 United Arab Emirates University
- 12 Zayed University

Our Collaborations



United States of America



United Arab Emirates



United States of America

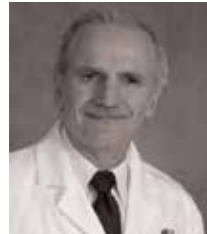


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