

رؤية
VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

جامعة
الملك سعود
King Saud University

المركز الجامعي لأبحاث السمنة
Obesity Research Center
جامعة الملك سعود King Saud University

مدينة الملك عبدالعزيز
للعلم والتكنولوجيا KACST

Obesity Research Center

2020 ANNUAL REPORT

College of Medicine
University Medical City
King Saud University

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Foreword of the Director

The Obesity Research center (ORC) is the first specialized, national center established for the comprehensive study of obesity and its related disorders. We bring together cutting-edge technologies and expertise to study and focus on key problems related to them. The center upholds the values of scientific temper and principles of good science and good research through its various activities to tackle obesity and related disease from different aspects. Even through the unprecedented difficulties faced by all due to the COVID-19 pandemic, the center has strived to put forth its best foot forward and delivered its best. Increasingly our center has pursued research projects, singularly and in collaboration with other centres, attempted research challenges across disciplines, and areas of expertise.

ORC is thankful for the support extended to it by the constant support of the College of Medicine, King Saud University (KSU) and King Abdulaziz City for Science and Technology (KACST).

Sincerely,

Prof. Assim A. Alfadda

Vice Dean for Postgraduate Studies and Scientific Research

Director, Obesity Research Center



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Mission

To improve our understanding of obesity by conducting basic, translational and clinical research and to apply this information towards effective preventive and therapeutic strategies.

Purpose of the Annual Report

The objective of the research centre annual report is to capture the vision, plans, activities, achievements and progress towards the Centre's overall goals and the goals of the College of Medicine in all aspects of the Centre's operations during the previous years.

The ORC brings together cutting-edge equipment and exceptional expertise and focuses them on key problems in obesity research. To help us achieve our objectives we have established a sophisticated proteomics facility and several research laboratories specializing molecular biology and genetics, cell culture, clinical chemistry and clinical-physiology. The ORC is supported by the National Program for Science, Technology and Innovation, Kingdom of Saudi Arabia.

The Annual Report details out the progress against the aims, deliverables and impact of the centre's activities. Each is dedicated to driving impact in critical spheres of influence, to creating impressive and meaningful breakthrough research, to reinforcing our commitment and to fostering innovation through partnerships and teamwork. The following pages offer snapshots of our activities and provide a glimpse into the breadth and depth of unmatched expertise at the ORC

إعلان



أبحث برقم العدد PDF

النسخة الورقية



الكاريكاتير

تحديد النهج البروتيني لمدمني «الأمفيتامين»

بمشاركة باحثين من كليتي الطب والصيدلة



لوصل باحثون من كليتي الطب والصيدلة بالجامعة بالتعاون مع المركز الوطني للتقنية الحيوية بمدينة الملك عبدالعزيز للعلوم والتقنية إلى تحديد النهج البروتيني لمدمني مادة الأمفيتامين، وتم نشر نتائج البحث في مجلة Drug and Alcohol Dependence المرموقة ذات معامل التأثير العالي والمنصفة ضمن أفضل المجلات العلمية في الربع الأول «Q1» في تخصص الإدمان، وتمت لكاشفارة بالبحث من طرف المحرر الرئيسي للمجلة بتهنئة الفريق البحثي على هذا العمل الرائع والمهم. وتضمن الفريق مجموعة من الباحثين من مركز أبحاث السمعة بكلية الطب -مختبر البروتيوم بقيادة الدكتور غانم الفدا والدكتور هشام بن عبدالكامل، ومن قسم علم الأدوية والسموم بكلية الصيدلة بقيادة الدكتور فوزي الأسعدي والدكتور ساري المنارج ومن المركز الوطني للتقنية الحيوية بمدينة الملك عبدالعزيز للعلوم والتقنية بقيادة الدكتور إبراهيم العنزي.

يعتبر إدمان مادة الأمفيتامين دواءً وبنائية على المصعدين المحلي والدولي، حيث وجدت العديد من الدراسات أن الاكتئاب العصبي والاضطرابات السلوكية لتأخر الاستخدام المزمن للأمفيتامين، وفي هذه الدراسة تم استخدام طريقة النهج البروتيني لمعرفة التغييرات البروتينية التي قد تطرأ على مدمني الأمفيتامين مقارنة بقرنائهم السليمين.

وقد وجدت الدراسة زيادة في وفرة 72 من البروتينات ونقص في 7 من البروتينات في عينات «دم» شحيت من مدمني مادة الأمفيتامين مقارنة بقرنائهم الطبيعيين وهذه البروتينات المتغيرة لها دور رئيسي في حدوث الاستجابات الالتهابية والتنوعية الخلوية والأمراض العصبية.

Figure 1 : Announcement in RESALAT AL. JAMEAH, the King Saud University newspaper, for the achievement of the Proteomics Unit from ORC in collaboration with College of Pharmacy and KACST for their publication of original research titled Serum Proteomic profiling of patients with amphetamine use disorder published in Drug and Alcohol Dependence Journal (Q1).

Overview of ORC Research Projects and Publications

Projects and Publications

The year 2020 was one filled with many challenges due to the unprecedented pandemic. Even with this bleak situation the center used the opportunity to enhance its publications and complete many of its projects and publish the findings. The publication list of the ORC, in ISI recognized journals with Q1 and Q2 ranking, shows the center's dedication towards driving forward original scientific research projects and meaningful publications. The various projects taken up by the center in the different realms drive the overall growth of the center and increase contribution of College of Medicine towards medicine and science.

Table 1 : The list of the published journal articles for the original research undertaken by the center in 2020

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
1.	Identification of Protein Changes in the Urine of Hypothyroid Patients Treated with Thyroxine Using Proteomics Approach	ACS Omega	Yes	Yes	Journal article	174	2.87	Q2

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
2.	Discussion, Diagnosis and Direction-Improving the Role of Healthcare Professionals in Obesity Care	Obesity	Yes	Yes	Journal article	190	3.71	Q1
3.	COVID-19 Pandemic Preparedness and Mitigation Plan: Department of Internal Medicine Experience from a Clinical Perspective	Journal of Nature and Science of Medicine	No	No	Journal article	-	-	-
4.	The Role of Healthcare Professionals in Patient Motivation to Lose Weight	Obesity	Yes	Yes	Journal article	190	3.71	Q1
5.	Distinctive metabolic profiles between Cystic Fibrosis mutational subclasses and lung function	Metabolomics	Yes	Yes	Journal article	73	2.88	Q2
6.	Determinants of Mental Health Outcomes Among People With and Without Diabetes During the COVID-19 Outbreak in the Arab Gulf Region	Journal of diabetes	Yes	Yes	Journal article	40	3.28	Q2
7.	Distinctive Metabolomics Patterns Associated With Insulin Resistance and Type 2 Diabetes Mellitus	Frontiers in Molecular Biosciences	Yes	Yes	Journal article	29	4.18	Q2

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
8.	Antimicrobial Mechanism and Identification of the Proteins Mediated by Extracts from <i>Asphaltum punjabianum</i> and <i>Myrtus communis</i>	ACS Omega	Yes	Yes	Journal article	174	2.87	Q2
9.	A matrix-assisted laser desorption/ionization imaging mass spectrometric approach to study weight-related changes within thyroid tissue	Journal of Mass Spectrometry	Yes	Yes	Journal article	115	2.26	Q3
10.	Impact of Gastric Sleeve Surgery on Plasma Retinol Binding Protein 4 and Adipsin Levels in Healthy Male Population	Pakistan Journal of Medical Sciences	Yes	Yes	Journal article	27	0.754	Q4
11.	Renin angiotensin system at the interface of COVID-19 infection	European Journal of Pharmacology	Yes	Yes	Journal article	174	3.263	Q2
12.	Validating candidate biomarkers for different stages of non-alcoholic fatty liver disease	Medicine	Yes	Yes	Journal article	144	1.55	Q3
13.	Efficiency enhancement of CIGS solar cell by WS2 as window layer through numerical modelling tool	Solar Energy	Yes	Yes	Journal article	167	4.67	Q2

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
14.	Recent progress and perspectives on electrochemical regeneration of reduced nicotinamide adenine dinucleotide (NADH)	Chemistry An Asian Journal	Yes	Yes	Journal article	103	3.69	Q2
15.	MicroRNA-3148 acts as molecular switch promoting malignant transformation and adipocytic differentiation of immortalized human bone marrow stromal cells via direct targeting of the SMAD2/TGF β pathway	Cell Death Discovery	Yes	Yes	Journal article	21	4.114	Q2
16.	Serum based proteomics profiling in adult patients with cystic fibrosis	International Journal Of Molecular Sciences	Yes	Yes	Journal article	140	4.556	Q1
17.	Rapid Implementation of a Diabetes Telemedicine Clinic During the Coronavirus Disease 2019 Outbreak: Our Protocol, Experience, and Satisfaction Reports in Saudi Arabia	Journal of Diabetes Science and Technology	No	Yes	Journal article	68	-	-
18.	Circulating proteomic signature for detection of biomarkers in bladder cancer	Scientific reports	Yes	Yes	Journal article	179	3.998	Q1

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
	patients							
19.	Serum proteomic profiling of patients with amphetamine use disorder	Drug and Alcohol Dependence	Yes	Yes	Journal article	158	3.95	Q1
20.	Effects of Gastric Sleeve Surgery on the Serum Levels of GH, IGF-1 and IGF-binding Protein 2 in Morbidly Obese Patients	BMC Gastroenterology	Yes	Yes	Journal article	69	2.489	Q3
21.	A proteomic approach towards understanding cryoprotective action of Me2SO on the CHO cell proteome	Cryobiology	Yes	Yes	Journal article	81	2.283	Q2
22.	Mapping COVID-19 related research from Saudi Arabia, a scoping review	Saudi Med J	Yes	Yes	Journal article	48	0.58	Q3
23.	Plasma-Based Proteomics Profiling of Patients with Hyperthyroidism after Antithyroid Treatment	Molecules	Yes	Yes	Journal article	131	3.267	Q2
24.	Comparative Analysis of Milk Fat Globular Membrane (MFGM) Proteome between Saudi Arabia Camelus dromedary Safra and Wadha Breeds	Molecules	Yes	Yes	Journal article	131	3.267	Q2

S. No	Title	Published Journal	ISI	Scopus	Type of Publication	H-index	Impact factor	Journal ranking
25.	The effect of monetary incentives on promoting weight loss in individuals with obesity	Journal of Nature and Science of Medicine	No	No	Journal article	-	-	-
26.	Anticancer, antioxidant, and acute toxicity studies of a Saudi polyherbal formulation, PHF5	Open Chemistry	Yes	Yes	Journal article	16	1.216	Q4
27.	Rare occurrence of central diabetes insipidus with dermatomyositis in a young male	Endocrinology, Diabetes & Metabolism Case Reports	-	Yes	Journal article	7		-
28.	Dried blood spot-based metabolomic profiling in adults with cystic fibrosis	Journal of Proteome Research	Yes	Yes	Journal article	156	4.268	Q1
29.	Proteomic and Molecular Assessment of the Common Saudi Variant in ACADVL Gene Through Mesenchymal Stem Cells	Frontiers in Cell and Developmental Biology	Yes	Yes	Journal article	31	5.18	Q2
30.	The effect of monetary incentives on promoting weight loss in individuals with obesity	Journal of Nature and Science of Medicine	No	No	Journal article	-	-	-

Ongoing Projects

The center has a number of ongoing projects in collaboration with different teams and researchers in various departments within King Saud University, including College of Medicine and King Khaled University Medical City. In addition to this a number of national and international collaborative projects are also ongoing. A number of projects undertaken by the center are presently in different phases of completion and other projects have been approved and will be started.

Table 2: The list of articles in press and different ongoing project presently being carried out in the Obesity Research center

Project Title	PI	State
Comparative effects of nebivolol/novokinin and nebivolol/valsartan combination on angiotensin II-induced cardiac pathology compared to component monotherapy	Dr. Rukhsana Gul	Accepted For publication
Differences in the URINE Proteome of Hyper-Hypothyroid Patients before and after Thyroid Hormone Replacement: A Proteomic Analysis.	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabelkamel,	Accepted For publication
Integrated Proteomic Approach for identification of Biomarkers Associated with Bladder Cancer Progression	Prof. Assim Alfadda Dr. Hicham Benabelkamel, Dr. Afshan Masood,	Submitted to cancer science journal

Project Title	PI	State
Proteomics and Comparative Analysis of Two Sequential <i>Candida glabrata</i> Clinical Isolates and Insight into Echinocandins Resistance	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	To be submitted for publication
Proteomics profiling of rare genetic disease CONCS	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabdelkamel,	To be submitted for publication
Metformin Study lipidomic	Prof. Assim Alfadda Dr. Hicham Benabdelkamel Dr. Afshan Masood	To be submitted for publication
Differences in the URINE Proteome of Hypo-Hyperthyroid Patients before and after treatment: A Proteomic Analysis.	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabdelkamel,	To be submitted for publication
The potential effect of the transcription factor Nrf2 on inflammatory response in adipocyte	Dr Hafedh Dekhil	Completed
Comparison of the effects of Nebivolol and Nebivolol +Valsartan combination intervention on amelioration of cardiovascular insulin resistance and obesity in a diet-induced obesity mouse model	Dr. Rukhsana Gul	Completed

Project Title	PI	State
Proteomics profiling of rare genetic disease OSGEP	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Peptidomics analysis of the Hypo-Hypothyroid Patients	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Proteomics Profiling of POROXYROMONAS GINGIVALIS proteins post two different treatments	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Proteomic profile of human serum with chronic exposure to Cannabis	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Proteomic profile of human serum with chronic exposure to amphetamine+ CANNABIS	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Nanoproteomics: cell treated by nanoparticles	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood, Dr Rukhsana Gul	Ongoing

Project Title	PI	State
Endometrial cancer study tissue Proteomics– Dallah project	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabdelkamel,	Ongoing
Endometrial cancer study Plasma Proteomics	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Liraglutide study proteomics	Prof. Assim Alfadda Dr. Aisha Ekhzaimy, Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Metformin study proteomics	Prof. Assim Alfadda Dr. Hicham Benabdelkamel, Dr. Afshan Masood	Ongoing
Thyroid tissue (GOITER) proteomics	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabdelkamel,	Ongoing
Characterization of inhibitory effects of novel nanoceria on biofilm formation	Dr Rukhsana Gul	Ongoing

Project Title	PI	State
Effects of β -adrenergic receptor antagonists on myocardial injury in lipopolysaccharide-induced LPS-induced endotoxemia	Dr. Rukhsana Gul	Ongoing
The activation of Nrf2 pathway may counteracts high glucose-induced shifts in substrate preference, mitochondrial dysfunction and cardiac remodeling in Diabetic cardiomyopathy	Dr.Hafedh Dekhil	Ongoing
The role of the NFE2L2 pathway in Mitochondria function and Biogenesis in Adipocyte	Dr. Hafedh Dekhil	Ongoing
Evaluation of Herbal Formulas Used by the Herbalists to Treat Obesity and related disease in Saudi Arabia	Dr. Hafedh Dekhil, College of Science, Dr Nael Abutaha	Ongoing
Studying diabetes complication data in a Saudi cohort in comparison to data from Hong Kong.	Prof. Assim Alfadda, Prof Ronald Ma	Ongoing
DNMT1 role in metabolic fitness of adipocytes through acting as an epigenetic safeguard of mitochondrial dynamics.	Prof. Assim Alfadda, Prof Jae Bum Kim	Ongoing
MSIA project. NPST project.	Prof. Assim Alfadda Dr. Hicham Benabelkamel, Dr. Afshan Masood	To Start
CORDIAL proteomics	Prof. Assim Alfadda Dr. Afshan Masood, Dr. Hicham Benabelkamel,	To Start

Non-Alcoholic Fatty Liver Disease in a Saudi Cohort with Type 2 Diabetes Mellitus

Dear Doctors;
We thank you for your help in recruiting
patients to this study.

Inclusion criteria

Men and women aged 18 to 60 years with
Type 2 Diabetes.

Exclusion criteria

1. Evidence of hepatic decompensation (ascites, clinical jaundice, encephalopathy).
2. Preexisting hepatocellular carcinoma, or other preexisting hepatic or extrahepatic malignancy.
3. Viral Hepatitis.
4. Autoimmune Hepatitis.
5. Primary Biliary Cirrhosis.

Please contact our Study Coordinator at:
Tel: 0536658879
KFMC EXT: 27509
E mail: cordialstudy@gmail.com



Figure 2: The largest cohort for studying Non-Alcoholic Fatty Liver Disease in a Saudi Cohort with Type-2 Diabetes Mellitus in collaboration with King Fahd Medical City

Education and Training

Training activities at the ORC

The Obesity Research Center at the College of Medicine, King Saud University (KSU) organizes several research training programs throughout the year. The training programs by the center are carried out in different disciplines to introduce the different aspects of medical research. The present activities were deferred due to the COVID - 19 pandemic.



Summer training Programs

During summers we offer an intensive three weeks summer research program (SRP) for students in the field of biological sciences. The program is open to the undergraduate students nominated by various colleges at King Saud University. This program is envisioned to motivate and encourage students interested in pursuing academic careers in research and teaching. Students selected for SRP interact one on one with their intellectual mentors and receive training in research methods and data analysis.

This program improves the academic experience of undergraduate students and exposes them to a research environment by giving them an opportunity to conduct hands on research with the expert faculty members. In addition to research, students participate in weekly meetings and seminars. At the end of the program, students give an oral or poster presentation of their research. Scientists at ORC also organize lectures and social events to create a unified environment for student trainees.

Advanced Molecular Biology Research Program

An extended advanced program is also conducted by the center for students with a basic research background who want to learn or improve advanced molecular techniques. ORC offers an intensive Advanced Molecular Biology course for two weeks for the post graduate students in the field of biological sciences. The biomedical research training program, which is a one week crash course providing a complete overview on molecular biology concepts and applications. This program is envisioned to motivate and encourage students interested in pursuing academic careers in research and teaching.

This program is open to scientists, research scholars, technicians and physicians working in various areas of biomedical research. Students selected for this training will be interacting one on one with their intellectual mentors and receive training in research methods and data analysis. During this advanced molecular biology course student will focus on the molecular cloning, overexpressing and functional characterization of protein in adipocyte.

The program offers theoretical knowledge and training sessions on both basic and advanced techniques, that are commonly used in molecular biology research such as DNA, RNA, protein extraction; electrophoretic techniques e.g., Sodium Dodecyl Sulphate PolyAcrylmide, Gel Electrophoresis (SDS-PAGE) and agarose gel electrophoresis; amplification techniques, e.g., Polymerase chain Reaction (PCR) and Reverse transcription-PCR (RT-PCR); immunoassays e.g., Immunoblotting and The enzyme-linked immunosorbent assay (ELISA). Furthermore, trainees get tips on writing and research skills for enhancing success in their future academic goals. In addition to this, students will conduct a small project under the complete supervision of research mentors who will interact with students to fit him into the research team. Research advisors will expect constant work from students, therefore trainees are required to give in a complete effort on their given projects.



Volunteer training program

Besides these training programs, ORC scientists mentor undergraduate students and graduate students enrolled in three or six months volunteer programs at College of Medicine, King Saud University. The volunteers are assigned to ongoing projects and work under the complete supervision of research mentors who train them about basic laboratory techniques, scientific reasoning and communication. The volunteers are infused with the values of research and given an opportunity to conduct original research and think critically to design their experiments, frame new ideas and test hypotheses. Most of the training programs organized by ORC are free of cost and offer students with a firm foundation for a future career in biomedical research. Due to concerns related to COVID-19 pandemic, majority of the training programs conducted at ORC were suspended for the year 2020.



Figure 3: Cellular and Molecular Biology Lab in the Obesity Research Center.



Figure 4: Volunteer training in the Cellular and Molecular Biology unit in Obesity Research Center

Training activities at the ORC

Even with ongoing pandemic, the proteomics unit hosted volunteers for training at its facility. The proteomics unit offers training to students, undergraduate and graduate, with an inclination to working with the state of the art proteomics technology. The training covers in detail the two major aspects of proteomics i.e., Gel-based proteomics and Mass spectrometry analysis. The students included in the training understand the current methodologies for analyzing and identifying proteins between healthy and diseased tissues, identifying metabolic pathways, and the comprehensive analysis of protein-protein interactions in different cell types. They will learn and have hands on experience in carrying out protein electrophoresis, learn basics of mass spectrometry, and protein database analysis. The gel-based training will give the students insight into different techniques like SDS-PAGE, Two-dimensional difference gel electrophoresis (2D-DIGE). It will also provide the basic knowledge about sample preparation, mass spectrometry workflow, and quantitative proteomics and will also discuss the basics of mass spectrometry and quantitative proteomics techniques.

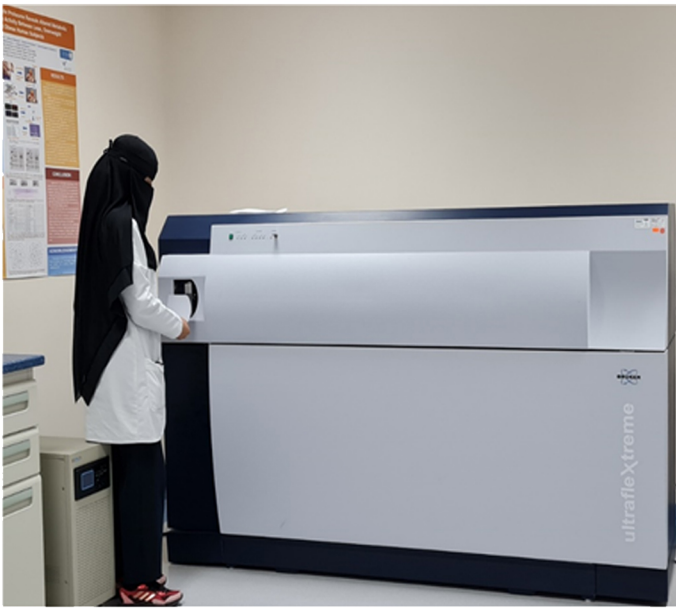


Figure 5: Volunteer training in the Proteomics unit in Obesity Research Center

Continuing Medical Education and Public Awareness activities

The center is active in providing Seminars, hosting eminent international and national speakers and conducting conferences and workshops to provide updated information on obesity and diabetes. We have invited eminent researchers in the field of adipocyte biology, clinical obesity, proteomics and proteomic imaging to deliver lectures and seminars on the most recent research topics, methods and technologies. The center conducts a yearly conference on Obesity and Diabetes: Current trends and Management, and actively participates in community-based program to increase public awareness about obesity, diabetes mellitus, its prevention and management at different schools, colleges and public forums.

Collaborations

National

Departments within College of Medicine KSUMC

The ORC collaborates with the different department within the college of medicine to help, assist and advance their research activities. This includes Endocrinology Division, Pathology Department, Obstetrics and gynecology Department, pediatrics and genetics Department, microbiology Division, endocrine surgery Division to name a few.

PI - Dr. Aishah Ekhzaimy Endocrinology Division	Cardiovascular effects of Liraglutide proteomics study
Co-I- Prof Abdulaziz Alsaif Endocrine Surgery Division	Proteomic analysis of Benign multinodular goiter
PI - Dr. Khalid Akkour Obstetrics and gynecology Department	Endometrial Cancer proteomics
PI - Dr Mohammed Albarrak Microbiology Division	Mycobacterial proteomics
Co-I- Dr Amany Fathaddin Pathology Department	MALDI imaging of Thyroid Tissue
PI- Dr Malak Alghamdi Paediatrics and genetics Department	Proteomics in identifying causes of hereditary diseases

College of Medicine

Colleges from King Saud University

The ORC collaborates with different colleges allied to KSU to help, assist and advance their research activities. This includes the College of Agriculture, College of Science, College of Nutrition, and College of Pharmacy.

Colleges in King Saud University

01

College of
Pharmacy

02

College of Food and
Agriculture Sciences

03

College of Science,
Bioproduct research chair,
Department of Zoology

04

Division of Nutrition,
College of Applied
Medical Sciences

National universities, Research and clinical institutes

The ORC collaborates with KACST, King Fahad Medical City, King Faisal Specialist Hospital and Research Center, King Abdulaziz University (Jeddah), King Abdulaziz Medical City (Riyadh, Jeddah).

National Universities, Research and clinical institutes



International

Seoul National University, Republic of Korea: Studying of adipocyte biology and its relation to chronic inflammation and different metabolic states, in collaboration with Prof. Jae Baum Kim.

Chinese University of Hong Kong: Studying diabetes complication data in a Saudi cohort in comparison to data from Hong Kong. This include prevalence of diabetic nephropathy and metabolomic changes that occur in patients with diabetic nephropathy in both countries with Prof. Ronald Ma.

McGill University, Canada: Studying the molecular basis of disease through MALDI proteomic imaging techniques with Prof. Pierre Chaurand.

International Universities

01

*Chinese University of Hong Kong
Professor Ronald Ma
Complications of Diabetes*

02

Seoul National University
Professor Jae Bum Kim
Adipokines and inflammation regulation of
Fat depots

03

McGill University
Professor Pierre Chaurand
MALDI imaging studies



Head of the center:

Prof. Assim A. Alfadda

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Vice Dean for Postgraduate Studies and Scientific Research
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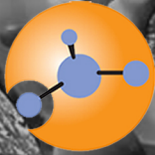
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VISION
2030

المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA