جامعة الملك سعود
King Saud University
1957

كلية الطب
College of Medicine

# RESEARCH FACILITIES IN THE COLLEGE OF MEDICINE


كلية الطب
**College of Medicine**
وكالة كلية الطب للدراسات العليا والبحث العلمي
Vice Deanship for Postgraduate Studies and Research

**First Edition, 2023**

## Preface

The College of Medicine has a diverse range of research facilities, each with its own area of expertise. These facilities are located in different research centers, research chairs, departments and units. This guide provides an overview of the research facilities available in the College of Medicine, as well as the resources that they offer.

The research facilities in the College of Medicine are staffed with experienced researchers who are dedicated to conducting medical research in different areas related to health problems facing our society. They use a variety of methods in basic and translational research. Other areas include clinical and population health research. These research facilities offer a variety of resources, including:

- **Equipment:** The labs have a wide range of basic and specialized equipment.
- **Expertise:** The labs are staffed with experienced researchers who can provide guidance and support to students and faculty.
- **Space:** The labs have enough space for students and faculty to conduct their research.

This guide is intended to help researchers find the resources they need to conduct their research. To find the right facility for your research, you can use the following information:

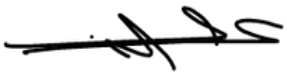
- **Facility Focus:** Each facility has a specific research focus on a certain disease or research area, such as for example, cancer research or liver disease research.
- **Research Methods:** Each facility uses a variety of research methods, such as basic science related techniques, clinical research platform, or population health research platform.
- **Resources:** Each facility has a different set of resources, such as equipment, expertise, and space.

If you have any questions about the research facilities in the College of Medicine, you can contact us at the Vice Deanship for Postgraduate Studies and Research, College of Medicine, at:

vdpcme@KSU.EDU.SA.

We hope that you find this guide helpful. We are looking forward for more collaborative and high-quality research in our College. We do extend the invitation to all students and researchers in King Saud University to engage in collaborative research with the College of Medicine to achieve our common goal in research excellence.

Thank you!



**Prof. Assim A Alfadda**

**Vice Dean for Postgraduate Studies and Research**

**College of Medicine**

**Contents**

## Name of the Research facility

# Animal Research and Experimental Surgery Facilities

| | |
|---|---|
| **Director/ Head** | Dr. Motaz Alogayyel |
| **Contact** | Mr. Hussain Almukhayzim<br>Phone: 011- 4671303 or 011- 4672165<br>Mobile: 0555118122 |
| **Email** | Exp.lap@ksu.edu.sa |
| **Research Lab location** | College of Medicine's old building<br>https://maps.app.goo.gl/jMCR9MqXN8NiT5tw7?g_st=iw |

**About the Center**

To support all staff, research teams, and students who are interested in the field of Animal Research and Experimental Surgery Research. The aim is to facilitate teaching and training activities to the medical community and support high-quality research to ensure a safe and proper environment for researchers and laboratory animals during experimental studies and training workshops.

We provide the following services:

**Animal housing rooms:** The main tasks of the facility are to house, raise, and maintain the different experimental animals, providing researchers with the animals necessary to carry out their projects.

**Experimental operating suite:** The experimental operating room works mainly with researchers to develop and implement experimental models required for different lines of research as well as follow- up and collection of different biological samples for such models.

**Training & workshop operation theater:** Surgeons and research teams use the ten-bed operation theater room And Robotic Surgery Room when training in:

**New surgical techniques:** such as endoscopic surgery, thoracic surgery, orthopedic surgery, ENT surgery

**Testing new medical devices and surgical materials:** we are providing areas for testing

**Animals we host:**

The number and species of animals used depend on the different lines of research to be carried out.

BALB/C C57BL/6 NUDE MICE RAT: SPRAGUE DAWLEY BALB/c is an albino, laboratory- inbred strain of the House Mouse from which a number of common substrains are derived.

Now over 200 generations, BALB/c mice are distributed globally and are among the most widely used inbred strains used in animal experimentation. It is the most widely used “genetic background” for genetically modified mice for use as models of human disease.

They are the most widely used and best-selling mouse strain, due to the availability of congenic strains, easy breeding, and robustness. The Wistar rat is currently one of the most popular rats used for laboratory research.

The Sprague Dawley rat and Long-Evans rats were developed from Wistar rats. Wistar rats are more active than others like Sprague Dawley rats.

Nude mice are useful for research into both cancer and immunology.

Inbred Strains of Mice, are an important process for the production of monoclonal antibodies. but do develop other types of cancers in later life, most commonly reticular neoplasms, lung and renal for being relatively resistant to diet-induced atherosclerosis, making them a useful model for Cardiovascular research animal species and models

**The workshop**

| | |
|---|---|
| **Orthopedic** | • Arthroscopic courses.<br>• Arthroplasty courses.<br>• Cadaveric approach courses. |
| **ENT** | • Broncho esophagoscopy & Laser Course<br>• Skull base workshop<br>• Advanced ENT Technique<br>• Advanced Endoscopic Imaging and Basic EMR/ESD |
| **Neurosurgery** | • Cervical spine surgery<br>• Basic and advanced neurosurgery courses |
| **Spine** | • Spine Update Cadaver Course<br>• Basic and advanced Spine courses |
| **General surgery** | • Basic and advanced laparoscopic courses |
| **Urology** | • Basic and advanced urology courses |
| **Plastic Surgery** | • Basic plastic suturing courses |

**Facilities Available**

| Equipment |
| --- |
| An experimental operating suite equipped with the necessary materials and equipment to carry out most types of scientific research involving Experimental surgery. |
| An isolation room for animals with the suction system that maintains proper temperature. and humidity levels |
| A reverse-isolation room for animals with immune deficiency that requires sterilization periodically. |
| laboratory animal rooms that offer independent ventilation cages that are in compliance with international standards and regulations for the breeding environment and laboratory room of mice and rats. |
| A ten-bed operations theatre with medical devices a large area suitable for workshops in various subjects and that accommodates a large number of members based on the workshop |
| Some support facilities include a small animal imaging core and biohazard housing at ABSL2 levels |

## Name of the Research facility

# Autism Research & Treatment Center

| | |
|---|---|
| **Director/ Head** | Prof. Laila Youssef Al-Ayadhi |
| **Contact** | 011- 8066306 |
| **Email** | lyayadhi@KSU.EDU.SA |
| **Research Lab location** | College of Medicine, 2nd Floor |
| **Website** | https://medicine.ksu.edu.sa/en/PhysiologyAutism |

**About the Center**

The Autism Research & Treatment Center (ART) is set up to understand and investigate the biomedical causes of autism spectrum conditions and develop new and confirm methods for assessment and intervention. The ART center encourages collaboration between scientists at King Saud University and outside, to accelerate this assignment.

| The ART Center has research programs as follows: |
|---|
| Biomedical investigation and intervention |
| Auditory integration therapy |
| Genetic study |

**Facilities Available:**

| Equipment |
|---|
| ELISA Reader |
| HPLC |
| Spectrophotometer |

## Name of the Research facility

## Chair on Vitiligo and Melanocyte Transplantation Research

| | |
|---|---|
| **Director/ Head** | Prof. Khaled Mohammed Al-Ghamdi |
| **Contact** | 011- 4692718 Mobile: 0504587330 |
| **Location** | Melanocytes culture laboratory, College of Pharmacy, KSU |
| **Email** | kmgderm@ksu.edu.sa<br>vitiligo@ksu.edu.sa |
| **Website** | c.ksu.edu.sa/vitiligo |

**About the Research Chair**

The Chair on Vitiligo and Melanocyte Transplantation Research involves in the culture of normal human melanocytes to observe the effects of various medicinal plant extracts and low-level lasers to treat vitiligo patients. The culture of various cancer cell lines to observe the effects of various anti- cancer drugs (synthetic formulations, isolated from plant extracts or nanoparticles). The research chair has Low-level lasers: Red, Blue, and UV lasers. Laminar Flow, CO2 Incubators, Phase contrast microscope, Centrifuge, Balance, Chromameter, and various cell culture-related equipment.

The main experiment performed in this lab

MTT assay to measure the proliferation of melanocytes or cancer cells after treatment. Cell migration assay to measure migration of cells.

Cell viability assay to measure the viability of cells. and Melanin content assay.

**Facilities Available:**

| Equipment | Model |
|---|---|
| Laminar flow | Nuaire |
| CO2 incubator | Nuaire |
| Phase contrast microscope | Olympus |
| ELISA reader | Biotek |
| Chromameter | Konica Minolta |
| Red laser | Azure |
| Blue laser | Azure |
| UV laser | Azure |

| Tests or Experiments |
|---|
| MTT assay to measure the proliferation of cells |
| Low-level laser therapy to embryonic stem cells and melanocytes |
| Cell migration assay to measure migration of cells |
| Cell viability assay to measure the viability of cells |
| Melanin content assay to measure melanin content from melanocytes |

## Name of the Research facility

## College of Medicine Research Center

| | |
|---|---|
| **Director/ Head** | Dr. Ibrahim Almaghlouth |
| **Contact Phone** | 011- 4670858 |
| **Email** | CMRC@ksu.edu.sa |
| **Research Lab location** | College of Medicine building/Third floor/Block 22 |
| **Website** | https://medicine.ksu.edu.sa/en/node/605 |

**About the Center**

The College of Medicine Research Center (CMRC) was established to serve as a model of excellence in interdisciplinary biomedical research that advances knowledge and enables novel biomedical discoveries to improve human health in Saudi Arabia and worldwide. Led by experienced clinical researchers, the CMRC Laboratory is located at the old College of Medicine building/Third floor/Block 22 under one roof, and the infrastructure is categorized as follows:

**Facilities Available:**

**Sample preparation facilities:**

Specific sterile and clean rooms are made available to prepare tissues, cells, nucleic acids, and proteins for analysis. The facility houses sample preparation instruments, and robots capable of handling hundreds of samples daily.

**Biobanking facility**

The new biobanking facility has the necessary equipment to store and manage human specimen samples, such as blood, urine, and tissue. The facility has deep freezers at -20°C, -80°C, and -150°C, and it uses RedCap for clinical data management.

**Cell and tissue culture facilities:**

This facility addresses various aspects of cell and tissue culture and cellular analysis, ranging from micro-manipulating single cells to visualizing and tracking molecules in live cells.

**Genomic Facilities:**

Whether one's interest is to follow a single gene or the interaction of many genes, this facility is built with care to address a detailed search for genetic variations from a single base pair to whole chromosomes, and beyond.

This facility supports the following tests or experiments DNA/RNA extraction, PCR, PCR-RFLP, Gel Electrophoresis, qPCR, DNA/RNA Bioanalyzer, and Western Blot. The molecular biology laboratory supports scientists in various types of work.

**List of major equipment available in the facility:**

| Equipment | Model |
|---|---|
| Flow cytometer | BD FACS Calibur |
| Flow cytometer | BD FACS Canto II |
| Real-Time PCR | Rotor-Gene Q |
| Gel Documentation system | |
| Plate reader | Biotek- synergy 2 multimode |
| Genetic Analyzer | HITACHI /3130 |
| Western Blot system | Mini-protean tetra system |
| Inverted Microscope | Nikon |
| Fluorescent Microscope | Olympus B51 |
| CO2 Incubators (IR water-jacketed, IR direct heat) | |
| Gel electrophoresis | Bio-rad mini-sub gel electrophoresis |
| Semi-dry plotter | Trans blot Turbo semi-dry |
| Chemiluminescence Western Blot Scanner | LI-cor C-digit scanner |
| Shaking incubator | GFL |
| Biobanking facility | Deep Freezers -20$^{O}$C, -80$^{O}$C and -150$^{O}$C |

| Tests or Experiments |
|---|
| The molecular biology laboratory supports scientists in various types of work DNA/RNA extraction, PCR, PCR-RFLP, Gel Electrophoresis, qPCR, DNA/RNA Bioanalyzer |
| ELISA (enzyme-linked immunosorbent assay) is a plate-based assay technique designed for detecting and quantifying substances such as peptides, proteins, antibodies, and hormones. |

## Name of the Research facility

# Colorectal Surgery Research Center and Chair on Colorectal Surgery Research

| | |
|---|---|
| **Director/ Head** | Prof. Omar Abdullah Bin Obaid |
| **Contact** | 0558670000 |
| **Email** | oalobaid@ksu.edu.sa |
| **Research Lab location** | Block 19, 20L/ Level 3/ Room 302 |

**About the Center**

The laboratory of the Colorectal Surgery Research Unit is equipped with the necessary devices and machines such as centrifuges, microscope and western blotting instrument.

| Main Area |
|---|
| Drug screening to develop a novel and effective anticancer drug |
| Creating a database for all colorectal cancer patients that include all patient information, which could affect the results of treatment of colorectal cancer. |
| In-Vitro Cell Culture work – Human Colorectal Cancer Cell lines. |
| A facility for colorectal stem cell transplantation and establishment of human cancer cell lines. |
| Well-structured Western Blotting Facility. |
| A Colorectal Cancer Biobank has been established in King Khalid University Hospital with around 200 samples since 2013 |

| Equipment | Model |
|---|---|
| Flow cytometer | BD-FACS |
| Western Blot system | Bio-Rad |
| PCR machines | Veriti, Applied Biosystems |
| Real Time Cell Analysis system | Xcelligence RTCA-DP system |
| Microplate Processor system | Evolis System |
| Cell Culture – Hood | Labgard |
| CO2 incubator | Thermo Scientific |

## Name of the Research facility

## Dr. Nasser Al Rashid Research Chair in Ophthalmology

| | |
|---|---|
| **Chair** | Prof. Ahmed Abu El-Asrar |
| **Contact** | 011- 4786100, extension: 3322 |
| **Email** | abuelasrar@yahoo.com, abuasrar@ksu.edu.sa |
| **Research Lab location** | Flat no 507, Level 5, Building 5, King Abdulaziz University Hospital (KAUH), KSU |
| **Website** | https://medicine.ksu.edu.sa/ar/node/6832 |

**About the Research Chair:**

It is a basic research laboratory dedicated to understanding the Pathological Mechanism of Diabetic Retinopathy (DR) and uveitis. The Dr. Nasser Al Rashid Research chair in Ophthalmology (NRRC) aims at

1. Studying the pathophysiological mechanism of diabetic retinopathy using human vitreous and tissue samples from diabetic and nondiabetic patients, animal models, and retinal cells culture,
2. Discovering molecular targets for therapeutic intervention in order to treat diabetic retinopathy at its earliest stage and
3. Studying molecular immune mechanisms involved in the pathogenesis of intraocular inflammation.

**Facilities Available:**

Cell & tissue culture, Molecular Biology Techniques, Microscopy, and Anlimal facilities.

| Equipment | Model |
|---|---|
| Fluorescence microplate reader | Spectra max GEMINI XPS |
| Spectrophotometer/ELISA microplate reader | Stat Faz 4200, Awareness Technology |
| Cell culture Laminar hood setup | 425-400G, LABGARD, Class II Biological safety |
| Tabletop autoclave | cabinet TA-300, D&E International Corp. |
| Chemiluminescence gel imaging system | G-BOX Chemi-XX8, Syngene |
| - 40 $^{O}$C Deep Freezer | MDF- U3333, Sanyo Biomedical Freezer, |
| Non-refrigerated High-Speed Centrifuge, | Z36 HK Hermle lab Tech NIKGMBH |
| Refrigerated High-Speed Centrifuge | Microfuge 22R, Bechman Coulter |
| C02 incubator | 3111, Thermo Scientific |
| Sonicator (probe type) | XL-2000 Misonix Ultrasonic Liquid |
| Fluorescence microscope | processors Olympus |
| Inverted Microscope | Olympus |
| Liquid Nitrogen tank | |
| Western Blot setup | Bio-Rad |
| Cryostat Microtome | CM2050 S, Leica |
| Water Bath | OLS200, Grand |
| Horizontal Shaker/Roter | Thermo Scientific |
| Western Blot setup | Biorad |
| 37 $^{O}$C Incubator | VS-1203P3V, Vision |

## Name of the Research facility

## Glaucoma Research Chair

| | |
|---|---|
| **Chair** | Prof Saleh A. Al-Obeidan |
| **Contact** | 011- 4786100 Ext-5540, 5532 |
| **Email** | salobeidan@ksu.edu.sa<br>akondkar@ksu.edu.sa |
| **Research Lab location** | King Abdulaziz University Hospital, KSU |
| **Website** | https://medicine.ksu.edu.sa/en/node/3151 |

**About the Research Chair**

The Glaucoma Research Lab, led by Prof. Saleh A. Al Obeidan, is a dedicated research chair focused on reducing visual disability resulting from glaucoma in the Kingdom. The lab is committed to advancing genetic research in order to identify the genetic factors that cause adult-onset or congenital forms of glaucoma to allow early interventions and prevent its occurrence. To achieve this, the lab is working to identify different genes and genetic variants associated with glaucoma in the Saudi population and establish predictive models for it. In addition, the team is building a comprehensive database for glaucoma patients in KSA to facilitate future research work. The goal of this research laboratory is to limit the impact of glaucoma in Saudi patients through targeted treatments that address genetic risk factors and may facilitate prenatal diagnosis in the future.

**Facilities Available:**

| Equipment | Model |
|---|---|
| DNA analyzer | THERMO FISCHER ABI 3730 |
| RT-PCT system | APPLIED BIO SYSTEM 7500 |
| Thermal cycler | APPLIED BIO SYSTEM Veriti 9901 |
| Thermal cycler | APPLIED BIO SYSTEM 9700 |
| Centrifuge | EPPENDORF 5810 |
| PCRr work station | LABCAIRE |
| Freezer-20 degree | GIBSON |
| Centrifuge | EPPENDORF 5430 and 5417 R |
| Freezer -80 degree | SANYO |
| Transilluminiator | GE |
| Molecular imager / gel doc. Sys / hood | BIORAD |
| Automated eia /chemistry analyzer | CHEMWELL 2900 |
| Affimetrix (fluidics, scanner, oven) | 3000 7G |
| Spectrophotometer /uv | NANODROP |

## Name of the Research facility

## Histology Lab (Anatomy Department)

| | |
|---|---|
| **Director/ Head** | Dr. Nihal Almuraikhi |
| **Contact** | 011- 4670811 |
| **Email** | nalmuraikhi@KSU.EDU.SA |
| **Research Lab location** | Anatomy Department, College of Medicine, First Floor |
| **Website** | https://medicine.ksu.edu.sa/en/node/2453 |

**About the Center:**

The Histology Research Facility is based in the Anatomy Department of the College of Medicine. It comprises of the latest in design light microscopes with the finest features. A regularly maintained extensive collection of histology slides and a high-resolution image library are central to teaching.

The histology lab also houses a multimedia microscope and projector screens, which are the key resources in delivering computer-assisted lessons. Multimedia microscopes also contribute to the development of a high-resolution digital image library essential for research purposes. The lab is also equipped with the latest and advanced high-resolution light microscope (BX53F) and basic lab equipment.

**Facilities Available:**

| Equipment |
|---|
| Tissue Processor |
| Embedding machine |
| Microscope |
| pH meter |
| Biosafety Cabinet |
| Cryostat |
| Microtome |

## Name of the Research facility

## Liver Disease Research Center

| | |
|---|---|
| **Director/ Head** | Prof. Khalid Alswat |
| **Contact** | 011- 467 2815<br>011-4672184 |
| **Email** | kalswat@KSU.EDU.SA |
| **Research Lab location** | Block 23 /Ground Floor |
| **Website** | https://saudiliver.ksu.edu.sa/en |

**About the Center:**

The center has established a national platform for liver diseases research; established a functional research center with allocated space, laboratory, and equipment; trained several researchers and research assistants; established an effective national and international collaboration; and, in particular, has established a national clinical database and a liver disease biobank. The laboratory applies the latest technologies to understand how genes are inherited, expressed, and regulated and their biochemical mechanisms. The lab facilities include the following instruments:

**Facilities Available:**

| Equipment | Model |
|---|---|
| PCR amplification system | Bio-Rad C1000 |
| Cell Separation System | SEPAX Biosafe |
| Spectrophotometer | Amersham Biosciences |
| Vortex | DAIGGER Genie 2 |
| Dry bath heating block | Labnet |
| Biobanking facility | Centrifuge /-80 $^{o}$C Freezers and 4 $^{o}$C |

| Research Activities |
| --- |
| Nationwide Hepatitis Database and Epidemiology of viral hepatitis their clinical long-term outcomes. |
| Nonalcoholic fatty liver disease epidemiology and natural history in the Kingdom |
| Genetic signatures of liver cancers. |
| Sponsored clinical trials in viral hepatitis. |
| Genomics of HBV and viral/host interaction. |
| Non-invasive liver fibrosis markers. |
| Pathogenesis and Biomarkers of Nonalcoholic Steatohepatitis (NASH). |
| Bariatric surgery effect on non-alcoholic Fatty Liver (NAFLD). |
| Blood sample separated labeling and Storage Facility |
| Validating candidate biomarkers for different stages of non-alcoholic fatty liver disease. |
| Assessment of liver inflammation and fibrosis after weight loss secondary to bariatric surgery in patients with nonalcoholic fatty liver disease. |

## Name of the Research facility

## Obesity Research Center

| | |
|---|---|
| **Director/ Head** | Prof. Assim Alfadda |
| **Contact** | 011-4692871 |
| **Email** | orc@ksu.edu.sa |
| **Research Lab location** | College of Medicine, West Building / Level 2 (01/2024) |
| **Website** | https://obesitycenter.ksu.edu.sa |

### About the Center

Obesity Research Center (ORC) has a fully equipped Proteomics facility and Molecular and Cell Biology facility.

### Proteomics Facility

The equipment in the Proteomics Facility allows protein separation by gel-based or gel-free methods, analysis by mass spectrometry, and protein identification by database searching. Proteins can be both identified and quantified in a wide variety of samples including simple mixtures (gel spots and bands) and complex biological samples (protein complexes, cell lysates, plasma, and urine).

### Major equipment available at Proteomic Facility are

| Model | Equipment |
|---|---|
| First Dimension gel separation system | Ettan IPGPHOR |
| Second Dimension gel separation system | Ettan DALT 6 |
| Biomolecular imaging | Azure- Sapphire |
| Gel documentation system | Alpha View |
| Biosafety Hood | Sterilchemgard III |

| | |
|---|---|
| MALDI-TOF system | UltraflexTerm time-of-flight (TOF) mass spectrometer outfitted with a LIFT-MS/MS device (Bruker Daltonics) |
| LC-MS/MS (High-resolution Q-TOF technology) | Bruker Maxis |
| LC-MS/MS (High-resolution Orbitrap technology) | Q-Exactive plus Thermo Fisher |
| HPLC | Agilent 1200 Series |
| Bioinformatic Tools and Analysis | Progenesis same spots software, IPA, metaboanalyst, Proteome Discoverer, Xcalibur, Panther, String Software |

| Tests or Experiments |
|---|
| The Proteomics lab provides consultation for designing projects, the number of samples required for running experiments, determining the cost of analysis, and discussing the novelty in the ideas. We additionally offer training to students, staff, faculty, and consultants. |
| Protein separation by gel-based or gel-free methods<br>• Sample preparation from all biological fluids and tissues.<br>• Protein Extraction, precipitation, clean-up, and quantification. |
| DIGE Experiment<br>• Cye Dye Labelling<br>• Separation of protein by First-dimensional electrophoresis based on Isoelectric point.<br>• Separation of proteins by second-dimension electrophoresis based on Molecular weight.<br>• Scanning of fluorescent gel images. |
| Statistical Analysis:<br>• Protein spot analysis by Progenesis Same Spots program (Nonlinear Dynamics, UK) by automated spot recognition approach for statistical analyses for gel image processing. |

| |
|---|
| Protein Identification and Mass Spectrometry Analysis:<br>• In solution or gel in situ protein digest<br>• Mass spectrometry using MALDI TOF.<br>• Protein identification using BioTools v3.2 (Bruker Daltonics) through peptide masses matching against the Mascot search algorithm (v2.0.04, Matrix Science Ltd., UK).<br>• The Peptide mass fingerprint are assessed using Flex Analysis software (version 2.4, Bruker Daltonics)<br>• Data interpretation and analysis with tables and generation of figures Quantitative Proteomics |
| Quantitative Labelling free high-resolution LC-MS/MS in solution digest protein |

**Molecular and Cellular Biology Facility (MCBF)**

The Molecular and Cellular Biology facility is equipped with all the basic instruments required for cell biology. This unit is the foundation of a wide array of basic and clinical research. The researcher and faculty involved in the Molecular and cellular biology unit decipher several areas of molecular and cellular processes. The research mainly focuses on the basic signaling pathways of different cells to understand their impact on different physiological or pathological processes.

Major equipment available at the Molecular and Cellular Biology facility are:

| Equipment | Model |
|---|---|
| RT PCR | ABI-7500 |
| PCR amplification system | Bio-Rad C1000 |
| Western Blot System | Bio Rad |
| Gel Documentation system | SynGene |
| Multiplex analyzer | Luminex 200 |
| Plate reader | Biotek- synergy 2 multimode |
| Inverted Microscope | Zeiss |
| Plate reader | Biotek- synergy 2 multimode |
| Spectrophotometer | Amersham Biosciences |

| Tests or Experiments |
| --- |
| Mammalian Cell Culture (primary and cell lines) |
| DNA/RNA extraction, Gel Electrophoresis, PCR, RT-PCR, cell lysis, protein extraction and western blot |
| ELISA (enzyme-linked immunosorbent assay) is a plate-based assay technique designed for detecting and quantifying substances such as peptides, proteins, antibodies and hormones. |
| Various equipment to separate the human specimen sample Like blood, urine, tissue, store (Deep Freezers -20◦C, -80◦C and -150 ◦C |


## Name of the Research facility

## Oncology Research Chair

| | |
|---|---|
| **Director/ Head** | Dr. Danny Munther Rabah |
| **Contact** | 0500025806 / 011- 4679748 |
| **Email** | drabah@ksu.edu.sa<br>cancer_chair@ksu.edu.sa |

**About Research Chair:**

Under the supervision of Prof. Danny Rabah, we have sought to improve prostate cancer scientific knowledge and awareness among community members in Saudi Arabia. Since our beginnings in 2009, we have established a network of national and international collaborations. We have obtained national and international research grants. We have conducted molecular, clinical, and public health studies on prostate cancer. We published two US patents, two translated medical books, and over 130 peer- reviewed research papers. We conducted the annual Prostate cancer update forum in 2016 and 2017, the annual prostate cancer awareness campaigns in 2012 and 2018, and Men's health campaign in 2019. We have accumulated considerable experience and professional know- how in scientific research.

**Facilities Available:**

- We have a Prostate Cancer Biobank
- Training medical students in the field of biomedical research
- Training urology residents and specialists on prostate MRI target biopsy
- Training sessions for primary health care physicians for early detection and screening of prostate cancer

| Equipment | Model |
|---|---|
| VIDAS® PC | bioMérieux |

| Tests or Experiments |
|---|
| VIDAS® is multiparametric immunoassay system based on the Enzyme Linked Fluorescent Assay (ELFA) technology.<br>VIDAS® offers routine batch or random access testing for serology, immunochemistry, antigen detection (such as tumor markers) and immunohemostasis. Five independent analytical sections allow you to perform 30 tests simultaneously. The VIDAS® PC software enables easy test launch, data management, result storage and bidirectional interface with the laboratory information system. |

## Name of the Research facility

## Physiology Department

| | |
|---|---|
| **Director/ Head** | Prof. Abdelrahman Alhowaikan |
| **Phone** | 011 - 8066301 and 011 - 8066303 |
| **Email** | physiology@KSU.EDU.SA |
| **Research Lab location** | 2nd floor, College of Medicine, |

**About the Department**

The Department of Physiology hosts faculty members and staff of diverse backgrounds, different skill sets, and varied research interests in the field of physiology and biology. The latter includes exercise, endocrine, reproductive, gastrointestinal, renal, and cardiovascular physiology in addition to hemostasis and coagulation and immune function. Moreover, the department has a clinical physiology and neurophysiology laboratory situated on a different campus that provides diagnostic services.

**Research areas and available techniques:**

| Available techniques | Research area |
|---|---|
| Exercise physiology | Reaction time measurement.<br>Upper and lower limb strength using specific dynamometers.<br>A multisystem exercise machine.<br>Calibrated ergometer. |
| Reproductive physiology | Organ bath system that enables the measurement of isometric smooth muscle contraction in human and animal fresh tissue samples. |
| Clinical physiology and clinical neurophysiology | Electroencephalography (EEG) using 128-channel Natus EEG set up with video. |
| | Electromyography (EMG) using Natus EMG set up. |
| | Nerve Conduction Studies (NCS) |
| | Pulmonary function tests (PFTs) using Platinum Elite PFT full set up, handheld spirometer, portable respiratory strength measurement, and exhaled nitric oxide analyzer (NIOX vero). |
| | Auditory and visual evoked potentials (AEP & VEP) using Surpass AEP and VEP setup. |
| | Analysis of body composition (TANITA) |
| | Visual Evoked Potentials (VEP) and Electroretinography (ERG) |
| | Auditory brain stem response (ABR) and electrocochleography (ECOG) |
| Cardiovascular physiology | Langendorff's apparatus is used to measure and evaluate a wide spectrum of highly reproducible data in both normal and abnormal animal hearts. For example, studying ischemic/ infarcted heart, ischemia-reperfusion injury, and ischemia-reperfusion pre- conditioning. |
| Hemostasis and coagulation | Clotting and coagulation assays |

**The list of main instruments currently available in the department are:**

| Equipment |
|---|
| Microscope |
| pH meter |
| Western Blot System |
| ELISA Reader |
| Microplate washer |
| Microplate Shaker |
| Sonicator |
| Homogenizers for tissues |
| Aggregometer (Platelet function analyzer) |
| Water bath |
| Balances |
| Deep Freezers (-20°C and -80°C) |
| Shaker |
| Cooling Centrifuge |
| Biologic safety cabinet |
| Biofuge (Centrifuge for Eppendorf tubes) |
| Hot Plate stirrer |
| Autoclave Bench |
| Incubator CO2 |
| Vortex |
| UV, visible Spectrophotometer |

## Name of the Research facility

## Prince Naif Immunology Research Lab

| | |
|---|---|
| **Director/ Head** | Prof. Saleh Zaid AlMuhsen |
| **Contact** | 011-4671336 |
| **Email** | smuhsen@KSU.EDU.SA |
| **Research Lab location** | 1st Floor College of Medicine |

**About the Center**

In the immunology lab at the College of Medicine develop a deep understanding of the integration of immunologic analysis with serum protein electrophoresis and other chemical analyses. Learn the different assays, interpret lab results for autoimmune diseases, and tests for immunodeficiency assays and HLA typing using morphological, cytogenetic, molecular, and flow cytometric diagnostic assessments.

**Cell culture Lab:**

The equipment in the cell culture lab allows sterile and safe handling of different tissues and cells. It's supplied by safety cabinets, CO2 incubators, Microscopes, cell analyzers, water baths, and cell counter.

**Molecular biology Main lab:**

Allows performing of different immunological tests by Flow cytometry, ELISA, cell sorting, and Cytokine analysis by Luminex analyzer. Also, Genetic analysis of different samples by Sanger sequencing, qPCR, and conventional PCR. Immunoblotting assays by western blot facilities is another privilege.

| Equipment | Model |
|---|---|
| Flow cytometer | Laser Flow Cytometer |
| Multiplex analyzer | LSRII Luminex 200 |
| Fluorescent Microscope | Olympus BX-53 |
| Cell sorter | ASTRIUOS II |
| InfraredImaging system | Odyssey clx |
| Genetic analyzer | GA 3730 |
| Thermal cycler | ABI Veriti |
| Plate reader | BioTech Epotech |
| Cell analyzer | Muse™ Cell Analyzer |
| Miscellaneous | Tissue homogenizer, Sonicator, Vortex, Western Blot system, inverted microscope, centrifuges, balances, and cold storage. |

## Name of the Research facility

## Stem Cell Unit (Anatomy Department)

| | |
|---|---|
| **facility Director/ Head** | Dr. Nihal Almuraikhi |
| **Contact** | 011- 4670811 |
| **Email** | nalmuraikhi@KSU.EDU.SA |
| **Research Lab location** | Anatomy Department, College of Medicine, First Floor |
| **Website** | https://medicine.ksu.edu.sa/en/node/1031 |

**About the Center**

The Stem cell unit applies the Flow Cytometry facility as well as the first fully functional stem cell lab in interests directed at Stem Cell Research as well as Therapeutics and Biomarker Discovery for Clinical Applications. The lab also has a molecular genetics setup (Including PCR systems and Bio-Rad gel documentation system).

Flow cytometry plays an important role in the understanding of many biological processes, due to its ability to simultaneously analyze multiple parameters on individual cells. Chemical and physical characteristics of cells which can be measured by flow cytometry include cell size, cell shape, surface membrane receptors, DNA content, nuclear antigens, intracellular Ca2+, intracellular pH, and gene expression.

**Facilities Available:**

| Equipmen |
|---|
| RT-PCR |
| Flow cytometer (under maintenance) |
| Microarray (under maintenance) |
| DNA Extractor |
| Western Blot System (under maintenance) |

| |
|---|
| Biosafety cabinets |
| CO2 incubators |
| Fluorescent Microscope and Inverted microscope |
| Spectrophotometer |
| Nanodrop |
| Centrifuge |

## Name of the Research facility

## Strategic Center for Diabetes Research

| | |
|---|---|
| **Director/ Head** | Prof. Assim Alfadda |
| **Phone** | 011- 4724179; 011- 4725682 |
| **Email** | scdr@ksu.edu.sa |
| **Research Lab location** | 8578 King Abdulaziz Branch Road, Al Wizarat, Riyadh 12622<br>https://goo.gl/maps/5ByV9285DXb6dQar6 |
| **Website** | https://scdr.ksu.edu.sa/ar |

**About the Center**

As a leading research center the Strategic Center for Diabetes Research (SCDR), College of Medicine, has been actively conducting research on the various aspects of diabetes. The laboratory provides a broad range of scientific clinical chemistry analysis. The research laboratory at SCDR participates and contributes to scientific research by performing clinical biochemistry, basic laboratory techniques, and biomarker research on diabetes and its complications. The high- performance microplate multimode reader facility allows the qualitative and quantitative detection of analytes from biological samples using microplate-based absorbance assay including ELISA methodology. A fully automated open-system immunoanalyzer provides high-quality assay performance and the most advanced biochip array analyzer facility serves as a platform to develop innovative strategies for performing sensitive, accurate, and precise biomarker analysis. All these equipment are well supported by different types of centrifuges, incubators, sample mixers, and storage (-20°C and -80°C freezers) systems.

**Facilities Available:**

| Equipment | |
|---|---|
| Biochemistry Analyzer | Randox Daytona |
| ELISA reader & washer | Biotek |
| Multiplex system | Evidence Indicator Randox |
| Immunoassay Analyzer | Evolis twin plus Bio-Rad |
| UV-Vis spectrophotometer | Nanodrop Thermo Scientific |

| Tests or Experiments |
|---|
| ELISA-based Biomarker test |
| Fully automated open-system immunoanalyzer |
| Clinical chemistry test and hematology for research purposes |
| Advanced biochip array analyzer facility |

## Name of the Research facility

## University Sleep Disorders Center

| | |
|---|---|
| **Chair** | Prof. Ahmed BaHammam |
| **Contact** | https://sleep.ksu.edu.sa/en/contact |
| **Email** | ashammam@ksu.edu.sa |
| **Research Lab location** | 1st Floor College of Medicine<br>https://sleep.ksu.edu.sa/en/LocationMap |
| **Website** | https://sleep.ksu.edu.sa/en |

**About the Center**

The USDC is the premier clinical sleep disorders center that not only provides top-quality care to patients with sleep disorders but also trains the next generation of sleep medicine fellows and technologists. Collaborating with prestigious basic science research centers and animal research facilities in and outside KSU, the USDC generates groundbreaking clinical and translational research that advances our understanding of sleep and its impact on health. Committed to excellence, the USDC follows the American Academy of Sleep Medicine's Clinical Practice Guidelines in all procedures and offers a comprehensive range of diagnostic and therapeutic services, including type I attended overnight sleep studies for all kinds of sleep disorders, as well as Multiple Sleep Latency (MSLT) studies and Maintenance of Wakefulness (MWT) tests. Actigraphy sleep monitoring and vigilance tests are performed when needed, and the center has even launched a pilot project to perform Home Sleep Testing (HST).

The USDC is also a prolific producer of high-quality research, with more than 400 peer-reviewed papers, book chapters, and 4 textbooks published to date. The center's staff members have presented more than 100 research presentations at national, regional, and international specialty scientific conferences, showcasing the USDC's cutting-edge research to the wider scientific community. The USDC actively collaborates with research centers at KSU, as well as other research centers nationally, regionally, and

internationally, as evidenced by its extensive publication record. Furthermore, the USDC offers unparalleled research opportunities to undergraduate and postgraduate students, including Master's and Ph.D. candidates, who can benefit from the center's state-of-the-art facilities and supportive research environment.

**Facilities Available:**

| Equipment Model | |
|---|---|
| | |
| (4) level 1 diagnostic polysomnography devices for performing sleep studies | Alice -6 (Philips/Respironics) |
| (1) Infrared reflectance (IR) oculogaphy (OPTALERT™) To measure drowsiness | Optalert Pty Ltd, Melbourne, Australia |
| All equipment is used for the clinical care of the patients as well as for research | |

**Contact**

For any inquiries or suggestions about this guide, please contact:

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College of Medicine

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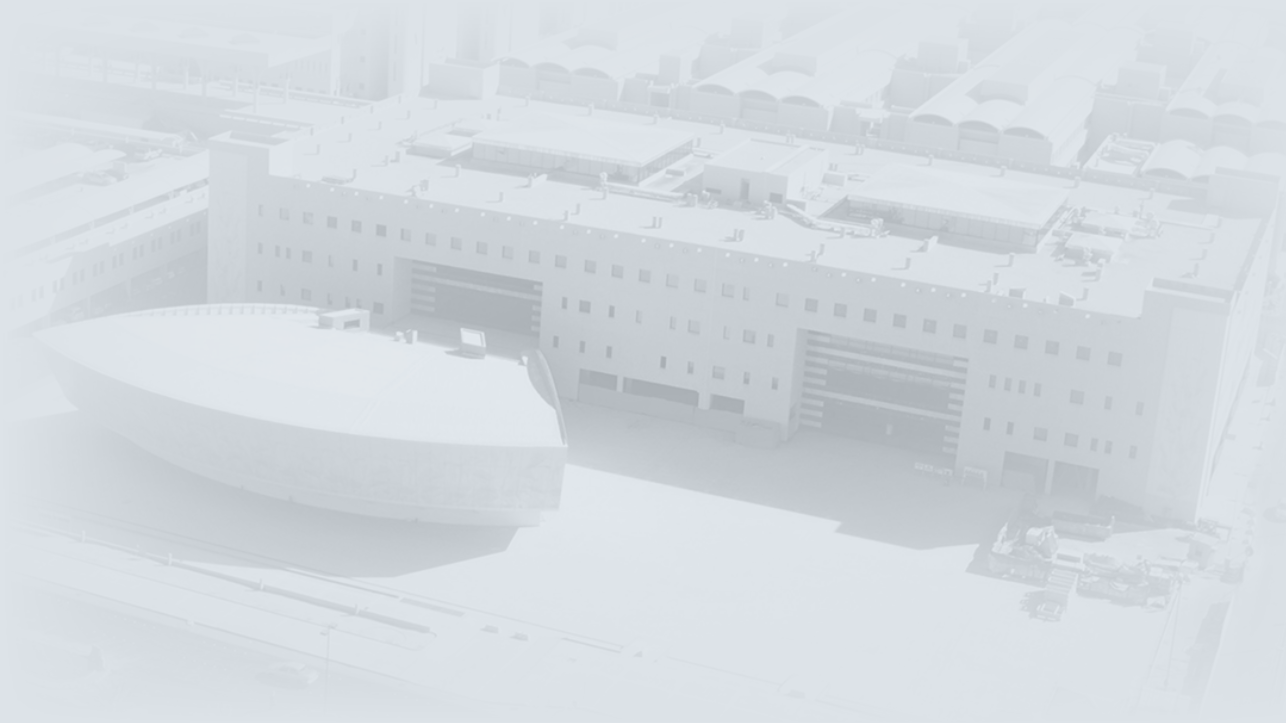

كلية الطب

**College of Medicine**

وكالة كلية الطب للدراسات العليا والبحث العلمي

Vice Deanship for Postgraduate Studies and Research