

College  
of Medicine  
& Medical  
Sciences

CMMS



# Master of Science in Regenerative Medicine



## Program Overview

Regenerative Medicine deals with the process of replacing, engineering and regenerating cells, tissues and organs to restore the normal functions in certain diseases or as an Antiaging therapy.

It is part of translational research in tissue engineering, and molecular and biomedical medicine. It may also involve the use of stem cells, immunomodulation therapy and transplantation of in vitro grown organs and tissues. This program is designed to address different aspects of Regenerative Medicine through courses and research to gain theoretical and practical knowledge on this rapidly advancing field of science. The program has two pathways of specialty, Anti-aging Health and Stem Cell Science. This two-year program leads to a Master of Science degree. Optionally, students may choose a one-year, non-thesis program leading to a Diploma.

## Vision

To bring pioneered program in Regenerative Medicine to the Gulf Cooperation Council (GCC) countries.

## Mission

- To train health professionals in the GCC countries in Regenerative Medicine.
- To provide high quality research in the field of Regenerative Medicine.



## Program Objectives

- Raise awareness on the importance of Regenerative Medicine in the region.
- Improve the quality of life and wellbeing and increase the average age of the GCC population.
- Acquire the fundamental principles of Regenerative Medicine with specific reference to ethical considerations.
- Conduct advanced scientific research in the different areas of Regenerative Medicine.
- Develop various skills and techniques in the molecular, cellular and clinical applications to achieve regenerative therapies.



## Learning Outcomes

By the end of this program, students should be able to:

- Incorporate the principles of preventative, integrative and Regenerative Medicine strategies and active aging.
- Change treatment and care for seniors to achieve better health outcomes and quality of life.
- Perform advanced techniques utilizing modern instrumentation and methodologies.
- Plan and carry out research relevant to the needs of their respective communities in the areas of their acquired expertise.
- Demonstrate a full understanding of ethical issues inherent in medical research involving humans and animals.
- Demonstrate oral and written communication skills to convey their ideas, plans, and results of experiments at various scientific settings.



## Program Outline

### The Master of Science Program

The Program has two major areas of specialization, namely:

- Anti-aging Health
- Stem cell Science

The Master of Science program is a Two-Year program organized as follows:

The curriculum is organized around 4 semesters (of 16 weeks duration each). The first semester consists of core courses, while the second semester is devoted to specialized courses. During each semester, the student organizes with the supervisor/s the required courses and the research work, which all spread over the semesters of the academic year.

At the end of the second semester, students must achieve a GPA of 3.0 or higher to proceed to thesis. The thesis topic is decided in consultation with the Supervisor and the approval of the Academic Committee of the program taking into consideration the student's interests and ongoing research activities. Thesis work can be partly performed by the student in his/her institution if a qualified supervisor is identified and technical facilities are available to carry out the planned experiments. Internal and external examiners evaluate the written thesis and examine the student orally.

### The Diploma Program

The Diploma Program is a one-year program organized around two semesters. The first semester consists of core courses (14 credit hours), while the second semester is devoted to 10 Credit Hours of specialized courses and a Diploma Project (4 credit hours). The program is implemented by a Director and decisions are made by an Academic Committee consisting of members representing the major specialties in the program according to the rules and regulations of the Arabian Gulf University (AGU).



## Outline of Courses

The students study 36 credit hours inclusive of a Master thesis, which is equivalent to 8 credit hours. The courses cover 28 credit hours as in the list below.

### A. Core Courses

The requirement of these Core Courses is 14 credit hours (1st semester).

Course Code	Course Name	Credit Hours
CMMSRM 600	Basic Stem Cell Science	2 Credit Hours
CMMSRM 601	Biology of Aging	2 Credit Hours
CMMSRM 602	Ethical, Legal and Social Issues of Stem Cell Research	2 Credit Hours
CMMSRM 603	Genetic, Epigenetic and Genomic Testing	2 Credit Hours
CMMSRM 604	Research Methodology	2 Credit Hours
CMMSRM 605	The Fundamentals of Regenerative Medicine	2 Credit Hours
CMMS 604	Research Methodology	2 Credit Hours
CMMS 621	Inferential Statistics and its Applications	2 Credit Hours



## B.1. Specialized Courses for Anti-aging Health Specialty

The requirement of these courses is 14 credit hours (2nd semester).

Course Code	Course Name	Credit Hours
CMMSAA 600	Metabolic and Endocrine Approaches and Hormone Therapy in Lifespan Health	2 Credit Hours
CMMSAA 601	Environmental Health in Anti-Aging	1 Credit Hour
CMMSAA 602	Nutrigenomics and Longevity Nutritional Therapies	2 Credit Hours
CMMSAA 603	Stem Cells Therapies in Lifespan Health	2 Credit Hours
CMMSAA 604	Gene Therapy in Lifespan Health	2 Credit Hours
CMMSAA 605	Antiaging Aesthetic Health	2 Credit Hours
CMMSAA 606	Anti-Aging Drugs and Supplements: Pharmacological Aspects	2 Credit Hours
CMMSAA 607	Lifestyle and Lifespan Health	1 Credit Hour



## B.2. Specialized Courses for Stem Cell Science Specialty

The requirement of these courses is 14 credits (2nd semester).

Course Code	Course Name	Credit Hours
CMMSSC 600	Embryonic, fetal and adult stem cells	2 Credit Hours
CMMSSC 601	Clinical applications of stem cells in Regenerative Medicine	2 Credit Hours
CMMSSC 602	Stem cell culturing and sorting techniques/differentiation	2 Credit Hours
CMMSSC 603	Hematopoietic stem cell transplantation	1 Credit Hours
CMMSSC 604	Tissue engineering	2 Credit Hours
CMMSSC 605	Immunological aspects of cellular therapy	2 Credit Hours
CMMSSC 606	Stem Cells and Translational Health	1 Credit Hours
CMMSSC 607	DNA Editing and Gene therapy	2 Credit Hours

## C. Diploma Project

Course Code	Course Name	Credit Hours
CMMSRMD 608	Diploma Project	4 Credit Hours

## D. Master Research Project

Course Code	Course Name	Credit Hours
CMMSRMD 609	Thesis	8 Credit Hours



## Methods of Assessment

Students' performance will be evaluated based on:

- Student Performance including presentations (30%)
- Written assignment (30%)
- Final written exam (40%)

## Admission Requirements

- The applicant is a citizen of one of the GCC countries or a citizen of an Arab country and is a resident in one of the GCC countries.
- Nomination/no objection letter from the Ministry of Education or Higher Education of the applicant's country (GCC citizens).
- A medical degree (e.g. MD or M.B.B.S) or bachelor's degree in dentistry, pharmacy, medical laboratory, biochemistry, molecular biology or cellular biology from a university recognized by the University. Courses in molecular biology or genetics are required. Courses in biochemistry, biology and cell biology are recommended.
- A minimum overall average of "Very Good" to be considered for the Master of Science and "Good" to be considered for the Diploma.
- Two years' experience in a health-related profession (Fresh graduates may be considered on merit).
- Evidence of adequate proficiency in the English language (minimum TOEFL score of 450 or IELTS of 5.0).
- Final acceptance shall be made after passing a personal interview and the admission examination.



## Graduation Requirements

### Master of Science

- Successfully complete a minimum of 28 credit hours of course work.
- Carry out a laboratory-based research project and submit and successfully defend a written Thesis (8 credit hours).
- Obtain a minimum cumulative GPA of 3.0 out of 4.0.

### Diploma

- Successfully complete a minimum of 24 Credit Hours of course work.
- Satisfactorily complete a Diploma project (4 Credit Hours).
- Obtain a minimum cumulative GPA of 2.0 out of 4.0.



## Program Faculty

### AGU Faculty

Dr. Afif Ben Salah

Professor, Department of Family and Community Medicine

Dr. Khaled Greish

Professor, Department of Molecular Medicine

Dr. Moiz Bakhiet

Professor, Department of Molecular Medicine

Dr. Randah Hamadeh

Professor, Department of Family and Community Medicine

Dr. Ahmed Jaradat

Associate Professor, Department of Family and Community Medicine

Dr. Ghada Al-Kafaji

Associate Professor, Department of Molecular Medicine

Dr. Sebastien Taurin

Associate Professor, Department of Molecular Medicine

Dr. Sfoug AlShammary

Associate Professor, Department of Molecular Medicine

Dr. Yasin Tayem

Associate Professor, Department of Pharmacology and Therapeutics

Dr. Cristina Skrypnik

Assistant Professor, Department of Molecular Medicine

Dr. Jamil Ahmed

Assistant Professor, Department of Family and Community Medicine

Dr. Mona Arekat

Assistant Professor, Department of Internal Medicine



## Adjunct Faculty

<b>Dr. Abdulla Awidi Abbadi</b>	Professor and Director of Cell Therapy Center, University of Jordan.
<b>Dr. Ahmed El-Sohemy</b>	Professor, Department of Nutritional Sciences, University of Toronto, Canada and Canada Research Chair in Nutrigenomics.
<b>Dr. Gunter Lepperdinger</b>	Professor, Department of Cell Biology, University of Salzburg, Austria and Head Leader, Research Group Stem cell Aging.
<b>Dr. Joao Pedro De Magalhaes</b>	Professor and Leader of Integrative Genomics and Aging Group, Institute of Ageing & Chronic Disease, University of Liverpool, United Kingdom.
<b>Dr. KINO-OKA Masahiro</b>	Professor, Division of Science and Biotechnology, Osaka University, Japan.
<b>Dr. SAWA Yoshik</b>	Professor, Faculty of Medicine, Osaka University, Japan.
<b>Dr. Serguei Kozlov</b>	Professor and Principle Scientist/Program Manager, Center for Advanced Preclinical Research, Frederick National Laboratory for Cancer Research, the National Cancer Institute, USA.