1. Introduction:

The College of Medicine, while consolidating on its undergraduate innovative educational programs, decided to embark towards non-traditional postgraduate programs and prepare to offer a Master and PhD in Molecular Medicine and Translational Research. The College has succeeded in establishing strategic alliances with leading universities and institutions in France, Japan, Australia and U.S.A. Agreements have been signed by His Highness, Sheikh Sultan Bin Muhammad Al Qassimi, with University Paris Diderot, L"Institut National De La Sante Et De La Recherche Medicale (INSERM) and Institut Gustave Roussy, the largest cancer institute in Europe, to support postgraduate training and research in laboratories that have earned an international reputation. An important aspect of the agreement with University Paris Diderot is to establish a joint supervision of a Master and PhD program in Molecular Medicine and Translational Research where the degrees are awarded by the two universities. The Master and PhD programs will be the cornerstone of the new Sharjah Institute for medical research at the University of Sharjah.

2. Collaborating Universities:

The program is located at the College of Medicine, University of Sharjah and University Paris Diderot. Both universities have agreed to associate their efforts in order to promote international exchanges, to increase their scientific cooperation and to favor the development of research and higher education at the University of Sharjah. In this respect, a full academic supervision insuring standard and quality of courses similar to Paris Diderot University will be implemented. The two universities declare their intention to collaborate in the exchange of faculty, students and common scientific direction of research and organization of courses at University of Sharjah and Paris Diderot University in Paris.
3. Academic supervision:

A Joint Academic Committee will be formed from the University of Sharjah faculty and faculty from University Paris Diderot, France. Faculty from collaborating universities linked with UoS will be invited to join this committee when needed (Mie University, Japan, Monash University, and Baker’s Institute, Australia). The committee oversees the program’s development, implementation and evaluation, and gives advice on issues related to its overall functions. Further, every graduate student shall be assigned two academic advisers (one from UoS and another from Paris Diderot).

4. Program Structure

This program will prepare graduates to pursue a research career and acquire the necessary knowledge and skills to join a PhD program. The Master is a full time program and it is non-thesis. The curriculum will be organized under modules. Each module will have more than one course. Course contents will be identified by the joint academic committee.

5. Admission Requirements

- Holders of Bachelor degree or equivalent (MBBS, BDS, BS) from Colleges of Medicine, Dentistry, Pharmacy, Health Sciences, Biotechnology or a related field can apply.

6. Duration and Graduation Requirements

2 years – similar to the French M1 and M2 “four semesters”; total of 48 credits.

Year 1: General cell and molecular Biology courses (list to be decided by the Program Academic Committee).

Year 2: Advanced and more focused courses in addition to a research project.
<table>
<thead>
<tr>
<th>Year</th>
<th>Semester</th>
<th>Course Title</th>
<th>Type</th>
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<td></td>
<td>Monoclonal antibodies: production and clinical use</td>
<td>Elective</td>
<td>0900712</td>
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The MS program consists of 16 courses; 3 credits each (Total 48 credits). Students are required to complete all Compulsory courses in M1 (Total of 24 credits), and all Compulsory and one selected Elective course per semester in M2 (Total of 24 credits).
**Course Description**

**0900701  Biology and genetics of cancer cells  3**
This course will focus on the topics related to cellular oncogenes, tumor suppressor genes, and genetic alterations in cancer development.

**0900702  Gene Expression  3**
This course will focus on the study of the process by which inheritable information from a gene's made into a functional gene product, such as protein or RNA. Topics will focus on the detailed study of transcription factors and the mechanisms of control of gene expression.

**0900703  Cell communication and signaling  3**
This course will focus on the study of processes by which a cell converts one kind of signal into another. Topics include: Detailed study of cytoskeleton and cell motility, adhesion molecules, tyrosine kinase receptors, G protein coupled receptors and cell cycle.

**0900704  Modern techniques in Molecular Biology I  3**
A research project under the supervision of a faculty member, through which students gain experience in advanced molecular biology techniques including, polymerase chain reactions, bacterial transformations, gel electrophoresis and blotting techniques.

**0900705  Selected topics in cell biology  3**
This course will focus on the understanding of cells. Topics covered will include understanding of abnormalities in genetic material that lead to cancer, the effects of carcinogens on cells, cell cycle control programmed cell death and regulation of the immune system.

**0900706  Biotechnology**
This course will focus on the use of biological systems in medicine, industry and agriculture; food and drug production; industrial application of genetic engineering.

**0900707  Bioinformatics  3**
This course will focus on the application of information technology to the field of molecular biology. Topics include: detailed studies on methods of genome analysis and modelisation, sequence analysis, analysis of mutations in cancer, prediction of protein structure and high-throughput analysis.

**0900708  Modern techniques in Molecular Biology II**
A continuation of the research project under the supervision of a faculty member.
member, through which students gain experience in advanced molecular biology techniques

**0900709**  
*Selected topics in immunology*  
This course will focus on Immunochemistry; structure of immunoglobulin molecules; antigen-antibody interactions; humoral, cellular immune responses, and immunotherapy.

**0900710**  
*Dendritic cells*  
This course will focus on the detailed studies of differentiation of dendritic cells and their use in immunotherapy. Topics include: types of dendritic cells and their life cycles, dendritic cells and cytokines, relation to HIV and autoimmune diseases.

**0900711**  
*Selected topics in cancer biology*  
This course will focus on understanding the underlying genetic and molecular changes of uncontrolled cell growth and metastasis. Topics include: genetic mutations, heredity, immune system dysfunctions, hormonal imbalances, oncogenes, tumor suppressor genes, and epigenetics.

**0900712**  
*Monoclonal antibodies*  
This course will focus on the methods used to develop monoclonal antibodies and on their use in medicine. Topics include: hybridoma cell production, purification of monoclonal antibodies, recombinant antibodies for cancer treatment and chimeric antibodies generation.

**0900713**  
*Allogenic cell transplantation*  
This course will focus on the process by which a person receives stem cells from a genetically similar but not identical person. Topics include: bone marrow transplant, graft type, graft versus host disease and infections.

**0900714**  
*Selected topics in molecular biology*  
This course will focus on the study of the molecular underpinnings of the process of replication, transcription, translation of the genetic material. Topics include: the biochemistry and role of biomolecules, the study of the chemistry behind biological processes, genetic interactions and knock out studies.

**0900715**  
*Research methods in molecular Biology*  
This course will focus on the interaction between various systems of a cell. Topics include interaction of DNA, RNA, and protein biosynthesis pathways. Statistical techniques, polymerase chain reaction and oligo design using appropriate software. SDS-PAGE analysis and blotting techniques and analysis.
0900716  Programmed cell death  3
This course will focus on the regulated process of programmed cell death. Topics include: the biochemical events leading to cell death, apoptosis, autophagy, anoikis and detailed studies on the basic concepts and pathways of programmed cell death and their impact on cancer therapy.

0900717  Animal models in cancer biology and therapeutics  3
This course will focus on the study of the basic concepts and methods related to the production of animal models and their role in cancer biology and therapeutics.

0900718  Research Project  3
Application of knowledge gained in biological research by conducting an independent, original project under the supervision of a faculty member.