GENETIC ENGINEERING AND MOLECULAR BIOLOGY RESEARCH CENTER

MOLECULAR BIOLOGY RESEARCH UNIT

President of the University
Prof. Dr. Mohammed Abdel-Sameea Eid

Chairman of the unit
Prof. Dr. Ahmed Abdu Geaies
Vice President of the University for Postgraduate Studies & Research Affairs

Director of the Unit
Prof. Dr. Asmaa A.A. Hussein
Professor of Zoonoses
**Molecular Biology Research Unit (MBRU):**

The Molecular Biology Research Unit of Assiut University has been established since 1996 and it is accredited unit by EGAC according to (ISO/IEC 17025) from 25/9/2012 (No. 211026).

This unit is one of the special units of Assiut University and is directed by a group of eminent professors and staff members from different faculties. The unit is highly equipped with all facilities that allow the staff members of the university as well as research assistants to get involved in the field of Molecular biology and to carry out updated research in this field. The unit also offers a lot of services to the community either medically in terms of diagnosing diseases or in the field of biological sciences. Technical and administrative affairs of the unit are planned and overviewed by regular meetings of a committee headed by the vice president of Assiut University for Postgraduate Studies and Research Affairs and the Chairman of the center.

**Unit Mission:**

- The unit is the premiere place for individuals interested in a theoretical understanding of molecular biology and applying that knowledge to develop new and more effective forms of technologies and applications.

- The unit advances technological capabilities for all people and to nurture and promote the professionalism of those engaged in these pursuits.
The unit seeks to meet the professional needs and interests of members as well as to improve public understanding of technology, innovation, design, molecular biology and its contributions.

Building up a strong basis for postgraduates in the field of molecular biology that could help them to design and carry out their research projects. Also provide the challenge for the beneficiaries to design their own laboratories.

**Unit Vision:**
- The unit will increase knowledge, advance understanding of the principals and mechanisms of molecular techniques.
- To serve the unit member by being the technical professional's best resource for achieving the duties and by providing an effective voice on policies that promote member's prosperity.
- To fulfill this steps, different modules of workshops will be organized for the participants according to their academic ranks.

**Unit Objectives:**
1. Developing high-throughput research tools that focus on why disease occurs and rapidly apply this knowledge to help people in the society.
2. Organizing laboratory based workshops to motivate the laboratory experiences and credentials of participants in different molecular techniques.

3. We aimed to be a reference lab. for diagnosis of many infectious and zoonotic diseases and we got the (ISO/IEC 17025) Accreditation from the Egyptian Accreditation Council. The accreditation (No. 211026 - 25/9/2012).
**Activities provided by the Unit:**

- **Training Courses and Workshops:**
  The unit organizes regular training courses and workshops every year for the staff members and postgraduate students of Assiut University and other Universities in Egypt to familiarize researchers with modern techniques such as PCR, protein biology, molecular techniques and cell culture techniques. These workshops include both theoretical part and practical training.

- **Seminars:**
  Egyptian and Foreign professors from Austria, Germany, USA and others are invited for lecture presentation and have been collaborated in the activities carried out by the unit.

- **Research Facilities:**
  There are research facilities for postgraduate students to finish up parts of their thesis and for staff members for doing their research.

- **Serving the community:**
  The unit carries several diagnostic techniques for diagnosing various infections in patients allover Upper Egypt by advanced molecular techniques. The most important service for the community is the routine qualitative and quantitative diagnosis of HCV and HBV. Diagnosis of other diseases as Avian and Swine Influenza is also carried out.
Equipment and Research Facilities of the Laboratories:

1. PCR (1) Extraction of nucleic acids and protein Lab.:

   This lab is designed for receiving the various samples of different sources for extraction of nucleic acids (DNA and RNA) and proteins, and determining their concentration and purity.

2. PCR (2) Lab:

   Most of the molecular biology techniques are carried out in this lab such as:
   - Different types of PCRs (Simple PCR, RT-PCR, RAPD-PCR, Nested-PCR, Multiplex PCR and long PCR…etc).
   - Routine diagnosis of infectious and zoonotic diseases (e.g. HCV and HBV, Avian and Swine Influenza…etc).

3. Gel Electrophoresis Lab:

   This lab has the facilities for carrying out electrophoresis of nucleic acids and proteins. Also, it has gel documentation system (CC-D camera, video image and PC) which is useful for analyzing different types of gels.

4. Real Time PCR and DNA Sequencing Lab:

   - Two Real time PCR systems from Stratagene and Applied Biosystems are used for absolute gene
quantification, detection of single nucleotide polymorphism and allelic discrimination.
- DNA sequencer (ABI Prism) from Applied Biosystems used in numerous applied field such as diagnosis, forensic biology, human genome, as well as many animal, plant, and microbial genomes.

5. Microbiological lab:
- It includes fully automated & Semi-automated ELISA for serodagnosis of many infectious diseases, detection of tumor markers (Cytokeratins), toxins and hormones (FSH, TSH, Prolactin, Testosterone, Progesterone...etc).
- It also includes Vitek system, which is a rapid automated microbiology instrument which provides bacterial identification and susceptibility testing after just 18 hours. Tests can be performed by direct inoculation from the specimen into a miniaturized automatic system.

6. Cell and Tissue Culture Lab:
This lab is provided by many facilities to culture different animal cells and tumor cell lines which can be used in different aspects of research studies.

7. Cooling room:
It includes many types of deep-freezers (-80, -40 and -20°C). Also, different volumes of liquid nitrogen containers', fume hood cabinet and ice maker.

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Financially Supported Research Projects:
- The unit submitted a project to the Higher Education Enhancement Project (HEEPF) and it has been accepted. The project titled "Upgrading knowledge and skills in Molecular Biology for Postgraduates".
- The unit submitted a project to the Hel Labs Certification Project (HLCP) and it has been accepted. The project titled "Upgrading of Molecular Biology labs and Technical skills for accreditation".
**Staff members:**
- Prof. Dr. Asmaa A.A. Hussein,
  Professor of Zoonoses & Director of the unit.

- Dr. Rania M.M Ewida,
  Lecturer of Milk Hygiene & Vice director of the unit.

**Technical Staff:**
- Marwa Awad Abdel-Hafez
  M.Sc. Pharmacy (Microbiology & Immunology) & Technical officer

- Fify Alfy Gabra
  B.Sc. Science (Chemistry & Microbiology)
  M.Sc. Microbiology

- Mai Mohamed Abdel-Hafez
  B.Sc. Science (Chemistry & Microbiology)

- Martina Adly Mansour
  B.Sc. Science (Chemistry & Microbiology)

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**Facebook Page:**
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DNA Extraction lab

Ultracentrifuge
Spectrophotometer

PCR (2) Lab.
Gradient Thermal Cycler

Water Deionizer
Gel Electrophoresis Lab

Gel Electrophoresis System
Gel Documentation System

Real Time PCR Lab
Real Time PCR

DNA Sequencer
Tissue Culture lab

CO₂ Incubators
Inverted Microscope

Microbiological Lab
VITEK System

Semi-automated ELISA system
Shacking Incubator

Kitchen

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