Alexandria University

Research Strategic plan

Faculty of Pharmacy 2019-2024

The research strategy of the faculty of Pharmacy aims to establish multi-disciplinary teams to enhance the development of both new drugs whether natural or synthetic as well as new therapeutic regimens

المحور	الأقسام	ارقام الدراسات
المحور الثالث (محور الصحة والسكان)	-الممارسة الصيدلية - الكيمياء الحيوية - الميكروبيولوجيا والمناعة - العقاقير - الصيدلانيات	١٢-١٣-١٤
المحور السادس (محور التطبيقات التكنولوجيا والعلوم المستقبلية)	-الممارسة الصيدلية - الكيمياء التحليلية - الصيدلة الصناعية - الصيدلانيات - الكيمياء الصيدلية	١٨-٣٠
المحور السابع (محور الصناعات الاستراتيجية)	- الكيمياء التحليلية - الصيدلة الصناعية - الصيدلانيات - الكيمياء الصيدلية - العقاقير	٩٤-٩٥-٩٦-١٠٢ -١٠٥

To accomplish this aim the following strategic plans were conducted:

- **Development of novel drugs of Pharmaceutical importance for the Egyptian market having higher biological activities with lower side effect toxicity:**

Departments in Charge	Strategies
Pharmaceutical Chemistry	1. The use of polymers and nanotechnology in drug synthesis 2. Design by computer (drug design program) 3. Evaluation and screening of chemotherapeutics and antibacterials among others.
Pharmaceutical Chemistry & Pharmacology	4. Design & synthesis of drugs as anti-hypertensive
	5. CADD for synthesis of Anti-inflammatory drugs
	6. CADD for synthesis of hypoglycemic drugs.
	7. CADD for synthesis of Anti-cancer drugs
Pharmaceutical Chemistry & Microbiology	8. Design and synthesis of compounds as Anti-malarial & Anti-leishmanial agents.
	9. Drug design and synthesis of drugs with potential anti-hepatitis C activities.
Biochemistry	10. Drug discovery in liver diseases.

➢ **Development of pharmaceutical dosage forms and industrial technologies of pharmaceutical products to improve drug bioavailability, stability and performance :-**

Department in choice	Strategies
Pharmaceutics & Industrial	1. Novel drug delivery systems • Enhanced drug targeting via nanovehicular drug delivery systems • Pulmonary drug delivery • Transdermal drug delivery • Wound healing enhancement
	2. Optimization of drug formulation
	3. Preparation of modified release drug formulations
Pharmaceutics	4. Post-marketing surveillance studies
	5. Pharmacy practice and clinical research
	6. Bioequivalence and pharmacokinetic studies
	7. Development of drug delivery system for personalized medicine(3D printing and nanotechnology)
	8. Cosmoceuticals
Pharmaceutical and pharmaceutics	9. Biopharmaceutical studies of of novel drugs and drug safety (cytotoxicity studies)
Pharmacy practice	10.Performance indicators

➢ **Improvement of analytical methods for newly marketed pharmaceutical preparations to overcome formulation problems :-**

Department in choice	strategies
Pharmaceutical Analytical Chemistry & Pharmaceutics	1. Drug quality control
	2. Formulations and stability studies
	3. Pharmacokinetics and bioavailability
	4. Drug-drug interactions
Pharmaceutical Analytical Chemistry	5. Quality control of impurities
	6. Forensic analysis
	7. Counterfeit drugs
Pharmacognosy	8. Evaluation and quality control of natural products and phytopharmaceuticals

- **Discovery of new local herbal drugs of pharmaceutical medicinal & industrial importances and development of stability and bioavailability studies of phytopharmaceutical products as well as bioequivalence studies of herbal medicine:-**

Department in choice	Strategies
Pharmacognosy	1. Drug Discovery
	2. Search for herbal raw materials of potential pharmaceutical and industrial importance.
	3. Mammalian and Plant tissue culture as tools for anticancer and antiviral screening of herbal products and phytopharmaceuticals, as well as for the production of plant active secondary metabolites.
	4. Applications leading to genetic improvement of medicinal plants (*Agrobacterium*-mediated transformation and protoplast fusion technology).

Fulfillment obligation towards society by investigating the pharmacotherapeutics of cardiovasvcular, renal, liver, erectile dysfunction and GIT diseases and identifying, managing the adverse effects of immunosupperssants and drugs of abuse:-

Department in choice	Strategies
Pharmacology	1. Establishing ideal drugs for the management of erectile dysfunction with maximal therapeutic value and minimal untoward effects.
	2. Identification and management of adverse effects of immunosuppressants, drugs of abuse and studying mechanism involved in antinocicepitivity.
	3. Providing guidelines for improving heaith related problems associated with the use of immunosuppressants and increasing the public awareness of problems associated with drugs of abuse and potential approaches to rectify these problems.
	4. Studying the pharmaco-therapeutics of diabetes and cardiovascular, renal, liver and gastrointestinal diseases.
	5. Identifying pharmacokinetic and pharmacodynamic profiles of therapeutic drugs engaged in treatment of these diseases.
Biochemistry	6. Develop basic research in pharmacogenetic of liver diseases. 7. Developing genetic diagnostic biomarkers to non-invasively liver fibrosis. 8. Developing basic research on non-alcoholic fatty liver disease

➢ **Spreading knowledge about principles of public health issues including source and control of microbial contamination in addition to means of defeating antibiotic resistance. As well as applying emerging technologies including tissue culture and recombinant DNA technology for the development of new biopharmaceutical products using biotechnology tools :-**

Department in choice	Strategies
Microbiology and immunology	1. Expansion in the mechanistic study of the emergence of multi-resistance to the activity of antibiotics in bacteria strains and ways to overcome this common problem which cannot be overcome during treatment especially in developing countries because of the misuse of medication and the consequent risk to the health of members of the community and the failure of antibiotic treatment.
	2. Microbial studies to increase the activity of antibiotics to achieve the maximum benefit and contribute to the clinical use of antibiotics to reach an optimal treatment regimen.
	3. Microbiological study on the impact of the use of mixtures of different antibiotics and the mechanisms leading to the killing of microbes in order to overcome the problem of bacterial resistance to antibiotics.
	4. Studying the effect of pharmaceutical compounds such as polymers, steroidal compounds and antihistamines on the effectiveness of antimicrobials
	5. In response to the needs of the pharmaceutical market, the department has adopted the following research directions: - Microbiological quality control and their relation to drug manufacture including the study of the harmful effects of microbial contamination on pharmaceutical raw materials and finished products.

	• Evaluation of preservatives and their interactions in the microbiological preparations. • Evaluation of antibiotics and factors affecting its effectiveness from microbiological point of view.
	6. The trend towards using some modern methods in the field of genetics and genetic engineering is adopted in the hope of linking a future plan for drug manufacture in Egypt. This includes the advancement of research in the field of antibiotic production technology by some bacterial strains through studying the microbial and biochemical properties of these strains to increase production so that it can be exploited in the industrial field.
	7. Microbiological studies to isolate and identify some microbial strains capable of degrading polluting materials to try to get rid of them and reduce the adverse impact on human health and the environment, as well as an attempt to take advantage of the various degradation products.
	8. Research work in the field of biotechnology and genetically modified microorganisms (GMOs) for immunological (vaccines) and therapeutic applications
	9. The department is adopting a trend towards linking the research with targets that fulfill services to the community such as identifying various microbes in water and air samples as well as pharmaceuticals and food products, leading to increased safety.

Vice Dean

For Graduate Studies and Research

Prof. Hala Mustafa

Dean

Prof. Mervat Amin Kassem