PRIDE

Pharmaceutical Research in Drug Evolution

SULTAN-UL-ULOOM COLLEGE OF PHARMACY

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EDITOR'S DESK

The Sultan-ul-Uloom College of Pharmacy plays a distinctive and essential leadership role in the academic and professional evolution of the pharmaceutical professions. Since its inception more than a century ago, the School has remained a place of innovation, creativity and excellence in pharmacy education. As the needs of society and the profession changed, the School pioneered new programs to better prepare future pharmacists for an expanded role in the health care profession.

The Institution was established in the year 1997, approved by AICTE, Pharmacy Council of India and Affiliated to Jawaharlal Nehru Technological University Hyderabad. The college has successfully completed 17 years of existence with excellent results year after year. The college has special distinction of producing 8 University Gold Medalists. The faculty and non-teaching associates have demonstrated teamwork in carrying innovations to upgrade the standard of quality improvement in the areas of Pharmacy education. The College has continued building collaborations that strengthen student clinical experiences and increase opportunities for postgraduate training in community and ambulatory care pharmacy.

We recently expanded long-standing partnerships with CRIUM Research Organization and Prime Hospitals that offer valuable student experiential training with underserved groups. We recently expanded long-standing partnerships with two federally qualified health centers that offer valuable student experiential training with underserved groups.

Consistently the top-ranked private school of pharmacy, the college continues to be an innovative program in pharmacy education that meets the needs of a changing world. Our faculty, alumni and students remain passionate about enhancing the quality and scope of the profession and providing service to those most in need. The School holds a leadership position in a national movement promoting pharmacy practice in safety-net clinics serving the homeless and uninsured.

Inside this issue:

VISION & MISSION

Vision:

Sultan-ul-Uloom College of Pharmacy aspires to emerge as an internationally acclaimed institute of excellence imparting holistic pharmacy education along with innovative research, industry interface and patient care with a humane touch.

Mission:

Our mission is to be an institute of academic excellence in nurturing outstanding pharmacists by

- Ensuring high standards in imparting quality pharmacy education effectively integrating critical thinking, problem solving, team spirit and leadership skills.
- Promoting the academic, entrepreneurial and career growth of the students with ethical values and social commitment for sustainable development.
- Quenching intellectual thirst and fostering scientific temper for cutting edge research in pharmaceutical and clinical sciences that translates into health care and caters to the needs of the society at large.
- Building a collaborative environment with pharmaceutical industries, academic, clinical and research organizations that values and rewards innovation, productivity and life-long learning.

Hypolipidemic Activity of Artemisia Vulgaris Root in Diet Induced Hyperlipidemic Animal Model

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Hyperlipidemia is a major cause of coronary heart disease, ischemic cerebrovascular disease and peripheral vascular disease. The main objective of this study is to evaluate the hypolipidemic activity of aqueous root extract of *Artemisia vulgaris* in cholesterol diet induced hyperlipidemic rats. Rats were randomly divided into five groups each comprising six rats. The study was conducted for two months which included 30 days of feeding period and next 30 days of treatment period. Group I served as normal control, group II, III, IV & V were fed with high-fat diet for 30 days during the feeding period and then the high-fat diet was replaced by standard diet for the next 30 days of treatment period. *Artemisia vulgaris* extract showed significant serum lipid lowering effects in hyperlipidemic rats which brought down total cholesterol level and Atherogenic Index at 30th day and hypolipidemic activity of *Artemisia vulgaris* was compared with rosuvostatin in diet induced hyperlipidemic rats.

Determination of Glutathione in PC-12 Cells Using a Simple HPLC-UV Method

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A highly sensitive and simple HPLC-UV method has been developed and validated for the assay of Glutathione (GSH) in PC12 cells. GSH is a major intracellular antioxidant and it plays a vital role in many biochemical reactions taking place in the human organism and is a major intracellular antioxidant. Due to its own sulfhydryl (SH) group, GSH readily react with Ellman's reagent to form a stable dimer which allows for quantitative estimation of GSH in biological systems by UV detection. The separation was achieved using a C8 column, a segmented gradient elution consisting mobile phase (A) {phosphate buffer adjusted to pH 2.5} and mobile phase (B) {acetonitrile} was used at a flow rate of 0.8 mL/min, and ultraviolet detection at 280 nm was utilised. The developed method was validated with respect to precision, accuracy, robustness, and linearity within a range of 1 - 20 µg/mL. LOD and LOQ were 0.05 and 0.1 µg/mL respectively. Furthermore, the method shows applicability for monitoring the oxidative stress in PC12 cells.

Some New Terminology in Clinical Pharmacy and Pharmacy Practice

PHARMIONICS: The term pharmionics refers to the new branch of the biopharmaceutical studies, namely the study of what patients do with the medicines they have been prescribed.
CHRONOLOGY GRAPH: The chronology diagram shows the dose units applied in a graph with a system of coordinates. The abscissa shows the observation period in days, the ordinate the hours of the day from 0:00 to 24:00 h. Every point in the diagram represents an application of the medication. The time interval between the doses corresponds to the regularity of the applications and permits an easier evaluation of the treatment result and also of adverse effects of the prescribed medication.
OVERCOMPLIANCE: This term is used when there is evidence that the patient has taken more than the prescribed amount of medication. The outcomes of overcompliance are product specific, but can be expected to include increased numbers and severity of adverse effects, with or without increased levels of therapeutic action.
WHITE-COAT COMPLIANCE: The patient's compliance in the observation period is predominantly inadequate. A few days prior to the consultation with his doctor, he improves his compliance and with it also most of the clinical parameters. This leads to the doctor wrongly assuming that the patient's long-term treatment with the prescribed medication is adequate. The tooth brush effect or white-coat compliance refers to the improvement in compliance that has been noted in the several days prior to a scheduled medical visit.
DRUG HOLIDAYS: This term implies that the patient discontinues the intake of his medication for three or more consecutive days. These so-called 'drug holidays' may tend to occur on days on which the patient changes his usual daily activities, that is chiefly at weekends, holidays and vacations. A drug holiday (sometimes also called a drug vacation, medication vacation, structured treatment interruption or strategic treatment interruption) is when a patient stops taking a medication(s) for a period of time; anywhere from a few days to many months or even years if they feel it is in their best interests.
RARE DISEASE: In the United States, 'rare disease' is defined as a disease with a prevalence of less than 200 000 patients. Some countries have defined a rare disease based on a prevalence of 0.1–0.5% of the population. A rare disease is sometimes referred to as an orphan disease.
ORPHAN DRUGS: An 'orphan drug' is defined as a drug to treat a rare disease. The term 'orphan drug' originated from the belief that there were drugs that no pharmaceutical sponsor wanted to develop and market, and thus they were like homeless orphans. One of the most important principles about orphan drugs is that they are a very heterogeneous group of drugs. In fact, they are as heterogeneous as any other group of drugs and, in most cases, should not be considered as a separate group.
COMPLEMENTARY AND ALTERNATIVE MEDICINE (CAM): is a broad domain of healing resources that encompass all health systems, practices, accompanying theories and beliefs, other than those intrinsic to the politically dominant health system of a particular society or culture, within a defined historical period. The nine most commonly used complementary medicines that are in use in most of Europe and North America are derived from St. John's Wort, Saw palmetto, Gingko biloba, Black cohosh, glucosamine/ chondroitin, SAM-e, Ephedra, Ginseng and Kava.
BIOPHARMACEUTICALS: There is one type of medicine which does not fit into the regulatory schemes is biopharmaceuticals, also known as biogenerics. Unlike the typical drug, which is of relatively low molecular weight (referred to as 'small chemical entities'), these massively large compounds are not easy to either synthesize or describe down to the individual atoms. They include compounds such as growth hormone, interferon, erythropoietin and somewhat over 100 additional products, with a very tempting projected generic market in the billions (US$).

Influences of Single Dose Effects of Antihyperlipidemic Drug Atorvastatin on the Pharmacodynamics and Pharmacokinetics of Glimepiride in Normal Rabbits

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The study was conducted to find out the influences of single dose effects of antihyperlipidemic drug atorvastatin on the pharmacodynamics and pharmacokinetics of glimepiride in normal rabbits. Rabbits were selected as suitable animal model for the study since adequate quantities of blood samples can be collected at the desired intervals of time. The study was divided into three stages and was conducted in the same group of rabbits after sufficient wash out period to collect paired data regarding glimepiride kinetics and hypoglycemic activity in the absence and presence of the atorvastatin. Blood samples were withdrawn at different time intervals from rabbit's marginal ear vein. Blood glucose level was estimated by GOD – POD method and serum concentration of glimepiride was estimated by RP-HPLC. Atorvastatin had minor effect on blood glucose level; on the other hand it enhanced the hypoglycemic effect of glimepiride when administered in combinations.

Self Emulsifying Drug Delivery System for Improved Oral Delivery of Indomethacin

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Indomethacin, an NSAID, shows hydrophobicity and hence bioavailability problems due to dissolution rate limiting step. In the present research the aim was to study and develop the potential self emulsifying formulations as an attempt to improve the solubility, dissolution and hence anti inflammatory activity of indomethacin. Preliminary investigation was to select the oil, surfactant and co surfactant by the solubility studies. Using capmul MCM (oil), tween 80 (surfactant), transcutol P (co surfactant) pseudo temary phase diagrams were constructed by water titration method to know emulsification region. All formulations showed more than 90% of drug release at the end of 60 min. Best formulation was used for further anti inflammatory activity which showed 76.73% inhibition in 5h. The plasma level profiles were significantly increased for SEDDS compared to pure drug. The study concluded that a potential SEDDS were developed with a better in vitro release, enhanced anti inflammatory activity and pharmacokinetic parameters.

Drugs with confusing names: Look-alike-Sound-alike (LASA) Drugs

The existence of confusing drug names is one of the most common causes of medication error and is of concern worldwide. With tens of thousands of drugs currently on the market, the potential for error due to confusing drug names is significant. Adverse events that can occur when drugs are dispensed as the wrong medications underscore the need for clear interpretation and better communication between the doctors who write prescriptions and the pharmacists who fill them. The FDA says that about 10 percent of all medication errors reported result from drug name confusion. This includes nonproprietary names and proprietary (brand or trademarked) names. Many drug names look or sound like other drug names. Some medicines, although marketed under the same or similar-sounding brand names may contain different active ingredients in different countries. Furthermore, the same drug marketed by more than one company may have more than one brand name. Contributing to this confusion are illegible handwriting, incomplete knowledge of drug names, newly available products, similar packaging or labeling, similar clinical use, similar strengths, dosage forms, frequency of administration, and the failure of manufacturers and regulatory authorities to recognize the potential for error and to conduct rigorous risk assessments, both for nonproprietary and brand names, prior to approving new product names. Medication errors can occur between brand names, generic names, and brand-to-generic names like Toradol and tramadol. But sometimes, medication errors involve more than just name similarities. More than 33 000 trademarked and 8 000 nonproprietary medication names were reported in the United States of America alone in 2004, and an estimated 24 000 therapeutic health products were reported in the Canadian market. The Institute for Safe Medication Practices (ISMP) has posted an eight-page listing of medication name pairs actually involved in medication errors. There are many other look-alikes, sound-alike (LASA) combinations that could potentially result in medication errors. Table I includes examples of name pairs that have been confused in several countries around the world.

Examples of confused drug name pairs in selected countries
Brand name is shown in italics—Nonproprietary name is shown in bold

Country	*Brand name* (Nonproprietary name)	*Brand name* (Nonproprietary name)
Australia	*Avanza* (**mirtazapine**)	*Avandia* (**rosiglitazone**)
	Losec (**omeprazole**)	*Lasix* (**frusemide**)
Brazil	*Losec* (**omeprazol**)	*Lasix* (**furosemida**)
	Quelicin (**succinilcolina**)	*Keflin* (**cefalotina**)
Canada	*Celebrex* (**celecoxib**)	*Cerebyx* (**fosphenytoin**)
	Losec (**omeprazole**)	*Lasix* (**furosemide**)
France	**fluoxétine**	*Fluvoxamine*
	Reminyl (**galantamine hydrobromide**)	*Amarel* (**glimepiride**)
Ireland	*Losec* (**omeprazole**)	*Lasix* (**furosemide**)
	morphine	**hydromorphone**
Italy	*Diamox* (**acetazolamide**)	*Zimox* (**amoxicillina triidrato**)
	Flomax (**morniflumato**)	*Volmax* (**salbutamolo solfato**)
Japan	*Almarl* (**arotinolol**)	*Amaryl* (**glimepiride**)
	Taxotere (**docetaxel**)	*Taxol* (**paclitaxel**)
Spain	*Dianben* (**metformin**)	*Diovan* (**valsartan**)
	Ecazide (**captopril/hydrochlorothiazide**)	*Eskazine* (**trifluoperazine**)
Sweden	*Avastin* (**bvacizumab**)	*Avaxim* (**hepatitis A vaccine**)
	Lantus (**insulin glargine**)	*Lanvis* (**toguanine**)

Total Parental Nutrition (TPN): An Update

Parenteral nutrition (PN) is feeding a person intravenously, bypassing the usual process of eating and digestion. The person receives nutritional formulae that contain nutrients such as glucose, amino acids, lipids and added vitamins and dietary minerals. It is called total parenteral nutrition (TPN) or total nutrient admixture (TNA) when no significant nutrition is obtained by other routes. It may be called total peripheral nutrition (also TPN) when administered through vein access in a limb, rather than through a central port in body. TPN bypasses the normal way the body digests food in the stomach. It supplies the fuels the body needs directly into the blood stream through a central IV line. The body needs three kinds of fuel—carbohydrates, protein and fat.

Carbohydrates provide calories to the body. The main energy source in TPN is dextrose (sugar).

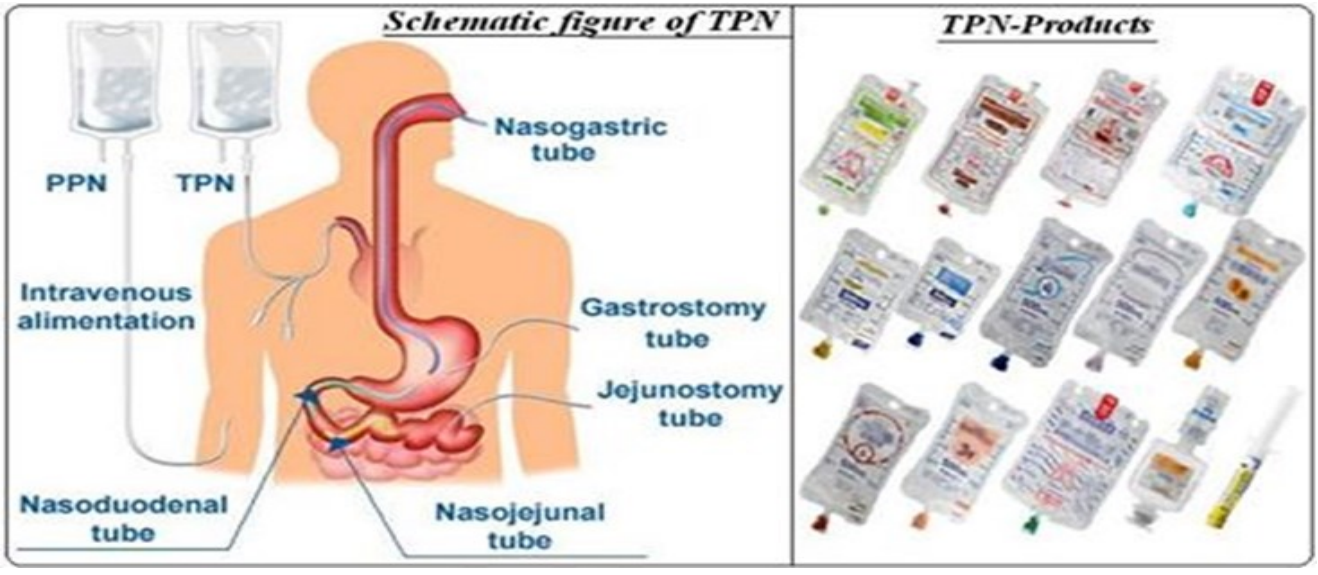
Protein—The body uses protein to build muscle, repair tissue & fight infections.

Fat or Lipids are another source of calories and energy. Fat supports and protects some of your organs and insulates your body against heat loss.

Electrolytes are important for bone, nerve, organ and muscle function.

Water is a vital part of TPN. It prevents patients from becoming dehydrated (too little fluid).

TPN may be the only feasible option for providing nutrition to patients who do not have a functioning gastrointestinal tract or who have disorders requiring complete bowel rest, including bowel obstruction, short bowel syndrome, Gastroschisis, prolonged diarrhea regardless of its cause, high-output fistula, very severe Crohn's disease or ulcerative colitis, and certain pediatric GI disorders including congenital GI anomalies and necrotizing enterocolitis. It is used for comatose patients, although enteral feeding is usually preferable. Parenteral nutrition is used to prevent malnutrition in patients who are unable to obtain adequate nutrients by oral or enteral routes.



Programme Outcomes (POs)

At the end of the programme the graduates shall

a. Acquire fundamental knowledge of pharmaceutical, clinical and life sciences, their practical applications, relevant historical landmarks and political issues.

b. Learn the basic principles of drug treatment, disease modifications, formulation development, manufacturing, quality assurance and analytical techniques.

c. Understand drug designing, cellular mechanism, molecular biology and molecular modelling.

d. Demonstrate knowledge of current regulatory guidelines and intellectual property rights.

e. Have thorough knowledge of pharmacovigilance, ADR–monitoring and pharmacogenetics.

f. Master the key concepts in modern pharmaceutical tools, software, equipments and their validation.

g. Greatly enhance their practical skills, scientific approach, analytical and critical thinking potential accomplishing the real time requirements of all stake holders.

h. Immensely benefit in organizing proficiency and knowledge dissemination in seminars, symposia and workshops.

i. Interact with industries, academic, clinical and research organizations widening their intellectual horizons and entrepreneurial skills.

j. Gain ability for sustainable development through team participation, communication, planning, time management, leadership and interpersonal skills.

k. Be groomed on societal, health and environmental safety, legal, cultural, ethical, moral and social practices for a better professional identity and lifelong learning.

l. Training graduates to achieve global competence to succeed competitive examinations in employment and higher education.

PRIDE

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Programme Educational Objectives (PEOs)

Academic Excellence: Graduates of this program shall gain profound knowledge in various disciplines viz., applied mathematics & sciences, anatomy, physiology, pharmacology, pharmaceutics, pharmaceutical chemistry, pharmaceutical analysis, phytochemistry, biotechnology and regulatory affairs to cater to the requirements of pharmaceutical industries, professional pharmacy practice, clinical research organizations, medical transcription and data management companies.

Core Competence: Graduates to be developed into highly competent individuals with practical skills by igniting scientific temper and promoting intellectual quest to gear ahead towards competitive examinations and diverse careers in the field of pharmaceutical sciences through the process of continuous learning.

Personality Development and Professionalism: To inculcate discipline, professionalism, team spirit, communication skills, social and ethical commitment in the graduates in order to adorn leadership roles facilitating improvement in healthcare sector with a distinct professional identity, business acumen, global recognition and sustainable development.

Collaboration: To benefit graduates through industry – institute interface and collaboration works with other academic, clinical and research organizations resulting in confidence building, knowledge advancement and entrepreneurial competencies.

Regulatory Affairs: Graduates to be trained in current acts and regulations governing good manufacturing practices, good laboratory practices, good clinical practices and environmental safety, thereby enhancing integrity and ethical values in their profession.