

IPORSIP-2000



**UNDERGRADUATE STUDENT
MINI SYMPOSIA
(USMS)**

POSTER PRESENTATIONS

POSTER PRESENTATION I. (USMS)

Construction Process Of The Web Site Of Gazi University Faculty Of Pharmacy Department Of Pharmaceutical Technology

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Construction of the web site is composed of two steps; design and application.

During the design process main considerations were; symbolization of the topics at the center of the page. This would help to direct people who are not familiar to the web language. Although this is a formal site which belongs to a government university, most of the users of this site are students.

The color selection is made according to the colors on the university logo. Color of the writing (blue) on white background and also the reverse, white writing on blue background allows contrast and makes it more readable.

During the application process, softwares: Microsoft Frontpage 98 (which is an hml editor), Adobe Photoshop, Cute FTO are used. During the design process, Adobe Photoshop is used for preparing the graphics, images and buttons. Different kinds of filters and effects (such as drop shadows of the writings) are used to create these buttons and images by the help of Adobe Photoshop. Microsoft Front Page 98 is used for ordering and establishment of the images, writings and buttons. This software is used to design the visualisation of the web site on the screen. Also, modification of these writing into buttons and links are all made by this software. These images and Java scripts are collected together in the page and html/htm folders are created. By this way, all the images and writings gained their own behavior and act like buttons and links. Consequently, all the images, writings, html/htm folders and java scripts are exported to CuteFTP to upload the site to a server which allows the site to be active on the internet.

**POSTER PRESENTATION II.
(USMS)**

Biotechnology In Pharmacy

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The field of pharmaceutical biotechnology is developing rapidly. For those working in the field of pharmacy, completely new techniques and products appear at a rapid pace. This is the result of the interplay between a number of different disciplines, most importantly: molecular biology, molecular genetics, bio-engineering, protein, sugar and nuclear acid chemistry and finally, but not least, the pharmaceutical sciences.

The total worldwide sales of biotechnology-produced pharmaceuticals continue to increase significantly.

Not only sales figures distinguish biotech compounds. Many of them are indicated for the treatment or prevention of serious life threatening diseases, e.g. cancer, viral infections, or hereditary deficiencies, or for previously untreatable conditions. These compounds often dramatically improve the patient's quality of life.

Therefore, the goal of this poster is to provide the visitors with an introductory model to familiarize themselves with biotechnology-related issues and terms. This is a basic focus on those issues related to the pharmaceutical profession. Target group is those pharmacy students who have not been in contact with modern biotechnology and wish to familiarize themselves with principles of this fast moving field. Our work consists basically headlines and main topics of the field as Molecular Biotechnology, Biophysical and Biochemical Analysis of Recombinant Proteins, Production of Biotech Compounds, Gene Therapy, Hematopoietic Growth Factors, Insulin, Growth Hormones, Vaccines, Monoclonal Antibody -based Pharmaceuticals, The Activator and Factor VIII, Recombinant Human Deoxyribonuclease, Follicle Stimulating Hormone (FSH).

POSTER PRESENTATION III. (USMS)

Elaborating Of Gallexcretory And Hepatoprotect Phytomedicines

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In spite of the fact that the demand on therapy has increased, only about 36 percent accounts for medicinal plants. The problems linked with the standardization of medical herbs, short terms of their preservation. Certain inexactitudes in dosing infusion and decoct straiten a wide usage of phytopreparations in clinical practice.

The diseases of organs having hepatic biliary system are wide spread. Thus, producing medical herbs having gallexcretory and hepatoprotective actions is a problem of today.

Aim of this research was to produce a hepatoprotective gallexcretory new galenic preparation derived from herbs.

As the objects of given investigation 9 plants of Georgian flora were used and 9 series of phytocomposition were studied. Raw material was collected in the different regions according with their preparation terms.

Hepatoprotecting activity was studied in rats with disease of hepatitis, challenge by CCL4; gallexcretory action in sucking pig with cholesterol.

On the grounds of biological research herb composition having 5 components has been investigated as the raw material resource to get a high effective hepatoprotective and gallexcretory remedy.

On the grounds of chemical and pharmacognostic chemical substance of 5 components herb composition has been established. The method of quantitative definition of flavonoid's sum in photocomposition is investigated. Relative error of the method doesn't exceed 3.95%.

On the grounds of technological research, a technological scheme of substance formation from 5 component herb composition has need formulations and a technology of preparing phytoprotective granules has also been investigated.

It was concluded from the biopharmacological study that the active substance can be released from granules in 10 minutes. While studying the stability, it was found that "Phytoprotective" granules are stable enough for two years preserving themselves in normal conditions.

With the help of biological research, it was proved that "Phytoprotective" granules have high hepatoprotective action and gallexcretory effect.

POSTER PRESENTATION IV.
(USMS)

Biodegradable Macromolecules In Tissue Engineering

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Tissue engineering is a multi-disciplinary field combining biology, materials science and surgical reconstruction. Shortage of organ donors and tissues increase the need for organ and tissue replacement by new biological substitutes regenerated from tissue specific cells and natural or synthetic polymer matrices. These matrices have an important role in Tissue Engineering as they support cells and carry bioactive agents such as growth factors. Biodegradability together with biocompatibility and suitable mechanical properties are preferred characteristics and are found only in a small group of materials such as reconstituted biopolymers (gelatin, collagen), some synthetic polymers (poly(lactide-co-glicolides), polyanhydrates) and minerals. A natural, biodegradable and biocompatible macromolecule known as poly(hydroxybutyrate-co-hydroxyvalerate) (PHBV) with varying ratios of HV has found increasing use in biomedical application.

Various Tissue Engineering applications involving biodegradable polymers including PHBV will be presented.

**POSTER PRESENTATION V.
(USMS)**

Liposome Mediated Gene Transfer Approaches

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Gene therapy involves treatment of diseases by products of foreign gene to return affected cells or tissues to their normal status. The successful application of this approach begins by developing a suitable carrier to deliver the genetic material to the site in question followed by expression of DNA. Different systems are being used to effectively transfer and express the foreign DNA in various types of mamalian cells. Some of the methods are: microinjection, electroporation, particle bombardment, polylysine conjugation, virus derived vectors and liposomes. After careful consideration, liposomes emerge with great promises. Since 1965, when liposomes were first introduced as a model cellular membrane (Bangham, 1965), they have been widely used as carriers for various kinds of substances to cells both in vitro and in vivo. Liposomes offer several advantages for their use in the delivery of DNA. They can protect DNA (or RNA) from inactivation or degradation, can be targeted to specific cells or tissues, and can overcome the problems associated with viral vectors. Many studies have been done to discover and improve the different aspects of liposome-mediated DNA transfer and a direct gene transfer protocol using a liposome-DNA complex has been approved for injection into the solid tumors of the patient. This review will cover various aspects of liposome-mediated DNA transfer to mamalian cells.

POSTER PRESENTATION VI.
(USMS)

Antibiotic Release From PHBV22 Implants

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In this project, Sulperazone (Sulbactam-Cefoperazone) or Duocid (Ampicilin-Sulbactam) loaded rods were prepared with poly(3-hydroxybutyric acid-co-3-hydroxyvaleric acid) copolymer (PHBV22) to be used in the treatment of osteomyelitis, a bone disease. In vitro release profile of the implants were studied at 37°C, pH 7.0.

Being biodegradable and non-toxic, PHBV is a good candidate for medical applications. Sulperazon and Duocid are wide spectrum antibiotics and are effective in the treatment of osteomyelitis which is a common problem in Turkey because of the high traffic accident rate leading to fractures.

The implant rods were prepared by mixing PHBV and the antibiotic (Sulperazon or Duocid) in a 1:1 (w/w) ratio. The paste was poured into a mold and maintained in a vacuum oven for 1 day. In order to prevent a rapid release rate, the rods were dip coated with PHBV solution. Three different coating solution concentrations were tried: 1.25, 5 and 9% (w/w). Release kinetics were determined in phosphated buffer saline (0.1 M, pH 7.0) at 37°C. the antibiotic release was completed in 24 hours for uncoated rods and rods coated with low concentration (1.25 and 5%) PHBV solution. With the 9% PHBV solution, however, the release could be extended to 48 h. The coating procedure is currently being optimized to provide a release for at least 15 days.

POSTER PRESENTATION VII.
(USMS)

**Electrochemical Determination Of Benzo[α]pyrene-DNA Adducts By
Using DNA Biosensor**

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Metabolites of the environmental pollutant benzo[α]pyrene are carcinogenic and mutagenic agents (1). BP, which also exists in cigarette smoke carcinogens, is implicated in the development of lung cancer (2). BP is metabolically activated to a variety of products and its biological properties have been studied comprehensively in model biological systems (3). BP-DNA adducts are formed by reaction of the exocyclic amino group of guanine to the benzylic carbon of the epoxide (4). No literature about the electrochemical determination of BP-DNA adducts has been recorded.

In this study, the determination of interaction between the BP and calf thymus double stranded DNA (dsDNA) and single stranded DNA (ssDNA) has been performed electrochemically by using carbon paste electrode (CPE). The interaction between the polynucleotides, such as poly[G] and poly[C], and BP has also been studied. The electrochemical signal of guanine was observed by using differential puls voltammetry at poly[G] modified CPE.

Electrochemical DNA biosensors (5) are useful devices to directly detect the BP-DNA adducts because of their major importance in cancer research.

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POSTER PRESENTATION VIII.
(USMS)

Hatching Eggs For The Evaluation Of Biopharmaceutical And
Pharmacodynamical Properties Of Excipients

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Hatching eggs are fertile eggs from the White Leghorn Hen. Within the first 14 days, the eggs are not the objective of German's animal protection regulations although they contain embryos with operating vascular and neuronal networks. Fertile hen's eggs were obtained from a specialised farm and hatched in an incubator at a temperature of $37.5 \pm 0.5^\circ\text{C}$ and $62.5 \pm 7.5\%$ humidity. The incubator was equipped with a computer-controlled rotation mechanism which imitates the turning of the egg by the sitting-hen. In the hen's egg test at the chorioallantoic membrane (HET-CAM), which has been recently accepted as an alternative for the Draize eye irritation test in rabbits by some authorities of the European Union, the irritation potential of excipients and formulations is estimated (1). After opening the egg at the vacuole, the vascularised CAM becomes accessible. The test substance is given for 20 s onto the CAM. The irritation potential can be estimated by observing the vascular properties. The grade of hyperaemia, hemorrhage, vascular lysis and protein coagulation is evaluated by a subjective scoring procedure. Furtheron, an overall irritation score can be calculated. Poly(ethyleneglycols), PEG, exhibited a strong relationship between the molecular weight and the irritation score. PEG 200 got a higher score than Polysorbat 80, whereas PEG 4000 was better tolerated. Hydrochloric acid (1 M) showed the highest irritation potential at the CAM. For a better access to the content of the egg, the fried egg test of Thanos was utilized (2). The fertile eggs are opened at the 4th day and the hatching is continued in petri dishes. Hence, drug permeation studies and the estimation of mucoadhesive potentials of excipients are feasible.

References

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POSTER PRESENTATION IX. (USMS)

Clotrimazole Dermal Suspensions- Physical Stability

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Clotrimazole is a synthetic derivative of imidazole with local anti-fungal effect, especially on the mucous membranes as it is very well tolerated (good patient compliance). The following pharmaceutical dosage forms have been used to administer the drug: dermal ointment and endovaginal and buccal tablets.

The objective of this study was to establish the formulation for dermal application. Since Clotrimazole possesses poor water solubility, low density, and is hydrophobic, floating in water. For formulation of a stable suspension, wetting, dispersing and viscosity agents must be added.

15 different suspensions of 1% Clotrimazole were formulated. In this suspensions, the following wetting agents were used: alcohol, glycerole, Tween 80, sodium lauryl sulfate. Methyl cellulose, hydroxypropyl cellulose, sodium carboxy methyl cellulose, polyvinyl alcohol, alginate and aerosil were used as viscosity agents. pH, rate (v) and ratio (F) of sedimentation were determined. Among all the formulations prepared, the Clotrimazole (1%) suspension containing methyl cellulose and Tween 80 was selected for further investigations.

**POSTER PRESENTATION X.
(USMS)**

Rectal Hydrogels Containing Dry Extract Of Ruscus Aculeatus

L. : Formulation And Biopharmaceutical Characterization

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The present study initiates into the application of a standardized dry extract of *Ruscus aculeatus* L. for the preparation of rectal hydrogels. Traditionally, these extracts have been used mainly for treatment of circulatory diseases of the lower limbs, some inflammatory conditions of anorectal mucosa, etc. The purpose of this study, was to formulate hydrogels with anti-hemorrhoid action, containing 2% dry extract of *Ruscus aculeatus* L. Several polymers, poloxamers and cellulose derivatives, have been used to develop stable formulations. The main characteristics of the hydrogels: rheological parameters, surface activity, pH, etc. were evaluated. The release profile of the active components and in vitro kinetic properties of the prepared optimal formulations of hydrogels containing dry extract of *Ruscus aculeatus* L. were also investigated.

POSTER PRESENTATION XI. (USMS)

Life Saving Excellence Of Biotechnology!? "Vaccines"

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Live organisms can be attacked by many pathogenic microorganisms. If they don't have enough immunity against these microorganisms, they won't be able to generate an immune response.

One of the most important successes of pharmaceutical biotechnology is the development of vaccines against infectious diseases. Vaccination was firstly used by Turkish and Chinese people against small pox in the 15th century. This was a simple technique of vaccination called variolation. In 1718 this technique was brought to Europe by Lady Mary Wortley Montagu who was the wife of the British Ambassador to Turkey at that time. When she was in Istanbul, she had observed the good points of variolation which was used by Turkish people and she had used this technique for her children. This had been the beginning of immunization studies in Europe.

The main law of vaccination is generating an immune response against infectious diseases by using the microorganisms or the products of microorganisms. Vaccines contain immunogen substances which have been prepared by manipulating the microorganisms or their products by using various biotechnological methods. When these substances are given to an organism, they generate an immune response.

Vaccination can be classified according to the form of immunogens contained in them:

1. Live attenuated vaccines
2. Vaccines prepared by purifying the macromolecules of microorganisms
3. Vaccines prepared by genetical manipulation:
 - a. Recombinant antigen vaccines
 - b. Recombinant microbial vectors
4. Synthetic peptides
5. Vaccines prepared from killed pathogens
6. Multivalence subunit vaccines
7. Anti-ideotype antibodies

The main goal of this study is to provide an overview on vaccines, the ways of preparation, vaccination in Turkey and the major problems.

POSTER PRESENTATION XII. (USMS)

Cloning

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Over the last two decades there has been a revolution in molecular biology. The cause of that development is a series of techniques variously referred to as genetic engineering, gene cloning, in vitro genetic manipulation or recombinant DNA technology. The ability to introduce genetic material by DNA replication and to pass it on to the progeny of cells forms the basis of this new technology. Genetic make-up of cells is altered by adding DNA from any source (animal, plant, microbial, or synthetic) outside. Genetically manipulated DNA can be introduced into bacterial species, animal cells, etc. This enormous development in biotechnology leads to cheap and efficient production of a tailored cell to cure or diagnose a disease. The best example of the application of cloning includes the transfer into the bacterium *E. Coli* of the human insulin gene, the interferon genes. Antibodies used in medicine are also produced by cloning. The application of the monoclonal antibody (McAb) technique begun with rat studies and rapidly skipped up to the human system leading to the generation of many useful specific agents, some of which have been used as diagnostics and therapeutic agents.

In mid-1980s, sheep and cow were cloned by direct transfer of the nuclei of embryos at the early stage. This indicated the possibility of transferring nucleus from partially differentiated cells. Keeping this in mind, in 1995, a group of scientists (I. Wilmut, K. Campbell et.al.) achieved to produce a genetically identical sheep, Dolly. After that, a new question arose in the mind of the scientists: Can cloning be applied to pharmaceutical manufacturing? Pharmaceutical industry has long been facing a major problem of providing biotechnological products of human origin such as hormones, enzymes, insulin, and functional proteins. Considering that the synthetic manufacturing of these products is nearly impossible at present, it becomes essential to produce them from animal or human resources. There we have to face a number of problems such as getting infected with HIV thru blood transfusion, refusal of an organ transplanted. Application of cloning allows the production of tissues, cells, and organs with the aimed properties and quality. This indicated the significance of cloning for medicine and pharmaceutical drug development.

POSTER PRESENTATION XIII. (USMS)

Applications Of Genetic Engineering To Pharmacy

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Recently, parallel to the developments in molecular biology, genetic engineering has also reached an advance level. Genetic engineering involves isolation, manipulation, and expression of genes causing change in genotype of the cell. The genetically tailored cell can be used for the treatment of diseases at genetic level.

Isolation of the gene may be the counterpart of a monogenic disease related gene or an anticancer gene or immune response producing gene. Normal human cells isolated from the individual, viral-based vectors, synthetic non-viral delivery systems such as "naked" DNA and polymers provide delivery and targeting to the tissue site. Controlled expression of the therapeutic gene is mostly used for vaccination or destructing cancer cells by cellular targeting.

The main objective of this project is to provide an introduction on genetic engineering and its medical applications.

Genetic engineering is used in replacement therapy for defective, inactive or absent proteins in patients: insulin vs. diabetes. Stimulation of immune system to generate a favorable response: e.g. colony stimulating factors for neutropenic interferons and interleukins for cancer patients, is achieved by application of genetic engineering. Targeting living cells and xenografting are other applications.

In conclusion, gene therapy provides "one-time" hit treatment that changes the genotype of a cell but remains permanent; target gene defects, cancer, HIV, viral and inherited diseases. Many clinical trials have been approved by regulatory bodies due to the promising outcome of the research. It will play a crucial role in healthcare as it allows correction of malfunctioning of a cell by directly inserting pure and accurate customized-designed gene into it. Genetic engineering forms a useful tool for diagnosis of inherited diseases. However, ethical considerations arise against misuse of the knowledge.

POSTER PRESENTATION XIV. (USMS)

Apoptosis: A Different Approach To Cure Diseases

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In physiology, apoptosis means programmed cell death, triggered by physiological and pharmacological stimuli. It is characterized by morphological specific features: chromatin condensation, DNA internucleosomal fragmentation, and nuclear disruption (karyorhexis). While plasmatic and nuclear membranes show blebbs formation of apoptotic bodies, the cytoplasm condenses. Apoptosis deletes damaged cells that may be deleterious for the organism. Thus, apoptosis is a genetic key-mechanism of organism defence against environmental damage. Keep in mind that it is different from necrosis, which is a pathological cell death. Cell death in apoptosis occurs without causing any immune response or inflammation. It regulates cell number at tumor development, hormon-based atropy, metamorphose, and embryonic development; and eliminates defected cells.

In this project, clinical application of apoptosis was studied. In many cases, it was proved that apoptosis can be formed by chemotherapeutics agents. It was reported that apoptosis inhibited skin cancer by means of topically applied curcumin. Curcumin, a yellow colored active substance isolated from the rhizomes of *Curcuma Longa*, induces apoptosis. NSAIDs are used in treatment of lung, breast, brain, colon, stomach, and prostate cancers as they initiate apoptosis in tumor cells. Although apoptosis is used in treatment of cancer when it is activated in tumor cells, it is not preferred to use programmed cell death to cure some diseases (heart infarctuse, ischemia, prevention of AIDS) in case of inactivation of normal cells.

The first achivement in use of apoptosis for treatment was in the case of a lung cancer where tumor cells induced apoptosis as a result of TP53 gene transfer. Treatment of breast and colon cancer with the same way followed it.

Apoptosis provides such a therapy without any side effect. Furthermore, it reduces the side effects of chemotherapy and radiotherapy when used in combination.

**POSTER PRESENTATION XV.
(USMS)**

**The Impact Of The Internet And Electronic Commerce On
Pharmaceutical Marketing**

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As a consequence of the recent developments in internet communication, marketing gained a new dimension. Electronic commerce emerged. Many consumers prefer shopping on internet. Many companies have homepages introducing their products and providing on-line sales and consultancy. More and more companies and sectors have began directing their sales and marketing toward the internet via world wide web sites to have a share in electronic market. Thus, a new challenging marketplace is formed. As for the most other products on the market, electronic commerce have provided opportunities for the marketing of pharmaceutical products, too. Companies selling raw materials for pharmaceutical manufacturing can extend their customer portfolia via internet. Customers in need of buying raw material can easily find potential sellers via internet communication and will have an opportunity to select the best product with the best preferred price in the comfort of their office. Chain drug stores (Walgreen, Osco drug, etc.) created web sites to reach their customers and/or patients world wide. Today, if you need a prescription to be prepared or a medicine, you can reach a drug store thru internet and get a pharmacist helping you on-line. The pharmacist can also get patient's history from his clinical file via internet and then, prepare the prescription accordingly. Hence, this will reduce the error on dispensing medicine. Electronic drug stores fasten the process of dispensing and sales and therefore, increase patient compliance. They also serve as health consultants. All these factors creates challenging marketplace for drugstores. Even leading pharmaceutical companies, today, have web sites to introduce their products and services and approach potential consumers. In this study, the impact of internet and electronic commerce on pharmaceutical marketing will be evaluated.

**POSTER PRESENTATION XVI.
(USMS)**

Genomics Technologies

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The recent advances in the genomics applications in the international markets created a new trend in industrial research and development. Genomics brings a new approach to drug development. It enlightens the scientists on determining the mechanisms diseases by use of genetic chips. It has a great potential to overcome the problems of traditional drug discovery methods that requires too much efforts and time. Within given time, cell-specific genetic subgroups in each cell is expressed with special balances. Scientists describe the indicators of genetic expressions as either normal or cancerous. Genomic research projects provides information on the genes responsible from hereditary abnormalities, the differently described genes and the genes of specific tissues. In this project, genomics technics will be intorduced.