NATIONAL AND CAPODISTRIAN UNIVERSITY OF ATHENS

THE SCHOOL OF PHARMACY

DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

MSc PROGRAM IN "I N D U S T R I A L P H A R M A C Y"

ATHENS 2002

COORDINATING COMMITTEE FOR POSTGRADUATE STUDIES

Professor G.Foskolos

Professor G.Th.Papaioannou

Professor P.Macheras

Professor C.Harvala

Professor N.Kolocouris

Professor A.Loukis

ADVISORY COMMITTEE FOR MSc PROGRAM IN INDUSTRIAL PHARMACY

Professor G.Th.Papaioannou

Professor P.Macheras

Associate Professor M.Efentakis

CONTENTS

BRIEF HISTORICAL REVIEW

The Department of Pharmacy was first established in 1843. In 1905 the Department became part of the Medical School and this lasted until 1922 at which time it became affiliated to the School of Sciences under which auspices it remained until 1982.

With the passing of the Law 1268/82 the Department of Pharmacy became part of the School of Health Science, along with the Departments of Medicine, Dentistry and Nursing.

In 1998 the Department was renamed "**School of Pharmacy**". Today it consists of three Departments :

a) The Department of Pharmaceutical Chemistry
b) The Department of Pharmacognosy- Chemistry of Natural Products
c) The Department of Pharmaceutical Technology.

The Division, now **Department of Pharmaceutical Technology,** was established in 1979. Two research laboratories collaborate within the Department, the Laboratory of Pharmaceutical Technology and the Laboratory of Biopharmaceutics and Pharmacokinetics. Research culminating in PhD diplomas has been carried out since the Division's inauguration, while MSc programs began in 1994. Currently two MSc programs are offered by the Department, one in Industrial Pharmacy and one in Clinical Pharmacy. Research is broadly based and expanding with support from Research Councils, industry and other sources. Strong links have been developed with pharmaceutical industry and hospitals and these support continuing innovations in basic and applied research, allowing rapid response to new challenges in pharmaceutical research.

MEMBERS OF STAFF

DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY

Head of Department	Professor G. Papaioannou
Laboratory Directors	
Pharmaceutical Technology	Professor G. Papaioannou
Biopharmaceutics-Pharmacokinetics	Professor P. Macheras
Remaining Teaching Staff	
Associate Professors	M. Efentakis
	C. Reppas
Assistant Professors	M. Constandinidou-Vlachou
	P.Dallas
	N. Drakoulis
	S. Markantoni-Kyroudis
	M.Rallis
	D.Rekkas
	M. Symillides
	G. Valsami
Secretary	V.Papathanassiou
	E. Kuritsi

MSc PROGRAM IN "I N D U S T R I A L P H A R M A C Y"

Admission Requirements

To be eligible to apply for the MSc program, an applicant must have completed his/her Bachelor Degree in Pharmacy, Medicine, Biology, Nursing, Chemistry or Chemical Engineering from a Greek or foreign university. Applicants may also be graduates of Pharmacy or Chemistry from Institutes of Higher Education (TEI). Students may be in the process of completing the pharmacy prerequisites when they file an application, but they must satisfactorily complete all prerequisites by the date of entry into the MSc program. Prior to their registration TEI graduates are required to pass examinations in the following undergraduate courses of the School of Pharmacy, University of Athens - Pharmaceutical Technology, Biopharmaceutics, Cosmetology and Pharmaceutical Analysis. The number of postgraduate students to be accepted each academic year is restricted to 22 and the announcement is published in the daily newspapers. Student selection takes place once each academic year, at the end of September, and the results are announced within 10 days.

Each applicant is obliged to supply the following papers with his/her application : a curriculum vitae, a photocopy of the undergraduate diploma or documents which will guarantee completion of the undergraduate degree prior to commencement of the first semester, a certificate acknowledging equivalence of the undergraduate degree (for all graduates of Universities outside Greece), a list of the grades received for each course taught in the undergraduate degree, proof of knowledge of one or more foreign languages or proof of adequate knowledge of the greek language (for foreign students only) and at least two letters of recommendation. In addition any scientific articles published by the applicant will be taken into consideration. Finally the selection of applicants is made following personal interviews by the Advisory Committee of the postgraduate program and approval by the General Asembly of the School of Pharmacy.

MSc Curriculum

The present curriculum consists of two years of study (four semesters). The first three semesters are intended to broaden the students' knowledge of subjects relating to the specialization through course work which involves over 320 hours of teaching courses (including laboratory work) and over 60 hours of seminars which students are obliged to attend. In the fourth semester, a laboratory- or library-based research project is undertaken.

Assessment

Postgraduate students must complete a minimum of 26 credit units of compulsory courses and 3 credit units of elective courses prior to beginning their research project for their dissertation (9 credit units) in the fourth trimester. For those courses which include practical work, successful completion of all laboratory exercises is required for successful completion of each course. Students are required to pass examinations in all courses and are graded in a scale of 1-10 with a pass mark of 5. Examinations take place at the end of each term (February and June). In case of failure a second final examination is allowed in September. The research project undertaken is required to be of a standard which will allow publication .

Course Structure of MSc Program

The courses of instruction for each semester with the number of credits granted to each of them, depending on the hours per week taught, the length of the laboratory courses (where applicable) and the importance of the course for the pharmacy curriculum, as well as the number of teaching hours per week are summarized in Table I.

TABLE I

MSc in Industrial Pharmacy – Program Outline

	Hours Per week	Credits
FIRST SEMESTER		
Physical Pharmacy	3 (T)	3
Quality Control GMP-GLP	3 (T+L)	3
Applied Pharmaceutical Analysis	2 (T)	2
Statistical Methods and their applications in the Pharmaceutical Sciences	3 (T)	3
Pharmaceutical Microbiology	3 (T)	3
SECOND SEMESTER		
Advanced Pharmaceutical Technology	3(T+L)	3
Advanced Cosmetology	3(T)	3
Advanced Biopharmaceutics /Pharmacokinetics	3(T)	3
Pharmacoeconomics-Marketing	3(T)	3
Elective Courses		
Novel Delivery Systems and Dosage Form Design	3(T)	3
Quality control and evaluation of products for topical use	3(T)	3
Clinical Pharmaceutical Analysis	2(T)	2
THIRD SEMESTER / FOURTH SEMESTER		
Research Methodology*	1(T)	
Seminars	3(T)	
Research dissertation		9

T=Teaching, L=Laboratory

*****Application of knowledge in this subject is examined within the research dissertation

The number of teaching hours per week shown in the above Table are only indicative and may be altered if considered necessary by the advisory committee responsible for the MSc

program. The content of each course and the teaching personnel responsible for each course are presented in the following pages.

FIRST SEMESTER

Physical Pharmacy

Teaching staff : G Papaioannou (Professor), M. Vlachou-Constandinidou (Assistant Professor)

Course content:

This course sets out to provide the physicochemical background to the design and use of pharmaceutical products with the use of physicochemical principles as applied to the various branches of Pharmacy. It encompasses the following topics:

Thermodynamics, Solutions of Nonelectrolytes, Solutions of Electrolytes, Ionic Equilibria, Buffered and Isotonic Solutions, Solubility and Distribution Phenomena, Complexation and Protein Binding, Kinetics, Diffusion and Dissolution, Interfacial Phenomena, Colloids, Micromeritics, Rheology, Coarse Dispersions, Polymer Science.

Suggested reading:

- Papaioannou G. (1998). Lessons in Physical Pharmacy and Pharmaceutics, 5th Edition (Greece, Athens.
- Martin A., (1993). Physical Pharmacy. Philadelphia Lea and Febiger
- Florence A., Attwood D. (1993). Physicochemical Principles of Pharmacy. London, Macmillan

Quality Control GMP-GLP

Teaching staff : D.Rekkas, P.Dallas (Assistant Professors)

Course content:

Introduction to Total Quality Management, Quality control, Quality Assurance, Cost of Quality, Quality Improvement Tools, Statistical Process Control(SPC), Process Capability Indices, Experimental Design, Official quality control methods for Pharmaceutical and Cosmetic products, Good Laboratory and Manufacturing practice.

Suggested reading:

- Juran, J.(1988) The Quality Control Handbook, 4th edition, McGraw Hill Inc.
- Barker T. (1985) Quality by Experimental Design, Marcel Dekker Inc.

Applied Pharmaceutical Analysis

Teaching staff: J. Atta-Politou (Assistant Professor, Dept. of Chemistry) and M. Koupparis (Professor, Dept. of Chemistry)

Course content:

Wet chemical techniques (titrimetry) electrochemical techniques (potentiometry, voltammetry);Spectrochemical techniques (UV,Vis,IR spectrophotometry), Atomic absorption and emission spectrophotometry, Fluorimetry;Separation techniques, chromatography (classification of methods, basic principles of chromatography); Gas chromatography (separation columns, qualitative analysis, quantitative analysis, instrumentation, detectors, preparation of derivatives for gas chromatography, separation of optical isomers); Liquid chromatography-HPLC-Normal phase chromatography-Reverse phase chromatography

Suggested reading:

- Munson,J.W. (Ed) (1981) Pharmaceutical Analysis . Modern Methods. Part A and B (1981), Marcel Dekker Inc., New York.
- Meyer, V.R., (1994) Practical HPLC, Second Edition; J. Wiley and Sons Ltd
- Krstulovic, A.M.(Ed) (1989) Chiral Separations by HPLC; Applications to pharmaceutical compounds (1989); Ellis Hoewood
- Hearn, M.T.W. (Ed) (1985) Ion-Pair Chromatography (1985); M. Dekker Inc.
- Beckett, A.H. and Stenlake, J.B. (1998) Practical Pharmaceutical Chemistry, The Athlone Press

Statistical Methods and their applications in the Pharmaceutical Sciences

Teaching staff: P.Macheras (Professor), C.Reppas (Associate Professor), M.Symillides, G.Valsami (Assistant Professors).

Course content:

Organizing and summarizing data. Measures of central tendency. Measures of dispersion. Basic probability concepts. Conditional probability. Probability distributions (binomial, Poisson and normal). Statistical Inference: Confidence Intervals (Parametric and Non-parametric). Hypothesis Testing: Parametric, distribution-free and non-parametric tests. Linear regression and correlation.

Suggested reading:

- Daniel, W.W. (1991). Biostatistics: A Foundation for Analysis in the Helth Sciences. New York, John Wiley & Sons
- Bolton, S. (1984). Pharmaceutical Statistics: Practical and Clinical Applications. New York, Marcel Dekker, Inc.
- Sokal, R.R. and Rohlf, F.J. (1981). Biometry. New York, W.H. Freeman and Company
- Glantz, S.A. (1981). Primer of Biostatistics. London, McGraw-Hill Book Company

Pharmaceutical Microbiology

Teaching staff: E. Lada-Hiteroglou (Assistant Professor, School of Medicine), G.Athanassiou (Ph.D.)

Course content:

General properties of microorganisms, morphology, structure of bacteria and viruses etc..Genetics of bacteria. Antimicrobial agents: antibiotics, disinfectants, antiseptics, preservatives. Antibiotic groups, their method of action and development of resistance. Evaluation of efficacy of antibiotics. Disinfectants, antiseptics : important examples and their method of action. Microbiological testing of drugs and cosmetics.

Suggested Reading:

- Hugo, W.B. and Russel A.D. (1995) Pharmaceutical Microbiology. 5th Edition, Edited by Russel and Hugo Blackwell Scientific Publications, London.
- Murray, Rosenthal, Kobayashi and Pfaller (1997) Medical Microbiology, 3rd Edition, Mosby.
- Block, S.S. (1991) Disinfection, Sterilization and Preservation, 4th Edition, Lea and Febiger, U.S.A.

Denyer, S.P. and Hugo, W.B. (1991) Mechanism of Action of Chemical Biocides: The Study and Exploitation Society for Applied Bacteriology Technical Series No. 27 Oxford: Blackwell Scientific Publications.

SECOND SEMESTER

Advanced Pharmaceutical Technology

Teaching staff: M. Efentakis (Associate Professor), D.Rekkas, P.Dallas (Assistant Professors)

Course content:

Encompasses preformulation, formulation and stability of pharmaceutical preparations. Manufacturing procedures of solid and semi-solid dosage forms such as tablets and capsules, suspensions, suppositories, creams, ointments, parenterals, transdermals etc. Hygiene and Safety in the Pharmaceutical Industry, Good Manufacturing and Laboratory Practice.

Suggested Reading:

- Lachman, L., Lieberman, H.A., Kanig, J. (1986) The Theory and Practice of Industrial Pharmacy, 3rd Edition, Lea and Febiger Inc.
- Carstensen,J. (1972,1973) Theory of Pharmaceutical Systems, Vol. I,II. Academic Press
- Banker,G. and Rhodes,C. (1995) Modern Pharmaceutics. 3rd Edition, Marcel Dekker, Inc.

- Chien, Y. (1992) Novel Drug Delivery Systems. 2nd Edition, Marcel Dekker Inc.

Advanced Cosmetology

Teaching staff: G. Papaioannou (Professor), P.Dallas, M.Rallis (Assistant Professors)

Course content:

Anatomy and Physiology of the skin. Types of excipients for the preparation of cosmetic products. Types of cosmetic products (antiperspirants, deodorants, sun-screen lotions, cleansing lotions, shampoos, hair dyes etc).

Suggested reading:

- Wilkinson,M.A., Moore,R.J. (1982) Harry's Cosmeticology, 7th Edition,Godwin,G.,London
- Butler,H. (1993) Poucher's Perfumes, Cosmetics and Soaps, Vol. 3, 9th Edition, Chapman and Hall
- Martini,M., Seller,M. (Eds) (1992) Actifs et Additifs en Cosmetologie Galenica, Lavoisier, Tec and Doc
- Goldsmith,L. (1991) Physiology, Biochemistry, and Molecular Biology of the Skin, Oxford University Press

Advanced Biopharmaceutics/Pharmacokinetics

Teaching staff: P.Macheras (Professor), C.Reppas (Associate Professor), M.Symillides, G. Valsami (Assistant Professors).

Course content:

Basic concepts in pharmacokinetics. Absorption analysis (Wagner-Nelson etc), Physiological models, Multicompartment models and Convolution/Deconvolution. Michaelis Menten and Chronopharmacokinetics. Theoretical Models for the study of oral absorption. Strategies for improving oral drug absorption. Alterations og GI physiology on oral drug absorption and experimental procedures for estimating oral drug absorption. Bioequivalence studies.

Suggested reading:

- Gibaldi, M. and Perrier, D. (1982). Pharmacokinetics. New York, Marcel Dekker, Inc.
- Wagner, J.G. (1993). Pharmacokinetics for the Pharmaceutical Scientist. Lancaster,USA, Technomic Publishing Co., Inc.
- Welling, P.G., Tse, F.L.S. and Dighe, S.V., Eds. (1991). Pharmaceutical Bioequvalence. New York, Marcel Dekker, Inc.
- Bolton, S. (1984). Pharmaceutical Statistics: Practical and Clinical Applications. New York, Marcel Dekker, Inc.

- Macheras, P., Reppas, C. and Dressman, J.B. (1995). Biopharmaceutics of Orally Administered Drugs. London, Ellis Horwood Series in Pharmaceutical Technology.
- Speight,T.M. and Holford N.H.G. (1997) Avery's Drug Treatment, 4th Edition, Adis International
- Evans,W.E., Schentag,J.J. and Jusko, W.J.(Eds) (1994) Applied Pharmacokinetics (1994) 3rd Edition, Applied Therapeutics,Inc.

Pharmacoeconomics-Marketing

Teaching staff: I. Yfantopoulos (Professor, School of Political Sciences and Social Administration), L. Dermetzoglou (Ph.D), B. Geroyiannis (Ph.D.)

Course content:

Basic principles of health economics, demand-supply-market structures. Health and drugs as social or private goods. The pharmaceutical industry in perspective. The Greek pharmaceutical industry and market. The role of European institutions and other international organisations. Health care reforms and their implications for the pharmaceutical industry. Pharmaceutical cost-benefit analysis, cost efficiency, cost containment.

Introduction to basic aspects of Pharmaceutical Marketing, the function of marketing in the Pharmaceutical Industry and the role of the Medical Representative, Sales Manager, Product Manager, Marketing Manager, Registration Manager and Training Manager

Suggested Reading:

- Luce B.R. and Elixhauser A. (1990) Standards for Socioeconomic Evaluation of Health care Products and Services. Springer Verlag. New York.

Folland S. Goodman A. Stano M. (1997) The Economics of Health and Health Care (Second edition), Prentice Hall.New Jersey.

ELECTIVE COURSES

Novel Drug Delivery Systems and Dosage Form Design

Teaching staff: M. Efentakis (Associate Professor), D.Rekkas, P.Dallas (Assistant Professors)

Course content:

Introduction to fundamentals of controlled drug delivery. Fundamentals of polymer characteristics and their effect in controlled drug delivery. Factors and mechanism influencing controlled release dosage form dosing and preparation. Preparation of oral controlled release products, reservoir devices, matrix devices. Bioadhesive preparation.

Detailed description of the phases involved in the development of dosage forms with examples focused on troubleshooting. Theoretical and practical applications of Experimental Design Techniques (e.g. Factorial design, Response Surface Methodology) in the developmental phases of dosage forms.

Suggested reading:

- Lachman, L., Lieberman, H.A., Kanig, J. (1986) The Theory and Practice of Industrial Pharmacy, 3rd Edition, Lea and Febiger Inc.
- Carstensen,J. (1972,1973) Theory of Pharmaceutical Systems, Vol. I,II. Academic Press
- Robinson,J. and Lee,V. (1987) Controlled Drug Delivery. Marcel Dekker, Inc.
- Lenaerts,V. and Gurny,R. (1990) Bioadhesive Drug Delivery Systems. CRC Press Inc.
- Rathbone,M. (1996) Oral Mucosal Drug Delivery. Marcel Dekker, Inc.
- Banker,G. and Rhodes,C. (1995) Modern Pharmaceutics. 3rd Edition, Marcel Dekker, Inc.
- Juran, J.(1988) The Quality Control Handbook, 4th edition, McGraw Hill Inc.
- Barker T. (1985)Quality by Experimental Design, Marcel Dekker Inc.
- Chien, Y. (1992) Novel Drug Delivery Systems. 2nd Edition, Marcel Dekker Inc.
- Rekkas, D.M. (1996) Dosage Form Design, Athens

Quality Control and evaluation of preparations for topical use

Teaching staff: M.Rallis (Assistant Professor)

Course content:

Physicochemical evaluation. N-Nitrosamines-Safety Data Sheets. In Vivo skin experimental pharmacology. Cell Cultures. Toxicity in vivo and in vitro. Efficacy testing (hydration, transepidermal water loss).

Suggested Reading:

- Kligman,A., Leyden,J. (Eds) (1982) Safety and Efficacy of Topical Drugs and Cosmetics, Grune and Stratton
- Frosch,P.J., Kligman, A.M. (Eds) (1993) Non Invasive Methods for the Quantification of Skin Function, Springer Verlag
- Mazzuli,F., Maibach,M. (Eds) (1996) Dermatotoxicology, 5th Edition, Taylor and Francis

Clinical Pharmaceutical Analysis

Teaching staff: J. Atta-Politou (Assistant Professor, Dept. of Chemistry) and M. Koupparis (Professor, Dept. of Chemistry)

Course content:

Preparation of biological fluid samples for analysis. Spectrophotometric, fluorometric and chromatographic methods of analysis of drugs in biological fluids. Immunoassay techniques (radioimmunoassay, enzyme immunoassay, fluorometric immunoassay, nefelometric immunoassay)

Suggested Reading:

- Pharmaceutical Analysis . Modern Methods. Part A and B (1981), Ed. J. W. Munson; Marcel Dekker Inc., New York.
- Thurman, E.M. and Mills, M.S. (1998) Solid-Phase extraction, Willey and Sons, Inc.
- Chamberlain, J. (1995) The Analysis of Drugs in biological fluids, Second Edition, CRC Press
- Diamandis, E.P. and Christopoulos, T.K. (1996) Immunoassay, Academic Press
- Ngo, T.T. (1988) Nonisotopic Immunoassays, Plenum Press

THIRD SEMESTER

SEMINARS

Course work is supplemented by seminars from leading industrial and academic scientists. The subject of each seminar and the speakers responsible for them are listed below :

N.Drakoulis, S.Kyroudis " Analytical techniques in Pharmacogenetics and Determination of dosage regiments"

S.Fotinos (LAVIPHARM S.A. Greece) "Research and Development of Pharmaceutical Products"

C. Kagkadis, Ph.D. (VIANEX S.A. Greece) "Principles of lyophilisation, lyophilised products, production and quality control"

N. Panayiotopoulos, D.Melissos, **S. Doukakis and Iordanidis** "Production and evaluation of Cosmetic products"

I.Giotaki (National Drug Organisation) "Approval procedures for Pharmaceutical Products"

P.Colombo (Professor-Univ of Parma, Italy) "Relationship between swelling and drug release. Mechanisms-kinetics involved"

Iliadis. A. (Professor-Univ. Marseille, France) "Population pharmacokinetics and formulation of dosage regiments: Background theory and applications".

Fattal. E. (Professor -Univ. of Paris, France) " Introduction to colloidal cariers and nanoparticles. In vivo fate of nanoparticles - Controlled delivery of oligonucleosides"

Kypparisidis. K. (Professor -Univ. of Thessalonica) " Microencapsulation - Applications"

Andreopoulos. A. (Professor – N.T.U.A.- Vice Rector) " Biodegradable polymers "

MSc in Industrial Pharmacy

COURSE TIMETABLE

FIRST SEMESTER

	Day of the week	**Time of day**
Quality Control GMP-GLP	Thursday	12:00-15:00
Applied Pharmaceutical Analysis	Tuesday	15:00-17:00
Physical Pharmacy	Wednesday	10:00-13:00
Statistical Methods and their applications in the Pharmaceutical Sciences	Monday	12:00-15:00
Pharmaceutical Microbiology	Thursday	16:00-19:00
SECOND SEMESTER		
Advanced Biopharmaceutics/Pharmacokinetics	Wednesday	12:00-15:00
Advanced Pharmaceutical Technology	Monday	14:00-17:00
Advanced Cosmetology	Thursday	112:00-15:00
Pharmacoeconomics-Marketing	Wednesday	17:00-20:00
Elective Courses		
Clinical Pharmaceutical Analysis	Thursday	15:00-17:00
Novel Pharmaceutical Systems and Drug Dosage Form Design	Tuesday	12:00-15:00
Quality control and evaluation of products for topical use	Thursday	15:00-18:00
THIRD SEMESTER		
Research Methodology	Monday	17:00-18:00
Seminars	Tuesday	17:00-20:00

Disertation

.

SEMESTER DATES FOR THE 2002-2003 ACADEMIC YEAR

FIRST SEMESTER

- Teaching Course Timetable- Monday 26th October 2002 - Friday 31st January 2003
- Examination Timetable : Monday 3rd February 2003 - Friday 28th February 2003
- Supplementary Examination Timetable : Monday 15th September 2003 - Wednesday 30th September 2003

SECOND SEMESTER

- Teaching Course Timetable- Monday 3th March 2003 - Friday 30th May 2003
- Examination Timetable : Monday 2nd June 2003 - Monday 30th June 2003
- Supplementary Examination Timetable : Monday 15th September 2003 - Tuesday 30th September 2003

THIRD SEMESTER

- Teaching Course Timetable- Monday 27th October 2003- Friday 30th January 2004
- Examination Timetable : Monday 9th February 2004 - Friday 27th February 2004
- Supplementary Examination Timetable : Monday 20th September 2004 – Thursday 30th September 2004

PRINCIPLE RESEARCH STAFF

Professor **GEORGE TH. PAPAIOANNOU** (e-mail:papaioannou@pharm.uoa.gr)

President of the School of Pharmacy (1997-1999), University of Athens, Director of Department of Pharmaceutical Technology (1998--), Director of the Laboratory of Pharmaceutical Technology (1990--),Member of the Greek Pharmaceutical Society, Member of the Greek Association of Pharmaceutical Chemistry, Member of the Association of Greek Chemists, Member of the Panhellenic Association of Pharmacists, President of the Greek Society of Cosmetology (1995--), President of the Greek Society of Pharmaceutical Technology (1996--)

Teaching Activities: Participates in teaching the undergraduate courses *Pharmaceutical Technology I*, *Evaluation and Control of Cosmetic Products* and *Cosmetology* and the postgraduate courses *Physical Pharmacy* and *Advanced Cosmetology*. Supervisor of several MSc and PhD students

Research Interests: Studies the physicochemical parameters implicated in the development of pharmaceutical dosage forms. More specifically – the study of skin components, such as lipids, and their role in the transdermal and transmembrane absorption of drugs and other substances from pharmaceutical dosage forms - the study of drugs used for the healing of skin trauma, irritation or inflammation – the use of liposomes and cyclodextrins in pharmaceutical dosage forms

Professor **PANOS MACHERAS** (e-mail:macheras@pharm.uoa.gr)

Director of the Laboratory of Biopharmaceutics and Pharmacokinetics, School of Pharmacy, University of Athens (1992--), Fellow of the American Association of Pharmaceutical Scientists, Member of the Controlled Release Society and the European Federation of Pharmaceutical Sciences, Member of the Editorial Board of the journals “Pharmaceutical Research”, “International Journal of Pharmaceutics” and “European Journal of Pharmaceutical Sciences)

Teaching Activities : Lecturer of the undergraduate courses *Biopharmaceutics - Drug Disposition* and *Pharmacokinetics*. Participates in teaching the postgraduate courses *Principles of Biopharmaceutics-Pharmacokinetics-Clinical Pharmacokinetics, Statistical Methods in Pharmaceutical Sciences, and Advanced Biopharmaceutics and Pharmacokinetics.* Lectures within the postgraduate Socrates program entitled New Forms and New Routes for Administration of Drugs. Supervision of M.Sc and Ph.D theses.

Research Interests: Research interests concentrate on 1) drug-macromolecules

(cyclodextrins, proteins) interaction , 2) drug dissolution and gastrointestinal absorption, and 3) classical and non-classical pharmacokinetic models for the analysis of bioequivalence, gastrointestinal absorption, and elimination of drugs.

Associate Professor **MANOLIS EFENTAKIS** (e-mail:efentakis@pharm.uoa.gr)

Member of the Controlled Release Society (CRS), Member of the Greek Local Chapter of the Controlled Release Society, Member of the Greek Society of Pharmaceutical Technology, Member of the Greek Pharmaceutical Society. . Reviewer for scientific journals of Analytical Science.

Teaching Activities: Teaches the undergraduate compulsory course *Pharmaceutical Technology* and the elective course *Novel Drug Delivery Systems* and participates in the laboratory training of undergraduate students in *Pharmaceutical Technology*. Participates in Teaching the postgraduate courses *Advanced Pharmaceutical Technology* and *Novel drug delivery systems-Dosage Forms Design.* Supervises M.Sc and Ph.D theses.

Research Interests*: Study* – Evaluation and Application of polymers in drug delivery systems, Development and evaluation of Controlled Drug Delivery Systems. Development and evaluation of Bioadhesive Systems for use in the buccal cavity. Formulation of cyclodextrin complexes in order to improve the solubility and stability of pharmaceutical formulations.

Assistant Professor **SOPHIA MARKANTONIS-KYROUDIS** (e-mail:kyroudi@pharm.uoa.gr)

Member of the European Society of Clinical Pharmacy and the Greek Pharmaceutical Association

Teaching Activities: Teaches the undergraduate elective course *Clinical Pharmacokinetics* and participates in the laboratory training of undergraduate students in Pharmaceutical Technology. Teaches the postgraduate courses *Case Presentations in Therapeutics, Pharmacokinetic considerations in Therapeutics* and participates in teaching the courses *Principles of Biopharmaceutics-Pharmacokinetics-Clinical Pharmacokinetics* and *Advanced Biopharmaceutics and Pharmacokinetics*. Supervises M.Sc and Ph.D theses.

Research Interests: Focus on the monitoring and evaluation of drug therapy - more specifically the study of the following : the need for drug therapy, the selection of the appropriate drug dose, form, frequency, duration and method of administration for the individual patient, the effects of drug therapy on the clinical condition of patients, drug use in the population with emphasis on the benefit to risk ratio and cost of drug treatment.

Assistant Professor **DIMITRIOS M. REKKAS** (e-mail:rekkas@pharm.uoa.gr)

Member of the American Association of Pharmaceutical Scientists (AAPS), Member of the Controlled Release Society (CRS), Member of the American Society for Quality (ASQ), Member of the Greek Local Chapter of the Controlled Release Society, Member of the Greek Society of Pharmaceutical Technology, Member of the Greek Pharmaceutical Society, Member of the Panhellenic Association of Pharmacists, Academic Responsible for the Socrates Program

Teaching Activities:

Undergraduate:

Pharmaceutical Technology III, Dosage Forms Design, Laboratory exercises in Pharmaceutical Technology *Graduate:* Quality Control, Advanced Pharmaceutical Technology, Novel Drug Delivery Systems-Dosage Forms Design

Research Interests: Controlled Drug Delivery Systems, Oral (Development - In-vitro evaluation and optimization), Transdermals (Development, in-vitro evaluation and optimization), Experimental Design (Factorial Design, Response Surface Methodology etc), Development, in-vitro evaluation and optimization of Dosage Forms

Associate Professor **CHRISTOS REPPAS** (e-mail:reppas@pharm.uoa.gr)

Member of the American Association of Pharmaceutical Scientists, Controlled Release Society, European Federation of Pharmaceutical Sciences

Teaching Activities: Teaches the undergraduate course *Biopharmaceutics and Drug Disposition* and participates in the laboratory training of undergraduate students in *Pharmaceutical Technology*. Participates in teaching the postgraduate courses *Principles of Biopharmaceutics-Pharmacokinetics-Clinical* Pharmacokinetics, Statistical Methods in Pharmaceutical Sciences and Advanced Biopharmaceutics and Pharmacokinetics. Gives lectures entitled New Forms and New Routes for Administration of Drugs within the postgraduate Socrates program. Supervision of M.Sc and Ph.D theses.

Research Interests: Concentrates mainly on oral drug absorption. Relevant activities in this field focus on three aspects. The first relates to the improvement of methods for treating *in vitro* and *in vivo* experimental data. The second relates to the effects of dosage form and dosing conditions on oral drug absorption. The third relates to the effects of dietary fibers on oral drug absorption.

Assistant Professor **MIRA SYMILLIDES** (e-mail:simillidou@pharm.uoa.gr)

Member of the Greek Pharmaceutical Association

Teaching Activities: Teaches the undergraduate course *Pharmacokinetics* and participates in the laboratory training of undergraduate students in Pharmaceutical Technology.

Participates in teaching the postgraduate courses *Principles of Biopharmaceutics -*

Pharmacokinetics - Clinical Pharmacokinetics, Advanced Biopharmaceutics and Pharmacokinetics and *Statistical Methods in Pharmaceutical Sciences.* Supervision of MSc theses.

Research Interests: Focus on Theoretical Pharmacokinetics (development of new methods for pharmacokinetic analysis, development of new parameters-absorption rate metrics), Bioequivalence (evaluation of rate and extent metrics using simulated and real data), in vitro Dissolution rate in various media (kinetic analysis, in vitro-in vivo correlations), effects of dosing conditions on oral drug Absorption.

Assistant Professor **PARASKEVAS P. DALLAS** (e-mail:dallas@pharm.uoa.gr)

Member of the American Association of Pharmaceutical Scientists (AAPS), Member of the Controlled Release Society (CRS), Member of the Greek Local Chapter of the Controlled Release Society, Member of the Greek Society of Pharmaceutical Technology, Member of the Panhellenic Association of Pharmacists, Member of the Greek Society of Cosmetology

Teaching Activities:

Undergraduate:

Properties and applications of raw materials, Cosmetic Technology, Laboratory exercises in Pharmaceutical Technology *Graduate:*Quality Control, Advanced Pharmaceutical Technology, Advanced Cosmetology, Novel Drug Delivery Systems-Dosage Form Design

Research Interests: Controlled Drug Delivery Systems, Oral dosage forms (Development and In-vitro evaluation), Transdermals and Topicals (Development and in-vitro evaluation), Experimental Design Development, in-vitro evaluation and optimization of Dosage Forms

Assistant Professor **MICHAIL RALLIS** (e-mail:rallis@pharm.uoa.gr)

Member of the European Society of Dermatological Research

Teaching Activities: Teaches the undergraduate and postgraduate courses *Cosmetology* and *Evaluation and Control of Cosmetic Products.*

Research Interests: Subjects related to the skin. Essentially pharmacologic - pharmacokinetic studies on antioxidants, anti-cancer drugs, absorption – transport of various substances, as well subjects related to skin lipids.

Assistant Professor **MARILENA VLACHOU-KONSTANTINIDOU** (e-mail:vlachou@pharm.uoa.gr)

Member of Greek Pharmacy Association, Member of Pharmaceutial Technology Association, Member of Dermatology Association , Member of Cosmetology Association, Member of Controlled Release Society (CRS)

Teaching Activities: Participates in teaching the undergraduate course *Pharmaceutical Technology I* and in the laboratory training of undergraduate students in Pharmaceutical Technology.Teaches the postgraduate course *Physical Pharmacy*.

Research Interests: Focus on the study of physicochemical properties of excipients used in the preparation of pharmaceutial dosage forms. Development and evaluation of Controlled Drug Delivery Systems. Development and evaluation of Bioadhesive Systems for use in the buccal cavity. Formulation of cyclodextrin complexes in order to improve the solubility and stability of pharmaceutical formulations.

Assistant Professor **Nikolaos Drakoulis, M.D., Ph.D.**

Clinical Pharmacologist, **Education:** Biochemistry, University of Tübingen, Medical School, Freie Universität Berlin (FUB), Graduation & License to practice medicine, Ph.D. in Medicine, FUB, Specialization in the field of molecular genetics, Inst. of Human Genetics, University Hospital, Berlin, Specialization in Human Pharmacoepidemiology, McGill University, Quebec, Canada, FUB, Diploma of security inspector for Biotechnology labs in the EU, TÜV Akademie Hessen, Specialization in Clinical Pharmacology, FUB, Board certification in Clinical Pharmacology, Berlin, Board certification in Clinical Chemistry, Athens.

Research Interests: Development of a simple non-invasive HPLC method to determine the activity of hepatic arylamine-N-acetyltransferase (NAT2) in humans (Inst. Clin. Pharmacology, Berlin). Development of new molecular genetic methods for the diagnosis of viral, bacterial and parasite infections in humans (Institute of Human Genetics, FUB). Development of new molecular genetic methods to evaluate the genotype of polymorphic drug metabolizing enzymes in humans in order to individualize pharmacotherapy with polymorphic drugs and detect non-,under- and overresponders (Inst. Clin. Pharmacology, Berlin). Design and execution of biochemical/genetic pharmaco-epidemiological clinical research protocols to detect high-risk groups within a population to develop various cancers (Inst. of Clin. Pharmacology, Berlin). Design and evaluation of four phase I studies of a new dihydropyridine calcium channel blocker, diperdipine YS-201 (Henning). Design and execution of a phase I study to evaluate the dose depended induction of CYP-450 activity by Omeprazol (Astra). Design of a multiple-dose pharmacokinetic study of ganglioside GM1 after i.v., i.m. or s.c. administration to healthy volunteers (Fidia). Initiation of Phase II, III/IIIb and IV local or multinational multicentric clinical studies in a total of 62 hospitals, GPs or Health Centers in Greece (BMS) **Work Experience:** University Assistant, Inst. Clin. Pharmacology, University Hospital, Berlin. Consultant to the Inst. of Forensic Medicine, FUB. Lecturer, Assistant Professor of Clinical Pharmacology, University Hospital. Expert Evaluator of the European Union DGXII AG Science Research and Development. Medical Director, BMS, Greece. Expert Evaluator of the Greek National Organization for Medicines (EOF).

Assistant Professor of Clinical Pharmacology at the School of Pharmacy, University of Athens. Member of the Committee for Proprietary Medicinal Products (CPMP) and the Ad Hoc Group on Pharmacogenetics at the European Agency for the Evaluation of Medicinal Products (EMEA).

ADVISORY RESEARCH STAFF

Professor **MICHAEL A. KOUPPARIS** (e-mail:m.koupparis@chem.uoa.gr)

Associate Chairman of the Greek Pharmacopoeia Committee and member of the European Pharmacopoeia Committee. Laboratory assessor for the National Accreditation System.
Author of education material for the postgraduate program “Quality Assurance” of the Greek Open University. Member of the Editorial Board of the journal “Analytical Letters”, reviewer for Scientific Journals of Analytical Science.

Teaching activities : Teaches the following courses:

Undergraduate Level: a) Analytical Chemistry I (Instrumental Analysis), and b) Laboratory Experiments of Classical Analytical Chemistry (Department of Pharmacy).

Graduate Level: a) Quality Control of Drugs (Departments of Pharmacy and Chemistry), b) Statistics - Chemometrics (1/2) (Departments of Chemistry and Pharmacy), c) Advanced Pharmaceutical Analysis I (Chemical, Physical, and Electrochemical Techniques) (Department of Pharmacy), d) Applied Pharmaceutical Analysis (1/2) (Department of Pharmacy), e) Clinical Pharmaceutical Analysis (1/2) (Department of Pharmacy), f) Bioanalytical Techniques (1/4) (Department of Chemistry), g) Advanced Analytical Chemistry (1/5, Automated Analysis) (Department of Chemistry), h) Research Methodology (Departments of Chemistry, Pharmacy , and Agricultural Industry).

Research interests: Covers the following topics: Development of new analytical methods for the determination of drugs and quality control of drugs using the analytical techniques: Potentiometry of ion selective electrodes, automated flow injection analysis, kinetic methods of analysis, high performance liquid chromatography, ion chromatography, immunochemical techniques. Binding studies of drugs with macromolecules (cyclodextrins, proteins, active charcoal). Dissolution studies of solid formulations. Bioequivalence studies.

Professor **JOHN YFANTOPOULOS**

Member of the International Association of Health Economics. Member of the International Society for Pharmacoeconomics and Outcomes Research. Advisor to World Health Organisation (WHO) on Health Policy and Health Economics. Advisor to the European Commission DG V on the Social Report of Europe, TACIS Programmes in West Siberia, Roumania, Moldova, Boulgaria PHARE (Russia) and CONSENSUS Albania. Editorial Board

in the International Journal of Health Systems and on the Greek journal of Archives of Hellenic Medicine.

Teaching Activities: Participates in teaching the undergraduate courses *Social Statistics and Quantitative Methods, Research Methodology, Public Finance and Public Policy, European Social Policy Health Economics* and *Pharmacoeconomics* (School of Pharmacy). He also participates in the following post graduate courses *European Comparative Analysis, European Health Policy* and *Advance Research Methodology.* Supervisor of several MSc and PhD students

Research Interests: Covers a wide range of European Comparative Analysis in the areas of Health Economics, Health Econometrics, Pharmaco-Economics and Social Research. He has undertaken several studies for the European Commission (DG I, V, XII and XVI) the Eurostat (Social Portrait, European Community Household Panel), the World Bank (Albania). He has also carried out several Pharmaco-Economic Studies which have been presented in International Conferences like, ISPOR Washington D.C. and ISTAC Edinburough U.K. and where published in International Journals.

Assistant Professor JULIA ATT-POLITOU (e-mail: politou@chem.uoa.gr)

Member of the International Association of Forensic Toxicologists (TIAFT), the Hellenic Society of Toxicology, the Greek Pharmaceutical association, the Greek Society of Medicinal Chemistry, the Hellenic Society of Forensic Sciences. Member of the Scientific Council of the Greek National Drug Organization for biocide products. Member of the Editorial Advisory Board of the scientific journal Pharmakeftiki. Reviewer for scientific journals of Analytical Science.

Teaching activities: Teaches the following courses:

Undergraduate level: a) Laboratory Experiments of Classical Analytical Chemistry (Analytical Chemistry I) and b) Laboratory Experiments of Instrumental Analysis (Analytical Chemistry II) to the students of the Department of Pharmacy,

Graduate level: a) Clinical Pharmaceutical Analysis (1/2, Department of Pharmacy), b) Clinical Chemistry II (1/3, Department of Chemistry, Master of Science in Clinical Chemistry). Supervision of M. Sc theses.

Research Interests: Covers the following topics:

Development and optimization of new analytical methods for the determination of drugs (or xenobiotics) and their metabolites in biological fluids. In vitro absorption studies of several drugs onto activated charcoal with applications to the treatment of acute drug intoxications using the analytical techniques of high performance liquid chromatography and potentiometry of ion selective electrodes. Development of new analytical methods for the determination of drugs in pharmaceutical formulations using the analytical techniques of UV-

Iis spectrophotometry, high performance liquid chromatography andpotentiometry of ion selective electrodes.