

Η συμβολή του Πανεπιστημίου στην ανάπτυξη της φαρμακευτικής έρευνας στην Ελλάδα

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Φυσικών Προϊόντων

Eurogroup της 5ης Μαΐου

Οι εννέα πυλώνες ανάπτυξης της χώρας είναι οι εξής:

- Τουρισμός
- Πρωτογενής παραγωγή και μεταποίηση αγροτικών προϊόντων
- Ενέργεια
- Διαμετακομιστικό εμπόριο & Συνδυασμένες μεταφορές
- **Έρευνα, Τεχνολογία & Καινοτομία**
- **Βιομηχανία Φαρμάκων**
- Βιομηχανία μετάλλων και δομικών υλικών
- Ναυτιλία και συναφείς δραστηριότητες
- Εμπορεύσιμες υπηρεσίες

Ρόλος του Πανεπιστημίου

- Συμβολή στην εκπαίδευση νέων επιστημόνων
Εκπαίδευση, προπτυχιακό, μεταπτυχιακό, συνεχιζόμενη εκπαίδευση
- Συμβολή στην Φαρμακευτική έρευνα
Υποδομές, εξεύρεση πόρων, εξειδικευμένο ερευνητικό προσωπικό



ΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

Α.ΔΙ.Π.

ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ
ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ
ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC

H.Q.A.

HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

DEPARTMENT OF PHARMACY

NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

External Evaluation Committee (EEC)

The Committee responsible for the External Evaluation of the Department Pharmacy of the National and Kapodistrian University of Athens consisted of the following four (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

- 1. Prof. Maria Polikandritou Lambros** (Coordinator)
Western University of Health Sciences, USA
- 2. Prof. George Imanidis**
University of Basel and University of Applied Sciences Northwestern Switzerland.
- 3. Prof. Harry Ischiropoulos**
University of Pennsylvania, USA
- 4. Prof. Barbara Papadopoulou**
Faculty of Medicine, Laval University, Quebec, Canada

A. Curriculum

To be filled separately for each undergraduate, graduate and doctoral programme.

Undergraduate Curriculum (UGC)

The goal of the curriculum is to prepare professional pharmacists to operate in public (community) pharmacies, hospitals, industry, academic research and governmental organizations within and outside Greece. Some of these domains of professional activity may require additional graduate and/or research training at doctoral level, clinical training and continuing education.

The undergraduate curriculum was determined according to national and European regulations and legal requirements governing the education of a pharmacist (XV/E/8341/6/93, Brussels 26.7.1995). The curriculum is thus consistent with its defined objectives and the requirements of society at large.


There is a standing curriculum committee in the Department that can handle adjustments and revisions.

The undergraduate curriculum was determined according to national and European regulations and legal requirements governing the education of a pharmacist (XV/E/8341/6/93, Brussels 26.7.1995). The curriculum is thus consistent with its defined objectives and the requirements of society at large.

The curriculum is compliant with general standards and legal requirements and implementation of its current goals is effective.

The course material is appropriate and the available time is adequate. The level of the offered

science is excellent. The Department has the necessary scientific personnel resources and appropriately qualified and trained staff to implement the curriculum. In fact, this is one of the major strengths of the Department.



Graduate Curriculum (GC)

The Department offers MSc degrees in 3 areas of pharmaceutical sciences, i.e., chemistry and natural products, clinical pharmacy and industrial pharmacy under 6 different subheadings. The objectives and contents of the curriculum of each of these degrees are adapted to the specific needs of the area and to the professional requirements.

The Department has in its ranks appropriately qualified scientific personnel to fully cover the teaching needs of the MSc degrees and the result fulfills universally accepted standards.

B. Teaching

The Department has a long-standing tradition in providing outstanding teaching using both pedagogic and practical methodologies. The teaching methodologies for the most part have evolved over the years and include new methods of electronic communication.

The teaching staff to student ratio, however, is not optimal. The Department requested that 80 new students be admitted in the previous academic year. However, 150 were admitted. The EEC fully agrees with the student limit requested by the Department since the smaller class size will improve laboratory training and administration of exams. Critically, a smaller class size will improve the quality of training in the 5th year. This will facilitate the conversion of the current final degree to MSc degree.

Faculty members are always available to students. The faculty has established student advisors. However, this service is under-utilized by the students. The EEC recommends that the Department and faculty advertise more often the various services and implemented changes to the students.

Laudable and resourceful efforts of the faculty secure functional teaching laboratories. ~~With the reduction of funding from the State and University, the faculty is forced to obtain grants~~ as well as seek support from the industry. Optimally, the University and the State should provide adequate funds and recourses for teaching laboratories in a timely manner. Moreover, ordering procedure for the supplies is challenging and counterproductive. State must remove these barriers.

C. Research

For each particular matter, please distinguish between under- and post-graduate level, if necessary.


APPROACH

- *What is the Department's policy and main objective in research?*
- *Has the Department set internal standards for assessing research?*

Research is an area of excellence of the Department. During the last decade a remarkable growth in terms of peer-review publications and research funds has been noted.

The EEC applauds the current efforts of the Department fully understanding that, at times, these research activities are accomplished under suboptimal conditions. Nonetheless, faculty members of the Department through tireless and valiant efforts have secured considerable funding for research and published research findings of high quality in peer-reviewed journals.

Grants and peer-review publications, two common indices, are used by the Department to assess success in research. Secondary indices include noteworthy awards, organization of national and international meetings as well as memberships in editorial boards and scientific societies.



Necessary repairs require lengthy and bureaucratic procedures, which at times hinder research progress.

The EEC ranks the quality and number of scientific publications as excellent. The collective H-index of the faculty places the Department in the top 100 departments of pharmacy and pharmacology in the world. The current ranking on the H-index is 74th together with Cornell University and University of Virginia.

NATIONAL TAIWAN UNIVERSITY RANKING | NTU RANKING
 PERFORMANCE RANKING OF SCIENTIFIC PAPERS
 FOR WORLD UNIVERSITIES 2012

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English (en-us) ▼

Pharmacology & Toxicology

Show 25 per page ▼ *It is available to click title buttons for arranging the criteria in order.

World Rank	University	Total Score details
126	Cardiff University	22.95
127	University of Athens	22.57
127	Mavo Clinic College of Medicine	22.57

Table 10 Pharmacology & Toxicology Subject Categories

Subject	Subject Category
Pharmacology & Toxicology	Pharmacology & Pharmacy
	Substance Abuse
	Toxicology



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NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS RANKINGS

Pharmacy

Survey Indices

	SCORE
Academic Reputation	37.40
Employer Reputation	47.00
Citations per Paper	81.20
H-index Citations	74.30

2013

SUBJECT	RANK
Pharmacy	151-200

SEARCH

Show Universities Only

Location

- Any -

Subject

- Any -

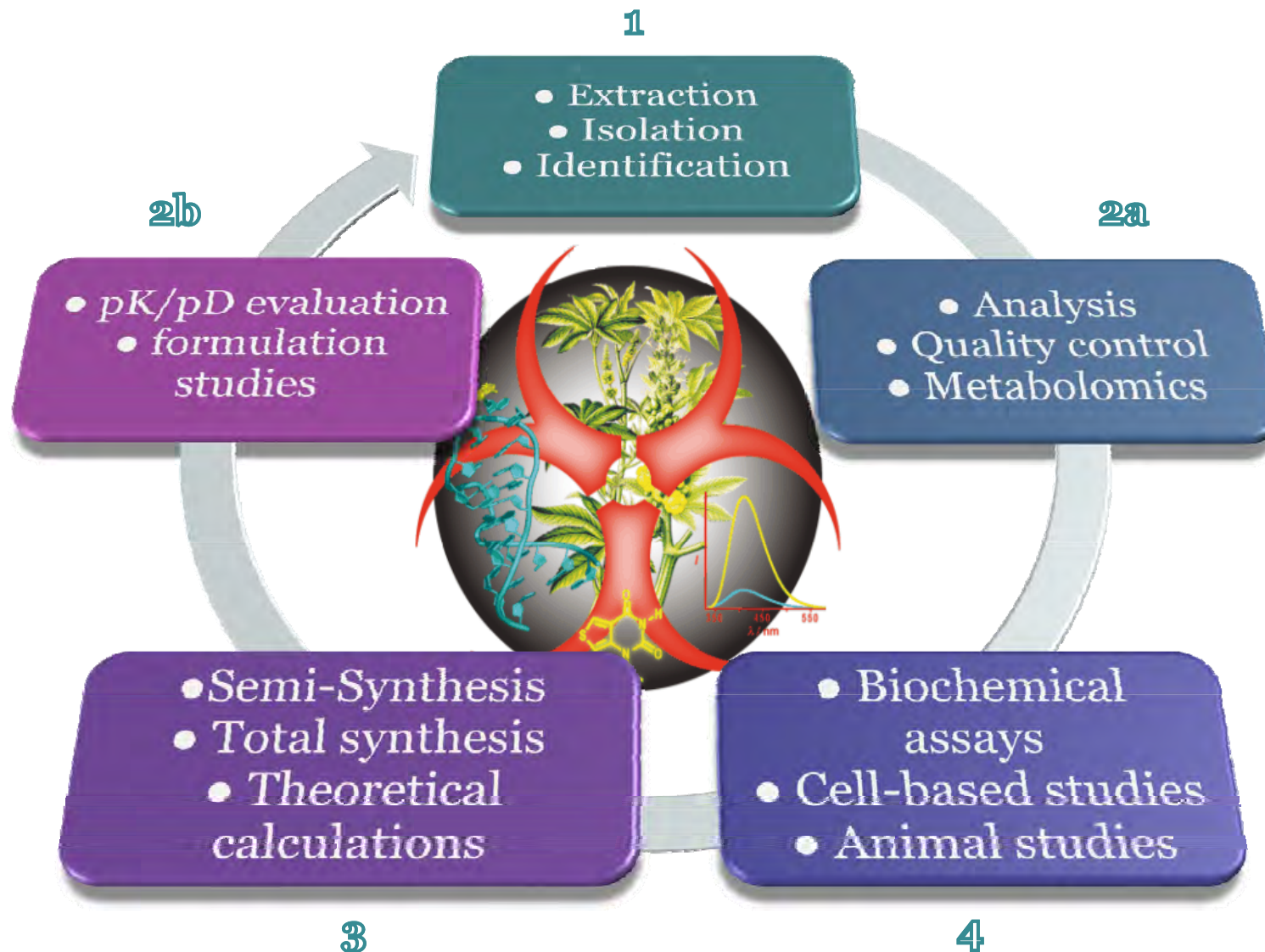
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Research Activities



Διεθνείς Συνεργασίες

- University of Oxford
- Université Paris V
- University of Basel
- University of Geneva
- Universite de Marseille,
- University of California- Scripps,
- The Rockefeller University
- Institut Curie Paris
- University of Vienna
- CNRS-Gif sur Yvette
- City of Hope
- National Institute of Neurological Disorders and Stroke (USA),
- NIH Laboratory of Molecular & Cellular Neuroscience
- Goethe University
- Dresden University
- University of Innsbourg

Εθνικές Συνεργασίες

- Πανεπιστήμιο Κρήτης,
- Αριστοτέλειο Πανεπιστήμιο Θεσσαλονίκης
- Πανεπιστήμιο Πάτρας
- Πανεπιστήμιο Ιωαννίνων
- ΤΕΙ Κρήτης
- ΤΕΙ Αθηνών
- Πανεπιστήμιο Θεσσαλίας,
- Δημοκρίτειο Πανεπιστήμιο Θράκης
- Εθνικό Μετσόβιο Πολυτεχνείο
- Ερευνητικό Κέντρο Δημόκριτος
- Εθνικό Ίδρυμα Ερευνών

Οργάνωση Διεθνών Συνεδρίων

- 7th Joint meeting of AFERP, ASP, GA, PSE & SIF, 2008, 3-8, August, Athens, Greece; Chair (1300 participants)
- 18th European Symposium on Quantitative Structure-Activity Relationships (EuroQSAR) , Rhodes- Greece, September 2010- Chair (450 participants)
- AAPS_Workshop_on_Biorelevant Μάρτιο 2013, Bethesda, USA (Συνοργανωτές: AAPS και FIP) co-chair
- More than 20 International conferences, and workshops
- Members of the organizing committee of several international conferences



Προσφορά στην κοινωνία

- ΕΟΦ (η πλειοψηφία των μελών του Τμήματος)
- ΚΕΣΥ
- ΔΟΑΤΑΠ
- ΙΚΥ
- Συμμετοχή σε ευρωπαϊκούς οργανισμούς (ΕΜΑ, ευρωπαϊκή φαρμακοποιεία)

Δια Βίου Εκπαίδευση

- Ενημερωτικές Διαλέξεις σε Φαρμακοποιούς Φαρμακείου (μεταδίδονται σε πραγματικό χρόνο διαδικτυακά και υπάρχει δυνατότητα συμμετοχής από απόσταση)
- Μετεκπαιδευτικά Μαθήματα και Εργαστηριακές ασκήσεις για Φαρμακοποιούς Φαρμακείου **compounding Pharmaceutical products Good Compounding Practices (GCPs)**.
- Μετεκπαιδευτικά Σεμινάρια σε συνεργασία με την Εταιρεία Εθνοφαρμακολογίας

Συνεργασίες με τη Φαρμακευτική Βιομηχανία

- Pharmathen
- UNI-PHARMA
- Galenica
- LAVIPHARM
- ELPEN
- Help
- Verisfield
- Demo
- Rafarm
- JANNSEN (Belgium)
- SERVIER (France)
- PIERRE-FABRE (France)
- ITI (USA)
- GSK (UK)
- AstraZeneca (Sweden)
- Roche (Switzerland)
- FRUTAROM (Switzerland)
- PHYTOLAB (Germany)
- FINZELBERG (Germany)
- BIONORICA (Germany)
- BASF (Germany)

Συνεργασίες με τη βιομηχανία τροφίμων και καλλυντικών

Τρόφιμα

- Γιώτης (Ελλάδα)
- Χαϊτογλου (Ελλάδα)
- VIVARTIA (Ελλάδα)
- Nestle (Switzerland)

Καλλυντικά

- KORRES / APIVITA (Ελλάδα)
- CODIF/ SOLIANCE/ LVMH group (Γαλλία)

Εταιρείες περιβαλλοντικού ενδιαφέροντος

- TERRA NOVA (Ελλάδα)

Λοιπές εταιρείες

- PHARMACIST (Ελλάδα)
- ALTERCHEM (Ελλάδα)
- BIO-HELLAS (Ελλάδα)
- Rigas labs s.a. (Ελλάδα)
- HITEX (France)
- Bruker (Germany)

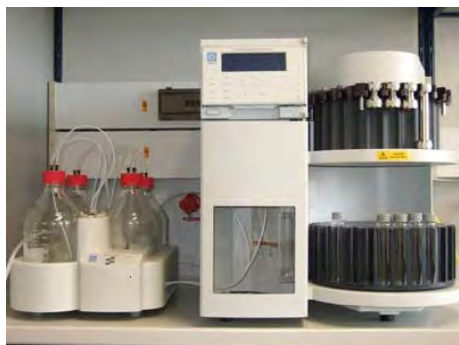
Περιφέρειες και οργανισμοί

- Περιφέρειες (Κρήτης, Κεντρικής Μακεδονίας)
- Γεωργικοί Συνεταιρισμοί (Ροδόπης, Τυρνάβου, Κρήτης)
- Ένωση Μαστιχοπαραγωγών Χίου,
- Ένωση Κροκοπαραγωγών Κοζάνης
- Ένωση Καλιεργητών αρωματικών & φαρμακευτικών φυτών Δ. Ελλάδας
- Αμερικάνικη Γεωργική Σχολή
- Ελληνικός οργανισμός εξωτερικού εμπορίου

Extraction - Extracts Collection

(ASE)

Accelerated Solvent Extractor



- ✓ Reproducible
- ✓ Fast
- ✓ HTE

(MAE)

Microwave Assisted Extractor



- ✓ Reproducible
- ✓ Extremely Fast
- ✓ Cheap
- ✓ Green

(SFE)

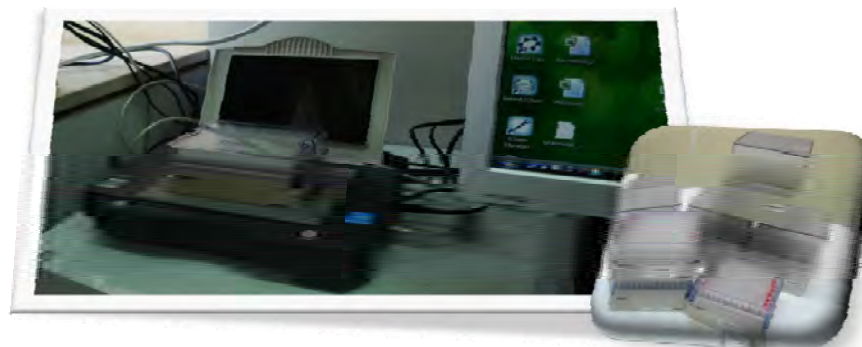
Supercritical Fluids Extractor



- ✓ Lipophilic material
- ✓ Cheap
- ✓ Environmental friendly

Extract libraries

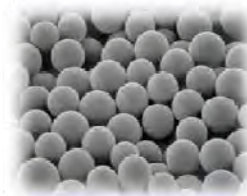
- > 5000 extracts (enriched extracts)
- bar-coded format
- organization & registration



Separation - Isolation

- Medium Pressure Liquid Chromatography - **MPLC** (X2)
- Fast CounterCurrent Chromatography - **FCPC** (X2)
- High Performance Liquid Chromatography
 - **prep-HPC-UV** (x2)
 - **semi/prep-HPLC-DAD** (X3)

Adsorption Resin Technology (ART)



1mm probe



- ✓ 4 times higher sensitivity
- ✓ 16 times faster measurement



Autosampler (60 places)



- ✓ 8 times higher mass sensitivity
- ✓ 12 times faster measurements

Identification



UHPLC-LTQ-Orbitrap



Finnigan MSQ Plus

Pilot Scale - Scale up

Formulation

- Spray – drier
- Two lyophilization units
- 2D barcoding system for encoding & storage

Fermentation/Bioevaluation

- Incubators
- Bioreactor
- Autoclave
- Plate reader



Pilot scale production

- 1000L Distillation/extraction unit
- 200L Distillation unit
- 100L Essential oil distillator
- 500L & 600L Extraction vessels
- Adsorption resin columns
- 100L Vacuum dessicator
- 20L Rotary evaporators
- Lyophilization unit
- 63L reactor for medicinal chemistry preparations

Publications, scientific and commercial activities

- 12 Monographs & Review articles
 - 15 Patents
 - 280 Publications in international journals
 - 400 Seminars/Posters in international conferences
 - Supervision of 30 PhD students, since 1994
-
- 11 European Grants
 - 38 National grants
 - 15 Grants from private companies as well as National & International Public Institutions
-
- 6 Products commercialized by many companies as biological reagents
 - 4 Compounds commercialised by major companies (Sigma-Aldrich, Merck, Calbiochem, Alexis) as kinase inhibitors

Τεχνοβλαστοί Πανεπιστημίου Αθηνών

- Οι τεχνοβλαστοί (spin-off) είναι σημαντικές δομές για την εξέλιξη και αξιοποίηση της πανεπιστημιακής τεχνογνωσίας
- **PHARMAGNOSE**: ο πρώτος τεχνοβλαστός του ΕΚΠΑ με στόχο την ανάδειξη και αξιοποίηση των φυσικών προϊόντων και των νέων τεχνολογιών που σχετίζονται με τη χημεία τους

Ερευνητικά Προγράμματα - Χρηματοδοτήσεις

- Σύνολο 442 χρηματοδοτημένα προγράμματα
- 15.000.000 € την τελευταία τριετία

ΤΜΗΜΑ	ΠΡΟΫΠΟΛΟΓΙΣΜΟΣ	ΚΟΙΝΟΤΙΚΟ ΠΛΑΙΣΙΟ ΣΤΗΡΙΞΗΣ	ΕΥΡΩΠΑΪΚΗ ΕΝΩΣΗ	ΕΛΛΗΝΙΚΟΙ ΦΟΡΕΙΣ (ΛΟΙΠΟΙ ΔΗΜΟΣΙΟΙ ΦΟΡΕΙΣ, ΟΤΑ ΚΑΙ ΔΙΑΦΟΡΟΙ ΤΡΙΤΟΙ)
Τμήμα Φαρμακευτικής	4.905.062,49	455.335,82	2.045.237,60	2.404.489,07

FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY: Prospecting for novel plant-produced compounds (KBBE-2009-3-1-04)

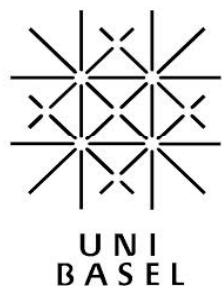
**"From Biodiversity to Chemodiversity:
Novel Plant Produced Compounds with Agrochemical and
Cosmetic interest"**



Total budget: 4 274 000 €
Duration: 4 years



CENTRE NATIONAL
DE LA RECHERCHE
SCIENTIFIQUE



Universidad de Panamá
(CIFLORPAN)



ATHENS



KORRES NATURAL PRODUCTS

FP7-PEOPLE-2011-IAPP Marie Curie Actions — Industry-Academia Partnerships and Pathways (IAPP)



NATPROTEC

Natural cosmetic products -
Sustainable development



**Integrated technologies for the
discovery and development of
cosmeceutical agents from plant
biodiversity**

Total budget:
2 267 979 €

Duration:
4 years

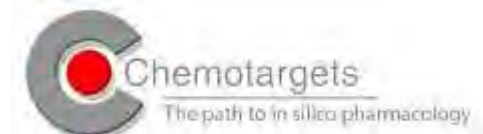


FP7-PEOPLE-2011-IAPP Marie Curie Actions — Industry-Academia Partnerships and Pathways (IAPP)



Exploitation of microbial biodiversity for the discovery and development of novel cosmeceutical agents

Total budget: 2 200 000 €
Duration: 4 years



FP7-PEOPLE-2011-IAPP Marie Curie Actions — International
Research Exchange Scheme (IRSES)



Exploring the Chemical Biodiversity with
Innovative Approaches to Fight
Chagas Disease and Leishmaniasis”

Total budget:
434 700 €

Duration:
4 years



FP7-PEOPLE-2011-IAPP Marie Curie Actions — Industry-Academia Partnerships and Pathways (IAPP)



Bioactive natural compounds extracted and isolated from olive tree using modern technologies: Probing into their therapeutic potential

Total budget: 1 055 602 € Duration: 4 years





What is Horizon 2020?

Horizon 2020 is the biggest EU Research and Innovation programme ever with nearly €80 billion of funding available over 7 years (2014 to 2020) – in addition to the private investment that this money will attract. It promises more breakthroughs, discoveries and world-firsts by taking great ideas from the lab to the market.

Innovation in SMEs through Horizon2020

Horizon 2020 actively supports SMEs by providing both direct financial support, and indirect support to increase their innovation capacity. 'Innovation in SMEs' aims at creating a bridge between the core of the framework programme - support to research, development and innovation projects - and the creation of a favourable ecosystem for SME innovation and growth.



Health, Demographic Change and Wellbeing

Responding to this challenge, research and innovation (R&I) under Horizon 2020 is an investment in better health for all. It aims to keep older people active and independent for longer and supports the development of new, safer and more effective interventions. R&I under Horizon 2020 also contributes to the sustainability of health and care systems.

During the first two years of Horizon 2020 (Work Programme for 2014/15), the EU will invest some **€1 200 million** in this Challenge.



F. Final Conclusions and recommendations of the EEC

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

The Department of Pharmacy is nationally and internationally recognized. This has been achieved by excellence in research and high quality of education. The Department developed a broad range of graduate programs covering all aspects of pharmaceutical sciences. There is a high success of job placement after completion of the MSc degrees.

An excellent doctoral program producing high quality research is in operation.

The quality and number of scientific publications is excellent and places the Department among the top 100 departments of pharmacy and pharmacology in the world.

The Department has attracted substantial funding from European sources.

The Department has established a respected network of international collaborations.

All of the above constitute tremendous assets and showcase the success of the Department.