



# ARCADE

**Advancement of Research Capability for the  
Development of New Functional Compounds**

**7th FRAMEWORK PROGRAMME  
Capacities - Theme FP7-2009-REGPOT-1  
Regional Potential  
Grant Agreement No. 245866  
Starting Date 1<sup>st</sup> December 2009**

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Institute of Organic and Pharmaceutical Chemistry  
National Hellenic Research Foundation

# **REGPOT-2009-1**

**1. Scientific/Technical Quality**

**2. Implementation**

**3. Impact**

# **ARCADE**

## **Specific Objectives**

**The ARCADE project is designed to address specific objectives which will have maximal impact on the Institute's research activities focussing on the design and synthesis of bioactive compounds and materials.**

# **1. Scientific/Technical Quality**

## **Specific Measures**

- 1. Exchange of know-how and experience***
- 2. Recruitment of incoming experienced researchers***
- 3. Acquisition, development, maintenance or upgrading of research equipment***
- 4. Organisation of workshops and conferences***
- 5. Dissemination and promotional activities***
- 6. Evaluation facility (optional)***

# ARCADE – Work Packages

- WP1** Exchange of know-how and experience
- WP2** Reinforcement of human resources
- WP3** Acquisition and upgrade of research equipment
- WP4** Conference and workshops
- WP5** Dissemination and promotional activities
- WP6** Management

# ARCADE – WP3

## Acquisition and upgrade of research equipment

### Identify Needs

- a new Mass Spectrometry Facility with at least 2 LC-MS instruments, one high-resolution accurate-mass and one routine, to support the synthetic chemistry output
- Upgrade of NMR with a third channel accessory
- Upgrade of protein purification and computational capabilities

# ARCADE – WP1

## Exchange of know-how and experience

- 7+ Partner labs
- Short visits to partners by IOPC senior staff
- Secondments of IOPC researchers to partner labs
- Short visits to IOPC by heads of partner labs
- Secondments of partner lab researchers to IOPC

# ARCADE – WP1

## Exchange of know-how and experience

**Prof. Mark Bradley, University of Edinburgh, UK.**

**Prof. Giancarlo Cravotto, University of Turin, Italy.**

**Prof. Wim Dehaen, University of Leuven, Belgium.**

**Prof. Edwin De Pauw, Université de Liège, Belgium.**

**Prof. Athanassios Giannis, University of Leipzig, Germany.**

**Dr. Simona Golič Grdadolnik, National Institute of Chemistry, Ljubljana, Slovenia.**

**Dr. Josep Maria Luis, University of Girona, Spain.**

**Prof. Sijbren Otto, University of Groningen, The Netherlands.**

**Prof. Andreas Pfaltz, University of Basel, Switzerland.**

**Dr. Matthias Wilmanns, EMBL-Hamburg, Germany.**



# ARCADE – WP2

## Reinforcement of human resources

WP2 involves the recruitment of

- **One** very experienced researcher with an extensive and broad specialisation in mass spectrometry

and **seven** experienced researchers for

- Synthesis of dendrimeric macromolecules and the study of their interactions with low molecular weight compounds by mass spectrometry and NMR
- Synthesis of bioactive compounds and compound libraries
- Synthesis of organic nanomolecular materials with experience in dendrimer synthesis and microwave/ultrasound techniques
- Asymmetric catalysis and the synthesis of chiral ligands and bioactive compounds
- Protein expression, purification, characterisation and study of protein-ligand interactions with biochemical and biophysical techniques
- NMR spectroscopy and *in silico* methodologies towards screening of potential drug molecules and structure determination
- Computational chemistry applied to design of bioactive molecules and photonic materials

# ARCADE – WP4

## Conference and Workshops

### **International Conference “Chemistry for Health”**

Experts in the field and the heads of the Partner Labs will be invited to make presentations. Special emphasis will be placed on the participation of young scientists and scientists from other convergent regions. Specific topics will include:

- Meeting the Challenges in Modern Medicinal Chemistry
- Chemistry in Combating Major Diseases
- Dendrimers : Synthesis and Biomedical Applications
- Chemistry for Medical Imaging
- Bioactive Natural Products
- Systems Chemistry

**Workshop** on Asymmetric Synthesis and Non-Conventional Advanced Synthetic Techniques for Fine Chemicals and Pharmaceuticals

**Workshop** on Advanced Mass Spectrometric and NMR Methods

**Workshop** on Design of Bioactive Molecules and Materials

# ARCADE – WP5

## Dissemination and Promotional Activities

**Creation and maintenance of ARCADE website ([www.arcade-iopc.eu](http://www.arcade-iopc.eu))**

**Creation of an updated IOPC brochure**

**Opening ceremony for the new infrastructure**

**One-day dissemination events for industry and for students**

**Dissemination to regional stakeholders & popularization activities**

## **2. Implementation**

### **1. Work Plan**

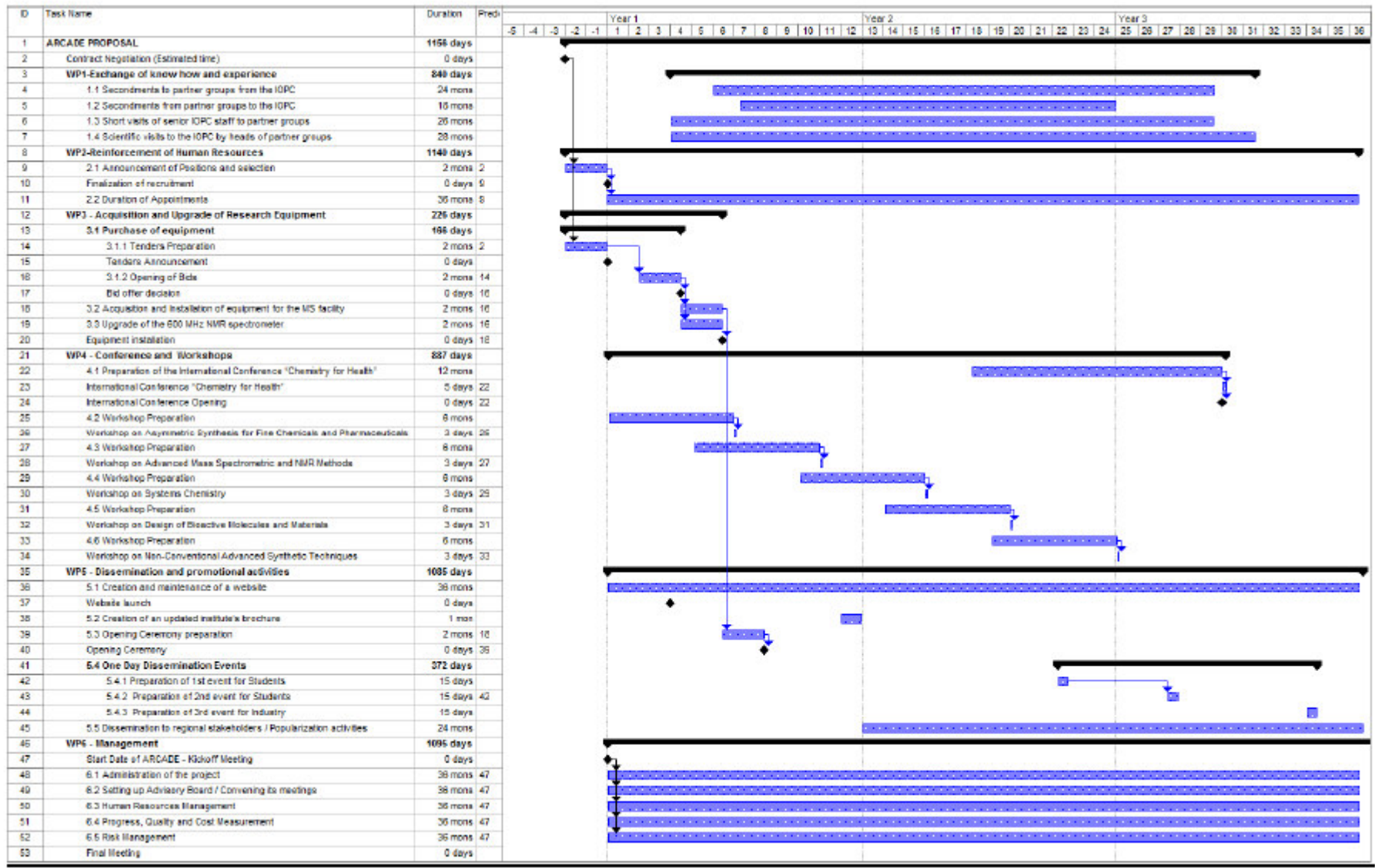
- ❖ **Deliverables**

- ❖ **Milestones**

- ❖ **Workpackages**

### **2. Management structure and procedures**

### **3. Resources to be committed - Budget**



Del. no.	Deliverable name	WP no.	Nature	Dissemination level	Delivery date
1	Report on the first year's exchanges	1	R	RE	12 <sup>th</sup> month
2	Report on the second year's exchanges	1	R	RE	24 <sup>th</sup> month
3	Final WP1 report including report on the third year's exchanges	1	R	RE	36 <sup>th</sup> month
4	Signed contracts with new experienced researchers	2	O	RE	1 <sup>st</sup> month
5	Tender announcements and reports on selection procedures	3	R	RE	1 <sup>st</sup> month
6	Report on technical characteristics of selected equipment	3	R	PU	2 <sup>nd</sup> month
7	Installation of new infrastructure	3	R	RE	4 <sup>th</sup> month
8	Conference Proceedings	4	R	PU	30 <sup>th</sup> month
9	Teaching materials supplied for Workshops	4	R	RE	6 <sup>th</sup> , 11 <sup>th</sup> , 16 <sup>th</sup> , 20 <sup>th</sup> , 25 <sup>th</sup> month
10	Website creation	5	R	RE	3 <sup>rd</sup> month
11	Updated institute's brochure	5	R	PU	12 <sup>th</sup> month
12	1st "one day dissemination event" for students, announcements and proceedings	5	R	PU	24 <sup>th</sup> month
13	popularization activities/ informative meetings	5	R	RE	24 <sup>th</sup> , 36 <sup>th</sup> month
14	conference announcements	5	R	PU	24 <sup>th</sup> month
15	2nd and 3rd "one day dissemination events" announcements and proceedings	5	R	PU	36 <sup>th</sup> month
16	publication reprints	5	R	RE	36 <sup>th</sup> month
17	conference announcements	5	R	PU	36 <sup>th</sup> month
18	Signature of the consortium agreement	6	R	CO	Upon proposal approval
19	Periodic Activity Reports	6	R	RE	12 <sup>th</sup> , 24 <sup>th</sup> month
20	Periodic Financial and Management Reports	6	R	RE	12 <sup>th</sup> , 24 <sup>th</sup> month
21	Project Final Activity report	6	R	RE	36 <sup>th</sup> month
22	Final Financial and Management Reports	6	R	RE	36 <sup>th</sup> month
23	Reports regarding obstacles of the proposal and actions taken, if applicable	6	R	RE	36 <sup>th</sup> month
24	Advisory's Board Report on implementation of ARCADE and perspectives of IOPC	6	R	RE	36 <sup>th</sup> month
25	Audit certificate reports	6	R	RE	12 <sup>th</sup> , 24 <sup>th</sup> , 36 <sup>th</sup> month



<b>Milestone number</b>	<b>Milestone name</b>	<b>Work package(s) involved</b>	<b>Expected date (Month)</b>	<b>Means of verification</b>
1	Start Date – Kickoff Meeting	WP6	1 <sup>st</sup>	Contract
2	Finalization of recruitment	WP2	1 <sup>st</sup>	Official letter of acceptance
3	Tenders for new equipment	WP3	1 <sup>st</sup>	Tenders announcement
4	Bid offer decision	WP3	2 <sup>nd</sup>	Official Record for the Committee decision
5	Website launch	WP5	3 <sup>rd</sup>	Website completed and running flawlessly
6	New equipment installation	WP3	6 <sup>th</sup>	Certificate of Installation
7	MS Facility Opening Ceremony	WP5	8 <sup>th</sup>	Invitations
8	International Conference Opening	WP4	30 <sup>th</sup>	Conference announcements and proceedings
9	Final Meeting	WP6	36 <sup>th</sup>	Minutes

Work package number	3	Start date or starting event:	1				
Work package title	Acquisition and upgrade of research equipment						
Activity Type	SUPP						
Participant number	1						
Participant short name	IOPC						
Person-months per participant:	9						

**Objectives** The objective of the WP3 is the acquisition of new equipment for the Mass Spectrometry Facility and the upgrade of the 600 NMR spectrometer.

#### Task 3.1. Purchase of equipment

Upon notification of project successful evaluation and prior to negotiations the WP 3 leader (*Dr Theodora Calogeropoulou*) assisted by (*Dr Maria Zervou*), who both have special expertise in the processes required for the acquisition of major items of equipment, will begin the preparation of the tender announcements for the desired equipment, in order to make them public immediately after the contract negotiations between NHRF and EC. The tender announcements will be made public according to national laws. The selection by the Management Board (Section 2.1.1) will be based on the following criteria i) technical characteristics ii) price iii) duration of warranty iv) availability of service within Greece. The successful applicants (Section 2.1.3) will be informed about the decision and will be invited to sign the contracts with the National Hellenic Research Foundation.

#### Task 3.2 Installation of equipment for the mass spectrometry facility.

The mass spectrometry facility will comprise a) a new mass spectrometer with capability of measuring accurate mass of small molecules and low resolution protein or dendrimer molecular weights. Suitable ionisation methods are Electrospray Ionisation (ESI) and Matrix Assisted Laser Desorption Ionisation (MALDI). b) a new LC-MS/MS for the routine analysis of mixtures of bioactive compounds or materials produced by the IOPC. In order to reduce experimentation time and cost, the MS facility will be complemented by an automated multiparallel protein purification system for the preparation of pure protein samples.

#### Task 3.3. Upgrade of the 600 MHz NMR spectrometer.

The upgrade of the newly acquired 600 MHz NMR spectrometer of IOPC will comprise a 3<sup>rd</sup> channel accessory and a <sup>1</sup>H/<sup>13</sup>C/<sup>15</sup>N triple resonance probe.

#### Deliverables

- Tender announcements and reports on selection procedures (1<sup>st</sup> month)
- Report on technical characteristics of selected equipment (2<sup>nd</sup> month)
- Installation of new infrastructure (4<sup>th</sup> month)



# ARCADE – WP6

## Management

**Reports, Financial Management, Organisation of Kick-Off and Final Meetings etc.**

**Human Resources Management**

**Progress, Quality and Cost Monitoring**

**Risk Management**

### **Advisory Board**

**Professor Dame Louise N. Johnson, FRS.** Professor Emeritus at the Department of Biochemistry, University of Oxford.

**Professor Alexandros Makriyannis.** Director of the Center for Drug Discovery at the Department of Chemistry and Chemical Biology in Northeastern University, Boston

**Professor Dr. Johannes G. de Vries.** Principal Scientist Homogeneous Catalysis at DSM, part-time professor at the University of Groningen and industrial visiting professor at the University of Bristol

# 3. Impact

## 1. **Expected impacts listed in the work programme**

- **Better integration of the selected research entities in the European Research Area as a whole**
  - ❖ *Impact of the project on other national or international research activities*
  - ❖ *Necessity for a European (rather than a national or local) approach*
  - ❖ *Partnership, including twinning with research groups elsewhere in Europe*
- **Upgrading the RTD capacity and capability as well as the quality of research carried out by the selected research entities**
  - ❖ *Human potential: number of new researchers*
  - ❖ *Human potential: training of research staff*
  - ❖ *Human potential: improvement of research management*
  - ❖ *Scientific equipment*
  - ❖ *Quality of research carried out by the selected research entities*
- **Improved research capacity for increased contribution to regional economic and social development**
- **Improvement of the potential of the selected research entities to participate in FP7 projects**
- **Assumptions and external factors that may determine whether the impacts will be achieved.**

## 2. **Spreading excellence, exploiting results. Disseminating knowledge**

- **Outline how you intend to achieve these benefits through engagement with stakeholders outside the network, and the public at large.**
  - ❖ *Diffusion to scientific community, stakeholders, private sector, general public*

# ARCADE

## Achievements so far

### *Exchange of know-how and experience*

8 outgoing long visits, 10 outgoing short visits, 1 incoming long visit, 1 incoming short visit have been made

### *Recruitment of incoming experienced researchers*

All 8 post-doctoral positions are filled

### *Organisation of workshops and conferences*

1 workshop organised in 2010, 1 in progress now

# ARCADE

## Achievements so far

### *Dissemination and promotional activities*

Project website : [www.arcade-iopc.eu](http://www.arcade-iopc.eu)  
Institute brochure drafted

### *Management activities*

Kick-off meeting in March 2010, Advisory Board meeting in May 2011,  
periodical reports June 2011.

### *Scientific output*

7 research articles, 32 conference presentations (8 oral, 24 posters), 6  
invited lectures.

# ARCADE

## Achievements so far

### *Acquisition, development, maintenance or upgrading of research equipment*

- a new accurate-mass high-resolution mass spectrometer
- an LC-MS instrument for the routine analysis
- HPLC systems for analytical method development
- automated multiparallel protein purification system
- A state of the art cluster of PC's
- 600 MHz NMR spectrometer triple resonance upgrade

