PROJECT PERIODIC REPORT

Grant Agreement number: 285950

Project acronym: SEEDRUG

Project title: Establishment of a Centre of excellence for structure-based drug target characterization strengthening the research capacity of south-eastern Europe

Funding Scheme: COORDINATION & SUPPORT ACTION

Date of latest version of Annex I against which the assessment will be made:

Period covered: from M1 (January 2012) to M48 (December 2015)

Name, title and organisation of the scientific representative of the project's coordinator:

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Declaration by the scientific representative of the project coordinator

I, as scientific representative of the coordinator of this project and in line with the obligations as stated in Article II.2.3 of the Grant Agreement declare that:

- The attached periodic report represents an accurate description of the work carried out in this project for this reporting period;
- The project (tick as appropriate) :
  ☒ has fully achieved its objectives and technical goals for the period;
  □has achieved most of its objectives and technical goals for the period with relatively minor deviations.
  □ has failed to achieve critical objectives and/or is not at all on schedule.
- The public website, if applicable
  ☒ is up to date
  □ is not up to date
- To my best knowledge, the financial statements which are being submitted as part of this report are in line with the actual work carried out and are consistent with the report on the resources used for the project (section 3.4) and if applicable with the certificate on financial statement.
- All beneficiaries, in particular non-profit public bodies, secondary and higher education establishments, research organisations and SMEs, have declared to have verified their legal status. Any changes have been reported under section 3.2.3 (Project Management) in accordance with Article II.3.f of the Grant Agreement.

Name of scientific representative of the Coordinator:.....Georgios A. Spyroulias, PhD, …… Professor, Department of Pharmacy, University of Patras.....

Date: .....25..../ ....02...../ ...2016.....

For most of the projects, the signature of this declaration could be done directly via the IT reporting tool through an adapted IT mechanism and in that case, no signed paper form needs to be sent.

FINAL REPORT

Performed SEEDRUG Activities

4.1. Final Publishable Summary Report

• Executive summary

SEE-DRUG is a joint project consisted of a number of groups working in various disciplines of basic and applied sciences, such as chemists, pharmacologists, biologists and bioinformaticians, that are all affiliated to the following **Departments of the University of Patras (UPAT):** Biology, Chemistry, Medicine and Pharmacy**. University of Patras** is one of the most eminent Education and Research Organizations of Greece (founded in 1964), while it is considered the premier academic institution in Western Greece and has recruited high quality researchers in modern fields of Life Sciences and exhibits a considerable number of funded, national and EU, research proposal in the field of Life Sciences.

SEE-DRUG's Major Aim managed to reinforce the scientific reach and socio-economic impact of the University of Patras (UPAT) at the area of western Greece and South-Eastern EU region. SEEDRUG project played a pivot role and assisted the objectives of UPAT to create a Regional Centre of Excellence for Structural Biology by enhancing the S&T research capacities and the human potential. The purchase and installation of state-of-the-art, unique in this EU region, scientific equipment, accessible to external users (both from academy and industry/private sector) empowered the capacities of the following institutional facilities: (a) the **Protein Production** facilities for high-yield production, isolation/purification and preliminary characterization of protein drug-targets, etc (bioreactors, incubators, modern protein liquid chromatography systems) and biopharmaceuticals, (b) the **Structural Biology** groups (high-field, high-definition 700MHz NMR equipped with cryoprobe for enhanced sensitivity, Crystallization robot) and the **Advanced Light Imaging** facilities (microscopes, new laser sources and high-capacity detectors for faster and better quality imaging) for in-cell light imaging, and (c) the **Pharmacology** groups, all targeting to the characterization of biomolecular drug-targets and lead therapeutic molecules in a comprehensive array of in vitro, ex vivo and in vivo systems (intravital microscope and myographs).
In this scientific, multidisciplinary, ecosystem, a number of appointed researchers performed their activities and transfer new knowledge and expertise, through effective use of the "twining" capabilities offered through SEEDRUG action plan, maximizing thus the impact of the S&T platform and assisted the UPAT groups to establish new or reinforce the existing links with EU academic institutions and Large Scale Infrastructures.

Dissemination and networking activities, increased significantly the impact of the UPAT as a research/academic entity in Greece and EU, through organization of high-impact workshops and conferences. Further, SEEDRUG results have been disseminated to both scientific community, through a number of national and international conferences and a substantial number of scientific publications. Nevertheless, SEEDRUG results were also communicated to the broader public, through electronic means and press releases.

- **Summary Description of the project context and objectives - Overview of the work performed and the main results achieved**

During the two periods of the projects (**M1-M48**), all the WP activities started as originally planned (**WP1-WP4 & WP7** started at **M1**), while the first Workshop (**WP5)** held at **M5.** Frequent meetings between consortium members and EAB members (three times during the first 12 months), were organized in order to organize, initiate and monitor the firs project activities and the coordinator assisted by the WP leaders ensured the effective management and reporting of the project throughout the project (**WP1)**. Meeting with EAB members were prooved very helpful since they monitored the progress of the project and they suggested corrective actions and proposed many ideas for the future reserach orientations of the consortium and the sustainability of the SEEDRUG facilities.

A huge effort was put on **WP2,** included the market survey and the determination of the technical specifications of the equipment. Additionally, while the entire procedure of the national procurements for the acquisition of the equipment was lengthy and time-consuming, which was finally successfully concluded during the 2nd period of the project. New S&T equipment was purchased and installed, while existing equipment was significantly upgraded with new, high-end instrumentation, maximizing thus the impact of the investment. SEEDRUG facility can now provide unique tools, in national and regional level, for establishment of new immaging applications. Technical staff were recruited and appointed at M15 through **WP2**.

In total, 16 experienced researchers were appointed in all available SEEDRUG positions (eight), positions through **WP3** activities. During the course of the WP3 activities, there were 2-3 experienced reseracher who got a job-offer by other academic institutions (in Greece and in EU countries) and the consortium replaced them immediately.

According to the foreseen **WP4** activities, 26 outgoing visits perfromed in P1 & P2 (42 months) and 18 incoming visits took place. Details about dates and costs of each visit habve been provided in P2 report. The total duration of the outgoing visits is rather similar to the visits' duration foreseen, although the number of the visits ws smaller than the one initially estimated. The duration of the visits was extended in some cases, in order to maximize the impact of the transfer-of-knowledge activity of WP4. The net result was that, within the same budget limits, the participating SEEDRUG scientists were deeply involved in new methodologies and become familiar with new techniques aligned with project's activities, transfering thus the acquired experience at UPAT. Overall, UPAT researchers visited a large number of EU partnering organizations (outgoing visits), in order to maximize the impact of WP4 activities and transfer knowledge between top-class EU research and academic entities and transferred new methodologies and techniques at the UPAT's home lab.

SEEDRUG's **WP5** had a great impact on the visibility of the project and UPAT as a prestigious academic entity in Greece and EU. All the workshops, conferences and other networking activities (info-days, seminars and other one-day events aiming to promote links with industries, SMEs etc.) originally planned, organized successfully within the 2nd period of the project. In total, 4 workshops (05/2012, 05/2013, 09/2013, 09/2014) and the International NMR Conference organized (NMR Applications in Life Sciences; 06/2015) along with a number of info-days and other networking activities. Details on the meetings' agendas, are provided in P1 & P2 reports. According to the initial plan, incoming visits of researchers from Easter EU countries (Slovenia, Bulgary, Turkey, Czech Republic, etc.) took place in ordrer to reinforce links with the Eastern EU region.

Among the activities of the WP5, one should note the "Inauguration of the UPAT's SEEDRUG Biomolecular NMR facility", with the participation of **Nobel Prize Winner 2002 in Chemistry, Prof Kurt Wuthrich (**ETH, Zurich & The Scripps Institute, LaJolla, USA**)**, **Dr. Dimitri Corpakis** who is the **Head of Unit B.5 'Spreading Excellence and Widening Participation'** (formerly, Head of Unit of the Regional Dimension of Innovation Department at European Commission), **Prof Lucia Banci, Director of a Large European Research Infrastructure on NMR** (CERM, University of Florence, Italy) and a number of local and regional stakeholders (11-13 October 2013). The event was attended not only scientists by scientists, but also by citizens of Patras and it was covered by a number of local or national newspaper and transmitted through web.
Ex-post Evaluation of the SEEDRUG project, was designed and planned within the **WP6** activities. WP6's objective was the evaluation, by external experts, of the UPAT's research facility and capability upgrade after the implementation of SEE-DRUG project. This activitiy initiated at **M19** of the project, when 4 individual external experts were nominated by EC and visisted UPAT/SEEDRUG labs **at November 2014 (month 35, P2) and September 2015 (M45, P3)** and discussed with project management team, the WPL leaders while the SEEDRUG consortium members presented their achievements in the framework of SEEDRUG along with their future plans. The evaluators have also discussed with the UPAT's Vice Rector about the institutional plans for the support of the facilities etsablished during the SEEDRUG project, with other SEEDRUG staff (researchers, technical staff etc.).
Dissemination of the project achievements **(WP7)** was performed through publications in peer-reviewing journals (39 articles published during P1 & P2), and participation in a number of conferences (with 59 oral and 79 poster presentations). The SEEDRUG's web-page became function during M1 of the project and exhibited a really large number of visits (totally >160000 hits). Additionally, SEEDRUG was advertised in 25 newspaper and newsletter articles, and in other documents.
Finally, it should be mentioned that all SEEDRUG work packages completed until the end of the project and all milestones reached. Specifically, the activities of the WP2, WP3, WP4, WP5 & WP7 ended by the end of the 2nd period (M42), given that the original duration of the project have been extended by six months, while WP1 (Project Management and Reporting) and WP6 (Ex-post Evaluation & Quality Assurance of UPAT's research potential), completed successfully at the end of the project (M48). The reporting of the SEEDRUG activities, including the financial reporting (auditing and budget analysis), has been performed as foreseen by the Grant Agreement, at M18, M42 and M42. All deliverables (totally 24) have been submitted according to the technical annex of the project.

- **Description of the final results and their potential impacts and use (including socio-economic impact and the wider societal implications of the project).**

The specific aim of the SEEDRUG REGPOT project is to reinforce and promote the S&T capacities of UPAT at an international level, through a strategic plan that targeted to create a scientific ecosystem to promote efficient, effective and synergistic use of the EU & National funding and public investments, in order to reach the smart specialization concept of this EU region (Western Greece & South-Eastern EU region).

After 4 years of activities all the SEEDRUG goals have been achieved, including the recently concluded task of the Ex-post evaluation and Quality assurance of SEEDRUG's and UPAT's

research potential (**WP6,** concluded at **M48**)**.** This activity, carried out in full agreement with the action plan:

(a) UPAT has now strengthened its research and innovation capacity in the field of Life Sciences and is capable to provide to the scientific community a S&T platform with high-end equipment and methodologies which allow to the users to work under the guidance of highly-qualified staff and perform high-quality research activities,

(b) 16 Experienced, highly qualified researchers have been appointed by the project, along with 2 person as technical staff and other managerial/administration personnel, who sum up at ~260-280 person/months moved and lived at the cities of Patras and Rion, contributing thus to the local economy,

(c) new research activities has been initiated and new groups of the UPAT and other Greek/non-Greek academic institution expressed their interest to use the equipment or to set-up new joint research projects

(d) new experimental protocols have been resulted by the 3,5 research activities of the implicated groups and the appointed researchers, while new services have been become available,

(e) the participation of UPAT in research consortia has been enhanced and new research proposals submitted,

(f) UPAT become a scientific pole of reference in South-eastern EU region, aligned with the *Research and Innovation Strategies for Smart Specialization (RIS3),* claiming an important role in the field of Life Sciences at regional/national level.

Synergies of SEEDRUG project with Structural funds:

UPAT and SEEDRUG project had a major contribution in the construction of the so-called "Greek National Roadmap of Research Infrastructures". SEEDRUG coordinator, Dr. G.A. Spyroulias, coordinated the UPAT-RISF project (the UPAT's proposal in the field of Functional and Structural Studies of Drug Targets) for the development of a National Research Infrastructure (RI) at Western Greece Region with the participation of Universities of Patras and Ioannina including the branch of Foundation for Research & Technology - Institute of Molecular Biology and Biotechnology sited at Ioannina, as well. The proposed action is based on the REGPOT SEEDRUG S&T capacities and aims to provide access and know-how to external regional, national and international academic and industrial users. The construction of the Greek RIs Roadmap was a three-stage procedure (including peer-reviewing scientific evaluation of the proposals) and UPAT-RISF is one of the two nodes in "INSPIRED" RI, an Infrastructure in the field of Biological & Medicinal Sciences. For more info please follow the link

http://www.gsrt.gr/News/Files/New987/road-map-web_version_final.pdf (page #51) &

https://ec.europa.eu/research/infrastructures/pdf/gr_roadmap-web_version_final2014.pdf

The result of this initiative provides a label of excellence to UPAT and REGPOT consortium at National and International level, which in concert with the EU & REGPOT label of excellence is expected to be critical in future fund raising efforts through structural funds. Indeed, the construction phase of the UPAT RI (scientific personnel, additional equipment, operational costs) are expected to get funding from the regional government having as financial source the structural funds.

Additionally, new EU funds are expected to UPAT and related with the activities of the teams involved in SEEDRUG. Among them, it worth mentioning the H2020 project, through the calls

for Infrastructures (H2020-INFRAIA-2014-2015; project's acronym: "iNEXT" and UPAT participate with the task to organize a Training Course), a project that started at 09/2015, while other proposal's submitted under the H2020 framework, are under evaluation process.
All the above activities are expected to attract new researchers, new users from academia and private sector at UPAT and to allow the research staff of the institution to use the S&T equipment for applications of wide interest (diagnosis, metabolomics, toxicology studies, analysis of foods, drinks, liquids etc.) for the regional stakeholders.

Long-term benefits for the regional scientific community and society:
The long-term benefits of SEE-DRUG implementation will be multifold, such as: (a) to increase the UPAT's visibility and status at EU scientific area, (b) to establish an international network with top-class EU Centers of Excellence and technology end-users at a regional or local level, including the bio-pharmaceutical industry, and (c) to create a number of positions for highly skilled scientists and thus enhance scientific and economic growth both at a local and at a regional level, and couple the research with innovation in order to provide to the regional community/society products and services of high added value.
One of the great achievements of the SEEDRUG was the establishment of strong collaborative links with a number of clinics of the UPAT's Hospital in diagnosis and analysis. New challenges are opened with the application of magnetic resonance diagnostics in newborns errors in metabolism, in leukemia patients (on-going collaboration with Prof. A. Spyridonidis and his department/clinic at the UPAT's Hospital), in cardiovascular diseases and in analysis of e-cigarettes, a filed where companies like BRUKER Biospin (the NMR manufacturing company) has shown a great interest to establish collaborative efforts with SEEDRUG consortium members (there is an on-going collaboration in diagnosis of errors in newborn's metabolism through NMR metabolomics with Prof N. Varvarigou and her department/clinic at the UPAT's Hospital).

• Description of the main S&T results/foregrounds

1) WP1 - Project Management (WP Leader/Coordinator Dr. George A. Spyroulias, WP Co-Leader Dr. George Patrinos)

The management and the coordination of the SEEDRUG project (including financial reporting) have been smoothly performed throughout the project duration. The project coordinator was in close collaboration with the WP Leaders, the EAB members and the UPAT's Research Committee staff, performing all the national and international procurements, and reporting activities, reporting on each WP in close collaboration with the WP Leader (they report progress, results, or deviations form he original plan in each of the SEEDRUG work-package).

According to the foreseen activities the monitoring of the project performed through the following activities/means:

- **(a)** Frequent meetings with WP leaders to monitor project's performance, resolve problems, manage, organize and submit the deliverables
- **(b)** Meeting with EAB members on-site (at UPAT) and communication with them through skype/email in order to notify them about the progress of the project, changes, delays in the schedule or to ask their opinion about issues related with the selection of the equipment, the research and networking activities,
- **(c)** Close collaboration with UPAT's Research committee for auditing and financial reporting
- **(d)** Preparation of deliverables and submission, Report writing, financial monitoring, auditing and submission of documents to EC portal,
- **(e)** WP2 activities' monitoring and corrective actions - Upgrade of S&T UPAT's capacities.
- **(f)** WP3 activities' monitoring and corrective actions - Recruitment of researchers & technical personnel and monitoring of the research activities in accordance with the WP3's plan,
- **(g)** WP4 activities' monitoring and corrective actions - Accomplishment of Incoming & outgoing visits to maximize the transfer of knowledge
- **(h)** WP5 activities' monitoring and corrective actions - Organization of workshops, conferences and other networking activities
- **(i)** WP6 - preparation of meetings with external evaluators and reporting
- **(j)** WP7 activities' monitoring and corrective actions - Dissemination activities to promote SEEDRUG achievements in other scientific communities and to the broad public of the region through scientific publications, press releases, live streaming coverage of events, newsletters etc.
- **(k)** Financial reporting for P1, P2 and P3 periods of the project – a delay occurred during the reporting of the P1 due to the massive strikes at Greek Universities, that period.
- **(l)** Preparation of the Final Project's report.

*Overall, the activities of **WP1** have been performed according to the SEEDRUG's Action plan.*

2) WP2 - Upgrade and Renewal of S&T Infrastructure (WP Leaders Dr. Kostas Poulas & Dr. George A. Spyroulias)

During the project's first period (P1) the following equipment has been purchased and installed: the 700 MHz NMR spectrometer, the Crystallization Robot, and a piece of functional microscopy facilities (upgrade stage I). During the project's second period (P2), it was achieved the upgrade of the UPAT's Light Imaging facilities, and the purchase and installation of the pharmacology facilities (intravital microscope & myographs) and the protein production/purification facilities, as it is described in details below. Additionally, it was scheduled various technical visits (according to the usage of the facilities) for the maintenance of the equipment and the transfer of knowledge between the manufacturer/supplier company and the SEEDRUG's technical staff along with implementation of new applications/techniques.

Specifically :

- **(a)** Purchase and installation of all equipment components: Crystallization Robot & Confocal Upgrade Stage I (**M16;** Delivery of Crystallization Robot at **M12,** installation at **M16**), 700MHz NMR Spectrometer (**M17;** Delivery at **M15,** installation at **M17)** Confocal upgrade (stage II & stage III) at **M21** and **M31**, respectively, Intravital microscope (**M31),** myographs, and protein facilities upgrade (**M39-M41).** Project Officer has approved the upgrade of protein facilities and details for this activity are provided below.
- **(b)** Recruitment of technical staff at **M16**.
- **(c)** Organization of a technical visit at **M30** & **M42.**

Report on: Upgrade and Renewal of S&T Infrastructure

(I) Market Survey & definition of equipment technical specification.

(a) NMR Spectrometer, Crystallization Robot & first stage update of Confocal Microscope – preparations for the appropriate settlement of NMR & Confocal upgrade

Many companies and local representatives contacted by SEEDRUG consortium members (only two NMR manufacturers offer at 2012-2013, high field 700MHz systems, Agilent/VARIAN & Bruker Biospin) and asked to submit quotations for the scientific equipment necessary for the project (confocal microscope, crystallization robot, myographs, intravital microscope etc). Negotiations with the companies have taken place in order to achieve the best value-for-money quotations and then the defined tech specs sheets were submitted to the Research Committee of the University of Patras

For the NMR Spectrometer, the centerpiece of the SEEDRUG S&T equipment, extensive market survey was performed, even during the submission of the SEEDRUG proposal, and two quotations have been accompanied the research proposal.

However, in order to update the technical feature of the NMR spectrometer the two companies (and their local representatives) were contacted and asked to provide specific information, about the sensitivity of the amplifiers for ^{1}H, ^{13}C & ^{15}N nuclei, the

durability of the cryogenic liquids which cold the coils (time period for two successive, liquid Nitrogen and Helium refills), the service periods for their cryogenically cooled probes, a list of customers in Greece and EU and a number of other technical specifications.
The same procedure followed for the Confocal components/units, for the Crystallization robot, the Intravital microscope and the myographs. Additional market survey was performed during the 2nd period of the project for the upgrade of the protein facilities.

Although the two NMR companies (VARIAN/Agilent and Bruker Biospin) corresponded in the majority of the request, only Bruker Biospin submitted a complete quotation and took part in the international procurement. It should also be noted, that Bruker Biospin, overpassed the requirement as described in the international procurement, offering additional parts/components/accessories that these requested. These additional parts were: (a) a sample case with 24-sample position, for high throughput analysis and automated/unsupervised measurements of 24 samples, (b) a room temperature Triple-nuclear ($^{1}H/^{13}C/^{15}N$) probe to replace the cryogenically cooled probe in case of technical problems, (c) a 4th channel accompanied with the appropriate amplifier for ^{2}H, for measurements of large, perdeuterated, biomolecular systems, extending thus the possibilities of the instrumentation to study molecules/complexes with MW >25kDa, (d) a gas separator for O2/N2 separation (e) four additional licenses for a PC processing station and additional days of training on UPAT.
It should be noted that almost a year after the conclusion of the national procurement of the 700MHz NMR instrument, where Bruker Biospin was selected as the suppliers, the other company, VANRIAN/Agilent who initially contacted by the SEEDRUG staff, announced the retirement and exit form the NMR business:
http://www.agilent.com/about/newsroom/presrel/2014/14oct-gp14028.html

Additionally, during the 1st project's period two different tenders (out of the three scheduled) were prepared for the update of the Confocal microscope. One included the purchase of components with a total value < 15 kEuros and there was no need for an International Open tender (conclusion of the tender at March 2013, delivery of the equipment in May2013), while the second and the third one took place in period 2. During the first period, a national procurement was also took place for the acquisition of the Crystallization Robot, which was finally delivered by the end of the 2012 and became functional after a few days. Additionally the suppliers, provided on-site training in the SEEDRUG members of the Lab of Molecular Biology and Immunology on the new methods in protein crystallization trials.

Another taks that the SEEDRUG groups had to undertake was the preparation of the installation plans and space for the NMR and the Confocal microscope upgrade. Therefore, new rooms had to be prepared according for the installation of the 700MHz NMR instrumentation and the Confocal microscope's new components. This preparation included works on the modification of the settings (gas flow lines, water lines, extra electric power lines 3-phases or 1-phase, new/additional phone and internet connections, air-conditioning etc.). For these works, SEEDRUG consortium

members had to work in collaboration with the technical and financial department of the University.

NMR laboratory preparation. For the NMR laboratory, which was decided to be at the new Pharmacy Building (a building that was not functional by the time that NMR equipment arrived and needed to be installed), many modification took place in order to prepare an operating room, and the main NMR laboratory, with higher roof, extra electrical power line form UPS, gas N2-separator transfer lines, normal air line connected to an air-compressor, etc. Costs of these modifications/preprations covered by UPAT. Additionally, UPAT (technical & financial department) contributed to this installation with the purchase of: **(a)** 1 Oil-Free Air-compressor accompanied with an air-dryer, **(b)** two powerful UPS systems; one 3-phase 30 kVa / 27 kW UPS and one 1-phase 10 kVa / 9 kW UPS, and **(c)** 4 air conditioning systems, 2 x 12k BTU for the NMR laboratory, 1 9k BTU for the NMR operation room and 1 9k BTU for the UPS room. Images from the NMR room sited at the new Pharmacy Building are provided below.

Similar preparation was prepared for the installation of the ***Confocal microscope components*** and the room where the existing Confocal microscope has been installed was transformed into a "dark room" with new electric power lines, new air-conditioning systems (two additional 9k BTU systems installed), water filters, etc

(b) **Intravital Microscope:** The criteria that prevailed in the choice of the specific instrument were as follows:

The instrument characteristics: the microscope has to be versatile, adapted to all small rodent laboratory animals, allow the use of fluorescent dye-loaded cells and possess excellent lens and camera characteristics, permitting the capture of sharp images and able to accept video monitoring (additional software purchased through REGPOT)

The quality of the instrument, durability and access service was also something the weighed heavily on our decision. Between the two major companies that provide such microscope, i.e. Zeiss and Leica, it quickly became apparent, by talking to colleagues in Athens and Crete, that Leica provides by far the best service. Indeed, since the installment of the Intravital Microscope, we have had access to advice from the Leica team. In addition, Leica installed a software through which, once we call for help, we provide the ability for REMOTE access to the microscope, in a way that the Leica technician can advise us in real time by looking through internet access) at the same pictures that we are looking through the lens.

Because, through a different program, we also had the possibility to purchase a reverse phase fluorescent microscope, we also arrived at a very good "deal" for both instruments, in such a way that the lenses and camera of the Intravital scope were upgraded and offered at a price that was unbeatable by other companies.

In short, for the quality and service provided, this was by far the most obvious option.

(c) **Myographs:** There are very few companies offering Myographs, especially with representative in Greece, because of the bureaucracy (translation of files from Greek to English and search in "Transparency" databases in Greek, accessible only to Greek companies). In addition, while some companies offered glass cuvettes, this was something we wanted to avoid because of frequent non-specific binding of chemicals. ADT Instruments offered stainless steel cuvettes, Furthermore ADT was not only extremely responsive to "tailor" the package to our specific needs, that included

(crucially) the ability to use both larger vessels (aorta) and microvessels (mesenterics), but included a 10-year warrantee on all parts, and ability to download upgraded software, something that per se is an important investment in the future usefulness of this expensive instrument (82K). In addition, Prof. Topouzis, had the opportunity to see an (older) version of this in use in London (Queen Mary College), where he visited via short-term exchanges made possible by REGPOT, and where he could ascertain the excellent quality, versatility and durability of the instruments made by DMT. Overall, DMT offered the best package that responded to our needs and warranted good working condition of the parts in the mid-future.

(d) **Upgrade of Confocal & light Imaging facilities during the P2 of the preoject:** Based on the needs for applications in our University and the acquisition of previous infrastructure we have decided to upgrade existent infrastructure available in "Live Imaging Facility of Patras University" that permit us to perform as many cutting edge applications as possible that will be useful in different research fields.

Specifically, our strategy aimed to the upgrade of an SP5confocal with the acquisition of an additional laser (405) and upgrade of the detectors that permit faster and better quality image acquisition. The representative of Leica in Greece was the only company that could offer such an upgrade.

In addition we have upgrade an inverted microscope from Olympus (IX83) by giving the opportunity to perform system coordinate imaging and real-time imaging with the acquisition of the appropriate parts. The representative of Olympus in Greece was the only company that could offer such an upgrade.

The above upgrade in Period 2 (**M19-M42)** performed in two major stage and it is mentioned in reporting documents/Deliverables as "Confocal Upgrade stage II & III" ("Upgrade stage I" performed during the 1st period and reported

In all above cases (update of Confocal microscope, Intravital microscopes, Myographs) **delays occurred, due to the fact that the original equipment, as defined in SEEDRUG Annex I at 2010-2011, was no longer manufactured, or not provided any more by the local representatives.** Under these circumstances, the Confocal Microscope update proved a tedious procedure, where every component had to be searched and selected with great care in order to be compatible, functional and cost-effective with the existing infrastructure. Building of a multi-component instrumentation, through the upgrade of an existing equipment is usually time-consuming and much more difficult than the purchase of an integrated instrument in an "al-in-once" procedure. For this reason the upgrade of the existing UPAT's Confocal infrastructure was decided to be done in different stages (three). **(M1)**

Finally, in all cases of equipment purchase, it was agreed with the companies, that they should provide services based on the web-based remote. Under these circumstances the companies' engineers and the REGPOT technical staff, could provide a cost- and time-effective trouble-shooting service and monitor of the equipment function. This service has been already applied in several cases up to now. Such a service will continue beyond the end of the REGOPT program, ensuring sustainability of the equipment and reducing, when it is possible, the cost of the equipment's maintenance.

(e) **Upgrade of Protein/production facilities:** Based on the ever-increasing needs for large-scale production of protein drug targets to: (a) feed the other SEEDRUG and

other UPAT's labs/groups that needs protein, RNA or DNA for experimental studies, (b) fulfill SEEDRUG role as National Research Infrastructure accommodating the needs of groups from many other Greek Academic & Institutional groups, and (c) proceed to a large-scale protein/RNA/DNA production for commercialization (as also suggested in the "Sustainability report" by the External Evaluators, as a source of income for the SEEDRUG facility), we planned the upgrade of the existing facilities with modern protein production equipment, such as bioreactors and flask incubator for bacterial and yeast culture cells (providing the possibility to monitor and adjust the pH of the culture, the CO_2 release of the cells, the O_2 needs, and to control a number of factors of the cell culture) a versatile Liquid Chromatography system adapted for both biomolecules and small organic molecules, a -80^{o}C freezer (absolutely necessary for storage of enzymes, plasmids, RNA/DNA/protein samples and biofluids for metabolomics analysis), a refrigerated centrifuge for large volumes and a sonication system. Specifically, we acquired a bioruptor plus sonication with a water cooler system that is appropriate for epigenetic DNA methylation, epigenetic chromatin analysis, next generation sequence and protein analysis. This apparatus with unique characteristics could help to extend findings on protein-protein and protein-DNA interactions obtained by the users of the "Live imaging facility" and furthermore could be used from the protein production facility users as well. This specific model selection was based on the high performance, the versatile applications and the scientific references that exist for the Bioruptor in the literature. The acquisition was performed directly from the company located in Belgium in order to reduce the cost. The same holds for the acquisition of the Chromatography system (GE Healthcare), which acquired directly from the authorized distributor in Austria and it is fully compatible with the existing chromatography systems in Department of Pharmacy and with the NMR equipment.

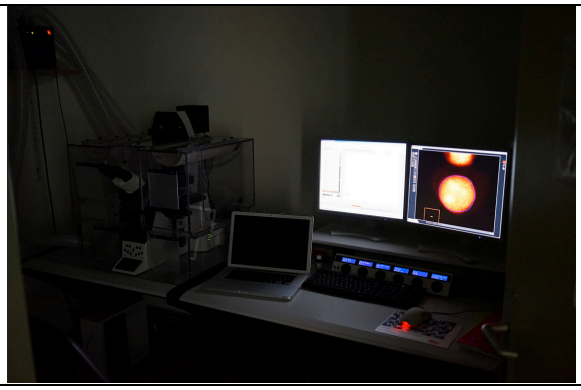
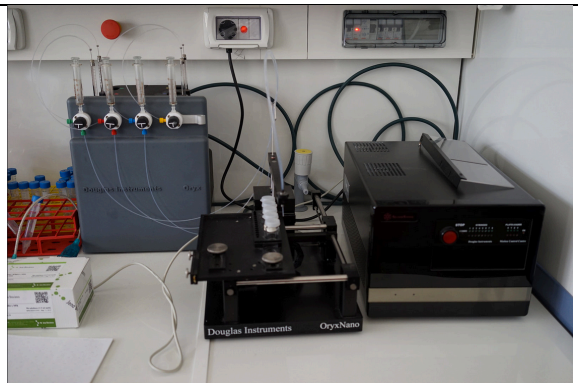
Note:

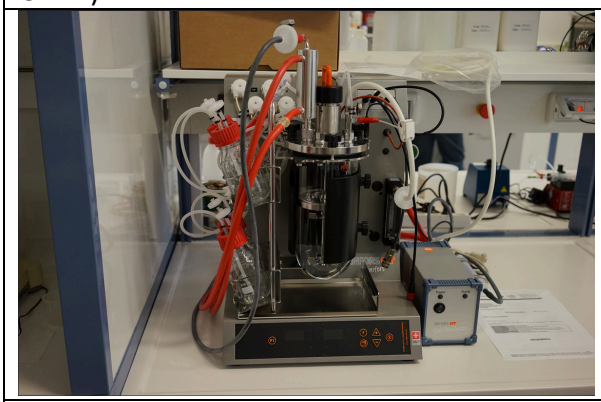
(1) The above purchase were carried out taking under consideration the ever increasing needs and demands by other consortia (Greek and EU) for the production of recombinant proteins, which will be used in other SEEDRUG units, like the Structural Biology unit, the Advanced Light Imaging facility and Pharmacology unit at UPAT. However, since the SEEDRUG project established a Regional/National Center of Excellence, there is a number of other groups active in the field of Life Sciences that address their request for high-purity recombinant proteins to SEEDRUG consortium. Additionally, a number of EU Research Consortia that would like to establish joint collaborative efforts with SEEDRUG groups, expect that SEEDRUG s able to provide a number of proteins which would be used by other groups in order to address interesting biological questions. Protein Production becomes now a prerequisite of sustainability of a facility or research center in the field of life sciences. Additional. Production of high-yield, highly pure proteins can be exploited for commercial uses and could establish joint collaborative links with regional bio-pharmaceutical industry (spin off companies, like ELDRUG S.A. and SMEs like CBL Patras or large "Pharma" industries existing in the Region nearby UPAT). The External Evaluators also stressed the last issue, during their two visits at U of Patras in the framework of WP6.

(2) The above activity was performed in compliance with the Grant Agreement Article 4, which allows the budget allocation: *"Beneficiaries are allowed to transfer budget between different activities and between themselves in so far as the work is carried out as foreseen in Annex I".* **The above action was approved by the Project Officer of the SEEDRUG**

Project, Ms. Anna Remond-Niewiarowska, imprinted in an Email of 04/07/2014, which has been also forwarded to the new Project Officer Ms Mersia Panagiotakou (22/10/2015). At this point it should be underlined that all the equipment foreseen at the SEEDRUG Action Plan, as imprinted in the ANNEX I, has been acquired and installed, becoming in full operation before the end of the project as described in details at WP2 deliverables and reports (please see below). Additionally, the cost of this action was covered by savings resulted in other categories of SEEDRUG actions and were not disturbed the work/actions foreseen in SEEDRUG's Annex I.
Therefore, all the activities in WP2 and other WPs have been carried out as foreseen in Annex I. Photos of the installed scientific equipment are provided below.

(II) **Preparation (jointly with the UPAT's Research Committee personnel) of the tender documents,** the announcements of the tenders at the journals (according to national laws for transparency in purchasing of equipment), preparation of the research equipment technical specifications' evaluation committees and committees for supervising the delivery and appropriate functioning of the equipment. **(M1-M6** for NMR, Crystallization Robot and Confocal upgrade – Stage I and **M19-M32** for the rest of the instrumentation).

<table>
<tr><td> 
</td><td>  </td></tr>
<tr><td>700MHz Biomolecular NMR facility at the Dept of Pharmacy, UPAT</td><td>Light Imaging Facility – Confocal microscope installed at the lab of UPAT's Medical School</td></tr>
<tr><td>  </td><td> 
</td></tr>
<tr><td>Light Imaging Facility – Confocal microscope installed at the lab of UPAT's Medical School</td><td>Crystallization Robot installed at the UPAT's Pharmacy Department</td></tr>
</table>

	
Myographs (Dept of Pharmacy, UPAT)	Myographs (Dept of Pharmacy, UPAT)
	
Refrigerated Centrifuge (Dept of Pharmacy, UPAT)	Shaking Incubators (Dept of Pharmacy, UPAT)
	
Biorector for bacterial and yeast cell cultures (Dept of Pharmacy, UPAT)	Prof S. Topouzis working with the Intravital microscope (Dept of Pharmacy, UPAT)

As was foreseen in SEEDRUG action plan, technical qualified personnel had to be recruited and appointed in order to ensure the smooth operation of the state-of-the-art equipment and especially the NMR spectrometer and to ensure the: (a) continuous monitoring of the equipment functioning (b) sustainability of the equipment, (c) the implementation of new experimental protocols, (d) maintenance, installation of new hardware and software and best usage of such advanced research equipment and (e) technical assistantship and advisory to the users of the facility, being also in contact with manufacturers and authorized company's engineers in case of required troubleshooting.
Aligned with the action plan, the recruitment of the technical personnel took place after the installation of the equipment._ Recruitment and appointment of technical personnel: Mr Kostas Marousis at **M15** with 28 months total contract duration (4+6+12+6months) until **M42** & Ms Foteini Roumanou at **M16** with 21 months total contract duration (9+12months)**.**

Detailed report on the recruitment of the technical staff provided in **Deliverable D2.2**

Finally, technical visits by the companies supposed to provide the S&T instrumentation were foreseen in the project's strategic plan. This task was designed with the aim to assist the SEEDRUG groups to monitor the proper function of the equipment in collaboration with the specialized personnel of the equipment manufacturers (i.e. Bruker Biospin for NMR instrumentation), to perform the technical service that only authorized personnel is allowed to do and to transfer knowledge to UPAT's technical staff on maintenance, troubleshooting and update of equipment's software along with the implementation of new applications.

During the two performed technical visits_**(**1st visit at **M31** and the 2nd at **M42**) not only technical service of the equipment took place, but also transfer of knowledge and SEEDRUG staff training on new applications, maintenance, occurred. Additionally, new applications have been installed for NMR metabolomics studies and drug design efforts. Detailed description on these technical visits was provided in the corresponding deliverables in period 2.

Finally, aligned with spirit and the long-term vision of the SEEDRUG project to become a regional/National Research Infrastructure, providing high quality service to institutional or external users, Standard Operating Procedures (SOPs), for all the NMR, Light Imaging & functional microscopy and pharmacology equipment, were prepared and submitted as project's deliverables (**D.2.3)** after M42.

Overall, despite the time-consuming process of the national procurements and, the activities of ***WP2 SEEDRUG's Action plan*** *were accomplished as originally planned. Additionally, the protein production UPAT's facilities have also been enhanced through the implementation of this project. Finally, the 6-montsh extension of the project duration allowed to the scientists and the technical staff to complete the equipment installation successfully, to develop the SOPs, to perform the technical visits timely and therefore to maximize the impact of WP2. UPAT's now demonstrates an amazing battery of modern S&T platform with powerful and complementary instrumentation in the field of Life Science, unique in Greece and South-Eastern EU region. Additional equipment purchased exploiting budget savings. All equipment pieces originally described at Annex I, were acquired and installed empowering thus the S&T UPAT's capacities as originally planned.*

(3) WP3 - Recruitment of researchers - Human resources empowering (WP Leader Dr. Andreas Papapetropoulos, WP Co-Leader Stavros Taraviras).

According to SEEDRUG action plan and project's technical annex, recruitment of experienced scientists in eight research positions took place as had been originally foreseen. Announcement of the research positions of SEEDRUG project, collection and evaluation of candidates' CVs and appointment of successful candidates took place under the equal gender opportunities policy.
Therefore the following activities carried out in order to hire the qualified researchers who were highly motivated in working within the ambitious plan of SEEDRUG and were experienced with the handling and operation with sophisticated, state-of-the-art S&T instrumentation as that acquired through SEEDRUG project:

- **(a)** Announcement of the 8 research positions in a large number of journals and web sites and call for expression of interest.
- **(b)** Collection of applications/CVs and evaluation of totally >60 candidates.
- **(c)** Appointment of researchers in 6 positions (positions #1, #3-4, #6-8) during **M1-M9,** appointment of a researcher at position #5 at **M10** and at position #2 at **M19.** Appointment of additional researchers at fields **#2, #4**, **#5, #7** to complete the work, either due to vacancies occurred during the course of the activities (people got offers from other academic institution for permanent jobs/positions) or due to the extension of the project.

Management of the appointed researchers: The total number of the researchers appointed in these 8 research fields was 16, for the entire duration of the project (42 months), while the first period (18 months) were appointed 12 researchers, during different time-periods of the project.

Data of Appointed researchers (field, researchers' names, contracts & duration):

In total, 16 experienced researchers were appointed in SEEDRUG over the 42 months period. 14 of these researchers worked during the **P2 (M19-M42)** of the project. The two researchers whose activities, started and ended within **P1** are: **(a) Dr. A. Galanis** appointed at **Field #1** (Expert #2), and **(b) Dr. Zongmin Zhou** appointed at **Field #6 (**Expert #2).

5 new researchers were recruited in **P2** of the project in the following positions/fields: **Field #2,** Expert #1, Detlef Bentrop**,** and Expert #2, Stavros Bariamis, **Field #4,** Expert #2, Sotirios Sideris, **Field #5,** Expert #2, Christina Kyrousi, and **Field #7,** Expert #2, Athanassios Spathis, while the other 9 researchers worked during the 2nd period of the project, were appointed during the first period and they continued their activities throughout P2.

Specifically, the names of the SEEDRUG researchers, along with the corresponding periods of engagement and salaries are given below:

Field #1: Peptide/protein labeling strategies for NMR studies, data analysis & structure determination

Expert #1: **Dr. Christos Chassapis,** appointed at **M1**. Period engaged in SEEDRUG: **01-2012 to 03-2015.** 01/2012 to 12/2014: 5 contracts for 12+12+4+4+4 months each. He offered his expertise in

recombinant protein production, labeled in $^{13}C/^{15}N/^{2}H$ nuclei for NMR studies and his experience in analysis of multinuclear 2D/3D NMR spectra and structure determination of proteins

Expert #2: Dr. Athanassios Galanis, appointed at **M2**. Period engaged in SEEDRUG: **02-2012 to 01-2013.** 1 contract for 12months. He worked on the production of synthetic polypeptides and their study with new structural methodologies, based on powder diffraction.

Field #2: Expert in Bio-NMR Spectroscopy Applications

Expert #1: **Dr. Detlef Bentrop,** appointment at **M19**. Period engaged in SEEDRUG: **07-2013 to 10-2013.** 1 contract for 3months. He offered his great experienced in setting up new NMR experiments for protein dynamics and protein-ligand/protein/RNA interactions, based on the newly installed 700 MHz NMR. He also assisted on the analysis of the conformational dynamics data of protein-RNA complexes.

Expert #2: **Dr. Stavros Bariamis,** appointment at **M31.** Period engaged in SEEDRUG: **07-2014 to 12-2014.** 1 contract for 6months**.** He offered his experience in NMR studies and the analysis of complex mixture of small bioactive molecules, natural products and metabolites

Field #3: Protein Crystallography & Biomolecular modeling/simulation

Expert #1: Dr Manousos E. Kambouris, appointed at **M3**. Period engaged in SEEDRUG: **03/2012 to 10/2014.** 03-2012 to 02-2014: 2 contracts for 12months each & 03/2014-10/2014 1contract for 8months. He worked on setting up new, efficient, molecular biology protocols on high yield production of proteins in bacterial and yeast expression systems and on the crystallization trials of a series of proteins

Expert #2: Dr. Andrew Stewart, appointed at **M18**. Period engaged in SEEDRUG: **06-2013 to 12-2013**. 1 contract for 7months. He enhanced the SEEDRUG capacities in the application of powder diffraction methods and data analysis of proteins.

Field #4: Molecular Biology and Biochemistry

Expert #1: Dr. George Lagoumintzis, appointed at **M3**. Period engaged in SEEDRUG: **02-2012 to 06-2015**. _02-2012 to 01-2014**:** 2 contracts for 12months each, 02/2014 to 12/2014: 1contract for 11 months & 01/2015 to 06/2015 2contract for 3+3months. He collaborated with experts in positions/fields #1 & &3 in order to optimize new molecular biology protocols for high-yield expression of proteins in bacteria and yeast and worked with the crystallization robot and new patented technology, for the efficient crystallization of proteins.

Expert #2: Dr. Sotirios Sideris, appointed at **M25.** Period engaged in SEEDRUG: **01-2014 to 06-2014.** 1 contract for 6 months. He offered his expertise in protein biochemistry in order to perform biological assays of a series of proteins implicated in neurodegenerative diseases.

Field #5: Confocal and Functional Microscopy

Expert #1: Dr. Alexandra Patmanidi appointed at **M10.** Period engaged in SEEDRUG: **10-2012 to 06-2015.** 10-2012 to 09-2013: 1 contract for 12months, 10/2013 to 01/2014: 1contract for 4months, 04/2014 to 09/2014: 1contract for 6 months & 10/2014 to 06/2015: 1contract for 9months. She offered her long-term experience on advanced light imaging techniques, in order to set up new application based on confocal microscopy and to visualize protein translocation into the cells.

Expert #2: Dr. Christina Kyrousi, appointed at **M33.** Period engaged in SEEDRUG: **09-2014 to 06-2015.** 1 contract for 10months. She applied a number of experimental methods in order to study protein-protein interaction into the cells, using confocal microscopy.

Field #6: *In vitro* assays used in vascular biology and inflammation

Expert #1: Dr. Panagiotis Panopoulos, appointed at **M4**. Period engaged in SEEDRUG: **01-2012 to 04/2014.** 01-2012 to 06-2012: 1 contract for 6months, 09-2012 to 04-2013: 3 contracts for 1+1+5 months, respectively, 09/2012 to 12/2012: 1 contract for 2.5 months, 12/2013 to 04/2014: 1 contract for 2.5months & 04/2014: 1 contract for 1month. He developed and optimised experimental

conditions for determine the catalytic activity of CSE and CBS enzymes by measuring their ability to produce H_2S (methylene blue assay) and for the measurement of phosphodiesterase activity in vitro, enabling the study of interaction of H_2S with each of the phosphodiesterases and the effect on cGMP/cAMP activity.

Expert #2: Dr. Zongmin Zhou, appointed at **M6**. Period engaged in SEEDRUG: **07-2012 to 12-2012.** 1 contract for 6months. He has developed and optimized experimental conditions for screen and characterization of novel heme-independent soluble guanylate cyclase (sGC) activators.

Expert #3: Dr. Glynos Constantinos appointed at **M10**. Period engaged in SEEDRUG: **10-2012 to 11-2014.** 10-2012 to 09-2013: 2 contracts for 6months each, 10/2013-09/2014: 2 contracts for 6months each & 10/2014 to 11/2014: 1contracts for 2 months. He offered his expertise as pulmonologist physician to study and evaluate a model of lung inflammation using an animal model of chronic obstructive pulmonary disease (COPD) using mice exposed to cigarette smoke and applied new protocols for the pathophysiology of COPD investigating the role of soluble guanylyl cyclase and the downstream signal pathway.

Field #7: *In vivo & ex vivo* assays used in vascular biology and inflammation

Expert #1: Dr. Vasilis Kotsikoris, appointed at **M3**. Period engaged in SEEDRUG: **03-2012 to 12-2014.** 03-2012 to 02-20142: 2 contracts for 12months each & 03-2014 to 12/2014: 1contract for 10months. He was implicated in the expression analysis, using qPCR and western techniques, of H2S-producing enzymes, namely CBS, CSE and 3MST.

Expert #2: Dr. Athanassios Spathis, appointed at **M32.** Period engaged in SEEDRUG: **08-2013 to 12-2013.** 1 contracts for 5months. He developed methodology to ultimately investigate the involvement of H2S (Hydrogen sulfide) in vascular responsiveness and inflammation in rodents. In this time period (5 months) that he was enrolled in SEE-DRUG, he constructed de novo lentiviral constructs that harbored each a distinct reporter whose activity denotes vascular cell activation

Field #8: Data acquisition/integration, database development & curation

Dr. Marianthi Georgitsi, appointed at **M2**. Period engaged in SEEDRUG: **02-2012 to 10-2013.** 02-2012 to 06-2013: 2 contracts for 12 & 5 months, respectively & 07-2013 to 10-2013: 1 contract for 4 months. She offered her expertise in data mining and database development, and she acquired genomic and pharmacogenomic data from the international literature (ie data mining), pertaining to a large number of populations and ethnic groups world-wide, and across tens of genes of interest, while she scrutinized and curated the relevant data, prior to database integration.

Detailed reports on the research activities of each one of the appointed researchers, performed during the entire period of the project, are provided in **Deliverables D3.1 & 3.2**.

*Overall, the activities of **WP3** performed as foreseen in the SEEDRUG's Action plan. In total, 16 experienced researchers engaged in the 8 foreseen position of the project, due to the fact that new activities developed or emerged in the research fields included in SEEDRUG project, while some researchers quit their position in order to get a permanent academic position in Greek or in other EU Countries' Universities or Research Institutes.*

(4) WP4 - Expertise exchanges – Twinning (WP Leader Dr. Kostas Poulas)

Transfer of knowledge activities planned within SEEDRUG project, were also designed in order to exploit the existing collaborative links and establish new ones, within a network of Partner Organizations (POs), which are established research or academic entities in the EU region, with many of them being among the well-recognized EU's Large Scale Research Infrastructures (RIs). Through the staff exchange (secondements/twining) based on outgoing and incoming visits, the SEEDRUG consortium anticipated to gain in scientific terms by transferring additional expertise and knowledge in modern topics of Life Sciences and additionally to implement in SEEDRUG, policies and procedure that are followed by EU RIs.
Specifically, the activities included: (i) Incoming visits by research staff from the partnering organizations and the research/academic institution of members of the External Advisory Board & outgoing visits of the SEEDRUG consortium members to the partnering organization and collaborating research/academic entities that expressed their willing to collaborate with SEEDRUG groups, aiming in transfer/exchange of knowledge and expertise through two ways visits, from UPAT to EU collaborating laboratories and *vice versa*, establishment of joint collaborating activities and preparation of new funding applications and research proposals, (ii) Establishment of strategic research collaboration with researchers coming from Western and Eastern EU Centers of Excellence, Large Scale Infrastructures and even with researchers from non-EU countries, like USA and Japan. The expected impact was the added value of the integration of the SEEDRUG participants in ERA resulted in new collaborations, joint research grant application in FP7/FP8.
The activities accomplished were the twinning/secondments performed throughout project's duration and could be summarized as follows:

(I) <u>26 outgoing twinnings during M19-M42</u>

- 17-24 June 2012, Dr. George Spyroulias to CERM at University of Florence, IT
- 14-20 July 2012, Dr. Andreas Papapetropoulos to University of Napoli, IT
- 2-9 September 2012, Dr. Stavros Topouzis to William Harvey Research Institute, UK
- 9-16 September 2012, Dr. Stavros Topouzis to University of Frankfurt, DE
- 27 October – 05 November 2012, Dr Irene Margiolaki to ESRF, Grenoble, FR
- 15-22 June 2013, Dr. Christos Chasapis to Imperial College, UK
- 16-28 July 2013, Dr. Zoe Lygerou, to Imperial College, UK
- 16-28 July 2013, Dr. Stavros Taraviras to Imperial College, UK
- 3-14, September 2013, Dr. Andreas Papapetropoulos, to University of London, UK
- 24-29 September 2013, Kostas Marousis to Bruker Biospin, CH
- 8-15, December 2013, Dr. Irene Margiolaki, to ESRF, Grenoble, FR
- 7-14 July 2014, Dr. G.A. Spyroulias, CERM at University of Florence, IT
- 2 -29 July 2014, Dr. S. Bariamis, CERM at University of Florence, IT
- 28 August – 6 September 2014, Dr. G.A. Spyroulias, to Institute Pasteur Paris, FR
- 1 September -15 October 2014,. F. Karavasili, to ESRF, Grenoble, FR
- 1 September – 15 October 2014, A Vlamas to ESRF, Grenoble, FR
- 22 October 2014 -28 February 2015, S. Chasapi, to CERM at Univ. of Florence, IT
- 1-15 December 2014, N. Giakoumakis to EMBL Heidelberg, DE
- 1-15 December 2014, S. Maxouri to EMBL Heidelberg, DE
- 01 February – 15 April 2015, Dr. A. Patmanidi to IC, UK
- 2-9 March 2015, Dr. G.A. Spyroulias to CERM at University of Florence, IT
- 2-9 March 2015, M. Birkou to CERM at University of Florence, IT

- 2-9 March 2015, K. Marousis to CERM at University of Florence, IT
- 3-16 May 2015, S. Maxouri to EMBL Heidelberg, DE
- 1-29 June 2015, K. Argyriou to ETH Zurich, CH
- 4-30 June 2015, S. Chasapi, to CERM at University of Florence, IT

Total duration of outgoing visits 77 weeks

(II) <u>18 incoming twinning during M19-M42</u>

- 20-27 September 2012, Dr. Vasso Episkopou from Imperial College, UK
- 12-16 May 2013, Dr. Harald Schwalbe from Goethe University of Frankfurt, DE
- 12-16 May 2013, Dr. Marco Betz from Goethe University of Frankfurt, DE
- 12-16 May 2013, Dr. Antonio Rosato from CERM at University of Florence, IT
- 12-16 May 2013, Dr Lucio Ferella from CERM at University of Florence, IT
- 15-21 July 2013, Dr. Angelo Gallo from CERM at University of Florence, IT
- 10-13 October 2013, Dr Lucia Banci from CERM at University of Florence, IT
- 6-18 July 2014, Dr. Bruno Coutard from U of Marseille, FR
- 2-17 September 2014, Dr Nicolas Papageorgiou, from U of Marseille, FR
- 15-21 July 2014, Dr. Angelo Gallo from CERM at University of Florence, IT
- 11-15 October 2014, Dr. Vasso Episkopou from Imperial College, UK
- 17-20 June 2015, Dr. Frederick Allain, from ETH – Zurich, CH
- 18-20 June 2015, M. Spraul, Bruker Biospin, DE
- 18-21 June 2015, Dr. I Felli from CERM at University of Florence, IT
- 17-20 June 2015, Dr. Harald Schwalbe from Goethe University of Frankfurt, DE
- 16-25 June 2015, Dr. Angelo Gallo from CERM at University of Florence, IT
- 25-30 June 2015, Dr. Vasso Episkopou from Imperial College, UK
- 16-21 June 2015, Dr. Kurt Wüthrich, from ETH – Zurich, CH

Total duration of incoming visits 20 weeks

<u>Note:</u> All SEEDRUG researchers who participated at WP4 Twinning activities have submitted an individual report of 1/2-pages, describing the work performed during their visits.

Overall assessment of the Outgoing visits (Outgoing twinnings) – Deviations form Annex I:

The twinning activities of the second period of the program was designed in order to maximize the impact of the activity and the overall project, and was driven by: (a) the new capacity of the participating labs, which was considerably empowered after the installation of the equipment, and (b) the new research collaborations developed during the first project period. The labs with the new equipment performed a higher number of visits in relation with the labs that have not acquired new scientific instrumentation.

Additionally, the performed twinning activities, both incoming and outgoing, were proved really successful and <u>many new applications and experimental procedure have been set up for the benefit of both the local (UPAT's) users and the external users (from academia, and industry).</u> Transfer of knowledge assisted the establishment of new experimental techniques on the newly acquired equipment and maximized the impact by the use of this unique equipment at UPAT.

Detailed reports on the research activities performed during the above secondments/twinnings are provided in **Deliverables D4.1. & 4.2**

Establishment of collaboration UPAT's SEEDRUG members and researchers from all over the world:

As a result of the organized workshops and the outgoing/incoming visits (twinning activities; **Tasks 4.1, 4.2 & 5.1)**, new collaborations have been established between UPAT's SEEDRUG researchers and invited researchers, thus between UPAT and NKI at Amsterdam/The Netherlands (Dr. A. Perrakis), BMRZ/Goethe U of Frankfurt, Germany (Prof. H. Schwalbe), CERM at Florence/Italy (Prof. C. Luchinat), U of Rutgers at NJ/USA (Prof. B. Kalodimos), John Hopkins University (Prof E. Moudrianakis), U of Santa Cruz (Prof. N. Sgourakis), Imperial College at London/UK (Prof. V. Episkopou), U of Lyon at France (Dr. T. Herrmann), Aix-Marseille University, at France (Dr. Bruno Coutard & Dr. Nicolas Papageorgiou), FMP Berlin (Prof. H. Oschkinat, Dr. A. Liokatis, Dr. U. Akbey), U of Utrecht, Bijvoet Center for Biomolecular Research at The Netherlands (Prof. Rolf Boelens), EMBL, Genomic Core Facilities at Heidelberg/Germany, (Dr. Vladimir Benes), and University College London/UK (Prof J. Christodoulou). New joint collaborative efforts are also initiated with researchers from neighboring Eastern EU countries (Dr. Somer Bekiroglu, TR; Dr. Kostas Tripsianes, CZ; Prof Janez Plavec, SI) and with many other EU researchers.

Additionally, a number of joint collaborative efforts have also been established between UPAT SEEDRUG participating groups with industrial partner or other academic entities and they reported in previous periodic reports (P1 & P2).

Finally, UPAT researchers participate in a number of EU H2020 proposal applications and in a few national projects, which have been already submitted. Additionally, two national grant applications have been submitted in collaboration with Bruker Biospin GmbH for NMR applications in metabolomics & magnetic resonance diagnostics.

In total, 77 weeks have been devoted to outgoing twinnings and 20 weeks to incoming ones (originally foreseen: 81 & 24 weeks respectively). The stays have fulfilled the aim of technology and knowledge transfer in the field of molecular and structural biology, NMR techniques, light imaging techniques and pharmacology, as described in the Annex I of the Grant Agreement, and have contributed to the establishment of sustainable collaborations with the Partnering Organizations.

Therefore, the WP4 maximized the aim of transfer of knowledge and the activity was performed as foreseen at Annex I both in terms of in-coming & outgoing twinnings, establishing a state-of-the-art S&T platform at UPAT. Minor deviations had no impact on the project implementation, as described in Annex I –DoW.

(5) WP5 Networking & Cooperation activities (WP Leader Dr. Stavros Topouzis)

The aim of this WP was the organization of high-impact workshops in order to enhance and facilitate the promotion of the S&T knowledge's transfer. For this reason two training workshops have planned for the first 18-months period (**M1-M18**) and two additional workshops and an International Conference was planned for the 2nd period of the project. Additionally, there was planned the organization of these series of workshop under the super-title "From Chemical to Structural Biology", where each one of the meeting would focus in a specific topic. Finally the SEEDRUG NMR Conference, that was the closing networking event of the project, was held at June 2015 **(M42)**, given the fact that the project duration was extended for six more months, until June 2015.

The SEEDRUG NMR Conference organized the period 17-20 June 2015, with great success and with a large number of participants (>200), 35 speakers and 41 poster presentations. **Prof Kurt Wüthrich, Nobel Prize Winner in Chemistry, 2002,** gave the opening lecture of the Conference**.**

It should also be noted that during the 3rd workshop, a Bilateral GREEK-TURKISH mini-symposium, was organized capitalizing thus the visits of researchers form Eastern EU countries, planned in the framework of this WP.

1st SEEDRUG Workshop "Peptide Synthesis & Protein Production/Labelling"
May 09-10, 2012

The 1st SEEDRUG Workshop (Peptide Synthesis & Protein Production/Labeling) was organized during the period 9-10 May at the Conference and Cultural Center of University of Patras, as a 2day event. 11 invited researchers (from many EU Research & Academic institutions) participated along with UPAT senior and experienced researchers (some of them are experienced researchers appointed in SEEDRUG project), and other scientist from other Greek Academic Entities performed oral presentations (totally 18 scientific presentations), during a 5 sessions program, covering the fields of peptide synthesis, protein expression & labeling strategies in bacterial and eukaryotic expression systems, NMR & Xray studies approaches to the study of peptides/proteins, case studies of difficult expressed & insoluble proteins, etc.

In the framework of the workshop, **a special session was organized with Invited speakers from the Greek National Documentation Center and National Contact Point for "Regions of Knowledge" & "Research Potential"** to provide an overview of new funding opportunities and program's the statistics. Mrs Christina Pascual & Ms Georgia Tzenou were the speakers in this ~1 hour session of the workshop.

The event was really successful and a great number of attendees, mainly graduate & undergraduate students, PhD and Post-doctoral researchers, registered over the 2 days of the workshop (>300 persons).

Impact aligned with SEEDRUG scopes: The latest techniques on the peptide synthesis, peptide or peptidomimetics use in pharmaceutical application and drug design, molecular biology applications in the drug target production/characterization for structural or functional studies and structural biology techniques were presented by greek and non-greek established researchers, while new research teams organized and links with other greek & EU institutions were established.

Added Value: Establishment of collaborative links between UPAT SEEDRUG consortium members and greek & EU researchers in the fields of Biochemistry/molecular biology, peptide chemistry, drug design and preclinical studies and others, resulted in funded grant application at national level (Thalis program from Greek Ministry of Education & religious affairs) and other proposal submission in FP7 framework (Marie Curie Actions).

2nd SEEDRUG Workshop "NMR Basics & Applications in Life Sciences"
May 12-14, 2013

The 2nd SEEDRUG Workshop (NMR Basics & Applications in Life Sciences) along with a practical session was organized during the period 13-15 May 2013, at the Conference and Cultural Center and the Computer Lab at the School of Medicine, of University of Patras, respectively. Therefore, there was a 3day conference event, including 2 days with oral presentations & and a full-day practical session, as originally, planted. A number of eminent scientists were invited as speakers, form all over the world (Germany, Italy, Czech Republic, France, Israel, USA, Canada, and others) and participated to this event. Among them, there was the Nobel Laureate, **Prof Ada Yonath (Nobel in Chemistry, 2009;** *for studies of the structure and function of the ribosome*) who has also received the Honorary PhD from University in a ceremony that open the SEEDRUG meeting. More than 250 persons attended the meeting over the two days. The practical session was organized in School of Medicine's Computer Lab, during the third day. It took place in a room with 40 workstations, where more than 60 persons attended the tutorials and obtained hands-on experience on using a variety of software related to NMR structural biology & computational biology.

Impact aligned with SEEDRUG scopes: All the recent achievements in NMR structural biology of drug targets were presented, including special applications, for very large biomolecular complexes, intrinsically disordered proteins, protein-RNA/DNA complexes and other drug targets. Additionally, the challenging field of the structure investigation of the ribosome and the discovery of new antibiotics was presented by the Chemistry Nobel Prize Winner of 2009, Prof Ada Yonath, was presented. The SEEDRUG researchers were discussed with the invited speakers the possibilities of joint collaborative efforts and grant applications. The promotion of the SEEDRUG project and its research activities was remarkable.

Added Value: Establishment of collaborative links between UPAT SEEDRUG consortium members and EU researchers in the fields of NMR & Xray structural biology resulted in preparation of grant application in national level (National Roadmap of Greek Research Infrastructures) and other proposal submission in FP7/FP8 framework (expression of interest, EUNMR for Life).

3rd SEEDRUG Workshop "Emerging Analytical Techniques in Protein Characterization"
September 19-20, 2013

Experienced researchers, from Japan, Germany, France, UK and other countries, were invited to present tools and methodologies in X-ray diffraction methods, for crystals & powders, NMR spectroscopy in vitro, in cell and as a tool in metabolomics, Mass spectrometry, high-throughput sequencing, etc.

Impact aligned with SEEDRUG scopes: World-class researchers, many of them Directors in Large Scale RIs worldwide, along with younger but established researchers provide a broad

spectrum of protein characterization tools, which are a prerequisite for high-level research efforts in the field of drug target characterization. The invited speakers visited the UPAT's Research Infrastructures (Light Imaging / Microscopes, NMR & X-ray Diffractometers) and established collaborative activities with SEEDRUG members (some of them have already resulted in joint grant applications; see also below **"Added value"** section).

Added Value: New techniques presented and collaborative links between UPAT SEEDRUG consortium members and EU researchers from Academia and EU companies in the fields of NMR & X-ray structural biology and NMR metabolomics, have established. These collaborations resulted in preparation of grant application in national level (local grants applications for NMR use in metabolomics) and UPAT-SPING8 (Japan) collaboration and grant applications.

4th SEEDRUG Workshop "Live cell imaging, Drug Screening & Preclinical assessment – Views Into Nuclear Function"
September 11-13, 2014

The SEEDRUG consortium organized a symposium entitled "Views into Nuclear Function" from 11-13 September 2014 into the Cultural and Conference Center of the University of Patras. Experts from around the world Japan, Germany, France, UK, USA and other countries, were invited to present tools, methodologies and scientific achievements. The symposium will be followed by practical on live cell imaging methods. The practical took place on September 13th and included hands-on sessions on Fluorescence Recovery After Photobleaching (FRAP), Fluorescence Loss in Photobleaching (FLIP), localized DNA damage and methods of analysis of functional imaging data. The program of the meeting is attached, and can also be downloaded through the link: www.nuclearfunction.upatras.gr

Impact aligned with SEEDRUG scopes: World experts gave state of the art methodologies and scientific achievements. The invited speakers visited the UPAT's Research Infrastructures

Added Value: New techniques presented and collaborative links between UPAT SEEDRUG consortium members and invited researchers have established. The practical workshop diffused live imaging methodologies and protocols established by the Live imaging facility in participants from Greece and other European countries.

SEEDRUG NMR Conference "NMR Applications in Life Sciences"
June 17-20, 2015

The NMR Conference, the last and biggest event of the foreseen networking activities, took place the period 17-20 June, 2015. A preconference event took place at the University of Patras, where UPAT Authorities (UPAT's Rector Prof. V. Kyriazopoulou, Dean of School of Health Sciences Prof. D. Kardamakis, Head of the Department of Pharmacy Assoc. Prof. S. Nikolaropoulos) honored Prof Kurt Wüthrich with the University of Patras, Honorary Doctorate Degree, for his contribution in the "development of NMR spectroscopy for determining the three-dimensional structure of biological macromolecules in solution". Kurt Wüthrich concluded the ceremony with a lecture for the public and the researchers, with the title "The Colorful Post-genomic Protein Universe". The fact that this event followed by the

SEEDRUG NMR Conference, for the University of Patras, was great. The NMR Conference offered at the scientific community a perspective of the latest achievements in the field of Molecular and Structural Biology and Drug Design, through oral the presentations of eminent scientists coming form various EU countries, USA and Greece. Especially the NMR community of EU, has been effectively represented by a number of speakers, while many Greek researchers form EU, USA and Greek academic Institutions presented their research activities. Many young researchers form EU and Greece were presented their activities either through short oral presentations or by posters.
The poster, the program and the Book of Abstracts of the meeting can be found here:
http://www.seedrug.upatras.gr/index.php?option=com_content&view=article&id=104&Itemid=221

Impact aligned with SEEDRUG scopes: Top-class researchers, many of them Directors in Large Scale RIs worldwide, along with younger but established researchers provide a broad spectrum of modern NMR application in various fields of life sciences (molecular & structural biology, RNA biology, quantitative analysis of food/rink substances, metabolomics etc.). The invited speakers visited the UPAT's Research Infrastructures and discussed on future joint collaborative projects with SEEDRUG members (see also below **"Added value"** section).

Added Value: A top-level scientific event organized in the framework of the SEEDRUG project and drew the attention of the entire EU scientific community in the field of Molecular & Structural Biology. Among the positive comments of practically all the participants and speakers, it should be mentioned the comment by Prof. Kurt Wüthrich, which is of great significance for the UPAT academic community and the institutional efforts in establishment of a Pole of Excellence in South-Eastern EU as foreseen in SEEDRUG project: "The impressive representation of the European NMR community at the SEE-DRUG conference will hopefully be an important signal for a future positive development of research in Patras in our area of specialization".
Additionally, a great deal of new collaboration was established and new joint proposal application is expected to set up into the next few months, targeting at the H2020 calls for grant applications.
Finally, a significant number of EU and US researchers would like to visit UPAT labs and collaborate in short- or mid-term basis.

Detailed program of the SEEDRUG Workshops & International Conference and Book of Abstracts could be found by following the links
http://www.seedrug.upatras.gr/index.php?option=com_content&view=article&id=103&Itemid=220
http://www.seedrug.upatras.gr/index.php?option=com_content&view=article&id=104&Itemid=221

The impact imprinted in documents available in the public

The 3rd, 4thst SEEDRUG workshops along with SEEDRUG NMR Conference and they satellite events were advertised by a large number of local newspapers. The participation of the Nobel laureate, Prof Kurt Wüthrich, who won the Nobel Prize in Chemistry at 2002, for his achievements in the development of Nuclear Magnetic resonance methodology in the structure determination of biomacromolecules, had a great impact on the scientific community of UPAT and the public of the town of Patras. The participation of Prof Kurt Wüthrich at the NMR Conference at June 2015, was his second visit at the University of Patras over the past 2 years, while the Department of Pharmacy, honoured Prof Kurt Wüthrich with

the Honorary PhD Degree in the framework of SEEDRUG activities. More than 200 persons attended his lecture, which open the SEEDRUG NMR Conference.
Articles from local newspapers, UPAT's website and others are also available and have been provided in previous reports/deliverables.

Other Workshops organized & supported by SEEDRUG consortium members, Seminars & Info-days

Two additional networking activities have been organized by SEEDRUG project. These networking activities include the organization of:

(I) an **International School on Fundamentals of Crystallography (April 2013)**, with the participation of Professor Carmello Giacovazzo, from the Institute of Crystallography of Bari (IT) was the only tutor of this workshop and more than 40 young researchers and post-docs attended the entire meeting.

Impact aligned with SEEDRUG scopes: A world-class researcher and excellent tutor provided a comprehensive overview and instructions on the analysis of data in Xray crystallography, one of the main research axes in SEEDRUG activities towards the structural characterization of drug targets and biomolecules of pharmaceutical interest. SEEDRUG members & UPAT's researchers had a unique opportunity to attend such a high-level scientific course, held for the very first time at UPAT university, promoting thus the scope and disseminating the activities of SEEDRUG project.

Added Value: Unique transfer of knowledge activity, from EU lab to UPAT, providing the opportunity to a number of research to obtain hands-on experience in the field of fundamentals of Xray crystallography. Tutorials provided by a pioneer in the crystallography field, Prof. Carmello Giacovazzo (University of Bari, IT). Increasing the impact and of UPAT in this field.

(II) an **International School: Powder & Electron Crystallography (8-12 July 2013)** addressing two very important topics focused in the use and further development of methods in powder and electron crystallography for the determination of the three dimensional structures of materials having technological interest as well as biological macromolecules. These topics were the **Powder Crystallography** (subjects covered: experimental methods, sample preparation, detectors, synchrotron radiation for powder diffraction, the unit cell determination, full pattern powder decomposition, space group determination, *ab initio* and *non ab initio* phasing techniques for powder diffraction data, computer simulations & other applications) & **Electron Crystallography** (subjects covered: physical bases of the electron diffraction and their special features with respect to X-ray and neutron diffraction, the experimental diffraction methods: elements of electron microscopy, traditional diffraction techniques and modern ones, such as the Precession Electron Diffraction (PED) and the Automated Diffraction Tomography (ADT) methods, Phasing via electron diffraction data: computer applications).

Impact aligned with SEEDRUG scopes: Eminent EU & nonEU researcher presented the latest applications and technological advancement on the powder and electron crystallography for small pharmaceutical molecules and drug target studies, which are included in the main research targets of SEEDRUG project. This event, which supported by SEEDRUG project, enhanced the impact of the UPAT on the field of Structural biology an promoted the international reputation of UPAT.

Added Value: Increasing of the international reputation of UPAT in the field of powder and electron crystallography and advertisement of the SEEDRUG research facilities recently established at UPAT. Establishment of new joint research activities.

Additional Events/Seminars/Info-days organized through SEEDRUG project are:

(III): An info day with seminars in the occasion of the Inauguration of the SEEDRUG NMR facility (11-13 October 2013), at a nearby hotel (Achaia Beach Hotel, Kastelokampos, Rion; 2.5km form UPAT) due to the strikes of the UPAT's administrative staff, organized by SEEDRUG. This info day was open not only to the entire UPAT's scientific community, but also to the broad public and was organized in such a way in order to: (a) provide information about the regional policy in Research and Innovation Strategies for Smart Specialisation and the new perspective of HORIZON 2020 programs and funding schemes, and (b) promote the idea of the establishment of a national/regional Research Infrastructure and the impact of such infrastructures in the basic research, innovation, and thus regional development.

The event took place the period 10-12 October 2013, with the participation of:

- **Prof. Stavros Koubias, former Rector** of UPAT, **Member** of the Western Greece Regional Committee for Research, Education & Innovation
- **Dr. Dimitri Corpakis, Head of Unit B.5,** 'Spreading Excellence and Widening Participation' at European Commission
- **Prof. Lucia Banci, Director,** Centre of Magnetic Resonance (CERM), U of Florence, Italy
- **Prof. Kurt Wüthrich**, **Nobel Prize 2002 in Chemistry** (ETH, Zurich & The Scripps Institute, LaJolla, USA).

Added Value: Increasing the awareness of SEEDRUG & UPAT research capacities and promotion/dissemination of SEEDRUG project at international level. Increasing the awareness of UPAT scientific community for the EU HORIZON2020 framework.

(IV): An event focused on the use of a new patented technology to study the interaction of small or large molecules with pharmaceutical interest, was organized as an Academic Demo/Info-day at 24th of July 2014 (11.00-19.00) at the laboratories of the UPAT's Department of Pharmacy, by **Dr. Francois-Xavier Ogi** (NanoTemper Technologies GmbH, Germany). More than 20 persons attended this event. Costs were covered by company and by UPAT's funding sources.

Added Value: Establishment of links between UPAT & international high-tech R&D companies in the field of drug discovery.

(V): An event focused on the future perspectives of the profession of pharmacists, chemists and biologists was jointly organized by the Academic Staff of UPAT's Department of Pharmacy and the graduate students of the same department at 11th of October 2014, at the UPAT's Cultural and Conference Centre. Many delegates form the Greek biopharmaceutical, cosmetics and chemistry Industry participated and presented the future direction of their companies, focused on the career perspectives offered this period by the Greek companies. More than 200 persons attended this event. Costs were covered by UPAT's funding sources.

Added Value: Establishment of links between UPAT & national biopharmaceutical companies.

(VI): An info day, with a representative from an international industry was organized at January 24th, 2015, at the Conference & Cultural Center of University of Patras. A course of scientific lectures, focused on the recent advances in the field of target identification and modern drug discovery process, was provided by Dr. Dimitrios Tzalis :

- **Dr. Dimitrios Tzalis, Founder & Chief Executive Officer of Taros Chemicals GmbH & Co. KG, Dortmund, Germany,** presented the current state of the European Lead Factory, a pan-European online platform, and its contribution to drug discovery in Europe. The European Lead Factory is a pan-European platform for drug discovery, organized in an Innovative Medicines Initiative (IMI) supported public private partnership (PPP), set to address this issue and to give a major boost to drug discovery in Europe. Comprising a collection of half a million compounds and a screening center, the European Lead Factory is trying to offer to the researchers in academia, small and medium-sized enterprises (SMEs) and patient organizations an unprecedented opportunity to advance medical research and develop new drug candidates. The European Lead Factory is a novel platform for innovative drug discovery driven by an international consortium of 30 partners and funded with € 195 Mio. This partnership is the first of its kind and creates unprecedented opportunities for the discovery of new medicines.

More than 100 persons attended this event.
Added Value: Establishment of links between UPAT & international biopharmaceutical company with great perspective in a field, which is fully aligned with SEEDRUG priorities and activities.

In this WP, among other networking activities, it was planned a task including short-term visits at UPAT, by research groups active in Chemical, Structural Biology and Pharmacology in Bulgaria, Turkey, and other Eastern EU countries in order to reinforce the links between Greece and these countries. These visits planned to be combined with workshops' organizations but grouped in a separate Task, and to this direction researchers form neighbouring and other Eastern EU countries, like Turkey, Bulgaria, Slovenia and Czech republic were invited to participate at the 4th SEEDRUG workshop (September 2014) and at the SEEDRUG NMR Conference (June 2015). They had the chance to present their on-going research activities and their experience from the use and access provided through the Research Infrastructure at Brno (Czech Republic) and Ljubljana (Slovenia), discuss on the possibilities of the establishment of joint collaborating efforts in the field of life sciences and use the UPAT's & SEEDRUG's NMR and other facilities.
So a number of researchers form Turkey, Bulgary, Slovenia, Chech Republic and Hungary, have visited UPAT and SEEDRUG facilities once or twice during the second project period.

*Overall, the activities of **WP5** have been performed according to the SEEDRUG's Action plan*

(6) WP6 Ex-post Evaluation & Quality assurance of UPAT's research potential (WP Leader Dr. Stavros Topouzis)

WP6 aim was to evaluate by external experts the UPAT's research facility and capability upgrade after the implementation of SEE-DRUG project. Therefore, "Ex-post evaluation by four individual experts selected by EC", was foreseen. The experts were appointed by the Commission following the suggestion made by the Project Officer (Ms Anna Remond), at M19 of the project. They visited EEDRUG facilities and UPAT two times. They reported on the progress and impact of the SEEDRUG project on the reinforcement of human & S&T capacities of the UPAT and suggested a viability and sustainability plan for SEEDRUG facilities. Report on the evaluators' meeting output/conclusions for the future UPAT's research capacity development

Organization of the 1st, on-site, visit of the Evaluators took place at the end of **M35** (26-29, November 2014)**.** During this 3-days visit the 4 external evaluators (Prof Roland Contreras, Chair; Prof Angela Danil de Namor, Prof. Koussay Delagi & Prof Jerzy Duszynski), visited the labs of the SEEDRUG consortium members and teams and examined the new equipment acquired and installed through SEEDRUG project, discussed extensively on the research activities of SEEDRUG groups, their future plans and the SEEDRUG project activities performed. They also had discussions with the appointed experienced researchers, the technical staff and they participated in meetings with University authorities (Vice Rector for the Research & Development, Prof. Dimosthenis Polyzos) and members from the UPAT's Research Committee, Prof Zoe Lygerou, who is also a SEEDRUG Consortium member). They collected information about the project and the activities already performed in order to prepare their reports and the first Report (**D.6.2)** prepared the period December 2014 – March 2015.
The second visit was scheduled for **M45** (9-12 September 2015), during the 3rd reporting period of the project.
However, the meeting was carried out and 2 out of the 4 evaluators could finally manage to visits University of Patras. The other two evaluators didn't manage to physically participate in the meeting, due to work overload. Prof Koussay Dellagi, although initially found appropriate the meeting dates, he expected to conclude his administration duties at the University of Reunion, but finally duties overload required the extension of his presence at his administration duties and could not travel to Patras. On the other hand, Prof Jerzy Duszynski, was nominated and accepted for the position of the Chair of the Polish Academy of Sciences and it proved difficult to travel at Patras, as well. Despite the difficulties encountered, special care had taken, to organize teleconferences during the dates of the meeting at Patras and the two external evaluators, who didn't manage to travel to Patras, participated, even remotely, in the meeting. They place some questions to the SEEDRUG coordinating team related with the progress and the implementation of the project since the first meeting.
Prof R. Contreras and Prof. A D. de Namor, visited once again the SEEDRUG labs where the recently acquired equipment was installed and discussed, participated in the demonstration of the equipment function and asked details about the experimental set-up and outcomes. They discussed in details about the comparative advantages provided by the successful implementation of the SEEDRUG project at University of Patras and they provided insightful

ideas for the commercialization of the services and products that SEEDRUG consortium can offer, beyond the end of the project.
Both the external evaluators, namely Profs Danil de Namor and Contreras (Chair of the External Evaluation Committee), were kind enough to remark that the overall investment was indeed very effectively handled, and that "…every euro have been spent wisely, in a cost-effective way, with a dual aim: (a) to better serve UPAT's overall research capacities and (b) to ensure future sustainability of the SEEDRUG Center of Excellence."
Finally, Prof. R. Contreras, asked additional information on the implementation of the SEEDRUG Action Plan, concerning the results and the goals achieved, the milestones reached and the measures taken so-far by the SEEDRUG members and the UPAT related bodies for the sustainability of the project. The four members of the committee distributed tasks and work among them in order to conclude the two Deliverables foreseen for the WP6 "Ex-post Evaluation" Tasks, that is: *(a) the final report from the SEE-DRUG facility evaluation by the external experts and (b) the Sustainability plan, including a report on the evaluators' meeting output/conclusions for the future UPAT's research capacity development.*

The outcome of the Ex-post evaluation and the two on-site visits by the team of the external evaluators are illustrated in two reports/deliverables:

- *Final report from the SEE-DRUG facility evaluation by external experts*
- *Sustainability plan – Report on the evaluators' meeting output/conclusions for the future UPAT's research capacity development*

Both of the above reports were among the last deliverables submitted at EC.

*Overall, the activities of **WP6** have been performed according to the SEEDRUG's Action plan.*

Potential impact and main dissemination activities and exploitation results

These activities of SEEDRUG project were designed through the WP7 – *Exploitation, Information and Dissemination*. Below, a description of the dissemination and project's promotion activities has been provided in details.

WP7- Exploitation, Information, Dissemination (WP Leader Dr. George Patrinos)

The dissemination activities of the project designed and performed through a separate work package with the aim to promote the SEEDRUG activities in the scientific community and to the broad public. Therefore, what was carried out was the (a) publication of research articles in high-impact scientific journals or books, (b) participation of the SEE-DRUG key representatives and experienced researchers in international scientific meetings, conferences and workshops aiming at the diffusion, via oral presentations, short papers and posters, of the results, the scientific achievements and the existence and availability of the established SEE-DRUG Infrastructure, and (c) the set-up, operation and update of a web portal.

Overall, the dissemination of SEEDRUG activities has been performed through many different means and a list of the achievements is provided below:

(I) Scientific publications, in peer-reviewed journals:	**=**	**40**
(II) Oral presentations in conferences/Seminars:	=	**59**
(III) Participation in Conferences and Large Scale RIs meetings:	=	**79**
(IV) Articles in newspapers, journals & newsletters	>	**25**
(V) Web-portal visits	>	**160,000**

(I) Scientific papers, published (or submitted for publication) in Journals and Books (names of the person involved in SEEDRUG project are in bold):

1. Hydrogen sulfide and nitric oxide are mutually dependent in the regulation of angiogenesis and endothelium-dependent vasorelaxation. Coletta C, **Papapetropoulos A**, Erdelyi K, Olah G, Módis K, **Panopoulos P,** Asimakopoulou A, Gerö D, Sharina I, Martin E, Szabo C. *Proc Natl Acad Sci U S A*. **2012**;109:9161-6.
2. NMR-based insights into the conformational and interaction properties of Arkadia RING-H2 E3 Ub ligase. **Chasapis C,** Kandias NG, Episkopou V, **Bentrop D, Spyroulias GA.** *Proteins*. **2012**;80:1484-9.
3. Structural studies of human insulin cocrystallized with phenol or resorcinol via powder diffraction. Karavassili F, Giannopoulou AE, Kotsiliti E, Knight L, Norrman M, Schluckebier G, Drube L, Fitch AN, Wright JP, **Margiolaki I**. *Acta Crystallogr D Biol Crystallogr.* **2012**;68:1632-41
4. cGMP-dependent protein kinase contributes to hydrogen sulfide-stimulated vasorelaxation. M. Bucci, **A. Papapetropoulos**, V. Vellecco, Z. Zhou, A. Zaid, P. Giannogonas, A. Cantalupo, S. Dhayade, K.P. Karalis, R. Wang, R. Feil, G. Cirino. *PlosOne* **2012**;7:e53319.
5. Selectivity of commonly used pharmacological inhibitors for cystathionine β synthase (CBS) and cystathionine γ lyase (CSE). Asimakopoulou A, **Panopoulos P, Chasapis CT,** Coletta C, Zhou Z, Cirino G, Giannis A, Szabo C, **Spyroulias GA, Papapetropoulos A**. *Br J Pharmacol* **2013**;169:922-32.
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8. Hydrogen sulfide-mediated stimulation of mitochondrial electron transport involves inhibition of the mitochondrial phosphodiesterase 2A, elevation of cAMP and activation of protein kinase A. K. Módis, P. Panopoulos, C. Coletta, **A. Papapetropoulos**, C. Szabo. *Biochem. Pharm*. **2013,** 86:1311-9
9. Hydrogen sulfide accounts for the peripheral vascular effects of S-zofenopril independently of ACE inhibition. M. Bucci, V. Vellecco, A.Cantalupo, V. Brancaleone, Z. Zhou, S. Evangelista, V. Calderone, **A. Papapetropoulos**, G. Cirino. *Cardiovasc Res*. **2014,** 102:138-47
10. High-resolution powder X-ray data reveal the T(6) hexameric form of bovine insulin. **Margiolaki** I, Giannopoulou AE, Wright JP, Knight L, Norrman M, Schluckebier G, Fitch AN, Von Dreele RB. *Acta Crystallogr D Biol Crystallogr* **2013**;69(Pt 6):978-90.
11. NMR conformational properties of an Anthrax Lethal Factor domain studied by multiple amino acid-selective labeling. Vourtsis DJ, **Chasapis CT,** Pairas G, **Bentrop D**, **Spyroulias** GA. *Biochem Biophys Res Commun*. **2014;**450:335-40.
12. Regulation of Mitochondrial Bioenergetic Function by Hydrogen Sulfide. Part II. Pathophysiological and Therapeutic Aspects. Módis K, Bos EM, Calzia E, van Goor H, Coletta C, **Papapetropoulos A**, Hellmich MR, Radermacher P, Bouillaud F, Szabo C. *Br J Pharmacol.* **2014**;171:2123-46.
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22. (1)H, (15)N, (13)C assignment and secondary structure determination of two domains of La protein from D. discoideum. Apostolidi M, Vourtsis DJ, **Chasapis CT,** Stathopoulos C, **Bentrop D, Spyroulias GA**. *Biomol NMR Assign*. **2014**;8:47-51.

23. NMR study of non-structural proteins-part II: ^{1}H, ^{13}C, ^{15}N backbone and side-chain resonance assignment of macro domain from Venezuelan equine encephalitis virus (VEEV). Makrynitsa GI, Ntonti D, **Marousis KD**, Tsika AC, Lichière J, **Papageorgiou N, Coutard B**, **Bentrop D**, **Spyroulias** GA. *Biomol NMR Assign*. **2015**;9:247-51.
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26. ^{1}H, ^{13}C and ^{15}N backbone and side-chain resonance assignment of the LAM-RRM1 N-terminal module of La protein from Dictyostelium discoideum. **Chasapis CT**, Argyriou AI, Apostolidi M, Konstantinidou P, **Bentrop D,** Stathopoulos C, **Spyroulias** GA. *Biomol NMR Assign*. **2015**;9:303-7.
27. A Peptide Mimetic of 5-Acetylneuraminic Acid-Galactose Binds with High Avidity to Siglecs and NKG2D. Eggink LL, **Spyroulias GA**, Jones NG, Hanson CV, Hoober JK. *PLoS One*. **2015**;10:e0130532.
28. Role of cGMP in hydrogen sulfide signaling. SI Bibli, G. Yang, Z. Zhou, R.Wang, **S. Topouzis, A. Papapetropoulos**. *NO Journal* **2015;**30:46:7-13,
29. Geminin deletion increases the number of fetal hematopoietic stem cells by affecting the expression of key transcription factors. Karamitros D, **Patmanidi** AL, Kotantaki P, Potocnik AJ, Bähr-Ivacevic T, Benes V, **Lygerou Z,** Kioussis D, **Taraviras S.** *Development*. **2015**;142:70-81.
30. "Human Insulin Polymorphism upon Ligand Binding and pH variation: The Case of 4-ethylresorcinol." S. Fili, A.Valmas, M. Norrman, G. Schluckebier, D. Beckers, T. Degen, J. Wright, A. Fitch, F. Gozzo, A. E. Giannopoulou, F. Karavassili, **I. Margiolaki.** (Submitted in *IUCrJ*, **2015**).
31. "Novel crystalline phase and first-order phase transitions of human insulin complexed with two distinct phenol derivatives". Valmas, A., Magiouf, K., Fili, S., Norrman, M., Schluckebier, G., Beckers, D., Degen, T., Wright, J.P., Fitch, A. N., Gozzo, F., Giannopoulou, A.E., Karavassili, F. **Margiolaki I.** *Acta Cryst.* **2015,** D71, 819-828.
32. "The power of Powders", Article on *ESRFnews magazine*, (vol. 69, page 18). Karavassili, F., Valmas, A., **Margiolaki, I.,** (2015).
33. Utilizing the virus-induced blocking of apoptosis in an easy baculovirus titration method. A. Niarchos, **G. Lagoumintzis** and **K. Poulas**. Scientific Reports, **2015**;5:15487
34. M. Suarez-Diez, E. Saccenti, **C. Luchinat,** C. Santucci, L. Tenori, **S. Chasapi,** A. Spyridonidis, **G.A. Spyroulias.** *Defining a Consensus for the Association Networks of Plasma and Serum Metabolites* ***J Proteome Research,*** *submitted.*
35. **.** *^{1}H, ^{13}C and ^{15}N Backbone and side-chain resonance assignment of human Angiogenin.* A. Tsika, D.S. Chatzileontiadou, D. Leonidas, **G.A.Spyroulias** ***Biomol NMR Assignments,*** *submitted*
36. *^{1}H, ^{13}C and ^{15}N Backbone and side-chain resonance assignment of the Nostoc sp. H-NOX domain.* I.I. Alexandropoulos, A. Argyriou, K. Marousis, S. Topouzis, A. Papapetropoulos, **G.A.Spyroulias.** ***Biomol NMR Assignments,*** *submitted*
37. *NMR insights on the conformational plasticity and ligase activity of intrinsically dynamical forms of ARKADIA E3 Ubiquitin Ligase*. M. Birkou, A. Loutsidou, C.T. Chasapis, D. Bentrop, M. Leli, T. Herrmann, V. Episkopou, **G.A. Spyroulias**. *Submitted*
38. *NMR & Biochemical assays reveal unexpected RNA binding properties of the La motif of D. discoideum Lupus Antigen protein.* A. Argyriou, D. Vourtsis, M. Apostolidi, C.T. Chasapis, D. Drainas, D. Bentrop, C. Stathopoulos, **G.A. Spyroulias**. *Submitted*
39. *Advanced Genetics in Myasthenia Gravis.* **K. Poulas,** Z. Zagoriti, **M. Kambouris, G. Lagoumintzis**. In *Novel Challenges in Myasthenia Gravis* (Ed. Tomaso Claudio Mineo, Nova Science Publishers, Inc) 2015.
40. *Leg Ulcer and Chronic Wounds: Innovative Healing Methods.* E. Paxinou, **G. Lagoumintzis,** Z. Zagoriti, A. Niarchos, I. Boltsis, **K. Poulas.** In *Leg Ulcers and Chronic Wounds: Symptoms, Treatment and Prevention* (Ed. Simon Green, Nova Science Publishers, Inc) 2015.

*The detailed report on the dissemination activities of SEEDRUG members through participation in Conferences with **Oral presentations and/or Poster Presentations** is provided in informative Tables (name of SEEDRUG participant(s), date/place/name of the event, title of oral or poster presentation, etc.) included in **Deliverables D7.1 & D7.2**.*

(IV) Press releases – Journal/Newspapers. During the **2nd period** of the project SEEDRUG activities were covered **in 5 editions/articles** in Greek Newspapers and other means, with the total number of presentations and commentaries in a local and national newspapers' editions and National Documentation Center's press release, being **25**, without including the announces of the project's activities or accomplishments through a UPAT's Press Release and University's web-site.

The SEEDRUG project has been presented also at the "Patras Innovation Quest", the period 24-26 April 2015, at Patras

Further, the SEEDRUG project has organized the Inauguration of the "SEEDRUG biomolecular NMR Facility, the October 10-12th, 2013, at Rion Patras, with the participation of Nobel Laureate at Chemistry 2002, Prof **Kurt Wüthrich** (ETH Zurich & The Scripps, LaJolla, USA), Prof **Lucia Banci** Director of Center of Magnetic Resonance at University of Florence (Italy) and Dr **Dimitri Corpaki**, Head of Unit B.5 'Spreading Excellence and Widening Participation'. This event was attended not only by a large numbers of scientists (Professor, senior researchers, young investigators and students) but also by the public of cities of Rion & Patras. The event was covered by Live streaming video, which counted ~1300 hits.

Additional, UPAT's SEEDRUG project was included and advertised by the DODS "The Parliament Magazine", Issue 382, 20th of January 2014.

Finally, the event of the Honorary Doctorate Degree to Nobel Laureate Prof Kurt Wüthrich (Nobel Prize in Chemistry, 2002), was covered by a number of local newspapers. Copies of the newspapers are provided in **WP5 Deliverables (D 5.2).**

(V) Web site design, creation & operation started before the official initiation of the project (01 January 2012). Web -site became active and operational in the first month of the project. The web site contains information on the objective of the project, the activities planned, the participants' expertise and on-going research activities, along with the research equipment, which will be acquired through SEEDRUG. Job Opportunities announcements and scheduled events were also presented at the web site. Positive comments were received from a large number of colleagues (from UPAT and other Greek Academic institutions) concerning the structure, organization and operation of the web-site (www.seedrug.upatras.gr). The web-site is being regularly updated over the duration of the project and more than **160.000** visits performed since it became functional **(M1).**

*Overall, the activities of **WP7** have been performed according to the SEEDRUG's Action plan.*

As it becomes evident by the above description, the SEEDRUG project, through its 4-years activities, had a significant impact on the reinforcing of the UPAT's research capacities and for the region of Western Greece and South-Eastern EU region. Specifically:

1) During the period of a devastating socioeconomic crisis in Greece, REGPOT-SEEDRUG project funded by ~3.2Meuros was one of the bigger (if not the biggest) fund attracted by UPAT for R&D activities. This project attracted and funded the activities of a number of highly qualified research that collaborated for a very first time with UPAT groups, while it managed to retain experienced researchers at UPAT and finally enhance the career of the most of them. SEEDRUG funded a number of networking activities and staff exchange with >120 of eminent and young scientists (two Nobel Prize winners visited for a first time Patras, Pros Ada Yonath and Prof Kurt Wuthrich; Prof K. Wuthrich is a great supporter of Greek Science & Research) visited Rion & Patras and had an impact on the regional society and economy. All the above had a remarkable effect in the international reputation of UPAT

2) The acquisition of state-of the-art S&T equipment with cost up to 1.6 M euros, enhanced remarkably the scientific platform of UPAT with unique and powerful research instrumentation that opened new possibilities in Life Science and structural Biology. This new scientific ecosystem attracts many researchers from Greece and neighboring countries to establish joint collaboration activities and to use SEEDRUG scientific capacities as external users. Therefore, SEEDRUG may play an important role to enhance the research activities and competitiveness, not only of UPAT's research groups, but will also assist groups form the Greece and other regions to enhance their research activities with experimental methodologies that could not be applied in Greek academia, before the implementation of SEEDRUG project.

3) Additionally, SEEDRUG groups established links with other REGPOT consortia "Neurosign", "InnovCrete", etc.) in Greece in order to reinforce their activities and build solid, integrated S&T platforms in the field of life sciences, structural biology and biomedical applications.

4) The role of SEEDRUG as a Center of Excellence in South-Eastern EU region has been recognized and the main objective of the REGPOT program (to create a Scientific Pole of Excellence at South-Eastern EU) has been fulfilled. This S&T equipment will assist UPAT and its groups to perform high-standard research activities, to submit high-quality research proposal and to increase their competitiveness in EU level increasing also the number of collaborations. The successful implementation of the SEEDRUG project had a significant impact in Greek academia, as well. A number of new projects have been initiated in collaboration with research groups from the Universities of Athens, Crete, Ioannina, Alexandroupoli and others. A significant number young investigators have been attracted by the SEEDRUG groups and a high number of PhD students applied to join SEEDRUG labs to start their research training activities and many of those students or young investigators prefer after the end of the project to remain in Greece instead of leaving abroad. The great success of the SEEDRUG project, was to demonstrate a significant S&T capacity that provide strong motivation, based on the existing scientific platform and the on-going research activities, to remain in Greece capable to perform high-quality research activities.

5) New funds from private sector have been attracted or expected to arise through the collaborative links based with SEEDRUG groups (e-smoking, electro-stimulation in

wound healing etc.). A number links with Medical Department and UPAT's Hospital clinics through the implementation of "applied research" protocols to clinical studies (with Pediatric, Nephrology and Hematology clinics) while a few attempts for establishment of joint collaborative projects with pharmaceutical companies and other companies, are underway.

6) Finally, as also noted above, implementation of the SEEDRUG project was the driving force in the promotion of the UPAT as a national-level research infrastructure in Biological & Medical Sciences, an action which is supported by the National Strategic National Reference Framework, which is resulted in the constitution of the ***National Greek Roadmap of Research Infrastructures***. SEEDRUG, constitutes one of the two pillars in National RI, named "INSPIRED" (document published at December 2014): https://ec.europa.eu/research/infrastructures/pdf/gr_roadmap-web_version_final2014.pdf (page #51)

Address project public website and relevant contact details

Website of SEEDRUG project: www.seedrug.upatras.gr

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Table 1. Budget distribution per WP and per Period of the SEEDRUG project (P1/M1-M18: 01/2012-06/2013, P2/M19-M42: 07/2013-06/2015, P3/M42-M48: 07-12/2015)

	Proposed[±]		Spent				
	Budget	**Person Months**	**P1**	**P2 [#]**	**P3**	**P1+P2+P3**	**Person Months**
WP1	**192900**	30+36*	72828.45	76619.33 (523.76) [#]	30969.24	**180940.78**	81.46
WP2	**1581250**	28	1199476.44	490034.96 (999.70) [#]	10350.00	**1700861.10**	28.37
WP3	**822000**	218	327200.00	424300.00 (3000.00) [#]	20280.00	**774780.00**	211.39
WP4	**215500**	6	28396.66	48708.08 (1328.43) [#]	20350.00	**98783.17**	16.39
WP5	**85700**	3	28406.42	58326.99 (3665.19) [#]	9564.00	**99962.60**	10.08
WP6	**61650**	3+3*	0	27488.10 (1000.00) [#]	28833.26	**57321.36**	9.33
WP7	**32200**	2	5273.02	27944.96 (1165.00) [#]	7607.00	**41989.98**	6.18
SUM	**2,991,200**	**329[§]**	**1,661,580.99**	**1,153,422.42 (11,682.08)[#]**	**127,953.50**	**2,954,638.99**	**363.20[@]**
7% [Ø]	**208,327**		116,219.67	80431.57 (817.75) [#]	8781.75	**206,250.78**	
TOTAL	**3,199,527**		1,777,800.66	1,233,853.99 (12,499.87) [#]	136,735.25	**3,160,889.77**	

[±] *Budget originally allocated (at Technical Annex) to each SEEDRUG WP activities*

[Ø] *Indirect Costs Reimbursed by EC (excluding tasks 1.3 & 7.3; totally 15,100euros)*

** Includes the administration and management personnel cost (different rate per month for WP3 and WP6, that is 1725 euros and 2250 euros, respectively)*

[#] *Includes costs (in parenthesis) of period 2, but submitted in a adjustment of Period 2, Form C*

[§] *Estimated for 42 months total project duration*

[@] *Final person month efforts for total duration of 48 months (after 6months extension in project duration)*

TABLE 2. MILESTONES

Milestone No	Milestone name	WP no.	Lead Beneficiary	Delivery date from Annex I dd/mm/yyyy	Achieved Yes/No	Actual/Forecast achievement date dd/mm/yyyy	Comments
1	Kick off meeting	WP1	UPAT	M1	YES	M2 – 23/02/2012	None
2	Conclusions drawn after the 1st External Advisory Board meeting	WP1 & WP4	"	M4	YES	M4 – 23/04/2012	None
3	Equipment purchase & Installation	WP2	"	M9	YES	M41 – 31/05/2015	Completed with a delay – extensive description of the long-term process is provided
4	Appointment of researchers	WP3	"	M12-M36	YES	M42 – 30/06/2015	Position with Expert #2 covered at M19
5	Organization of Workshops and a Conference in Greece	WP5	"	M12-M36	YES	M42 – 30/06/2015	According to the plan and the amendment of the project (6 months extension) – 2 workshops + 1 Conference organized the period M19-M42.
6	Completion of the evaluation plan & report submission	WP6	"	M48	YES	M48 – 31/12/2015	None
7	Web portal operational	WP7	"	M2	YES	M1 – 25/01/2012	None

Milestones completed in period **M1-M18**

Milestones completed in period **M19-M42**, or to be completed in **M48**

4.2. Use nd dissemination of foreground

Section A (public)

This section includes two templates

- Template A1: List of all scientific (peer reviewed) publications relating to the foreground of the project.
- Template A2: List of all dissemination activities (publications, conferences, workshops, web sites/applications, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters).

These tables are cumulative, which means that they should always show all publications and activities from the beginning until after the end of the project. Updates are possible at any time.

TEMPLATE A1: LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES

NO.	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Year of publication	Relevant pages	Permanent identifiers[1] (if available)	Is/Will open access[2] provided to this publication?
1	Hydrogen sulfide and nitric oxide are mutually dependent in the regulation of angiogenesis and endothelium-dependent vasorelaxation.	Coletta C Papapetropoulos A Erdelyi K Olah G Módis K Panopoulos P Asimakopoulou A Gerö D Sharina I Martin E Szabo C	Proceedings of the National Academy of Sciences of the United States of America	Vol.109 No.23	Kenneth R. Fulton	Washington USA	05/01/2012	9161-9166		no

[1] A permanent identifier should be a persistent link to the published version full text if open access or abstract if article is pay per view) or to the final manuscript accepted for publication (link to article in repository).

[2] Open Access is defined as free of charge access for anyone via Internet. Please answer "yes" if the open access to the publication is already established and also if the embargo period for open access is not yet over but you intend to establish open access afterwards.

2	NMR-based insights into the conformational and interaction properties of Arkadia RING-H2 E3 Ub ligase.	Chasapis CT Kandias NG Episkopou V Bentrop D Spyroulias GA	Proteins	Vol.80 No.5	John Wiley & Sons	New York, USA	05/2012	1484-1489		no
3	Structural studies of human insulin cocrystallized with phenol or resorcinol via powder diffraction	Karavassili F Giannopoulou AE Kotsiliti E Knight L Norrman M Schluckebier G Drube L Fitch AN Wright JP Margiolaki I	Acta Crystallographica Section D Biological Crystallography	Vol.68 No.12	John Wiley & Sons	New York, USA	12/2012	1632-1641		no
4	cGMP-dependent protein kinase contributes to hydrogen sulfide-stimulated vasorelaxation	M. Bucci A. Papapetropoulos V. Vellecco Z. Zhou A. Zaid P. Giannogonas A. Cantalupo S. Dhayade K.P. Karalis R. Wang R. Feil G. Cirino	PlosPne	Vol.7 No.12	Public Library of Science	San Francisco, California, USA	28/12/2012			yes
5	Selectivity of commonly used pharmacological inhibitors for cystathionine β synthase (CBS) and cystathionine γ lyase (CSE)	Asimakopoulou A Panopoulos P Chasapis CT Coletta C Zhou Z Cirino G Giannis A Szabo C Spyroulias GA Papapetropoulos A	British Journal of Pharmacology	Vol.169 No.4	Wiley-Blackwell	USA	06/2013	922-932		yes (after 12 months)

6	Genomic variation in the MAP3K5 gene is associated with β-thalassemia disease severity and hydroxyurea treatment efficacy	Tafrali C Paizi A Borg J Radmilovic M Bartsakoulia M Giannopoulou E Giannakopoulou O Stojiljkovic-Petrovic M Zukic B Poulas K Stavrou EF Lambropoulou P Kourakli A Felice AE Papachatzopoulou A Philipsen S Pavlovic S Georgitsi M Patrinos GP	Pharmacogenomic	Vol.14 No.5	Future Science Group	London, United Kingdom	04/2013	469-483		no
7	Insights into soluble guanylyl cyclase activation derived from improved heme-mimetics	von WantochRekowski M Kumar V Zhou Z Moschner J Marazioti A Bantzi M Spyroulias GA van den Akker F Giannis A Papapetropoulos A	Journal of Medicinal Chemistry	Vol.56	ACS Publications	Washington, USA	04/10/2013	8948-8952		no
8	Hydrogen sulfide-mediated stimulation of mitochondrial electron transport involves inhibition of the mitochondrial phosphodiesterase 2A, elevation of cAMP and activation of protein kinase A	K. Módis P. Panopoulos C. Coletta A. Papapetropoulos C. Szabo	Biochemical Pharmacology	Vol.86	Elsevier	Amsterdam, Netherlands	01/11/2013	1311-1319		yes

9	Hydrogen sulfide accounts for the peripheral vascular effects of S-zofenopril independently of ACE inhibition	M. Bucci V. Vellecco A.Cantalupo V. Brancaleone Z. Zhou S. Evangelista V. Calderone A. Papapetropoulos G. Cirino	Cardiovascular Research	Vol.102	Oxford University Press	Oxford, United Kingdom	2014	138-147		yes
10	High-resolution powder X-ray data reveal the T(6) hexameric form of bovine insulin	Margiolaki I Giannopoulou AE Wright JP Knight L Norrman M Schluckebier G Fitch AN Von Dreele RB	Acta Crystallographica Section D Biological Crystallography	Vol.69 No.6	John Wiley & Sons	New York, USA	06/2013	978-990		no
11	NMR conformational properties of an Anthrax Lethal Factor domain studied by multiple amino acid-selective labeling	Vourtsis DJ Chasapis CT Pairas G Bentrop D Spyroulias GA	Biochemical and Biophysical Research Communications	Vol.450 No.1	Elsevier	Amsterdam, Netherlands	18/07/2014	335-40		no
12	Regulation of Mitochondrial Bioenergetic Function by Hydrogen Sulfide. Part II. Pathophysiological and Therapeutic Aspects	Módis K Bos EM Calzia E van Goor H Coletta C Papapetropoulos A Hellmich MR Radermacher P Bouillaud F Szabo C	British Journal of Pharmacology	Vo.171 No.8	Wiley-Blackwell	USA	04/2014	2123-2146		yes (after 12 months)

13	Mast cells mediate malignant pleural effusion formation	Giannou AD Marazioti A Spella M Kanellakis NI Apostolopoulou H Psallidas I Prijovich ZM Vreka M Zazara DE Lilis I Papaleonidopoulos V Kairi CA Patmanidi AL Giopanou I Spiropoulou N Harokopos V Aidinis V Spyratos D Teliousi S Papadaki H Taraviras S Snyder LA Eickelberg O Kardamakis D Iwakura Y Feyerabend TB Rodewald HR Kalomenidis I Blackwell TS Agalioti T Stathopoulos GT	The Journal of Clinical Investigation	Vol.125 No.6	American Society for Clinical Investigation	USA	01/06/2015	2317-2334		yes
14	Direct proof of the in vivo pathogenic role of the AChR autoantibodies from myasthenia gravis patients	Kordas G Lagoumintzis G Sideris S Poulas K Tzartos SJ	PlosOne	Vol.9 No.9	Public Library of Science	San Francisco, California, USA	26/09/2014	e108327		yes
15	Scale up and safety parameters of antigen specific immunoadsorption of human anti-acetylcholine receptor antibodies	Lagoumintzis G Zisimopoulou P Trakas N Grapsa E Poulas K Tzartos SJ	journal of neuroimmunology	Vo.267 No.1-2	Elsevier	Amsterdam, Netherlands	15/02/2014	1-6		no

16	Non-contact current transfer induces the formation and improves the X-ray diffraction quality of protein crystals	Boltsis I Lagoumintzis G Chatzileontiadou DSM Giastas P Tzartos SJ D. Leonidas D Poulas K	Journal of Crystal Growth and Design	Vo.14 No.9	ACS Publications	Washington, USA	07/08/2014	4347-4354		no
17	ATP-Sensitive Potassium Channel Activation Induces Angiogenesis In Vitro and In Vivo	Umaru B Pyriochou A Kotsikoris V Papapetropoulos A Topouzis S	Journal of Pharmacology and Experimental Therapeutics	Vol.354 No.1	American Society for Pharmacology and Experimental	USA	07/2015	79-87		yes (after 12 months)
18	Guanylyl cyclase activation reverses resistive breathing-induced lung injury and inflammation	Glynos C Toumpanakis D Loverdos K Karavana V Zhou Z Magkou C Dettoraki M Perlikos F Pavlidou A Kotsikoris V Topouzis S Theocharis SE Brouckaert P Giannis A Papapetropoulos A Vassilakopoulos T	American Journal of Respiratory Cell and Molecular Biology	Vol.52 No.6	American Thoracic Society	USA	06/2015	762-771		no
19	Mechanoresponses of human primary osteoblasts grown on carbon nanotubes	Kroustalli A Kotsikoris V Karamitri A Topouzis S Deligianni D	Journal of Biomedical Materials Research	Vol.103 No.3	John Wiley & Sons	New York, USA	03/2015	1038-1044		no
20	Extending the translational potential of targeting nitric oxide/cGMP-regulated pathways in the cardiovascular system	A. Papapetropoulos A. J. Hobbs S. Topouzis	British Journal of Pharmacology	Vol.172	Wiley-Blackwell	USA	2015	1397-1414		Yes (after 12 months)

21	Evaluation of the distribution of Paclitaxel by immunohistochemistry and nuclear magnetic resonance spectroscopy after the application of a drug-eluting balloon in the porcine ureter	Liourdi D Kallidonis P Kyriazis I Tsamandas A Karnabatidis D Kitrou P Spyroulias GA Kostopoulou ON Marousis K Kalpaxis DL Goumenos DS Liatsikos E	The Journal of Endourology	Vol.29 No.5	Elsevier	Amsterdam, Netherlands	05/2015	580-589		no
22	(1)H, (15)N, (13)C assignment and secondary structure determination of two domains of La protein from D. discoideum	Apostolidi M Vourtsis DJ Chasapis CT Stathopoulos C Bentrop D Spyroulias GA	Biomolecular NMR Assignments	Vol.8 No.1	Springer Science Business Media	Germany	12/2014	47-51		no
23	NMR study of non-structural proteins-part II: 1H, 13C, 15N backbone and side-chain resonance assignment of macro domain from Venezuelan equine encephalitis virus (VEEV)	Makrynitsa GI Ntonti D Marousis KD Tsika AC Lichière J Papageorgiou N Coutard B Bentrop D Spyroulias GA	Biomolecular NMR Assignments	Vol.9 No.2	Springer Science Business Media	Germany	10/2015	247-251		no
24	Backbone and side chain NMR assignment, along with the secondary structure prediction of RRM2 domain of La protein from a lower eukaryote exhibiting identical structural organization with its human homolog	Argyriou AI Chasapis CT Apostolidi M Konstantinidou P Stathopoulos C Bentrop D Spyroulias GA	Biomolecular NMR Assignments	Vol.9 No.1	Springer Science Business Media	Germany	04/2015	219-222		no

25	NMR study of non-structural proteins--part I: (1)H, (13)C, (15)N backbone and side-chain resonance assignment of macro domain from Mayaro virus (MAYV)	Melekis E Tsika AC Lichière J Chasapis CT Margiolaki I Papageorgiou N Coutard B Bentrop D Spyroulias GA	Biomolecular NMR Assignments	Vol.9 No.1	Springer Science Business Media	Germany	04/2015	191-195		no
26	1H, 13C and 15N backbone and side-chain resonance assignment of the LAM-RRM1 N-terminal module of La protein from Dictyostelium discoideum	Chasapis CT Argyriou AI Apostolidi M Konstantinidou P Bentrop D Stathopoulos C Spyroulias GA	Biomolecular NMR Assignments	Vol.9 No.2	Springer Science Business Media	Germany	10/2015	303-307		no
27	A Peptide Mimetic of 5-Acetylneuraminic Acid-Galactose Binds with High Avidity to Siglecs and NKG2D	Eggink LL Spyroulias GA Jones NG Hanson CV Hoober JK	PLoSOne	Vol.10 No.6	Public Library of Science	San Francisco, California, USA	25/06/2015	e0130532		yes
28	NMR & Biochemical assays reveal unexpected RNA binding properties of the La motif of D. discoideum Lupus Antigen protein	A. Argyriou D. Vourtsis M. Apostolidi C.T. Chasapis D. Drainas D. Bentrop C. Stathopoulos G.A. Spyroulias					To be submitted			n/a
29	NMR insights on the conformational plasticity and ligase activity of intrinsically dynamical forms of ARKADIA E3 Ubiquitin Ligase	M. Birkou A. Loutsidou C.T. Chasapis D. Bentrop M. Leli T. Herrmann V. Episkopou G.A. Spyroulias					To be submitted			n/a
30	Role of cGMP in hydrogen sulfide signaling	Sl Bibli G. Yang Z. Zhou R.Wang S. Topouzis A. Papapetropoulos	NO Journal	Vol.30 No.46	Elsevier		2015	7-13		no

31	Geminin deletion increases the number of fetal hematopoietic stem cells by affecting the expression of key transcription factors	Karamitros D Patmanidi AL Kotantaki P Potocnik AJ Bähr-Ivacevic T Benes V Lygerou Z Kioussis D Taraviras S	Development	Vol.142 No.1	The Company of Biologists	United Kingdom	01/01/2015	70-81		yes
32	Human Insulin Polymorphism upon Ligand Binding and pH variation: The Case of 4-ethylresorcinol	S. Fili A.Valmas M. Norrman G. Schluckebier D. Beckers T. Degen J. Wright A. Fitch F. Gozzo A. E. Giannopoulou F. Karavassili I. Margiolaki	Journal of International Union of Crystallography		Elsevier	Amsterdam, Netherlands	2015			Yes (after 6 months)
33	Novel crystalline phase and first-order phase transitions of human insulin complexed with two distinct phenol derivatives	Valmas, A. Magiouf, K. Fili, S. Norrman, M. Schluckebier, G. Beckers, D. Degen, T. Wright, J.P. Fitch, A. N. Gozzo, F. Giannopoulou, A.E. Karavassili, F. Margiolaki I.	Acta Crystallographica Section D Biological Crystallography	Vol.71	John Wiley & Sons	New York, USA	2015	819-828		no
34	The power of Powders	Karavassili, F. Valmas, A. Margiolaki, I.	ESRFnews magazine	Vol.69			2015	18		no
35	Utilizing the virus-induced blocking of apoptosis in an easy baculovirus titration method	A. Niarchos G. Lagoumintzis K. Poulas	Scientific Reports	Vol. 5	Nature Publishing Group		22/10/2015	15487		yes

36	Defining a Consensus for the Association Networks of Plasma and Serum Metabolites	M. Suarez-Diez E. Saccenti C. Luchinat C. Santucci L. Tenori S. Chasapi A. Spyridonidis G.A. Spyroulias	OMICS A Journal Of Integrative Biology				Submitted			n/a
37	1H, 13C and 15N Backbone and side-chain resonance assignment of human Angiogenin	A. Tsika D.S. Chatzileontiadou D. Leonidas G.A.Spyroulias	Biomolecular NMR Assignments		Springer Science Business Media	Germany	Submitted			n/a
38	1H, 13C and 15N Backbone and side-chain resonance assignment of the Nostoc sp. H-NOX domain	I.I. Alexandropoulos A. Argyriou K. Marousis S. Topouzis A. Papapetropoulos G.A.Spyroulias	Biomolecular NMR Assignments		Springer Science Business Media	Washington, USA	Submitted			n/a
39	Advanced Genetics in Myasthenia Gravis	K. Poulas Z. Zagoriti M. Kambouris G. Lagoumintzis	Novel Challenges in Myasthenia Gravis		Nova Science Publishers	New York, USA	2015			n/a
40	Leg Ulcer and Chronic Wounds: Innovative Healing Methods	E. Paxinou G. Lagoumintzis Z. Zagoriti A. Niarchos I. Boltsis K. Poulas	Leg Ulcers and Chronic Wounds: Symptoms, Treatment and Prevention		Nova Science Publishers	New York, USA	2015			n/a

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES WORKSHOPS/SEMINARS/INFODAYS CONFERENCE ORGANIZATION								
NO.	Type of activities[3]	Main leader	Title	Date/Period	Place	Type of audience[4]	Size of audience	Countries addressed
1.	1st SEEDRUG Workshop	G.A.Spyroulias/ S. Topouzis	Peptide Synthesis & Protein Production/Labelling	05/2012	Patras, GR	investigator, Faculty members, PhD candidates, MSc students, and undergraduate students	>300 registered participants	EU & USA
2	2nd SEEDRUG Workshop & Practicals	S. Topouzis/ G.A.Spyroulias	NMR Basics & Applications in Life Sciences	05/2013	Patras, GR	"	>250 registered participants	EU, USA
3	3rd SEEDRUG Workshop	G.A.Spyroulias/ S. Topouzis	Emerging Analytical Techniques in Protein Characterization	09/2013	Patras, GR	"	80-100 registered participants	EU, USA, Japan
4	4th SEEDRUG Workshop & Practicals	S. Taraviras/S. Topouzis/ G.A.Spyroulias	Live cell imaging, Drug Screening & Preclinical assessment - Views Into Nuclear Function	09/2014	Patras, GR	"	>160 registered participants	EU, USA, Asia, Japan
5.	Greek-Turkish Mini-Symposium	G.A.Spyroulias	NMR Applications in Life Sciences	06/2015	Patras, GR	"	>60 registered participants	EU, Balkan countries, Turkey, Cyprus
6.	International SEEDRUG Conference	G.A.Spyroulias	Structural Biology	06/2015	Patras, GR	"	>250 registered participants	EU, USA
7.	Seminar/ Info-day	G.A.Spyroulias	Inauguration of SEEDRUG Biomolecular 700MHz NMR Facility	10/2013	Patras, GR	" & Broad Public	>120 registered participants	EU, USA
8.	Seminar/ Info-day	G.A.Spyroulias	EUROPEAN LEAD FACTORY	01/2015	Patras, GR	" & Broad Public	>100 registered participants	EU

[3] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[4] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES ORAL PRESENTATIONS								
NO.	Type of activities[5]	Main leader	Title	Date/Period	Place	Type of audience[6]	Size of audience	Countries addressed
1.	Seminar/ U of Athens, Dept of Chemistry, Greece	G.A. Spyroulias	Conformational plasticity of polypeptides through Biomolecular NMR Spectroscopy	01/2012	Athens, GR	Experienced and young investigator, Faculty members, PhD candidates, MSc students, and undergraduate students	>80	Greece
2.	12th Eurasia	G.A. Spyroulias	NMR study of Arkadia E3 ubiquitin ligase domain to correlate Zn(II) coordination with protein architecture,	04/2012	Corfu, GR	"	>800	World-wide
3.	2nd Summer School of Proteins	G.A. Spyroulias	Conformational Dynamics and Drug Design Approaches through NMR - Basics and Applications	05/2012	Athens, GR	"	>80	Greece

[5] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[6] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

4.	15th HSMC	G.A. Spyroulias	Identifying functionally important residues of Arkadia E3 ubiquitin ligase ring domain in E2 recruitment and E3-E2 interaction	05/2012	Athens, GR	"	>150	European Countries
5.	3rd ARCADE Workshop, NHRF	G.A. Spyroulias	NMR Conformational Dynamics and SAR studies of biologically relevant macromolecules	05/2012	Athens, GR	"	>80	European Countries
6.	WIRE2012	G.A. Spyroulias	The SEE DRUG Project at University of Patras	06/2012	Krakow, PL	"	>1000	European Countries
7.	4th Neurocypres Annual meeting	G.A. Spyroulias	Insights on the conformational exchange properties of GLIC ECD by solution NMR - Implications on 5/6mer subunit socialization	06/2012	Vienna, AT	"	>40	World-wide

8.	Seminar	G.A. Spyroulias	Elucidating the intrinsic plasticity of the extracellular domain of a prokaryotic nAChR homologue by solution NMR - implications on 5/6mer subunit socialization	06/2012	U of Florence, Dept of Chemistry, Florence IT	"	>40	Italy
9.	32nd EPS	G.A. Spyroulias	Selective amino acid isotope labeling strategies for solution NMR studies of high-molecular-weight protein drug-targets	09/2012	Athens, GR	"	>1000	World-wide
10.	6th HECRA	G.A. Spyroulias	NMR-driven Structure Function Correlation studies of Arkadia E3 Ubiquitin Ligase RING domain	09/2012	Athens, GR	"	>150	World-wide
11.	Seminar	G.A. Spyroulias	Conformational Dynamics & Function of Proteins by Solution NMR	11/2012	Department of Chemistry, U of Crete Heraklion, GR	"	>60	Greece
12.	63rd EEBMB	G.A. Spyroulias	NMR Insights on the functional modulation of the RING domain of Arkadia tumor suppressor	11/2012	Heraklion, GR	"	>500	World-wide

13.	3rd EAST-NMR AUM	G.A. Spyroulias	NMR Structural Biology at University of Patras & the SEEDRUG Project	11/2012	Lasko, Slovenia	"	>150	European Countries
14.	Turkish NMR Meeting	G.A. Spyroulias	Solution NMR Studies of E3 Ub Ligase RING and Alphaviruses MACRO Domains	12/2012	Istanbul, TR	"	>60	European Countries
15.	IAEA Headquarters	I. Margiolaki	Method Development for Structural Studies: From Materials Science to Structural Biology	06/2012	Vienna, AT	"	>150	World-wide
16.	Macro-molecular Structure of Biological & Non-Biological Materials	I. Margiolaki, F. Karavasili & coworkers	Proteins & Powders: Samples, Data & Polymorphism	11/2012	Hurghada, Egypt	"	>400	World-wide
17.	63rd EEBMB	A. Patmanidi & S. Taraviras	The role of Geminin in the self-renewal and differentiation of hematopoietic stem cells	11/2012	Herakleion Crete, GR	"	>500	World-wide
18.	World Companion Diagnostics Summit	G. Patrinos	Pharmacogenomics in developing countries in Europe	03/2012	Frankfurt, DE	"	>600	World-wide
19.	2nd Latin American Pharmacogenomics Conference	G. Patrinos	Pharmacogenomics and Public health	06/2012	Rio de Janeiro, BRAZIL	"	>700	World-wide

20.	8TH Golden Helix Pharmacogenomics Day	G. Patrinos	Genomics and rare diseases	11/2012	Brno, CZECH REPUBLIC	"	>120	World-wide
21.	VIIIth Joint Meeting on Medicinal Chemistry	A. Papapetropoulos	Soluble guanylyl cyclase: a new look at an old drug target	07/2013	Lublin, POLAND	"	>500	World-wide
22.	11TH Symposium of Hellenic Society of Pharmacology	A. Papapetropoulos	GC activators: from molecular pharmacology to clinical use	03/2013	Athens, GR	"	>150	Greece
23.	2nd European Conference on the Biology of Hydrogen Sulfide	A. Papapetropoulos	Modulation of H2S levels in cells and tissues using pharmacological agents: advances and pitfalls	09/2013	University of Exeter, UK	"	>300	World-wide
24.	6th International Conference on cGMP	A. Papapetropoulos	NO-H2S interactions involve cGMP	06/2013	Ertfurt, DE	"	>300	World-wide
25.	Celebrating the 50th anniversary of the Replicon Theory	Z. Lygerou	Multi-step loading of human Mini Chromosome Maintenance proteins in live human cells	03/2013	Paris, FR	"	>300	World-wide
26.	The European Cancer Stem Cell Research Institute	S. Taraviras	Controlling self-renewal and fate commitment decisions in stem cell	03/2013	Cardiff University, UK	"	>400	World-wide

27.	1st Forum of Health	S. Taraviras	The University of Patras Unit of Functional Microscopy and its contribution at basic and applied research	04/2013	Patras, GR	"	>150	Greece
28.	Seminar	S. Taraviras	Geminin, a novel player in cell fate decisions	06/2013	Oxford, UK	"	>60	UK
29.	Seminar	G.A.Spyroulias	Conformational Dynamics of Proteins, Biomolecular Interactions and Drug Design Efforts using NMR	03/2013	Patras, GR	"	>60	Greece
30.	1st Forum of Health	G.A.Spyroulias	State-of-the-art NMR instrumentation & modern NMR applications in the service of Life Sciences	04/2013	Patras, GR	"	>150	Greece
31.	«NANOTHEO» Workshop	G.A.Spyroulias	High-resolution analysis of protein structure, dynamics and interaction through Biomolecular NMR	05/2013	Patras, GR	"	>60	Greece

32.	2nd Research Coordination Meeting of International Atomic Energy Agency	I.Margiolaki/ G.A.Spyroulias	NMR conformational dynamics of proteins & protein complexes	09/2013	Rion GR	"	>80	World-wide
33.	5th BBBB International Conference	G.A.Spyroulias	Conformational Dynamics and Drug Design Approaches through NMR	09/2013	Athens, GR	"	>450	World-wide
34.	2013 European Annual Human Genetics Conference	G. Patrinos	Pharmacogenomics and developing countries in Europe	06/2013	Paris, France	"	>800	World-wide
35.	5th EMBO meeting	G. Patrinos	Pharmacogenomic applications of whole genome sequencing	09/2013	Amsterdam, The Netherlands	"	>250	World-wide
36.	Workshop on Powder & Electron Crystallography	I. Margiolaki	Proteins & Powders: Samples, Data & Structures	07/2013	Patras, GR	"	>60	European Countries
37.	2nd Research Coordination Meeting of International Atomic Energy Agency	I. Margiolaki	Development of novel methodologies for the study of nano-crystalline materials	09/2013	Rion GR	"	>300	European Countries
41.	Seminar	S. Taraviras	Geminin, a novel player in cell fate decisions	11/2013	USA Medical School of Harvard	"	>120	US

42.	**Seminar**	**S. Taraviras**	**Geminin, a novel player in cell fate decisions**	**11/2013**	**USA Tufts University School of Medicine**	"	**>120**	**US**
43.	**64th EEBMB**	**A. Patmanidi, S. Taraviras**	**Geminin binds onto distal and proximal elements of HoxA9 and regulates fate commitment decisions of embryonic haemopoietic stem cells**	**12/2013**	**Athens, GR**	"	**>500**	**World-wide**
44.	**64th EEBMB**	**K.Poulas, G.Lagoumintzis & coworkers**	**Effect of non-contact current transfer in protein crystallization: experiments with two model proteins**	**12/2013**	**Athens, GR**	"	"	"
45.	**IYCR2014, Opening Ceremony, UNESCO**	**I. Margiolaki**	**Macromolecular Powder Diffraction: Past, Present, Future**	**01/2014**	**Paris, FR**	"	**>450**	**World-wide**
46.	**Seminar**	**S. Taraviras**	**Geminin, a novel player in cell fate decisions in haematopoietic system**	**02/2014**	**Athens, GR**	"	**>120**	**Greece**
47.	**ICRI 2014 Workshop**	**G.A.Spyroulias**	**Structural Biology by NMR: Knowledge transfer form EU RIs to Greece**	**04/2014**	**Athens, GR**	"	**>60**	**European Countries**
48.	**15th conference of Medicinal Chemistry**	**I. Margiolaki**	**Macromolecular micro-crystallography: Perspectives in Drug Discovery**	**04/2014**	**Patras, GR**	"	**>150**	**Greece**

49.	**EPDIC14 - The European Powder Diffraction Conference**	**F. Karavasili & I. Margiolaki**	**Macromolecular Micro-crystallography: Application to Pharmaceutical Proteins**	**06/2014**	**Aarhus, DK**	**“**	**>400**	**European Countries**
50.	**32nd CNC – Trends in Drug Research**	**G.A.Spyroulias**	**Insights on the conformational plasticity of drug-target proteins**	**05/2014**	**Limassol, Cyprus**	**“**	**>60**	**World-wide**
51.	**Seminar**	**G.A.Spyroulias**	**Atomic-level investigation of Structure, Dynamics & Interactions of proteins, through Biomolecular NMR**	**05/2014**	**Thessaly, GR**	**“**	**>60**	**Greece**
52.	**7th HeCrA**	**I. Margiolaki**	**Macromolecular Powder Diffraction: Current status & Future prospects**	**09/2014**	**Heraklion, Crete, GR**	**“**	**>150**	**World-wide**
53.	**7th HeCrA**	**G.A.Spyroulias**	**NMR Conformational Dynamics of La and RRM1 Motifs of La Protein**	**09/2014**	**Heraklion, Crete, GR**	**“**	**“**	**“**
54.	**Pharmacogenomics and Genomic Medicine: Bridging Research and the Clinic**	**Z. Zagoriti G.Patrinos, M.Kambouris, G.Lagoumintzis**	**STAT4 rs7574865 SNP in genetic susceptibility of early-onset Myasthenia Gravis**	**09/2014**	**Aigina, Athens, GR**	**“**	**>120**	**World-wide**
55.	**2nd Conference in Pharmaceutical Sciences**	**G.A.Spyroulias**	**Application of NMR Spectroscopy to the study of biomolecules and pharmaceutical**	**10/2014**	**Patras, GR**	**“**	**>700**	**Greece**

56.	**Greek NMR Users Mereting**	**G.A.Spyroulias**	**Atomic-level investigation of Structure, Dynamics & Interactions of proteins, through Biomolecular NMR**	**10/2014**	**Athens, GR**	**“**	**>40**	**Greece**
57.	**Seminar**	**G.A.Spyroulias**	**Conformation, Plasticity and Socialization of biomolecules through NMR**	**02/2015**	**NCSR Demokritos, Athens, GR**	**“**	**>60**	**Greece**
58.	**1st International Congress of Controlled Release Society – Greek Chapter**	**G.A.Spyroulias**	**NMR insights into the Conformational Dynamics and interaction of biomolecules with therapeutic interest**	**05/2015**	**Athens, GR**	**“**	**>150**	**Greece**
59.	**1st International Congress of Controlled Release Society – Greek Chapter**	**K.Poulas**	**Crystallization of proteins under the influence of microcurrents and electromagnetic fields**	**05/2015**	**Athens, GR**	**“**	**“**	**“**

TEMPLATE A2: LIST OF DISSEMINATION ACTIVITIES POSTER PRESENTATIONS								
NO.	Type of activities[7]	Main leader	Title	Date/Period	Place	Type of audience[8]	Size of audience	Countries addressed
1.	12th Eurasia	G.A. Spyroulias & coworkers	NMR study of Arkadia E3 ubiquitin ligase domain to correlate Zn(II) coordination with protein architecture, dynamics and function	04/2012	Corfu, GR	"	>800	World-wide
2.	15th HSMC	G.A. Spyroulias & coworkers	Identifying functionally important residues of Arkadia E3 ubiquitin ligase ring domain in E2 recruitment and E3-E2 interaction	05/2012	Athens, GR	"	>200	World-wide
3.	12th Chianti Workshop	G.A. Spyroulias & coworkers	NMR-driven Structure-Activity correlation study of Arkadia E3 ubiquitin ligase ring domain	06/2012	Florence, Italy	"	>120	World-wide

[7] A drop down list allows choosing the dissemination activity: publications, conferences, workshops, web, press releases, flyers, articles published in the popular press, videos, media briefings, presentations, exhibitions, thesis, interviews, films, TV clips, posters, Other.

[8] A drop down list allows choosing the type of public: Scientific Community (higher education, Research), Industry, Civil Society, Policy makers, Medias, Other ('multiple choices' is possible).

4.	**6th HECRA**	**G.A. Spyroulias & coworkers**	**NMR-driven structure-function correlation studies of Arkadia E3 ubiquitin ligase ring finger domain**	**09/2012**	**Athens, GR**	"	**>100**	**Greece**
5.	**63 EEBMB**	**G.A. Spyroulias & coworkers**	**NMR insights on the functional modulations of the RING domain of Arkadia tumor suppressor.**	**11/2012**	**Herakleion/Crete GR**	"	**>500**	**World-wide**
6.	**63 EEBMB**	**G.A. Spyroulias & coworkers**	**Application of NMR in the structural analysis of different domains of Anthrax Lethal Factor metalloprotease**	**11/2012**	**Herakleion/Crete GR**	"	"	"
7.	**63 EEBMB**	**G.A. Spyroulias & coworkers**	**Unraveling the conformational plasticity of the extracellular domain of a prokaryotic nAChR homologue in solution by NMR**	**11/2012**	**Herakleion/Crete GR**	"	"	"
8.	**63 EEBMB**	**G.A. Spyroulias & coworkers**	**A comparative NMR study of three alphavirus macro domains**	**11/2012**	**Herakleion/Crete GR**	"	"	"
9.	**63 EEBMB**	**G.A. Spyroulias & coworkers**	**Expression and NMR analysis of two domains of recombinant La protein from D. discoideum**	**11/2012**	**Herakleion/Crete GR**	"	"	"

10.	**Turkish NMR Meeting**	**G.A. Spyroulias & coworkers**	**NMR conformational dynamics of Arkadia E3 ubiquitin ligase RING domain.**	**12/2012**	**Istanbul, Turkey**	"	**80**	**European Countries**
11.	**Turkish NMR Meeting**	**G.A. Spyroulias & coworkers**	**Preliminary solution NMR studies of three viral macro domains**	**12/2012**	**Istanbul, Turkey**	"	"	"
12.	**6th HECRA**	**I. Margiolaki & co-workers**	**Phase mapping of insulin using Synchrotron X-ray powder diffraction methods" I. Margiolaki**	**09/2012**	**Athens, GR**	"	**>100**	**Greece**
13.	**EPDIC 13**	**I. Margiolaki & co-workers**	**Phase mapping of insulin using Synchrotron X-ray powder diffraction methods**	**10/2012**	**Grenoble, France**	"	**>250**	**France & EU countries**
14.	**EPDIC 13**	**I. Margiolaki, & A.S. Galanis**	**Electron diffraction as complementary tool to overcome obstacles of structural studies by XRPD**	**10/2012**	**Grenoble, France**	"	"	"
15.	**EPDIC 13**	**I. Margiolaki & co-workers**	**Investigation of insulin polymorphism via Synchrotron X-ray Powder Diffraction**	**10/2012**	**Grenoble, France**	"	"	"

16.	**EPDIC 13**	**I. Margiolaki & co-workers**	**Crystallization and Structural Studies of the nsP3 Macro Domain of the Mayaro Virus**	**10/2012**	**Grenoble, France**	**“**	**“**	**“**
17.	**EPDIC 13**	**I. Margiolaki & co-workers**	**alpha-“NaLuF4”: 6 fold Twinning with Modulation and Diffuse Scattering**	**10/2012**	**Grenoble, France**	**“**	**“**	**“**
18.	**4th International Congress on Stem Cells and Tissue Formation**	**S. Taraviras & co-workers**	**Ablation of Geminin in haematopoietic stem cells alters their ability to self-renew and differentiate**	**07/2012**	**Dresdner, DE**	**“**	**>300**	**World-wide**
19.	**63rd EEBMB**	**A. Patmanidi & S. Taraviras**	**The role of Geminin in the self-renewal and differentiation of hematopoietic stem cells**	**11/2012**	**Herakleion Crete, GR**	**“**	**>500**	**World-wide**
20.	**1st European Conference on the biology of H2S**	**P. Panopoulos, A. Papapetropoulos & coworkers**	**Selectivity of commonly used pharmacological inhibitors for cystathionine β-synthase (CBS) & cystathionine γ-lyase (CSE)**	**06/2012**	**Smolenice, Slovakia**	**“**	**>300**	**World-wide**
21.	**5th Conference of Helenic Society of Biomechanics**	**S. Topouzis, V. Kotsikoris & co-workers**	**Effect of mechanical stimulation and carbon nanotube substrate on osteoblast gene expression**	**09/2012**	**Thessaloniki, GR**	**“**	**>150**	**Greece**

22.	**11th ICBSR**	**I. Margiolaki & co-workers**	**Synchrotron Radiation reveals polymorphism of human insulin crystals"**	**09/2013**	**Hamburg, Germany**	**"**	**>500**	**World-wide**
23.	**EWMA 2013**	**K. Poulas & co-workers**	**Application of wireless microcurrent electrical stimulation in treatment of complicated wounds: clinical & in vitro studies**	**09/2013**	**Copenhagen, Denmark**	**"**	**>200**	**World-wide**
24.	**13th Greek Conference on Diabetes**	**K. Poulas & co-workers**	**Wireless Microcurrent Stimulation in treatment of diabetic wounds: clinical & in vitro studies**	**05/2013**	**Athens, GR**	**"**	**>200**	**Greece**
25.	**39th Greek Medical Conference**	**K. Poulas & co-workers**	**Wireless Microcurrent Stimulation in treatment of diabetic wounds: clinical & in vitro studies**	**05/2013**	**Athens, GR**	**"**	**>300**	**Greece**
26.	**BEMS 2013 + BIOEM2013**	**K. Poulas & co-workers**	**Wireless Microcurrent Stimulation in treatment of diabetic wounds: clinical & in vitro studies**	**06/2013**	**Thessaloniki, GR**	**"**	**>200**	**Greece**

27.	**3rd Bio-NMR Annual User Meeting**	**G.A. Spyroulias & co-workers**	**NMR conformational dynamics of Arkadia & Arkadia-2 E3 ubiquitin ligase RING domains**	**06/2013**	**Budapest, Hungary**	"	**>150**	**European Countries**
28.	**3rd Bio-NMR Annual User Meeting**	**G.A. Spyroulias & co-workers**	**A comparative NMR study of four viral macro domains**	**06/2013**	**Budapest, Hungary**	"	"	"
29.	**Euromar 2013**	**G.A. Spyroulias & co-workers**	**NMR conformational dynamics of Arkadia & Arkadia-2 E3 ubiquitin ligase RING domains**	**07/2013**	**Herakleion, GR**	"	**>800**	**World-wide**
30.	**Euromar 2013**	**G.A. Spyroulias & co-workers**	**NMR insight on the conformational plasticity of the extracellular domain of a prokaryotic nAChR homologue**	**07/2013**	**Herakleion, GR**	"	"	"
31.	**Euromar 2013**	**G.A. Spyroulias & co-workers**	**A comparative NMR study of four viral macro domains**	**07/2013**	**Herakleion, GR**	"	"	"
32.	**Euromar 2013**	**G.A. Spyroulias & co-workers**	**NMR structural investigation and RNA binding properties of LA protein domains from D. Discoideum**	**07/2013**	**Herakleion, GR**	"	"	"
33.	**Euromar 2013**	**G.A. Spyroulias & co-workers**	**Conformational dynamics of N-/C-Terminal domains of Anthrax Lethal Factor metalloprotease**	**07/2013**	**Herakleion, GR**	"	"	"

34.	**Meeting for the National Greek Roadmap of Research Infrastructures**	**G.A. Spyroulias & co-workers**	**UPAT-RISF:**	**04/2013**	**Athens, GR**	"	**100**	**Greece**
35.	**Celebrating the 50th anniversary of Replicon Theory**	**S. Taraviras & co-workers**	**Geminin, an inhibitor of DNA replication, regulates self-renewal and commitment decisions in stem cells**	**03/2013**	**Paris, FR**	"	**>300**	**World-wide**
36.	**19th Congress of the European Society of Biomechanics**	**S. Topouzis, V. Kotsikoris, & co-workers**	**Effect of shear stress, cyclic uniaxial stretch and gravitational unloading on the cytoskeleton and gene expression of bovine capillary endothelial cells**	**08/2013**	**Patras, GR**	"	**>300**	**European Countries**
37.	**11th International Conference on Biology and Synchrotron Radiation (BSR)**	**I. Margiolaki & G.A Spyroulias**	**Synchrotron Radiation reveals polymorphism of human insulin crystals**	**09/2013**	**Hamburg, DE**	"	**>300**	**World-wide**
38.	**26th Meeting of the Hellenic Society for Neuroscience**	**Nikolopoulou P, Stathopoulou A, Lygerou Z., Taraviras S.**	**Geminin, an inhibitor of DNA replication, regulates self-renewal and commitment decisions in stem cells**	**12/2013**		"	**>150**	**European Countries**
39.	**64th EEBMB**	**G.A. Spyroulias & coworkers**	**Structure-Function relationship of mutated forms of ARKADIA E3 Ubiquitin Ligase RING domain**	**12/2013**	**Athens, GR**	"	**>450**	**World-wide**

40.	**64th EEBMB**	**G.A. Spyroulias & coworkers**	**NMR insights on the conformational plasticity of the extracellular domain of a prokaryotic nAChR homologue**	**12/2013**	**Athens, GR**	"	"	"
41.	**64th EEBMB**	**G.A. Spyroulias & coworkers**	**NMR conformational dynamics of ARKADIA & ARKADIA-2 E3 Ubiquitin Ligases RING domains**	**12/2013**	**Athens, GR**	"	"	"
42.	**64th EEBMB**	**G.A. Spyroulias & coworkers**	**Structural and functional studies on La and RRM1 motifs of an important tRNA-associated chaperone**	**12/2013**	**Athens, GR**	"	"	"
43.	**40th Annual Panhellenic Medical Conference**	**K.Poulas, G.Lagoumintzis & coworkers**	**Chemoimunological study of wireless microcurrent electrical stimulation in treatment of wounds**	**05/2014**	**Athnes, GR**	"	**>250**	**Greece**
44.	**40th Annual Panhellenic Medical Conference**	**K.Poulas, M.Kambouris & coworkers**	**Non-contact current transfer in antimacrobial treatement: clinical and in vitro studies**	**05/2014**	**Athens, GR**	"	"	"
45.	**Meeting for the National Greek Roadmap of Research Infrastructures**	**G.A.Spyroulias**	**UPAT-RISF**	**06/2014**	**Athens, GR**	"	**100**	**Greece**

46.	**EPDIC14 - The European Powder Diffraction Conference**	**A. Valmas & I. Margiolaki**	**Novel crystalline phase and first order phase transitions of human insulin complexed with phenol-derivatives**	**06/2014**	**Aarhus, DK**	**“**	**>400**	**World-wide**
47.	**VIth MuscleTech Network Workshop**	**G. Lagoumintzis, K. Poulas et al.**	**Innovative electroceuticals for accelerating trauma recovery and enhancing athletes’ muscle performance**	**11/2014**	**Barcelona, Spain**	**“**	**>500**	**World-wide**
48.	**MOBIHEALTH 2014, 4th International Conference on Wireless Mobile Communication and Healthcare**	**G. Lagoumintzis, S. Sideris, M. E. Kambouris et al.**	**Wireless Microcurrent stimulation technology improves firework burn healing. Clinical applications of WMCS tehnology**	**11/2014**		**“**	**>400**	**World-wide**
49.	**3rd European Meeting on Hydrogen Sulfide**	**. Topouzis & A. Papapetropoulos**	**The role of hydrogen ulphide in the adherence of endothelial cells in vitro**	**05/2014**		**“**	**>200**	**European Countries**
50.	**4AUM – BIO-NMR Conference**	**Marousis K, Herrmann T, V Episkopou, et al.**	**INVESTIGATION OF THE STRUCTURE-ACTIVITY RELATIONSHIP OF E3 UBIQUITIN LIGASES: MUTATIONS OF ARKADIA RING-H2 DOMAIN**	**05/2014**	**Warsaw, Poland**	**“**	**>150**	**European Countries**

51.	4AUM – BIO-NMR Conference	Argyriou A., Chasapis CT, Corringer J.-P.	NMR insights on the conformational plasticity of the extracellular domain of a prokaryotic nAChR homologue	05/2014	Warsaw, Poland	"	"	"
52.	FEBS-EMBO	Vourtsis D, Argyriou A., Stathopoulos C et al.	NMR CONFORMATIONAL DYNAMICS OF La AND RRM1 MOTIFS OF La PROTEIN	09/2014	Paris, FR	"	>1000	World-wide
53.	FEBS-EMBO	Tsika A., Ntonti D., Coutard B, Bentrop D, et al.	SOLUTION NMR STUDY OF VIRAL MACRO DOMAINS	09/2014	Paris, FR	"	"	"
54.	25th tRNA Conference	Vourtsis, D. Et al.	NMR conformational dynamics of La protein domains La, RRM1 and RRM2	09/2014	Kyllini, GR	"	>150	World-wide
55.	CTSB & HeCrA7	A. Argyriou, C.T. Chasapis, D. Bentrop, G.A.Spyroulias	NMR conformation dynamics of La and RRM1 motifs of La protein	09/2014	Crete, GR	"	>100	World-wide
56.	CTSB & HeCrA7	M. Birkou, C.T. Chasapis, D. Bentrop, G.A.Spyroulias	NMR insights in the structure-activity relationship of Arcadia E3 ubiquitin ligase	09/2014	Crete, GR	"	"	"
57.	CTSB & HeCrA7	D. S. Chatzileontiadou, A. Tsika, et al.	High yield production of Met(-1)-Angiogenin for Xray crystallography and NMR studies	09/2014	Crete, GR	"	"	"

58.	**CTSB & HeCrA7**	**A.C. Tsika, et al.**	**Solution NMR study of viral macro domains**	**09/2014**	**Crete, GR**	"	"	"
59.	**16th Hellenic Symposium of Medicinal Chemistry**	**Tsika A., Spyroulias G.A.et al.**	**EXPRESSION AND STRUCTURAL DETERMINATION OF MAYARO VIRUS MACRO DOMAIN VIA NMR SPECTROSCOPY**	**01/2015**	**Patras, GR**	"	**>120**	**Greece/ EU countries**
60.	**16th Hellenic Symposium of Medicinal Chemistry**	**Argyriou A., Chasapis CT., Bentrop D., Spyroulias GA**	**NMR CONFORMATIONAL DYNAMICS OF LAM, RRM1 AND RRM2 DOMAINS OF La PROTEIN**	**01/2015**	**Patras, GR**	"	"	"
61.	**16th Hellenic Symposium of Medicinal Chemistry**	**Giannari D, Chasapis CT, Bentrop D, Episkopou V, Spyroulias G.A.**	**AN NMR-DRIVEN STUDY ON THE FUNCTIONAL AND STRUCTURAL ROLE OF THE CONSERVED TRYPTOPHAN IN ARKADIA & ARKADIA-2C RING DOMAINS**	**01/2015**	**Patras, GR**	"	"	"
62.	**16th Hellenic Symposium of Medicinal Chemistry**	**Ntonti D, Coutard B, Papageorgiou N, Spyroulias GA**	**SOLUTION NMR STUDY OF VIRAL MACRO DOMAINS**	**01/2015**	**Patras, GR**	"	"	"
63.	**16th Hellenic Symposium of Medicinal Chemistry**	**Vourtsis D, Chasapis CT, Bentrop D, et al.**	**EXPRESSION OF THE N-TERMINAL DOMAIN OF ANTHRAX LETHAL FACTOR AND PREDICTION OF ITS SECONDARY STRUCTURE VIA NMR ANALYSIS**	**01/2015**	**Patras, GR**	"	"	"

64.	**Patras IQ**	**G.A. Spyroulias et al.**	**NMR Applications in Biomedical research, Analytical Chemistry and Diagnostics**	**04/2015**	**Patras, GR**	"	**>400**	**Greece**
65.	**6th Panhellenic Conference on Biomedical Technologies**	**G. Lagoumintzis, K. Poulas et al.**	**Muscle strain recovery with the aid of pulsed electromagnetic fields in professional football players**	**05/2015**	**Athens, GR**	"	**>300**	**Greece**
66.	**41o PanHellenic Medical Congress**	**G. Lagoumintzis, K. Poulas et al**	**Combined therapy of Wireless Microcurrent stimulation technology and pulsed electromagnetic fields for chronic wounds**	**06/2015**	**Athens, GR**	"	"	"
67.	**41o PanHellenic Medical Congress**	**G. Lagoumintzis, K. Poulas et al**	**Muscle strain recovery with the use of Wireless Microcurrent stimulation technology in high performance athletes**	**06/2015**	**Athens, GR**	"	"	"
68.	**NMR Applications in Life Sciences: Exploring Peptides & Proteins**	**G. Lagoumintzis, K. Poulas et al.**	**Crystallization of proteins under the influence of microcurrents and electromagnetic fields**	**06/2015**	**Patras, GR**	"	**>250**	**World-wide**

69.	**NMR Applications in Life Sciences: Exploring Peptides & Proteins**	**G. Lagoumintzis, K. Poulas et al.**	**Study of the effect of pulsed electromagnetic fields (pemf) in classical swine fever virus polymerase (csfvp) crystallization**	**06/2015**	**Patras, GR**	"	"	"
70.	**NMR Applications in Life Sciences: Exploring Peptides & Proteins**	**A. Niarchos, G. Lagoumintzis, K. Poulas et al**	**Apoptosis blocking assay: an accurate and quick assay for baculovirus titration**	**06/2015**	**Patras, GR**	"	"	"
71.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Argyriou A., Chasapis CT., Bentrop D., Spyroulias GA**	**NMR CONFORMATIONAL DYNAMICS OF LAM, RRM1 AND RRM2 DOMAINS OF La PROTEIN**	**06/2015**	**Patras, GR**	"	"	"
72.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Argyriou A., Alexandropoulos I. Papapetropoulos A.**	**NMR study of a soluble Guanylate Cyclase (sGC) human homologue: the HNOX domain from Nostoc sp.**	**06/2015**	**Patras, GR**	"	"	"
73.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Argyriou A., Corringer J.-P. Et al.**	**NMR INSIGHTS ON THE CONFORMATIONAL PLASTICITY OF THE EXTRACELLULAR DOMAIN OF A PROKARYOTIC nAChR HOMOLOGUE**	**06/2015**	**Patras, GR**	"	"	"

74.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Birkou M., Marousis K., Herrmann T., et al.**	**ATOMIC-LEVEL INSIGHTS ON THE STRUCTURAL AND FUNCTIONAL ROLE OF A CONSERVED TRP RESIDUE IN RING DOMAIN CLASS OF E3 UBIQUITIN LIGASES**	**06/2015**	**Patras, GR**	"	"	"
75.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Bouga M., Argyriou A., et al.**	**CLONING, ISOLATION AND EXPRESSION OF THE RING DOMAIN OF RNF11, A ZINC Zn(II) PROTEIN, WITH E3 UBIQUITIN LIGASE ACTION**	**06/2015**	**Patras, GR**	"	"	"
76.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides &**	**Ntonti D., Makrynitsa G, Coutard B, et al.**	**NMR INSIGHTS ON STRUCTURE OF TWO VIRAL MACRO DOMAINS**	**06/2015**	**Patras, GR**	"	"	"
77.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Marousis KD, Birkou M, Bentrop D, et al.**	**Investigation of the structure-activity relationship of E3 ubiquitin ligases: mutations of Arkadia RING-H2 domain**	**06/2015**	**Patras, GR**	"	"	"

78.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Tsika A, Melekis S, Chasapis CT, Coutard B, et al.**	**Structure– Activity Relationship study of Mayaro and Chikungunya viruses' macro domains via solution NMR spectroscopy**	**06/2015**	**Patras, GR**	"	"	"
79.	**SEEDRUG NMR Applications in Life Sciences – Exploring Peptides & Proteins**	**Vourtsis D, Chasapis CT, Bentrop D, et al.**	**EXPRESSION OF THE N-TERMINAL DOMAIN OF ANTHRAX LETHAL FACTOR AND PREDICTION OF ITS SECONDARY STRUCTURE VIA NMR ANALYSIS**	**06/2015**	**Patras, GR**	"	"	"
80.	**7th International Conference on cGMP**	**A. Argyriou, A. Papapetropoulos, G.A. Spyroulias**	**NMR study of a soluble Guanylate Cyclase (sGC) human homologue: the H-NOX domain from Nostoc sp.**	**06/2015**	**Trier, DE**	"	**>250**	**World-wide**

Section B (Confidential or public: confidential information to be marked clearly)
Part B1

The applications for patents, trademarks, registered designs, etc. shall be listed according to the template B1 provided hereafter.

The list should, specify at least one unique identifier e.g. European Patent application reference. For patent applications, only if applicable, contributions to standards should be specified. This table is cumulative, which means that it should always show all applications from the beginning until after the end of the project.

Template B1: List of applications for patents, trademarks, registered designs, etc.					
Type of IP Rights[9] [10]:	**Confidential Click on YES/NO**	**Foreseen embargo date dd/mm/yyyy**	**Application reference(s) (e.g. EP123456)**	**Subject or title of application**	**Applicant (s) (as on the application)**
Patent	NO	-	WO	Crystallization of Proteins	WMCS Technology
Registered Designs (Greek	YES		201503007	Microbiology	Ikonomidis K. et al
Registered Designs (Greek	YES		20130100384	Cheese production	Ikonomidis K. et al

Part B2
Please complete the table hereafter:

[9] Note to be confused with the "EU CONFIDENTIAL" classification for some security research projects.
[10] A drop down list allows choosing the type of IP rights: Patents, Trademarks, Registered designs, Utility models, Others.

Type of Exploitable Foreground[11]	Description of exploitable foreground	Confidential Click on YES/NO	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application[12]	Timetable, commercial or any other use	Patents or other IPR exploitation (licences)	Owner & Other Beneficiary(s) involved
	New crystallization method, under microcurrent conditions	NO		Crystallization methodology	Medical Industrial inspection	2017		WMCS Technology,…..Poulas K
	Antimicrobial effect of microcurrents	YES			Medical Industrial inspection	---		Ikonomidis K, …. Poulas K
	Increase of cheese yield under special conditions	YES			Food Industrial inspection	2017		Ikonomidis K, …. Poulas K

In addition to the table, please provide a text to explain the exploitable foreground, in particular:

- Its purpose
- How the foreground might be exploited, when and by whom
- IPR exploitable measures taken or intended
- Further research necessary, if any

Potential/expected impact (quantify where possible)

[11] A drop down list allows choosing the type of foreground: General advancement of knowledge, Commercial exploitation of R&D results, Exploitation of R&D results via standards, exploitation of results through EU policies, exploitation of results through (social) innovation.

[12] A drop down list allows choosing the type sector (NACE nomenclature) : http://ec.europa.eu/competition/mergers/cases/index/nace all.html

4.3 Report on societal implications

Replies to the following questions will assist the Commission to obtain statistics and indicators on societal and socio-economic issues addressed by projects. The questions are arranged in a number of key themes. As well as producing certain statistics, the replies will also help identify those projects that have shown a real engagement with wider societal issues, and thereby identify interesting approaches to these issues and best practices. The replies for individual projects will not be made public.

A General Information *(completed automatically when **Grant Agreement number** is entered.*	
Grant Agreement Number:	285950
Title of Project:	SEE DRUG
Name and Title of Coordinator:	Georgios A. Spyroulias, Professor

B Ethics	
1. Did your project undergo an Ethics Review (and/or Screening)? • If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final project reports? Special Reminder: the progress of compliance with the Ethics Review/Screening Requirements should be described in the Period/Final Project Reports under the Section 3.2.2 *'Work Progress and Achievements'*	***0Yes ●No***
2. Please indicate whether your project involved any of the following issues (tick box) :	***YES***
RESEARCH ON HUMANS	
• Did the project involve children?	NO
• Did the project involve patients?	NO
• Did the project involve persons not able to give consent?	NO
• Did the project involve adult healthy volunteers?	NO
• Did the project involve Human genetic material?	NO
• Did the project involve Human biological samples?	NO
• Did the project involve Human data collection?	NO
RESEARCH ON HUMAN EMBRYO/FOETUS	
• Did the project involve Human Embryos?	NO
• Did the project involve Human Foetal Tissue / Cells?	NO
• Did the project involve Human Embryonic Stem Cells (hESCs)?	NO
• Did the project on human Embryonic Stem Cells involve cells in culture?	NO
• Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	NO
PRIVACY	
• Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	NO
• Did the project involve tracking the location or observation of people?	NO
RESEARCH ON ANIMALS	
• Did the project involve research on animals?	NO
• Were those animals transgenic small laboratory animals?	NO
• Were those animals transgenic farm animals?	NO

• Were those animals cloned farm animals?	NO
• Were those animals non-human primates?	NO
RESEARCH INVOLVING DEVELOPING COUNTRIES	
• Did the project involve the use of local resources (genetic, animal, plant etc)?	NO
• Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	NO
DUAL USE	
• Research having direct military use	0 Yes ● No
• Research having the potential for terrorist abuse	NO

C Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator		1
Work package leaders	2	10
Experienced researchers (i.e. PhD holders)	3	13
PhD Students	5	3
Other **+ Technical/Managment**	4	1

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	
Of which, indicate the number of men:	**X**

D Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project?

● Yes
○ No

6. Which of the following actions did you carry out and how effective were they?

	Not at all effective				Very effective
❑ Design and implement an equal opportunity policy	○	○	○	●	○
❑ Set targets to achieve a gender balance in the workforce	○	○	○	●	○
❑ Organise conferences and workshops on gender	○	○	●	○	○
❑ Actions to improve work-life balance	○	○	●	○	○

○ Other:

7. Was there a gender dimension associated with the research content – i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?

○ Yes- please specify

● No

E Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?

● Yes- please specify: Organized a summer school with students

○ No

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?

● Yes- please specify: Websites,Booklets,Video,DVD,Live Streaming

○ No

F Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?

● Main discipline[21]: 1.5

● Associated discipline[21]: 1.3

● Associated discipline[21]: 3.1

G Engaging with Civil society and policy makers

11a Did your project engage with societal actors beyond the research community? *(if 'No', go to Question 14)*

○ Yes
● No

11b If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?

○ No
○ Yes- in determining what research should be performed
○ Yes - in implementing the research
○ Yes, in communicating /disseminating / using the results of the project

[21] Insert number from list below (Frascati Manual).

11c In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	○ ○	Yes No

12. Did you engage with government / public bodies or policy makers (including international organisations)

- ○ No
- ○ Yes- in framing the research agenda
- ○ Yes - in implementing the research agenda
- ○ Yes, in communicating /disseminating / using the results of the project

13a Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?

- ○ Yes – as a **primary** objective (please indicate areas below- multiple answers possible)
- ○ Yes – as a **secondary** objective (please indicate areas below - multiple answer possible)
- ○ No

13b If Yes, in which fields?

Agriculture		Energy		Human rights	
Audiovisual and Media		Enlargement		Information Society	
Budget		Enterprise		Institutional affairs	
Competition		Environment		Internal Market	
Consumers		External Relations		Justice, freedom and security	
Culture		External Trade		Public Health	
Customs		Fisheries and Maritime Affairs		Regional Policy	
Development Economic and Monetary Affairs		Food Safety		Research and Innovation	
		Foreign and Security Policy		Space	
Education, Training, Youth		Fraud		Taxation	
Employment and Social Affairs		Humanitarian aid		Transport	

13c If Yes, at which level?

- ○ Local / regional levels
- ○ National level
- ○ European level
- ○ International level

H Use and dissemination

14. How many Articles were published/accepted for publication in peer-reviewed journals?	40
To how many of these is open access[22] provided?	24
How many of these are published in open access journals?	13
How many of these are published in open repositories?	n/a
To how many of these is open access not provided?	16
Please check all applicable reasons for not providing open access:	
☑ publisher's licensing agreement would not permit publishing in a repository ❑ no suitable repository available ☑ no suitable open access journal available ❑ no funds available to publish in an open access journal ❑ lack of time and resources ❑ lack of information on open access ❑ other[23]: ……	

15. How many new patent applications ('priority filings') have been made? *("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).*		3
16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	Trademark	
	Registered design	2
	Other	1 (patent)
17. How many spin-off companies were created / are planned as a direct result of the project?		2
Indicate the approximate number of additional jobs in these companies:		

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:

☑	Increase in employment, or	❑	In small & medium-sized enterprises
❑	Safeguard employment, or	❑	In large companies
❑	Decrease in employment,	❑	None of the above / not relevant to the project
☑	Difficult to estimate / not possible to quantify		

[22] Open Access is defined as free of charge access for anyone via Internet.
[23] For instance: classification for security project.

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (*FTE = one person working fulltime for a year*) jobs:	*Indicate figure:* 18
Difficult to estimate / not possible to quantify	❑

I Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?

○ Yes ● No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?

○ Yes ● No

22 Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?

☑	Press Release	❑	Coverage in specialist press
☑	Media briefing	❑	Coverage in general (non-specialist) press
☑	TV coverage / report	☑	Coverage in national press
❑	Radio coverage / report	☑	Coverage in international press
☑	Brochures /posters / flyers	☑	Website for the general public / internet
☑	DVD /Film /Multimedia	☑	Event targeting general public (festival, conference, exhibition, science café)

23 In which languages are the information products for the general public produced?

☑	Language of the coordinator	☑	English
❑	Other language(s)		

***Question F-10*:** Classification of Scientific Disciplines according to the Frascati Manual 2002 (Proposed Standard Practice for Surveys on Research and Experimental Development, OECD 2002):

FIELDS OF SCIENCE AND TECHNOLOGY

1. NATURAL SCIENCES
1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]
1.2 Physical sciences (astronomy and space sciences, physics and other allied subjects)
1.3 Chemical sciences (chemistry, other allied subjects)
1.4 Earth and related environmental sciences (geology, geophysics, mineralogy, physical geography and other geosciences, meteorology and other atmospheric sciences including climatic research, oceanography, vulcanology, palaeoecology, other allied sciences)
1.5 Biological sciences (biology, botany, bacteriology, microbiology, zoology, entomology, genetics, biochemistry, biophysics, other allied sciences, excluding clinical and veterinary sciences)

2 ENGINEERING AND TECHNOLOGY
2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)

2.2 Electrical engineering, electronics [electrical engineering, electronics, communication engineering and systems, computer engineering (hardware only) and other allied subjects]

2.3. Other engineering sciences (such as chemical, aeronautical and space, mechanical, metallurgical and materials engineering, and their specialised subdivisions; forest products; applied sciences such as geodesy, industrial chemistry, etc.; the science and technology of food production; specialised technologies of interdisciplinary fields, e.g. systems analysis, metallurgy, mining, textile technology and other applied subjects)

3. MEDICAL SCIENCES

3.1 Basic medicine (anatomy, cytology, physiology, genetics, pharmacy, pharmacology, toxicology, immunology and immunohaematology, clinical chemistry, clinical microbiology, pathology)

3.2 Clinical medicine (anaesthesiology, paediatrics, obstetrics and gynaecology, internal medicine, surgery, dentistry, neurology, psychiatry, radiology, therapeutics, otorhinolaryngology, ophthalmology)

3.3 Health sciences (public health services, social medicine, hygiene, nursing, epidemiology)

4. AGRICULTURAL SCIENCES

4.1 Agriculture, forestry, fisheries and allied sciences (agronomy, animal husbandry, fisheries, forestry, horticulture, other allied subjects)

4.2 Veterinary medicine

5. SOCIAL SCIENCES

5.1 Psychology

5.2 Economics

5.3 Educational sciences (education and training and other allied subjects)

5.4 Other social sciences [anthropology (social and cultural) and ethnology, demography, geography (human, economic and social), town and country planning, management, law, linguistics, political sciences, sociology, organisation and methods, miscellaneous social sciences and interdisciplinary , methodological and historical S1T activities relating to subjects in this group. Physical anthropology, physical geography and psychophysiology should normally be classified with the natural sciences].

6. HUMANITIES

6.1 History (history, prehistory and history, together with auxiliary historical disciplines such as archaeology, numismatics, palaeography, genealogy, etc.)

6.2 Languages and literature (ancient and modern)

6.3 Other humanities [philosophy (including the history of science and technology) arts, history of art, art criticism, painting, sculpture, musicology, dramatic art excluding artistic "research" of any kind, religion, theology, other fields and subjects pertaining to the humanities, methodological, historical and other S1T activities relating to the subjects in this group]