SEVENTH FRAMEWORK PROGRAMME

FP7 Marie Curie Actions – People

Co-funding of Regional, National and International Programmes

DELIVERABLE

1.3 - Final Report

INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

NanoTrain for Growth

Project n°: 600375

Project Acronym: NanoTRAINforGrowth

Project Full Name: INL Fellowship programme in nanotechnologies for biomedical, environment and food applications

Marie Curie Actions
COFUND Final Report

Period covered: 01/01/2013 to 31/12/2017

Period number:

Start date of project: 1st January 2013

Project beneficiary name: International Iberian Nanotechnology Laboratory (INL)

Project beneficiary organisation name: International Iberian Nanotechnology Laboratory (INL)

Date of preparation: February 2018

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Duration:

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1 INTRODUCTION

This is the final report covering the period of the project from 01/01/2013 to 31/12/2017 of the INL NanoTRAINforGrowth Fellowship programme (in nanotechnologies for biomedical, environment and food applications) financed under the People Programme – Marie Curie Cofunding of Regional, National and International Programmes (COFUND) under the 7th Framework Programme of the European Community.

2 PUBLISHABLE SUMMARY

The International Iberian Nanotechnology Laboratory´s (INL) Post-doctoral fellowship programme allowed for experienced researchers (from all over the world and nationality) to sketch out a research project and work on their own research idea, at INL´s Facilities. Fellows have access to a completely new state-of-the-art infrastructure and have the opportunity to enhance their expertise via a research project, in a scientific topic of their choice, and that is well within INLs strategic research and technological development areas. The NanoTRAINforGrowth COFUND programme funded 24 fellows. A 2 year employment contract was offered to each fellow.

The International Iberian Nanotechnology Laboratory's (INL) post-doctoral programme was designed to support the career development of researchers by enhancing their research experience and to integrate them in world class research facilities, in a stimulating research environment with state-of-the art equipment and excellent performing research groups. INL´s Nanotrainforgowth COFUND programme was focused in 4 main research areas: 1) Nanomedicine; 2) Environmental & Food Control. 3) Nanoelectronics and 4) Nanomachines & Nanomanipulation.

In total, during the 60 months of contract duration, the NanoTRAINforGrowth launched 5 calls and 24 fellows from eight nationalities were hired.

3 PROJECT OBJECTIVES FOR THE PERIOD

The project´s objectives were achieved. The main deviation were the number of published calls is comparison to the workplan *in Annex I of the Grant Agreement*. We were only expecting to launch 2 calls for the total duration of the project and a total of 5 calls had to be launched. All the calls were launched and closed.

No recommendations were made in the previous review.

Facts & Figures of the NanoTRAINforgrowth programme for the contract duration until month 60 are:

- Five calls for proposals were launched;
- **24** fellows were hired;
- Post-doctoral experience of the recruited fellows are distributed as follow: **20%** with 4 years' experience; **60** with less than 4 years and **20%** with more than 4 year's experience;
- Fellows come from **8** different nationalities: **60%** are coming from the EU and the remaining **40% are** coming from Asia and South America;
- 2 fellows resigned;
- All calls were largely disseminated. Actually, huge efforts were on disseminating each of the calls. Dissemination means were through websites, research jobsearch engines; personal contacts, targeted emails, specialized journals and events;
- **2** trainings were done in collaboration with Porto Business School "From the Lab to the Market". The trainings were focused on the following complementary skills: Competences & Ethics; Management & Leadership; Strategy & Marketing; Finance & Accounting and Innovation & Entrepreneurship.

4 Calls Launched

The table below presents an overall summary all the calls.

Table Nº1: Number Calls Published, Applications Received and Nº Selected Fellows.

Call	Launch	Deadline	Nº applications Received	Nº Elegible applications	Nº Non eligible applications	Positions offered	Fellows employed
1st	4 Feb 2013	4 Jul 2013	80	65	15	6	3
2nd	17 Sep 2013	17 Nov 2013	78	46	32	10	9
3rd	19 May 2014	20 Jul 2014	55	36	19	6	4
4th	12 Nov 14	11 Jan 15	42	35	8	5	5
5th	30 Jun 16	31 Aug 16	85	62	23	3	3

TOTAL	**255**	**182**	**66**	**30**	**24**

In the actual reporting period we have 2 fellows employed.

5 WORK PROGRESS AND ACHIEVEMENTS DURING THE PERIOD

5.1 Deviations

No major deviations were encountered during this reporting period.

5.2 Dissemination

All calls were largely disseminated. Actually, huge efforts were on disseminating each of the calls. Dissemination means were through websites, research jobsearch engines; personal contacts, targeted emails, specialized journals and events.

- Websites:
  - ⇒ NanoTrainforGRowth – ntg.inl.int
  - ⇒ INL webpage; facebook, twitter and Linkedin
  - ⇒ Euraxess
  - ⇒ Research Gate
- Nature Jobs - featured highlight and hardcopy (2nd Call)
- IEEE - Institute of Electrical and Electronics Engineers (3rd Call)
- INL´s staff members personal networks
- List of worldwide coverage of university communications departments
- List of specific dedicated contacts related with INL´s main RTD areas
- List of university communication departments in Spain
- List of university contacts in Portugal

The whole programme´s team members were fully involved in dissemination activities. The activities were designed to provide information to potential fellowship applicants and other stakeholders, which were informed during the programme about its activities, calls and progress. Furthermore, information material about the programme´s application procedures and results were periodically prepared and disseminated. Electronic newsletters were developed, containing the results and activities performed and achieved within the programme. Each newsletter was electronically mailed to stakeholders and all INL community (example enclosed).

Each fellow was invited to share their participation in conferences, seminars and events at INL or abroad and to share posters, presentations and publications related to their research proposal and correspondent research activities (examples enclosed). The message of some advertising material was focused on practical aspects and outcomes of scientific knowledge, touching directly on applications that influence people's daily life with the associated risks and opportunities. It was also focused on the way science is developing, since it is also important to create awareness about new scientific developments. Some of the materials were developed at a level accessible for secondary school students, thereby encouraging students who visited INL to consider a career in research.

Information material covering various elements of the programme, both general and specific, were

produced in English and distributed towards a large number of people. Flyers/Posters were also developed containing the main information on the project. Objectives, call and application procedures were disseminated every time researchers travel to attend meetings, conferences and seminars (examples encloses).

5.3 Evaluation and selection of fellows

The evaluation process for the fellow proceeded as follows:

First stage: candidate eligibility check

Second stage: CV and RTD project evaluation

Evaluation of the project proposals and CVs of the candidates by experts. After this step of the evaluation, the results were handled to the Selection Committee which elaborated a list of excluded candidates and shortlisted candidates. The Selection Committee then suggested a list of shortlisted candidates for the interview. The methodology for assessing the CVs was the one included in annex 1 of the grant agreement:

Table Nº2: Evaluation grid for CVs

General skills	Max. Score	Skills parameters	Skills	Score
Experience	5	Pre-doctoral experience Post-doctoral Experience	Candidates are evaluated on multiple parameters, including but not limited to, laboratory and computational experience, participation in general laboratory management activities, courses taught, coordination of bachelor and master students, etc.	
Scientific outputs	30	Publications Patents	Patents & scientific publications: book chapters, articles in scientific journals and proceedings of international conferences that the candidate has authored or co-authored. The impact of publications (measured by the impact factor of the journals and the number of citations by other authors) is taken into account as well as scientific and technological level, degree of innovation, evidence of international collaboration, and contribution to advancing the state of knowledge. **Note:** impact factor and number of citations are recommended to be included for each listed publication	
RTD Projects	10	Coordination/ participation in multi-institutional International projects Coordination/ participation in National projects Other projects	Other scientific activities: participation of the candidate as a coordinator or researcher in scientific projects subject to competitive application process taking into account the territorial scope, size, level scientific / technological and degree of innovation. Research autonomy will be valued.	
Mobility and inter-disciplinarity	5	PhD Post-doctoral positions	Candidates with research experience in more than one research institution and/or research areas will be valued	
TOTAL				**50**

And the **Proposed RTD project**

This second stage of the evaluation was performed by INL´s internal researchers. From one side to ensure that the project ideas were well within INL´s activity areas, to assure we had the equipment needed for the implementation of the fellow´s respective project. INL´s internal researchers then made a 1st screening and raking of researchers, which list was then passed on the selected external evaluators and selection committees established for each of the calls.

The external selection committees would then made their evaluation based on a critical review of the CVs and project´s of each of the top ranked candidates in comparison with the analysis of the overall number of applications received.

Third stage: Interview and final assessment

The selection committees reached their final ranking and pre-selected candidates for the interviews. The best and 1st top ranked application were then selected for the interview and out of these the ones that performed best were selected.

5.4 Selected applications fellow per call

Table Nº 3 – Selected fellows and title of RTD projects for all 5 calls launched.

Three calls during the 1st reporting period (month 1-24); two calls launched during the reporting period (months 25-48) and no calls launched during this reporting period (months 48-60).

Call Nº	Name	Panel	Project Title
1st Call	Alejandro Ferron	Nanoelectronics	Understanding Inelastic Electron Tunneling Spectrocopy in Magnetic Tunnel junctions
	Honyan BI	Nanomedicine	Microfluidic Device for in-vitro Drug Metabolism
	Laura Salonen	Nanomanipulation	Nanoporous Chiral Covalent Organic Frameworks for Molecular Sensing and Biocatalysis
	Yaunshui Zheng	Nanoelectronics	Plasmonic Solar Water Splitting
	Andre Pereira	Nanoelectronics	Spincaloritronic-based Devices as a New Route for Energy Harvesting
	Soumen Das	Nanomedicine	Multifunctional cor-shell nanoparticles for cancer theray and imaging
2nd Call	Diana Viegas	Nanoelectronics	Core-shell nanoparticles for biomedical applications: synthesis and characterization via light scattering and characterization via light scattering
	Xiaoguang Wang	Nanoelectronics	Development of High-performance Electrocatalysts Consisting of TiO2/M (M=Pt, Pd) Composite Nanostructures via One-pot Dealloying Route
	Vanessa	Nanoelectronics	$CuInSe_2$ quantum dots for Intermediate Band Solar Cells

	Iglesias		
	Rosana Dias	Nanoelectronics	Design and fabrication of an AlN-based broadband oscillator with piezoelectric transduction for microenergy harvesting applications
	Pablo fucinos	Food	Smart-Nanohydrogels as Phage-Delivery Systems for the Control of Foodborne Pathogens (Smart-Nano-Phages)
	Raquel Queirós	Food	Biosensing device for the detection of paralytic shellfish poisons based on smart nanomaterials
	Karola Boeheme	Food	Development of a biosensing device for food control applications, combining Gold Nanoparticle and Ligation Chain Reaction
	Ines Pinto	Nanomedicine	Cell-contraction markers for diagnosis of epithelial tumors
	Andrey Timopheev	Nanoelectronics	Dynamics of a spin-torque oscillator under the coherent phonon pumping
	David Caballero	Nanomedicine	Mechanics of migrating tissues on nano-engineered polarized biomimetic systems for clinical diagnostics
3rd Call	Dehua Xiong	Nanoelectronics	PEC cells for water splitting based on p-type mesoporous ABO2 delafosite photocathodes
	Wei Li	Nanoelectronics	Advanced Sulfur Cathode Materials for the Next-Generation Li-S Batteries
	Nagamalai Vasimalai	Food Security & Environment Control	Lab-on-a-chip for highly selective and instant detection of enviromenmental and health hazard chemicals in lateral flow water and food samples using novel nanomaterials flow and food sample using novel nanomaterials
	Juan Andrés Rubiolo Gaytán	Food Security & Environment Control	Magnetoresistive biosensor development for the detector of toxicogenic microalgae
	Ana Sousa Hervés	Nanomedicine & Nanomanipulation	Biodegradable nanogels for multidrug resistance cancer therapies
	Juan Gallo	Nanomedicine & Nanomanipulation	Externally actuated theranostic magnetic nanoparticles for cancer diagnosis and controlled drug release
4th Call	Marisa Passos	Food	Targeted nanoparticles for delivery of marine phycotoxins with pharmacological potential as therapeutical agents
	Alejandro Maestu	Food	Multipathogen detection lab-on-a-chip based on Loop-mediated Isothermal Amplification combined with gold nanoparticles
	Liliana Pires	Nanomedicine	Development and Application of Microneedles to Induce Immunotolerance in the Context of Multiple Sclerosis
	Edite Figueiras	Nanomedicine	**Development of a multi-color MIET-FLIM system for the study of cell motility in cancer cells and adult stem cells**
	Tangyou Sun	Nanoelectronics	High conversion efficiency nano-structured optoelectronic devices realized by simple, cheap, high throughput nanotechnologies
5th Call	Oscar Silvestre	Nanomedicine	Engineered nanoparticles targeting the mitochondria for organelle bio-sensing, enhanced photothermal therapy and gene/drug delivery
	Andrea Duarte	Nanomedicine	Nanoparticles for microglia targeting: from early diagnosis to neurological diseases treatment.
	Kamal Adberrafi	Nanomaterials	Micro-concentrator solar cells

Note: Names highlighted in red accepted other professional challenges.

5.5 Selection Committees per call launched

The evaluators were selected based on the area expertise. For a matter of coherence the group of evaluators among the five calls was usually repeated. The experts were of Portuguese and Spanish Nationality.

Calls Launched during Reporting Period Month (1-24)

1st call	**Nanoelectronics and Nanomanipulation**		
		Paulo Freitas	Representing the Scientific Director
		Moisés Piedade	Representing an External Expert
		João Pedro Araujo	Representing an External Expert
		Paula Galvão	Representing Human Resources
	NanoMedicine; Food Security& Environment Control		
		Paulo Freitas	Representing the Human Resources
		Luis M. Botana	Representing an External Expert
		M. Lopez Quintela	Representing an External Expert
		Sergio Figueiras	Representing Human Resources

2nd Call	**NanoMedicine; Food Security& Environment Control**		
		Paulo Freitas	Representing the Scientific Director
		Luis M. Botana	Representing an External Expert
		M. Arturo Lopez Quintela	Representing an External Expert
		Paula Galvão	Representing Human Resources
	NanoManipulation		
		Paulo Freitas	Representing the Scientific Director
		João Pedro Araujo	Representing an External Expert
		Luis M. Botana	Representing an External Expert
		Paula Galvão	Representing Human Resources
	Nanomedicine		
		Paulo Freitas	Representing the Scientific Director
		Mario Barbosa	Representing an External Expert
		M. Arturo Lopez Quintela	Representing an External Expert
		Paula Galvão	Representing Human Resources
	Nanoelectronics		
		Paulo Freitas	Representing the Scientific Director
		João Pedro Araujo	Representing an External Expert

		João Pedro Conde	Representing an External Expert
		Paula Galvão	Representing Human Resources

3rd Call	**Nanomedicine & Nanomanipulation**		
		Paulo Freitas	Representing the Scientific Director
		Fernando Monteiro	Representing an External Expert
		Fernando Dominguez	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Nanolectronics		
		Paulo Freitas	Representing the Scientific Director
		João Pedro Araujo	Representing an External Expert
		Luís Carlos	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Food Security& Environment Control		
		Paulo Freitas	Representing the Scientific Director
		Luis M. Botana	Representing an External Expert
		Antonio Vivente	Representing an External Expert
		Fernando Torres	Representing Human Resources

Calls launched during Reporting Period Month (25-48)

4th Call	**Nanomedicine & Nanomanipulation**		
		Paulo Freitas	Representing the Scientific Director
		Prof. Rodolfo Miranda	Representing an External Expert
		Fernando Dominguez	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Nanolectronics		
		Paulo Freitas	Representing the Scientific Director
		João Pedro Araujo	Representing an External Expert
		Luís Carlos	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Food Security& Environment Control		
		Paulo Freitas	Representing the Scientific Director
		Luis M. Botana	Representing an External Expert
		Antonio Vivente	Representing an External Expert
		Fernando Torres	Representing Human Resources

5th Call	**Nanomedicine & Nanomanipulation**		
		Paulo Freitas	Representing the Scientific Director
		Prof. Rodolfo Miranda	Representing an External Expert
		Prof. João Conde	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Nanolectronics		

		Paulo Freitas	Representing the Scientific Director
		João Pedro Araujo	Representing an External Expert
		Luís Carlos	Representing an External Expert
		Fernando Torres	Representing Human Resources
	Food Security& Environment Control		
		Paulo Freitas	Representing the Scientific Director
		Luis M. Botana	Representing an External Expert
		Antonio Vivente	Representing an External Expert
		Fernando Torres	Representing Human Resources

6 Ethical Issues

The funded projects do not present ethical issues.

6.1 Deliverables & Milestones

Table Nº2: List of Deliverables for this period.

Deliverables List		Month
D. 1.2	Periodic report	√
D. 1.3	Final report	√
D. 2.4	Report on how dissemination activities actually took place	√
D. 2.5	Dissemination material on each Fellow project supported	√
D. 3.1	Reports on evaluation and selection process	√
D. 3.2	Reports on helpdesk members and activities	√
D. 4.1	List of selected and funded proposals that may raise potential ethical issues	Not applicable
D.4.2	Annual Reports on ethical issues from all funded projects	Not applicable
D.4.3	List of Experts composing the different ethical committees	Not applicable

Table Nº3: List of Milestones

Milestones	**Delivery Date (months)**
Development of the NanoTRAINforGrowth programme call documents	Month 6
Development of the Programme marketing material (e.g. brochures)	Month 6
Development of the NanoTRAINforGrowth programme website	Month 6
Launch of Call Nº 1	Month 2 (February 2013)
Recruitment of fellows	Month 9 (September 2013)
Launch of Call Nº 2	Month 9 (September, 2013)
Recruitment of fellows	Month 15 (March, 2014)
Launch of Call Nº3	Month 17 (May, 2014)
Recruitment of Fellows	Month 27 (March, 2015)

Launch Call N°4	Month 23 (November,2014)
Recruitment of Fellows	Month 27 (March,2015)
Launch Call N°5	Month 30 (June, 2015)
Recruitment of Fellows	Month 37 (January, 2016)

7 PROJECT MANAGEMENT

This is a mono beneficiary grant so no project management issues have arisen. The main issue was not employing the planned number of fellows in the first calls launched. Three additional calls were launched, (in relation to those initially planned) and a contract amendment on the duration of the project was signed, extending the project duration from 4 to 5 years.