

 PRINCIPE FELIPE CENTRO DE INVESTIGACION	FORMULARIO	D100-P-02-F-01
	JOB OFFER	
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Reference: R1.05/2019

Position title: International PhD Student within ITN MSCA Biomolmacs

Group: I-36

Job description (function and tasks):

The main aim of the project BIOMOLMACS is to establish a multidisciplinary training network on the emerging topic of molecular machines. In the last decades, great efforts have been spent on the development of synthetic strategies for the creation of molecular machines, and these efforts have been acknowledged by the Nobel committee in 2016. The next important step is to incorporate the molecular machines in devices with application potential. For this purpose, the machines will be integrated in mesoscopic assemblies by employing well-defined polymeric components with structural and functional control. Sequence controlled polymers open up greater possibilities in the precise formation of nanoparticles such as polymersomes, and even support the generation of artificial cells. The combined molecular toolbox of molecular machines and precisely designed synthetic macromolecules will support the design of devices with innovative nanomedical application potential. 15 Early Stage Researchers will be trained on the design, synthesis, and characterization of such complex (macro)molecular building blocks, their subsequent devices, as well as their utilization in artificial and living cells. Besides, biophysical understanding of molecular interactions in living/synthetic systems will bridge the gap between fundamental and applied research.

In particular, ESR13 will be trained under the guidance of Prof. Maria J. Vicent (Polymer Therapeutics Lab at CIPF) on mitochondria targeted ROS mediated polypeptide-drug conjugate delivery platforms. The aim is to design bioresponsive polypeptide based conjugates capable to target mitochondria and delivery the selected cargo under specific trigger (ROS). Proline-based block copolymers will be synthesized and fully characterized by NCA polymerization methods. Alternatively star-shaped proline-based polymers with self-assembling properties and crosslinked stabilization possibilities will be also synthesized to explore different topologies and therefore different cellular trafficking and distribution. Proline oligomers already target mitochondria but Triphenyl phosphonium (TPP) or other well-known residues could be added to enhance this effect. Model drugs capable to modulate cell death (mitochondria mediated apoptosis) such as Apaf-1 inhibitors (antiapoptotic) or bcl-2 inhibitors (pro-apoptotic) will be conjugated through ROS-sensitive linkers following well-established post-polymerization modifications. Conjugates and polymers will be labeled with fluorescence probes through non-biodegradable linkers to allow cell trafficking studies.

Selected conjugates will be evaluated in adequate cell models regarding cytotoxicity as well as pharmacological activity. Once demonstrated the mitochondrial targeting, the synthesized proline-rich polymers will be also utilized to coat molecular motors synthesized by ESR1 and to evaluate their intracellular localization. The expected outcome of this project is the design and creation of polypeptide-based drug delivery systems with the ability to selectively release the drug in selected intracellular organelles, such as mitochondria. This would be a key drug delivery platform for many unmet clinical needs as per the importance of mitochondria regulatory roles. The use of the mitochondria-targeted polymers in more complex hybrid

structures could act synergistically to better deliver challenging cargos to such specific organelle.

Research Center description:

The Prince Felipe Research Centre, CIPF, was created to develop first-rate, competitive and internationally relevant research in the fields of Neurobiology, Advanced Therapies, Rare & Genetic Diseases, Molecular Mechanisms of Disease and Computational Genomics. The research centre, located in Valencia, occupies an area of 32,000 m² and it is equipped with the most advanced infrastructures, facilities and technological equipment.

Basic requirements of the position:

- The candidate should have a Bachelor degree in Chemistry, Material sciences, Pharmacy or biotechnology
- High English level spoken and written
- The researchers can be of any nationality and must not have resided in Spain in the last 12 months.

Merits:

1. Training
 - 1.1. Master in Analytics, Chemistry, Material Sciences
2. Experience. In Polymer Therapeutics
3. Knowledge of Cell biology
4. Experience in Organic Synthesis
5. Experience in characterization of materials

Valuation criteria:

1. Training - 15%
 - a. Academic Qualifications - 5%
 - b. Complementary Training - 10%
2. Experience. Polymer Therapeutics. - 25%
3. Knowledge of Organic Synthesis - 25%
4. Experience in Polymer Characterization – 25%
5. Other merits. – 10%

Contract

- Professional category: Predoctoral researcher R1
- Salary Level: In agreement with the ITN MSCA criteria:
 - Living allowance of €37.434,96 (gross salary/year + social security)
 - Mobility allowance of €7,200/year
 - Family allowance where applicable(all values before tax and social security payments)
- Funding Source/Project: H2020-MSCA-ITN-2019 (Proposal no:859416, BIOMOLMACS)
- Duration: 3 years
- Starting date: 1/06/2020
- Working day: Full
- The deadline for receipt of resumes will be open until 15th March 2020

Selection process:

The system will consist in the following phases:

- 1) Phase of compliance with the requirements established in the call. Only candidates with the essential requirements will be considered.
- 2) Merit valuation phase.
- 3) Interview phase (The 3 candidates with the highest score in the merit phase will go to the interview phase)

The selected candidates will go to the interview phase.

How to present your candidacy?

Interested candidates should send their CV, cover letter and references only by email to the following address: selection@cipf.es.

In order to comply with Law 15 /1999 of December 13, for The Protection of Personal Data, we inform you that the personal data contained in your resume will be included in a personal data file owned by the Foundation Prince Felipe Research Centre, CIPF, to enable you to participate in our recruitment process, and if appropriate, it may be used for processing appropriate aid, grants and funding to enable this recruitment.

By submitting your resume, you agree to your personal data to be treated in the commented terms, allowing CIPF to share this data with other public and private institutions with the exclusive aim of applying for grants for the financial funding of this institution and its research projects linked to your data.

You may exercise your rights of access, rectification, cancellation and opposition by writing to CIPF, Calle Eduardo Primo Yúfera , 3, CP 46012 Valencia and attaching your ID.

Please indicate the offer reference number in the subject field. If you have any questions about this offer, please contact the Human Resources Department by email to: recursoshumanos@cipf.es

