

## Expressions of Interest for hosting MSCA fellows

### SPANISH HOSTING OFFERS - IF 2021

#### [EURAXESS](#)

#### TITLE

Marie Curie Post Doc position in INiBICA: **Expression of Interest for Hosting a Marie Curie Fellowship**

#### HOSTING SUMMARY

**The group:** Diabetes Mellitus and associated complications **leading by Prof Manuel Aguilar at the Biomedical research and innovation Institute of Cadiz (Spain)** is interested in **hosting a Marie Curie Fellowship in** Immunomodulation in early stages of Diabetes Mellitus: a potential target for new treatments. **2 Marie Skłodowska-Curie projects are offered to be supervised by Dr Ana Arroba.**

Dr Ana Arroba has been working in immunomodulation during 11 years. After getting her bachelor degree on Biology, she defended her thesis on neurodegenerative processes during Diabetes Mellitus type 1 and joined Dr. de la Rosa and Prf. F. de Pablo's group, as a postdoctoral fellow at CIB-CSIC. In a second postdoctoral fellow, she joined Cotter's Lab in University College of Cork (Ireland). Her research experience is focused on neuroprotection and immunomodulation during degenerative diseases (Diabetes, Retinitis pigmentosa, Diabetic retinopathy, Prion Diseases,..). Dr Ana Arroba has published more than 37 scientific peer-reviewed scientific articles and has taken part of 25 national and 2 international projects.

#### HOSTING DETAILS

##### **Description of the center:**

This project will be carried out at the Proteomic Core facility in the INiBICA (Biomedical Research and Innovation Institute of Cadiz). INiBICA links the health focused research developed between the hospital and the University of Cadiz (UCA). Its main objective is to stimulate, develop and harmoniously integrate basic, clinical and public health research, and to potentiate transnational research to encourage better sharing of the scientific advances in the areas of the prevention and treatment of the most common health problems.

Both institutions, INiBICA and UCA, are dedicated to excellence in patient care, research and education. They all serve local, national and international communities with all the aspects of their mission. Fully equipped laboratories for developing this project (animal care, cell cultures, histology approaches) are available in the different departments. FCADIZ is a private non-profit organization which The Foundation manages the activity of the Cadiz Institute of Biomedical Research and Innovation, hereafter referred to as INiBICA. INiBICA (managed by Foundation of Cadiz, FCADIZ) offers coverage for every healthcare area in the province of Cadiz, with a population of more than 1.2 million people who are potential

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beneficiaries of the activities carried out by the Institute. INIBICA principally consists of the University Hospital Puerta del Mar (Cadiz) and the University of Cadiz, which form its basic nucleus, together with the group of Public Health Centres of the province of Cadiz. In total, it manages more than 780 researchers and an annual budget of some three million euros, a figure which increases yearly.

### Description of the group:

Diabetes Mellitus and associated complications Research Group is a dynamic and multidisciplinary team belonging to the Department of Endocrinology and Institute for Biomedicine Research and Innovation in Cadiz (Instituto Investigación e Innovación Biomédica de Cádiz-INIBICA). The Diabetes Research Team works at the intersection of basic research of diabetes and its complications with a focus on translational aspects to improve population health.

The Post-doctoral Fellow will be in charge of a Marie Skłodowska-Curie Action Individual Fellowships (MSCA IF) funded project that aims to investigate the relationship between the modulation of inflammatory parameters and new therapeutic approaches.

### Description of the project/projects:

- Project 1 Objective: Type 1 Diabetes Mellitus (DM1) is caused by a loss of beta cell mass mediated by a selective autoimmune process. It is started by an inflammatory phenomenon characteristic -insulitis- and is exerted by the action of pro-inflammatory and radical cytokines free by altering the proliferation / cell death balance. Macrophages at the level systemic and microglia in the retinal environment are important regulators of these processes and their loss in tissues determines an inflammatory state. The inflammatory process. It also seems to play a fundamental role in the appearance and progression of main complications of DM such as retinopathy. Along these lines, the increased presence of macrophages of the proinflammatory subtype 1 (M1) during DM, in classical pro-inflammatory cytokines in a pre-diabetic state. Relying on the duality of macrophages, recent studies have shown that the presence of macrophages in subtype 2 (M2) or anti-inflammatories may participate in the Pancreatic regeneration in the diabetic context. This duality is the cornerstone of our study, since we intend to modulate the onset or progression of DM and / or its complications by inducing M2 response in macrophages such as the microglia (retinal immune system) using bioactive molecules of marine origin, which they have anti-inflammatory effects. These bioactive molecules will be encapsulated in biopolymers, since the efficacy of a pharmaceutical treatment is often seen counteracted by inadequate permeability of the target cell membrane, which prevents treatments from reaching their specific intracellular targets. Objectives are: 1) Obtaining a collection of bioactive natural products from both, marine origin and synthetic analogues. 2) Bioactivity assay of the compounds in immune, pancreatic and retinal cell lines. Determination of intracellular signaling pathways involved in the anti-inflammatory response. 3) Level study molecular structure of compounds and bioinformatic design of their mechanism of action. 4) Encapsulation and release of molecules with bioactivity in polymers endowed with pancreatic and / or retinal tropism. 5) Analysis of the efficiency of action of the encapsulated biomolecules with specific tropism in organotypic cultures (ex vivo) of the retina and pancreas of the animal model of T1DM, as. as in the in vivo system using the BB rat.
- Project 2 Objective: The proteomic pattern analysis can help identify critical differences between each state of DM1, which may contribute to classify patients according to their condition and apply a treatment personalized and / or proceed to

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preventive intervention. Thus, the analysis of proteomic profiles at different stages of the progression of DM1 could become a useful tool for the management of DM, due to the great information related to the evolution of the disease and possible secondary complications that could appear DM1 and its complications (retinopathy and nephropathy) present a specific pattern of progression that is not established under any clinical parameter. The identification of the proteomic profiles at each stage of the disease and their association with the development of complications could provide us with a tool useful for the diagnosis and prevention of DM1 and its complications. Objectives: 1. Obtaining biological samples from human populations representative of the different stages of DM1. 2. Proteomic analysis of the biological samples obtained (serum, tear, urine) in patients with DM1. 3. Bioinformatic analysis of the parameters obtained. 4. Validation of potential predictive biomarkers of DM1 and its complications.

### Description Principal Investigator

Prof. Manuel Aguilar has been working in Diabetes Mellitus and associated complications. Specialty of Endocrinology and Nutrition by the MIR system at H.U. Clinical Granada (1982-85). Doctoral Thesis in 1984 (outstanding cum laude). Incorporation through contest opposition to H.U. Puerta del Mar de Cádiz as F.E.A. in 1987. Head of Section (1991), Director of the Clinical Management Unit (2002) and Head of Endocrinology Service and Nutrition (2004). Associate Professor of the UCA 1991-2011; Director of the Comprehensive Diabetes Plan of Andalusia (2009-2015). Professor of University since 2011 and Scientific Deputy Director of the Biomedicine Research Institute of Cádiz (INIBICA; 2017-2018).

#### INVESTIGATION:

He made a 13-month stay (1992-93) as a postdoctoral researcher at the University of Washington (School of Medicine) in Saint Louis (MO, USA) after obtaining FIS Grant for the Extension of Studies (Exte 92/5643). He leads a Research Group (CTS-368) of the PAIDI (Andalusian Plan for Research, Development and Innovation) since 1997 with maintained research activity and scientific production. His data in WOS are: publications 105; sum of times cited 1987; h-index 22; average citations per item 18.9; average citations per year 56.8; peer review 28 (<https://publons.com/dashboard/records/publication/authored/>). Research ID: A-2549-2009 and ORCID: 0000-0003-1396-395x. He has also obtained more than 20 Research Projects as IP in competitive calls and funds for an approximate value of 1 million Euros. He has participated as Speaker and Author of communications in National Congresses (134) and Internationals (56) in the preparation of chapters of Books and Monographs (44) and in Guides and Clinical Consensus (16).

#### TEACHING

In the evaluations of his teaching activity he has always received scores in Q1 in Cadiz University (School of Medicine). He has been responsible for the research training of 18 doctoral thesis (11 doctors). All have received the qualification of Apt cum laude (one, extraordinary prize). He has directed the Teaching Unit of Endocrinology and Nutrition of the Puerta del Mar Hospital (Cádiz) from its creation in 1996; he has been President of the Local Teaching Commission (1996-2000) and Member of the National Commission of Endocrinology and Nutrition (1997-2003).

#### MANAGEMENT

The most notable are the following:

- Director of the Group of the Andalusian Research Plan CTS-368 (1997-present).
- Director of the Clinical Management Unit of Endocrinology and Nutrition (2002-present).
- President of the Local Teaching Commission of the H.U. Puerta del Mar (1996-2000).
- President of the Andalusian Society of Endocrinology and Nutrition (2002-2005).
- President of the Spanish Diabetes Society (2008-2012).

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- Director of the Andalusian Integral Diabetes Plan (2009-2015).
- Scientific Vice-Director of the INiBICA (2017-18).
- External evaluator of FIS and ACSA research projects (1996-actual).

### CURRENT SITUATION

Full Professor since March 2018. He coordinates the subject of Medical Pathology II of the 4th year of the Degree in Medicine (ECTS Credits 9, Theoretical Credits 6.75, Practical Credits 12). He has 4 Sexenios of Research Activity (1992-2015) and 3 teaching quinquennia (1991-2014). He continues his assistance work in the HUPM as Chief of Endocrinology and Nutrition Service and as Director of the Research Group (PAIDI; CTS-368).

Scientific Director of the INiBICA from January, 2020.

### Supervisor Publications (in DM; past 5 years)

-Modulation of microglia polarization dynamics during diabetic retinopathy in db/db mice. **Arroba AI**, Alcalde-Estevez E, García-Ramírez M, Cazzoni D, de la Villa P, Sánchez-Fernández EM, Mellet CO, García Fernández JM, Hernández C, Simó R, Valverde AM. *Biochim Biophys Acta*. 2016 Sep;1862(9):1663-74. doi: 10.1016/j.bbadis.2016.05.024. Epub 2016 Jun 4. PMID: 27267343. Q1

-Imbalance between pro-apoptotic and pro-survival factors in human retinal pericytes in diabetic-like conditions. Beltramo E, **Arroba AI**, Mazzeo A, Valverde AM, Porta M. *Acta Ophthalmol*. 2018 Feb;96(1):e19-e26. doi: 10.1111/aos.13377. Epub 2017 Jan 27. PMID: 28127871. Q1/D1

-IGF-1, Inflammation and Retinal Degeneration: A Close Network. **Arroba AI**, Campos-Caro A, Aguilar-Diosdado M, Valverde AM. *Front Aging Neurosci*. 2018 Jul 5;10:203. doi: 10.3389/fnagi.2018.00203. eCollection 2018. PMID: 30026694. Q2

-Topical Administration of GLP-1 Receptor Agonists Prevents Retinal Neurodegeneration in Experimental Diabetes. Hernández C, Bogdanov P, Corraliza L, García-Ramírez M, Solà-Adell C, Arranz JA, **Arroba AI**, Valverde AM, Simó R. *Diabetes*. 2016 Jan;65(1):172-87. doi: 10.2337/db15-0443. Epub 2015 Sep 17. PMID: 26384381. Q1/D1

-Effect of Topical Administration of Somatostatin on Retinal Inflammation and Neurodegeneration in an Experimental Model of Diabetes. Hernández C, **Arroba AI**, Bogdanov P, Ramos H, Simó-Servat O, Simó R, Valverde AM. *J Clin Med*. 2020 Aug 10;9(8):2579. doi: 10.3390/jcm9082579. PMID: 32784955. Q1/D1

-Modulation of microglia in the retina: new insights into diabetic retinopathy. **Arroba AI**, Valverde AM. *Acta Diabetol*. 2017 Jun;54(6):527-533. doi: 10.1007/s00592-017-0984-z. Epub 2017 Mar 27. PMID: 28349217. Q2

-Synthesis of polyfluoroalkyl sp<sup>2</sup>-iminosugar glycolipids and evaluation of their immunomodulatory properties towards anti-tumor, anti-leishmanial and anti-inflammatory therapies. Sánchez-Fernández EM, García-Moreno MI, **Arroba AI**, Aguilar-Diosdado M, Padrón JM, García-Hernández R, Gamarro F, Fustero S, Sánchez-Aparicio JE, Masgrau L, García Fernández JM, Ortiz Mellet C. *Eur J Med Chem*. 2019 Nov 15;182:111604. doi: 10.1016/j.ejmech.2019.111604. Epub 2019 Aug 8. PMID: 31425910. Q1/D1

-Somatostatin protects human retinal pericytes from inflammation mediated by microglia. Mazzeo A, **Arroba AI**, Beltramo E, Valverde AM, Porta M. *Exp Eye Res*. 2017 Nov;164:46-54.

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doi: 10.1016/j.exer.2017.07.011. Epub 2017 Jul 20.PMID: 28734673. Q1

-Somatostatin protects photoreceptor cells against high glucose-induced apoptosis. **Arroba AI**, Mazzeo A, Cazzoni D, Beltramo E, Hernández C, Porta M, Simó R, Valverde ÁM. Mol Vis. 2016 Dec 30;22:1522-1531. eCollection 2016.PMID: 28050125.Q1

-The sp<sup>2</sup>-iminosugar glycolipid 1-dodecylsulfonyl-5N,6O-oxomethylidenenojirimycin (DSO<sub>2</sub>-ONJ) as selective anti-inflammatory agent by modulation of hemeoxygenase-1 in Bv.2 microglial cells and retinal explants. Alcalde-Estévez E, **Arroba AI**, Sánchez-Fernández EM, Mellet CO, García Fernández JM, Masgrau L, Valverde ÁM. Food Chem Toxicol. 2018 Jan;111:454-466. doi: 10.1016/j.fct.2017.11.050. Epub 2017 Nov 27.PMID: 29191728 Q1/D1

-Anti-Inflammatory (M2) Response Is Induced by a sp<sup>2</sup>-Iminosugar Glycolipid Sulfoxide in Diabetic Retinopathy. Cano-Cano F, Alcalde-Estévez E, Gómez-Jaramillo L, Iturregui M, Sánchez-Fernández EM, García Fernández JM, Ortiz Mellet C, Campos-Caro A, López-Tinoco C, Aguilar-Diosdado M, Valverde ÁM, **Arroba AI**. Front Immunol. 2021 Mar 18;12:632132. doi: 10.3389/fimmu.2021.632132. eCollection 2021.PMID: 33815384. Q1

>> Publications= 37 H Index=19 Patent=00 Grants =27, 4 of them as PI

### Supervisor International collaborations:

- 2 Consortium
- 2 Network

### Supervisor most relevant research projects grants:

NUMBER OF FILE: PY20\_01331

TITLE: Uso de biopolímeros con tropismo celular específico para la administración de moléculas bioactivas de origen marino en el tratamiento de la Diabetes Mellitus y sus complicaciones asociadas.

MAIN INVESTIGATOR: Ana I. Arroba

FINANCIAL ENTITY / PROGRAM: Call for grants for the financing of research and innovation Consejería de transformación económica, Industria, Conocimiento y Universidades. FEDER. CENTER: Hospital Puerta del Mar. INIBICA. Cádiz BUDGET: € 50.000. PERIOD OF REALIZATION: 2021-2024.

NUMBER OF FILE: PI-0012-2019

TITLE: Determinación de la inflamación temprana como una nueva diana terapéutica en el diagnóstico y tratamiento de la diabetes mellitus y sus complicaciones. el uso de productos naturales bioactivos de origen marino.

MAIN INVESTIGATOR: Ana I. Arroba

FINANCIAL ENTITY / PROGRAM: Call for grants for the financing of biomedical research and innovation and in Health Sciences within the framework of the integrated territorial initiative 2014-2020 for the province of Cádiz. ITI funds. FEDER. CENTER: Hospital Puerta del Mar. INIBICA. Cádiz BUDGET: € 313.000,00. PERIOD OF REALIZATION: 2020-2023.

NUMBER OF FILE: PI18 / 01287

TITLE: Influence of Exendin-4, Peptide-1 (GLP-1), and Role of Exosomes as Biomarkers in the Pathogenesis of Type 1 Diabetes Mellitus and its Complications

MAIN INVESTIGATOR: Manuel Aguilar Diosdado / Ana I. Arroba Espinosa

FINANCIAL ENTITY / PROGRAM: Ministry of Science and Innovation. Carlos III Health Institute. CENTER: Hospital Puerta del Mar. INIBICA. Cádiz. BUDGET: € 62,920.00. PERIOD

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OF REALIZATION: 2019-2021.

NUMBER OF FILE: PI-00123-2018

TITLE: Retinopatía Diabética: La inflamación como una nueva diana terapéutica. Papel de los exosomas.

MAIN INVESTIGATOR: Ana I. Arroba

FINANCIAL ENTITY / PROGRAM: Call for grants for the financing of biomedical research Junta de Andalucía. CENTER: Hospital Puerta del Mar. INIBICA. Cádiz BUDGET: € 48.000. PERIOD OF REALIZATION: 2018-2021

### More information:

- Number of positions available: 2

Type of contract: Full time

- Status: Postdoctoral researcher
- Working hours: 37.5 hours/week (Flexible)
- State / province: Cádiz
- City: Cádiz
- Postal code: 11009
- Street: Avda. Ana de Viya, 21
- Organisation: Hospital Puerta del Mar
- Country: Spain
- Website: <http://inibica.es/en/>
- Phone mobile phone: (+34) 636 174 993

## APPLICATION DETAILS

- **Envisaged job starting date:** within 3 months after receiving the offer
- **Application deadline:** 15/08/2021
- **How to apply:** The application must be submitted electronically to [rrhh@inibica.es](mailto:rrhh@inibica.es) and shall include: Cover letter (1 page) explaining your motivation, research interests and how you scientifically can contribute to the project. To include a progress plan would be valued. CV (mas 3 pages, including publications if any), Diplomas, diploma supplements and transcripts, Contact information to 1-3 references, Documentation on English language proficiency.
- **Application e-mail:** [rrhh@inibica.es](mailto:rrhh@inibica.es)

## REQUIRED EDUCATION LEVEL

- **Required education level 1:** Medicine, Biology, Chemistry, Mathematics, Pharmacy, Veterinary,
- **Degree:** PhD
- **Degree field:** Sciences

## REQUIRED EXPERIENCE LEVEL

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- **Main research field:** Bioinformatic, Bigdata, Endocrinology, Neurosciences
- **Sub research field:** Omics
- **Years of research experience:** > 3 years

### REQUIRED LANGUAGES

- **Language:** English, Spanish
- **Language level:** C1

### ADDITIONAL REQUIREMENTS

- **Skills:** Excellent time management, rigor, perseverance, scientific creativity and originality, writing skills, sense of priority and ability to work with others. Solid skills in statistics
- **Specific requirements:** Experience in proteomic tests: G-LISA, ELISA, Western blot, immunohistochemistry, confocal microscopy, flow cytometer, silencing by siRNA, precipitation, RNA extraction, RT-PCR, etc. Growth and maintenance of cell lines: Experience in the isolation of different cell types from human and rat blood. Management of experimental animals. Category A, B and C according to the European regulation

At the deadline for the submission of proposals (**October, 2021**), researchers:

- shall be in possession of a doctoral degree
- must not have resided or carried out their main activities in the country of Spain for more than 12 months in the 3 years immediately prior to the abovementioned deadline.