

Una manera de hacer Europa



BUENAS PRÁCTICAS

Actuaciones Cofinanciadas

“Development of lines of research on the Physiopathology of Spinal Cord Injury”
in Toledo Paraplegic National Hospital
Mancha Health Service (SESCAM)

Programa Operativo de Castilla la Mancha

Año 2018

Fondo Europeo de Desarrollo Regional

The “Development of lines of research on the Physiopathology of Spinal Cord Injury” in Toledo Paraplegic National Hospital is submitted as a “Good Practice” of Castilla-La Mancha Health Service in 2018.

The action presented consists on the co-financing by ERDF of lines of research carried out by the Research Unit of Paraplegics National Hospital on the pathophysiology of spinal cord injury, with the aim of converting them into cutting-edge therapies that can be transferred to the patients, from the models of animal experimentation (preclinical) to the clinical practice, obtaining the total or partial recovery, and the improvement of the quality of life of the people affected by these pathologies.

The eligible cost was € 12.907.990, with the contribution from the European Regional Development Fund (ERDF) of € 10.326.392.

As a result of this action, it is estimated that the number of researchers in this Center will increase by 15%.



This action is considered a “Good Practice” due to:

1°. The role of the ERDF in the action has been conveniently disseminated among the beneficiaries, potential beneficiaries and the public in general.

The minimum requirements for advertising have been met so that the action is subject to funding through the European cohesion policy. Specifically, plaques have been placed in each of the laboratories where the research activity is carried out, on the ground floor, first and second floor of the Hospital Research building.



Ground Floor.



First Floor.



Second Floor.



Apart from the above, due information regarding the developed action has been given on the website of Paraplegics National Hospital:

At the same time, ERDF contribution to the development of the action has also been disseminated through three types of digital press: specialized in the subject and generalist of regional and national scope:

Specialized in the subject:

<http://www.infomedula.org/?p=3718>



PORTADA REVISTA INFOMÉDULA INI

El hospital participa en el Programa Operativo FEDER de Castilla-La Mancha 2014-2020 para potenciar su capacidad investigadora

in ACTUALIDAD



Generalist of regional scope:

<http://www.gentedigital.es/toledo/noticia/2625665/el-hospital-de-paraplejicos-de-toledo-investiga-la-regeneracion-de-la-lesion-medular-gracias-a-los-fon%e2%80%a6/>

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El Hospital de Paraplégicos de Toledo investiga la regeneración de la lesión medular gracias a los fondos Feder

El Hospital Nacional de Paraplégicos de Toledo participa en el Programa Operativo del Fondo Europeo de Desarrollo Regional (Feder) de Castilla-La Mancha 2014-2020 a través de una operación para el desarrollo de varias líneas de investigación relacionadas con la fisiopatología, la protección y la regeneración funcional de la lesión medular.

Generalist of national scope:

<https://www.lavanguardia.com/local/castilla-la-mancha/20190503/462005071675/el-hospital-de-paraplejicos-de-toledo-investiga-la-regeneracion-de-la-lesion-medular-gracias-a-los-fondos-feder.html>

LAVANGUARDIA | Castilla La Mancha

El Hospital de Paraplégicos de Toledo investiga la regeneración de la lesión medular gracias a los fondos Feder

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Finally, a leaflet has been published informing about the performance and its co-financing by ERDF for its distribution in meetings and events.



- ✓ La investigación en Ciencias de la Salud en Castilla-La Mancha se lleva a cabo, principalmente, en los centros sanitarios del SESCAM, cuyo compromiso y el de sus profesionales sanitarios e investigadores permite mantener fructíferas líneas de investigación en diferentes campos de la Biomedicina.
- ✓ El Hospital Nacional de Parapléjicos lleva más de cuatro décadas de experiencia clínica en la lesión medular y sus trastornos asociados, siendo un centro monográfico de referencia a nivel nacional e internacional en el tratamiento integral de esta patología. En base a ello, el SESCAM ha apostado por potenciar la investigación en Neurociencia en dicho centro hospitalario, centrando sus esfuerzos en la patología medular y degenerativa del Sistema Nervioso.
- ✓ A través de la Unidad de Investigación del Hospital Nacional de Parapléjicos se logra generar y divulgar conocimiento científico sobre la fisiología y patologías relacionadas con el sistema nervioso lesionado, y sobre nuevas intervenciones terapéuticas dirigidas a curar o a mejorar la calidad de vida de las personas afectadas.

El Hospital Nacional de Parapléjicos participa en el Programa Operativo del Fondo Europeo de Desarrollo Regional (FEDER) de Castilla-La Mancha, 2014-2020, a través de una operación para el desarrollo de líneas de investigación sobre la fisiopatología, protección y regeneración funcional de la lesión medular.

Programa de creación y consolidación de infraestructuras y servicios científico-tecnológicos del Hospital Nacional de Parapléjicos, 2015-2023

- ✓ El objetivo temático del programa es promover el desarrollo tecnológico, la innovación y la investigación de calidad.
- ✓ Con esta operación cofinanciada por FEDER, se persigue fomentar la capacidad investigadora de la Unidad de Investigación del Hospital Nacional de Parapléjicos, desarrollando líneas de investigación sobre la fisiopatología de la lesión medular para convertirlas en terapias de vanguardia que se trasladen desde los modelos preclínicos a la práctica clínica.
- ✓ Este programa contribuirá al aumentar el perfil tecnológico de Castilla-La Mancha a través de la búsqueda de la excelencia y la captación del talento, reforzando la base investigadora en el campo de la Biomedicina y respaldando la inversión que en las estrategias de I+D+i de la Comisión Europea 2014-2020 se destina a invertir en aquellos campos en los que Castilla-La Mancha es fuerte y competitiva.



2º. The action incorporates innovative elements.



The fundamental problem of spinal cord injuries is that the main cells of the nervous system, the neurons, as a consequence of the super specialization they have acquired throughout human evolution, have lost their reproductive capacity. If the death of neuronal tissue occurs as a result of a traumatic or degenerative process, the human organism is not capable of generating new neurons, losing part

of the transmission of nerve impulses, between the brain and the rest of the organs, muscles, nerves that are below the injured area.

The lines of research developed for this action in the Hospital are generating innovative results in the treatment of Spinal Cord Injury, such as the magnetic resonance techniques applicable to the analysis of degeneration and repair of the injured spinal cord or the precise location of cellular transplants in animal models, pending transfer to clinical practice with humans.



Some of the preclinical research lines seek to develop new materials to manufacture biocompatible implants with nerve tissue to favor the selective growth of injured nerves. As an example, the use of graphene (material with high electrical conductivity, very flexible, 200 times harder than steel and 5 times lighter than aluminum) is being used by two research groups of the Center, trying to seek recovery of nerve impulses in the area of

the injured spinal cord.

3°. Adaptation of the results obtained to the established goals.

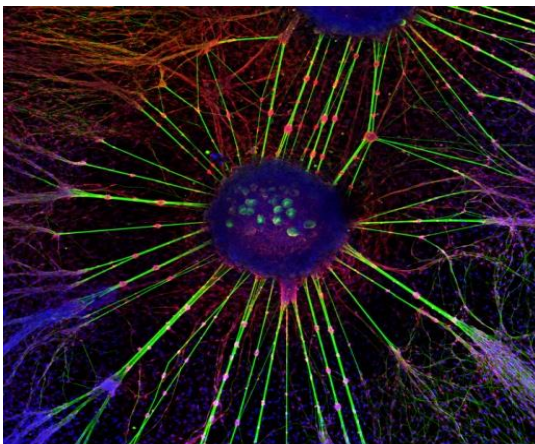
Through the lines of work developed in our research center, we have achieved as a most significant result a critical mass of high level researchers, capable of collaborating and competing with other national and international research centers, in the capture of resources and in the development of cutting-edge research projects in biomedicine.



Through the lines of research financed with ERDF, it is contributing to a progressive increase of the technological profile of our region, through the search of excellence in research, the recruitment of research staff with a high degree of qualification that reinforce the researcher base of the center. Consolidating Paraplegics National Hospital as a National and International Reference Center, in the Treatment and Recovery of Patients Affected by a Spinal

Cord Injury.

4°. Contribution to the resolution of a problem or weakness detected in the scope of execution.



Investment in R + D + i of Castilla-La Mancha Region is around 0.69% of its GDP, far from the 1.20% of the whole of the Spanish State declared in 2018 and far from the objective of 2% set by the European Union as an objective for the year 2020.

Paraplegics National Hospital has allocated in the year 2018 about 8% of its total budget to the research area, in a clear commitment to innovation and development, as a model for the

future in the development of our region.

The lines of research financed with ERDF, and the progressive increase in the number of researchers involved in its development, will contribute to reducing the research investment gap that our region maintains with the average of the Spanish State.

5°. High degree of coverage on the addressed population.

Main group to which the lines of research are aimed are the patients affected by a spinal cord injury, which are the group to whom all efforts are led in the search for innovative solutions to improve their quality of life, or even their future functional recovery as far as the current techniques allow.

Likewise, through these research activities it is possible to benefit other groups of people in this area, not only in Castilla la Mancha region, but also in the national and international level.



Finally, the results of these researches will reach all citizens through informative and training actions carried out by Paraplegics National Hospital, by means of training agreements with various national and regional universities along with Secondary Schools of our Region. Besides this, the Paraplegics National

Hospital welcomes undergraduate and graduate students to actively participate in raising awareness about the associated problems with patients suffering from spinal cord injury.

6°. Consideration of horizontal criteria of equal opportunities and non-discrimination, as well as social responsibility and environmental sustainability.

In terms of equal opportunities and non-discrimination, researchers involved in action, around 40%, are women. Not in vain, the General Research Program of the Paraplegics National Hospital is developed under the premise of reducing the existing gender gap in the field of biomedicine.

Likewise, the Research Unit of Paraplegics National Hospital complies with the European regulations on biosanitary and biosecurity waste management. Thus, in this last subject, the experimental research operating rooms, the animal facility and the cell culture unit have a level of biosafety 2, according to the activity carried out in them.

7°. Synergies with other policies or instruments of public intervention.

The lines of research that are presented have a series of synergies with other lines of financing that enhance the specific weight of the investment in R & I carried out by Paraplegics National









Hospital in the whole of Castilla-La Mancha. Thus, the Hospital also benefits from other aid for the purchase of equipment and infrastructures, which is essential for the promotion of research work through other lines co-financed by the ERDF in Castilla-La Mancha.



WELCOME TO NEUROFIBRES

This research project aims at maturing a novel technology for the treatment of spinal cord injury, namely the implantation of bio-functionalised electroconducting microfibres to promote guided neural regeneration across the lesion. It is funded by the European Commission under the H2020-FETPROACT-01-2019 call in the topic bio-electronic medicines and therapies. The project will span four years (2017-2020) and will develop and test an advanced, microfiber-based electroactive implant to repair the spinal cord in rodents and pigs. The microfibres will have a dual neurobiological function, namely providing localised electrical microstimulation to neural cells, as well as a biocompatible, aligned micro-scaffolding with anchored biomolecules for directing neural cell growth. A trans-disciplinary consortium of seven European research institutions will join efforts to accomplish this challenging goal.

[READ MORE](#)

 <p>SESCAM Servicio Salud Castilla-La Mancha</p> <p>MORE INFORMATION</p>	 <p>UCAM The University of Cambridge</p> <p>MORE INFORMATION</p>	 <p>AXON AXON Cable</p> <p>MORE INFORMATION</p>	 <p>UNITN The University of Trento</p> <p>MORE INFORMATION</p>
 <p>KTH Royal Institute of Technology</p> <p>MORE INFORMATION</p>	 <p>AMU Aix Marseille Université</p> <p>MORE INFORMATION</p>	 <p>USAAR Universität des Saarlandes</p> <p>MORE INFORMATION</p>	 <p>FET PROACTIVE H2020 program</p> <p>MORE INFORMATION</p>

European partners, from 6 countries.

Likewise, as already mentioned, reaching a critical mass of excellent researchers allows capturing material and financial resources complementary to those provided by ERDF. This is achieved thanks to leading research projects as a result of competitive competition for national and international different public or private research organisms. As a most significant example, we can review the laboratory of Axonal Repair and Biomaterials, which coordinates a European project "Neurofibres" for Horizon 2020, involving a total of 7



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