

The Institution

The **Research Institute of the Hospital de la Santa Creu i Sant Pau Foundation** (IR Sant Pau) is a scientific foundation whose mission is to improve the health and quality of life of the population through the production and dissemination of scientific knowledge, the international training of researchers, and the promotion of innovation and health by incorporating medical advances into clinical practice and health policies. Founded in 1992, it has been a centre of research excellence affiliated with the Autonomous University of Barcelona (UAB) since 2009 and, since 2011, a CERCA centre (Research Centres of Catalonia).

For the Foundation, it is a priority to ensure that the recruitment of the most suitable candidate for any position is carried out through an open, transparent, and merit-based selection process (OTM-R). Following these guidelines promotes staff mobility, knowledge exchange, and ultimately enhances the quality of teaching and research. In line with the European Union's human resources strategy, the selection and recruitment procedures of our institution are governed by a set of basic principles that guarantee equal access to employment. Accordingly, the constitutional principles of equality, merit, and capability are applied, in full compliance with current national and international regulations, specifically the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (C&C). The principles of the C&C apply to the recruitment of all staff within the institution, regardless of professional category. For this reason, our Foundation has held the "HR Excellence in Research" award granted to IIB Sant Pau since 2015.

The **Research Institute Foundation of the Hospital de la Santa creu i Sant Pau** specifies

CANDIDATES interested in applying for Predoctoral Fellowships to carry out a doctoral thesis in collaboration with the Molecular Physiology of the Synapse research group.

The Laboratory of Molecular Physiology of the Synapse was founded in 2012 at the Sant Pau Research Institute in Barcelona and is led by Dr. Àlex Bayés (group website: www.molecular-synapse.org)

; Dr. Bayés' Google Scholar profile:
https://scholar.google.com/citations?user=UXZ_kiwAAAAJ&hl=ca

). Our objective is to understand how the synaptic proteome is organized and functions, particularly at excitatory synapses in the cortex and hippocampus. We study how this set of proteins regulates synaptic plasticity and, consequently, cognition and behavior. We also analyze how molecular alterations can lead to cognitive disorders such as intellectual disability or autism.



We apply Systems Biology strategies, combining mass spectrometry–based proteomics with bioinformatic analysis. In addition, we have recently gained experience in electroencephalographic (EEG) analysis. This has led us to conduct studies integrating proteomic and bioinformatic data with EEG data, with the aim of understanding how different patterns of brain activity modulate, over the medium to long term, the characteristics of the synaptic proteome and therefore its functional properties.

Another fundamental area of the group's research is the characterization of synaptic molecular pathology in cognitive disorders. We focus particularly on non-syndromic intellectual disability, as many of the genes involved in these disorders are localized at the synapse. Within these neurodevelopmental disorders, we primarily investigate encephalopathy caused by SYNGAP1 deficiency.

The research project for which we are seeking a predoctoral researcher focuses on expanding some of our most recent findings. We have shown in affected individuals that SYNGAP1 deficiency markedly reduces a type of sleep-related brain waves (Ribeiro-Constante et al. 2024), known as spindles, which play a key role in long-term memory and can be detected by EEG. This same phenotype is also observed in animal models of this neurodevelopmental disorder. Our proteomic studies in these models suggest that molecular mechanisms involved in synaptic stabilization, which are essential for the formation and maintenance of long-term memory, are severely disrupted as a consequence of spindle deficiency. This may represent a relevant pathophysiological mechanism for this and other neurodevelopmental disorders. The manuscript containing these results is currently under review (NREM Oscillations Mediate Sleep-Dependent Proteome Dynamics to Support Synaptic Stabilization, del Castillo-Berges et al.; it will soon be available on bioRxiv).

The main objective of the project for the predoctoral researcher is to demonstrate the direct relationship between spindle alterations and the observed proteomic changes. In addition, we aim to evaluate whether genetic restoration of Syngap1 in adult animals allows recovery of these brain waves and, if so, whether this recovery has a positive impact at both the proteomic and cognitive levels.

Essential requirements:

- Bachelor's degree in the field of Health Sciences
- Official Master's degree in the field of Health Sciences
- Oral and written knowledge of the two official languages of Catalonia
- Knowledge of office software tools (Excel, Word, PowerPoint, etc.)



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Additional valued skills:

- Strong academic record
- Intermediate or advanced level of English (minimum B2)
- Academic or professional experience abroad
- High level of motivation for basic and translational research
- Research experience in biochemistry and molecular biology
- Experience handling animal models for experimentation
- Official accreditation to work with experimental animals
- Programming skills in R and/or Python
- Ability to work independently and to reason autonomously and critically
- Ability to work as part of a team and collaborate effectively

It offers:

- Completion of a PhD in Neurosciences at the Autonomous University of Barcelona within the framework of projects developed by the Research Group
- Support in applying for competitive public calls to obtain a predoctoral researcher contract (AGAUR, ISCIII, MICIU, etc.)



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Those interested must preferably deliver their Currículum Vitae in PDF, by email to the Management of the Santa Creu i Sant Pau Hospital Research Institute Foundation, address seleccio@recercasantpau.cat, indicating the reference **2026/013**

The submission period will end on January 30th, 2026, at 3:00 p.m.

Fundació Institut de Recerca de l'Hospital de la Santa Creu i Sant Pau, sited at C. Sant Quintí, 77-79, 08041, Barcelona, Tel: 93 291 90 50, NIF: G-60136934, as Data Controller and in compliance with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) and the Organic Law 3/2018 of 5th of December, on the protection of personal data and the guarantee of digital rights, will treat your data with the sole purpose of developing this call. The legal basis for this treatment is the article 6.1 a, c and f from the GDPR, giving that we will ask for your consent, the treatment is necessary for the application of precontractual measures and its necessary to satisfy the legitimate interests pursued by the Data Controller.

The data will be kept during the necessary time to develop the call. Data will be treated solely by that areas and services that are allowed to in accordance with their assigned competences and functions. There will be no data cessions made unless there is a legal obligation to do so. You are entitled to exercise the rights of access, rectification, deletion, opposition, limitation and portability. In case you have any doubts, you can contact the data protection delegate at dpo_ir@santpau.cat. You also have the right to file a complaint to the relevant control authority.

PERMANENCE COMMITMENT: *Selected persons who will hold the summoned or vacant position, will not be able to apply for a new call until 1-year period has expired. In case of part-time job positions, this period will be of 6 months. In both cases, the period will compute from the date of publication of the resolution. The vacant summoned, and the ones that derive from it (intern movements), will be successively covered on the same proceeding among the submitted candidates to each particular call, regardless of whether this entails coverage of places in turns other than the call.*

Barcelona, 16/01/2026



Departament de RRHH

Fundació Institut de Recerca de l'Hospital de Sant Pau