



UNIVERSITAT DE  
BARCELONA

Institute of  
Neurosciences of  
the University of  
Barcelona

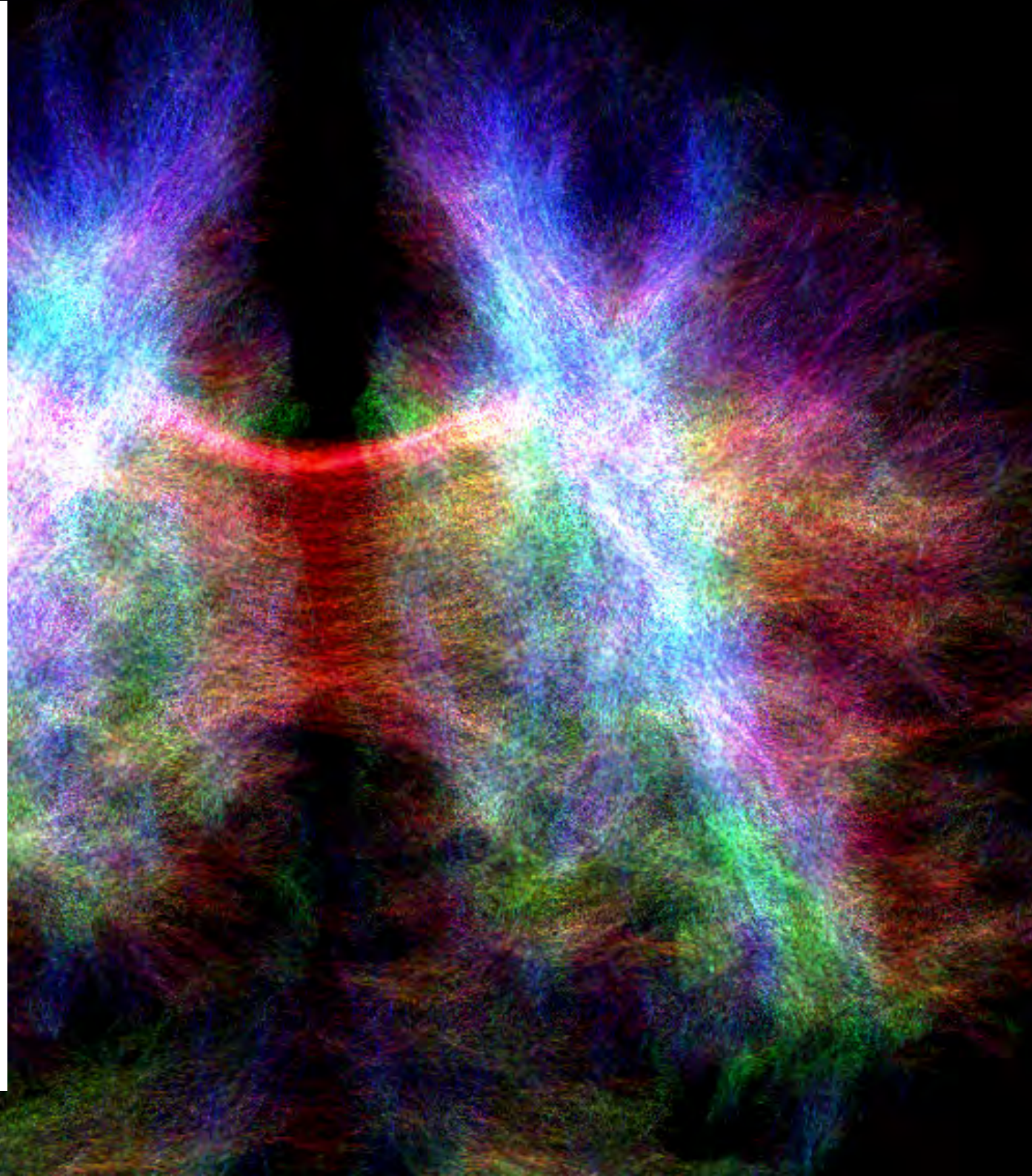
# ANNUAL REPORT 2021



Institut de Neurociències  
UNIVERSITAT DE BARCELONA



EXCELENCIA  
MARIA  
DE MAEZTU

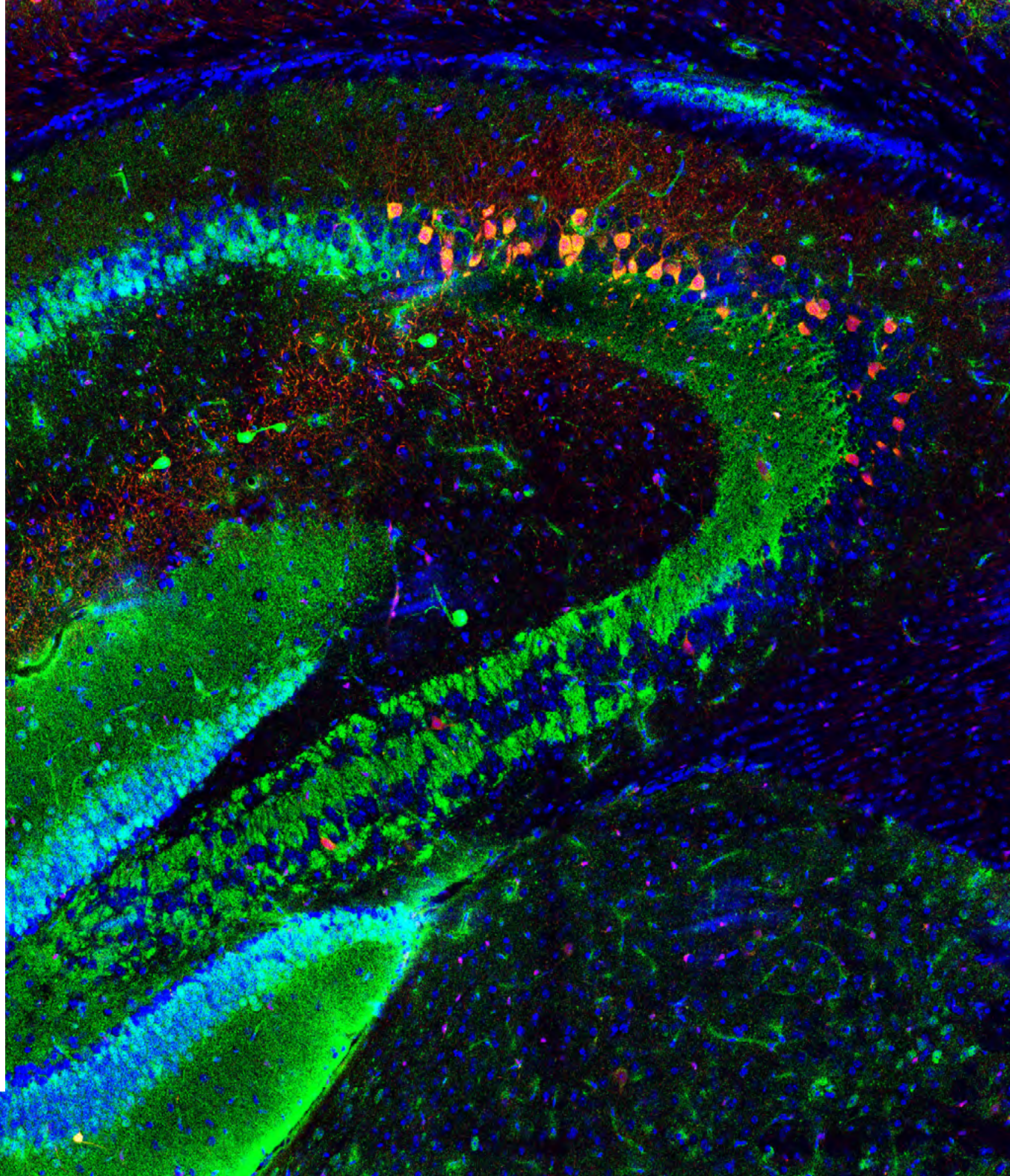


# Table of Contents

<b>Foreword</b>	<b>3</b>	<b>Mental Health</b>	<b>72</b>
Institute of Neurosciences	4	Bipolar disorders	74
Message from the Director	5	Child and adolescent psychiatry and psychology	77
Governing and Advisory Bodies	6	Epidemiology of mental health disorders and ageing	80
<b>2021 in a Nutshell - Global Numbers</b>	<b>7</b>	Gerontology: Health and ageing	83
<b>UBneuro actions and activities</b>	<b>10</b>	Interpersonal Violence	84
		Measurement and research	87
		Schizophrenia	90
<b>Research</b>	<b>27</b>	<b>Cognitive and Behavioural Neuroscience</b>	<b>93</b>
<b>Pathophysiology of Nervous System Diseases</b>	<b>28</b>	Brain Plasticity and connectivity: Language, memory and reward	95
Cell biology of neurodegeneration	30	Neuropsychology	99
Cellular and molecular basis of sensory disorders	31	Quantitative psychology	102
Developmental neurobiology and regeneration	32	The auditory, motor, emotional and numerical brain	104
Mechanisms of synaptic transmission	33	Virtual reality	106
Molecular and cellular neurobiotechnology	34	Vision and control of action	109
Molecular bases of rare brain diseases and channelopathies	36	Artificial Intelligence	111
Neural development	38		
Neuropharmacology, neuroepigenetics, neurodegeneration and ageing	40		
Neurophysiology	44		
Pharmacological strategies for neuroprotection	47		
Neuropharmacology and pain	49		
Stem cells and neurodevelopment	52		
<b>Experimental Neurology</b>	<b>53</b>		
Clinical and experimental research in Parkinson's disease and other neurodegenerative movement disorders	55		
Clinical research in Alzheimer's disease and other cognitive disorders	56		
Mechanistic and therapeutic approaches in neurodegenerative disorders	59		
Neuroimaging in degenerative disorders	62		
Neuronal network dysfunction in neurological and psychiatric disorders	64		
Neuropathology	67		
Pathogenesis of immune-mediated neuronal disorders	69		

# FOREWORD

Annual Report  
2021



# Foreword

## Institute of Neurosciences

The **Institute of Neurosciences** (UBneuro) was launched in 2015 under the premise to gather all research at the University of Barcelona that focused on a common goal: understanding the nervous system as a whole to give response to society challenges. It is a frontrunner in international neuroscience research, being one of the few institutes in the world that investigates the brain at every level. This includes research groups in neurobiology, neuropharmacology, pathophysiology, neurology, psychiatry, clinical psychology, neuropsychobiology and cognitive neurosciences.

The Institute has been awarded with the Maria de Maeztu Excellence Unit accreditation, and gathers near to 460 researchers from the University of Barcelona, in the multicultural city of Barcelona. We encourage and welcome collaborations with international research groups and organisations!

Our members enjoy benefits such as being part of a close community, learning from some of the best neuroscience researchers in the world, collaborating in both the private and public sectors, and state-of-the-art facilities.



**#34** Neuroscience  
and Behaviour

## Foreword



Dr. Jordi Alberch  
Director

## Message from the Director

It is my pleasure to release the 2021 edition of the Annual Report of the Institute of Neurosciences of the University of Barcelona (UBneuro).

During this year our Scientific Strategic Programme of Maria de Maeztu Unit of Excellence award (MdM) was evaluated by an external international committee of the Spanish Ministry of Science and Innovation. The committee congratulated the activities of the Institute and gave us the score of "Satisfactory", which is the highest. They mentioned "Research outcomes are of high quality in comparison to international standards and clearly designate UBneuro as an important unit of neuroscience research".

In fact, the Institute has achieved an international research leadership in Neuroscience with an outstanding scientific contribution over the past few years. We are proud to rank 34th in the Neuroscience and Behaviour in the US News Best Global Universities Ranking (out of 400). This result would not have been possible without our researchers and their investigation that using multidisciplinary approaches, have obtained novel findings in understanding brain function and pathology from the molecular levels to cognition and behaviour. We also keep a close interaction between basic and clinical research, and these bridges are reinforced by the eight scientific and technological platforms that support multiple research groups. Many of these fascinating discoveries have only been possible thanks to the wide international collaborative networks of the researchers of the Institute.

UBneuro has also increased the scientific strength thanks to the attraction of new researchers. Several young and talented researchers joined the Institute as group leaders. Furthermore, we have continued with the programmes to retain and attract the best talent, including new grants for excellent master and PhD students, and a personalized support programme for researchers interested in applying for Postdoctoral fellowships.

We continuously endeavour to align our research activities with the Responsible Research and Innovation guidelines fostered by the European Commission supporting the design of inclusive and sustainable research and innovation. This 2021 we have finally been able to return to do some of the activities and conferences such as the Barcelona Lecture series and the V PhD Workshop. We also organized the 10th International Meeting on Neuroacanthocytosis Syndromes from 10-12 March. In the outreach part, we took advantage of the digital tools and several campaigns were created to show the research we do from UBneuro. Our [corporate video](#) to enhance the brand of the Institute, has already more than 20,000 visualisations. Other actions that have been taken are the "NeuroArt", "Meet the Brains", "Una Finestra al Cervell", "Training the next generation of neuroscience leaders" and the "Europeans Researcher's Night 2021".

Overall, we keep working toward scientific excellence and strive to advance neuroscience research at all scientific levels, from discovering new innovative strategies to identifying new therapeutical approaches for neurological and psychiatric disorders, gathering knowledge and building collaborations across disciplines to ultimately tackle current and future challenges and together build a better world.

Jordi Alberch

*MD, PhD, Director*

A handwritten signature in black ink, appearing to be 'J. Alberch', written in a cursive style.

## Governing and Advisory Bodies

### Board of Directors

#### Director

- **Jordi Alberch, MD, PhD**  
Department of Biomedical Sciences

#### Deputy Director

- **Georgina Guilera, PhD**  
Department of Social Psychology and Quantitative Psychology

### Representatives of research areas

---

- **Josep Marco, PhD**  
Department of Cognition, Development and Educational Psychology
- **Xavier Gasull, PhD**  
Department of Biomedical Sciences
- **Maria Angels Jurado, PhD**  
Department of Clinical Psychology and Psychobiology
- **Raul Estevez, PhD**  
Department of Physiological Sciences
- **Merce Pallas, PhD**  
Department of Pharmacology,  
Toxicology and Therapeutic Chemistry
- **Yaroslau Compta, MD, PhD**  
Department of Medicine

### PhD Committee

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Josep Argerich, Carla Castany, Esther Garcia, Laura Montejo, Alba Ortega, Marta Riba, Irene Sanchez, Gizem Senel

### Scientific Advisory Board

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- **Kimmo Alho, PhD**  
University of Helsinki, Finland
- **Ernest Arenas, MD, PhD**  
Karolinska Institute, Sweden
- **Mercedes Atienza, PhD**  
Universidad Pablo de Olavide, Spain
- **Carmen Sandi, PhD**  
Ecole Polytechnique Federale de Lausanne, Switzerland
- **Frederic Saudou, PhD**  
Institute of Neuroscience, University Grenoble-Alps, France

### Management team

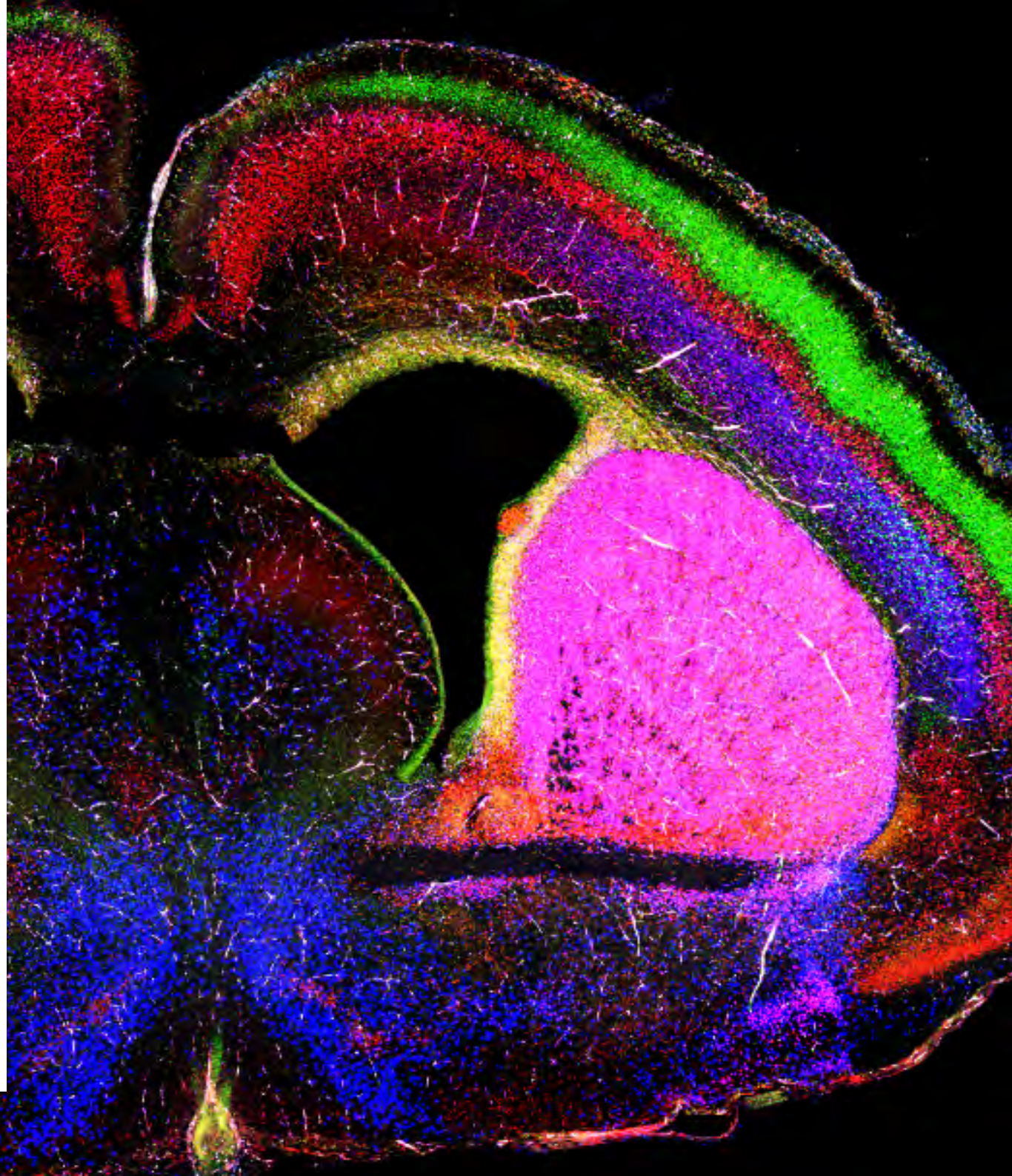
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- **Marta Turro**  
Administrative officer
- **Cristina Pulido, PhD**  
Research developer
- **Laia Tremosa, MSc**  
Communication manager
- **Marçal Arumí, MSc**  
Communication manager since December
- **Katia Verger, PhD**  
Transference manager
- **Sara Alaoui**  
Junior trainee in Digital information and documentation

2021 IN A NUTSHELL

# GLOBAL NUMBERS

Annual Report  
2021



OUTPUTS

613  
Total  
articles

1

- JAMA
- Science
- JAMA Neurology
- Cell Metabolism
- Lancet Psychiatry
- American Journal of Respiratory and Critical Care Medicine
- Neuron
- Nature Communications
- Journal of Autoimmunity
- Nature Human Behaviour
- Biological Psychiatry
- EMBO Molecular Medicine
- PNAS
- Nature Medicine

2

- JAMA Psychiatry
- Evolution

3

- Acta Neuropathologica
- Molecular Psychiatry
- Brain
- Neurology
- Cell

7

- Alzheimer's & Dementia

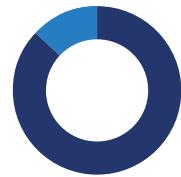
INPUTS

398 Ongoing Projects | 48.4 M€



75% National projects  
36.3M€

25% International projects  
12.1M€



83% Public Funding  
40.2M€

17% Private Funding  
8.2M€



EXCELENCIA  
MARÍA  
DE MAEZTU

MDM-2017-0729. Ministerio de Economía, Industria y Competitividad. Institute of Neurosciences of the University of Barcelona. 2,000,000€



2 Advanced Grants



4 Research professors  
6 Academia professors

4

CIBERs

CIBERNED, CIBERSAM,  
CIBERER, CIBERESP

2

RETICs

RETICs of Cell Therapy, RETICs of  
Ophthalmology and Vision

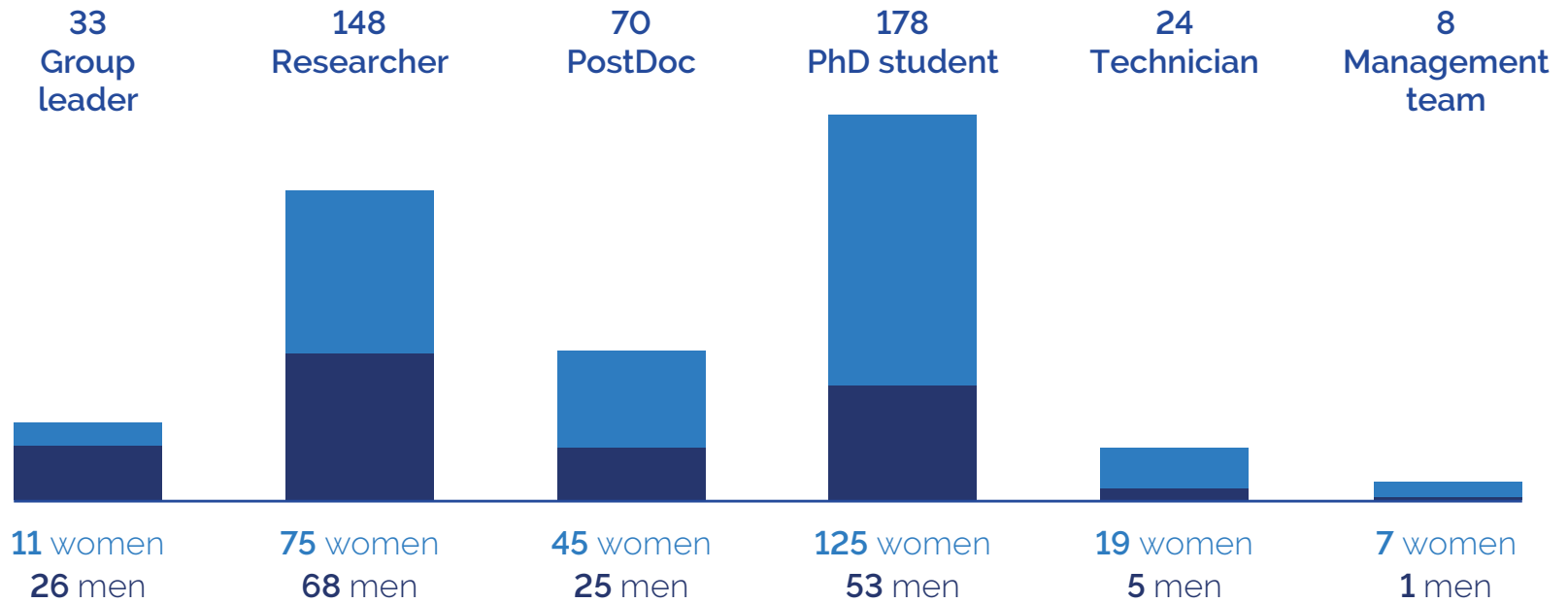
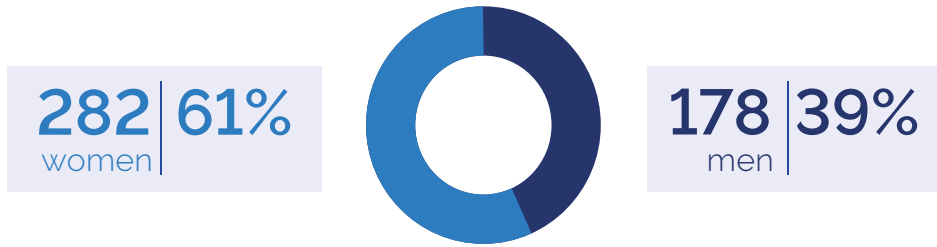
16

Patents  
ongoing

6

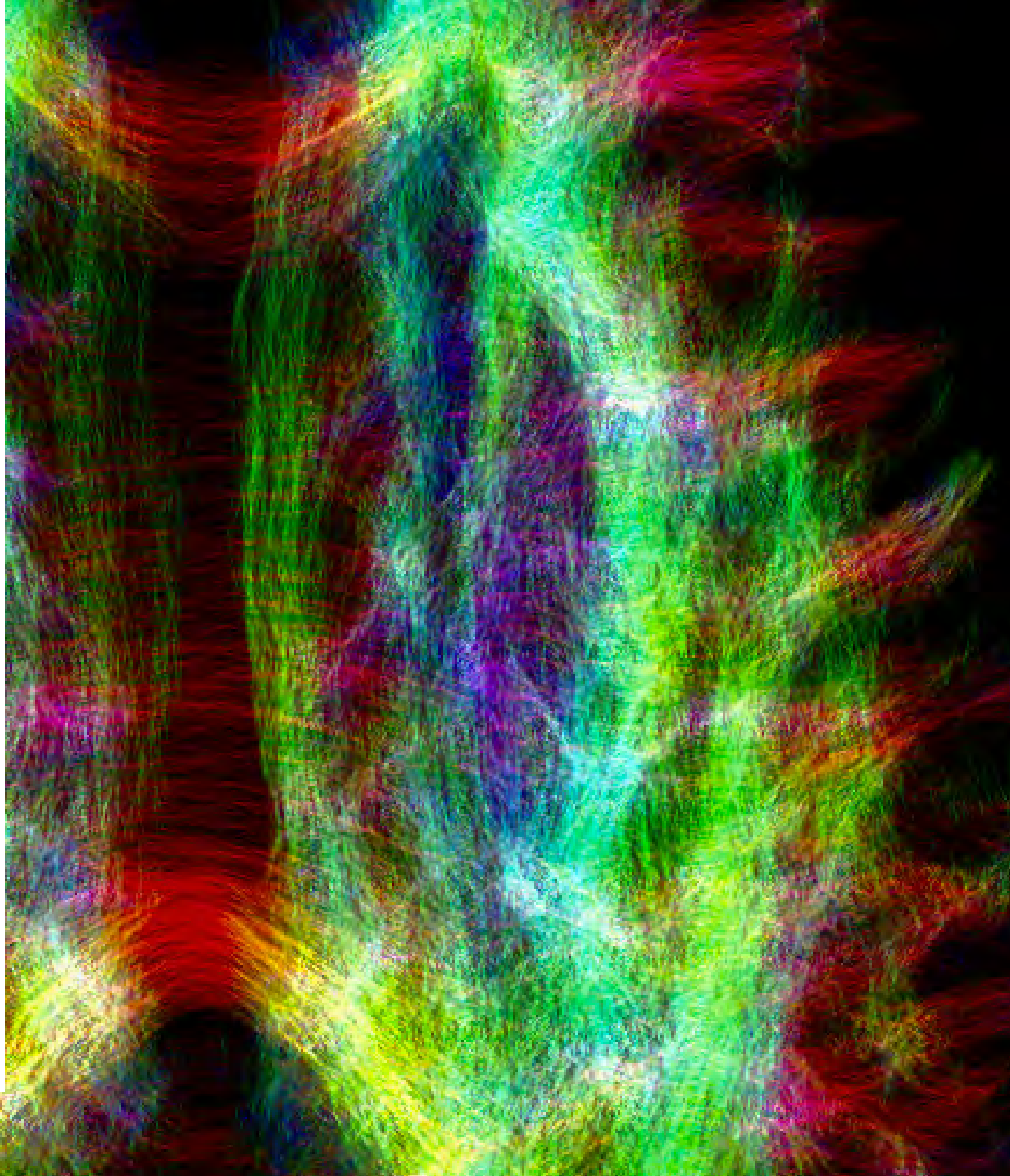
Spin-offs  
ongoing

# 460 Total Human resources



# **UBNEURO ACTIONS AND ACTIVITIES**

**Annual Report**  
2021



## UBneuro actions and activities



The several actions performed during 2021 under the frame of the strategic research plan established since the **María de Maeztu Excellence Award** aim to push research at UBneuro at the frontiers of knowledge. The main objectives of the strategic research plan of UBneuro were:

- 1) to promote technological and knowledge transfer towards improving health and well-being of our society,
- 2) to support high-quality training activities through Master and PhD Programs in Neuroscience and Cognition,
- 3) to support research at the frontiers of knowledge, which attracts highly talented personnel with a multidisciplinary approach,
- 4) fostering synergies among the different areas of brain research, moving from genetic and cellular aspects to cognition/behaviour and virtual reality, and
- 5) to align our research activities with the Responsible Research and Innovation guidelines fostered by the European Commission.

Below we briefly describe the most relevant UBneuro actions during 2021 according to these objectives.

# UBneuro actions and activities

## 1) Technological and knowledge transfer promotion

At UBneuro, we positively impact society by transferring our scientific and technological knowledge which contributes to improve people's health and quality of life, thanks to the solid relationship between academy and private industry. Our engagement with the valorization and transformation of research results into products and services is our contribution to alleviate the economic burden represented by neurological and psychiatric disorders.

Concerned with knowledge transfer, this year we have 6 active spin-offs and 16 active patents.

## Spin-offs

- **Braingaze:** Technology-driven detection and digital treatment for cognitive disorders. [More information](#)
- **Cytes Biotecnologies:** Offers services based on cell isolation and cell solutions for in vitro models. [More information](#)
- **Virtual bodyworks:** Applies immersive virtual reality to health improvement both, mental and physical (diagnosis of dyslexia, autism, adult ADHD and early onset detection of Alzheimer's disease). [More information](#)
- **Neurekalab:** Science to overcome learning difficulties. [More information](#)
- **AIGecko Technologies** Image recognition and analysis services based on algorithms, and artificial intelligence. [More information](#)
- **Mind & Identity:** Virtual reality to revolutionize psychological treatments. [More information](#)

# UBneuro actions and activities

## Patents

1. Method of Measuring Attention. AVCRI147. Hendrik Anne Super
2. Method for predicting the onset of extrapyramidal symptoms (EPS) induced by an antipsychotic-based treatment. AVCRI196. Sergi Mas, Patricia Gasso, Cristina Malagelada, Miquel Bernardo, Amalia Lafuente
3. Diagnosis of a neurologic disease. AVCRI233-E. Josep Dalmau, Francesc Graus
4. Extensímetro para estructuras biológicas. AVCRI243-E. Jaume Palou, Miquel Soler, Anna Nualart, Carles Solsona
5. Mitochondrial markers of neurodegenerative diseases. AVCRI247-E. Marta Barrachina, Isidre Ferrer, Marta Blanch
6. Motor training. AVCRI263-E. Mavi Sanchez, Mel Slater
7. Physiological response. AVCRI264-E. Mavi Sanchez, Mel Slater, Jorge Arroyo
8. Phenoxy cyclohexylurea derivatives for use in reducing accumulation of amyloid plaques and/or hyperphosphorylation of tau protein. UBTT0307a. Sandra Codony, Christian Griñan-Ferre, Rosana Leiva, Merce Pallas, Santiago Vazquez
9. Compounds as soluble epoxide hydrolase inhibitors. UBTT0307d. Sandra Codony, Christian Griñan-Ferre, Merce Pallas, Santiago Vazquez
10. Synthetic I2 imidazoline receptor ligands for prevention or treatment of human brain disorders. UBTT0327. Maria Carmen Escolano, Merce Pallas, Christian Griñan-Ferre, Sonia Abas, Luis-Felipe Callado, Jesus A. Garcia
11. Methods and pharmaceutical composition for the treatment of neurodegenerative disease. UBTT0329-E. Jean-Antoine Girault, Albert Giralt, Veronica Brito, Silvia Gines
12. Methods and systems for gradual exposure to a fear. UBTT0345. Mel Slater
13. Measuring and improving attention. UBTT0410. Hendrik Anne Super
14. Combinación nutracéutica y su uso para el tratamiento de trastornos neurológicos. UBTT0421-E. Angeles Garcia, Alfonso Luis De Oyarzabal, Xavier Altafaj
15. Secreted splicing variant of klotho for treating bone disorders. UBTT0426-E. Joan Roig, Miguel Chillon, Assumpcio Bosch, Merce Pallas, Christian Griñan-Ferre
16. Dynamics within supramolecular IKVAV Matrices Enhance Functional Maturation of Human iPSCs-derived Neurons and Regeneration. PCT/US2020/015006. Zaida Alvarez, Alberto Ortega, Kohei Sato, Evangelos Kiskinis, Samuel I. Stupp

# UBneuro actions and activities

## Technological platforms

We developed a program to potentiate advanced technical and scientific platforms. The eight specialized platforms created in 2019 have been extended in 2021:

- Animal research facility
- Neuropharmacology
- Electrophysiology facility
- Clinical and experimental neurology and neuropathology
- Advanced microscopy
- Neuroimaging
- Virtual Reality biosensor platform
- Electroencephalography (EEG) and Magnetoencephalography

## Infrastructure

UB has been extremely successful in the last infrastructure call launched by the Spanish Ministry of Science and Innovation with Next GenerationEU funds. CCiTUB has obtained different equipment that will be very useful for making a step forward in the quality of UBneuro research:

- **4D Bioprinting.** The four-dimension bioprinting is a powerful and innovative technology to print central nervous system tissue engineering to test drugs and study pathogenic mechanisms. **Budget: 999,604 €**
- **Preclinical Molecular and Functional Imaging Service.** This platform consists of an advanced translational biomedical imaging platform that would be made up of three equipments: i) Integrated PET / SPECT / CT / OI in vivo imaging system for preclinical research; ii) Optical coherence tomography system; and iii) Digital ultrasound system. **Budget: 1,039,346 €**
- **Multiphoton Microscope for In Vivo Imaging.** Configuration with double-headed, Upright and Inverted Microscope, conventional and high-speed resonant scanner, with tunable Pulsed Laser Near Infrared and Infrared for excitation with 2 photons. **Budget: 570,000 €**
- **High Content Screening Platform.** Latest Generation High Content Screening Platform based on spinning disc confocal microscopy that allows acquisition of 2D and 3D optical section images at high speed with 2 cameras. **Budget: 654,036 €**
- **FIB-SEM.** Focused Ion Beam (FIB) and scanning electron microscopy (SEM) that can work in cryogenic mode and correlates with confocal microscopy. **Budget: 1,228,000 €**

# UBneuro actions and activities

## 2) High-quality training activities

The Institute of Neurosciences assumes that the future of our society relies on visionary and endeavoring spirits, and certainly those can be found in new young generation. Thus, one of our major goals is to attract and promote the most brilliant talent. Below we list training actions and achievements, performed during this period at each research profile:

## Master students

**Master** students could apply to 5 master degrees:

1. Inter-university Master of Neurosciences (Coord. Esther Pérez-Navarro)
2. Master of Research in Behaviour and Cognition (Coord. Ferran Pons)
3. Master degree in General Health Psychology (Coord. Adela Fuste Escolano)
4. Inter-university Master of Introduction to Mental Health Research (Coord. Eduard Vieta)
5. Cognitive Science and Language (Coord. Laura Bosch).

Additionally, 2 workshops on how to develop the research career and how to look and apply for PhD fellowships specially with UBneuro research groups were given to master students by our research developer.

# UBneuro actions and activities

## PhD students

**PhD students** can join **6 Doctoral Programs of the UB** and **2 MSCA-ITN programs**.

1. PhD in Biomedicine (Coord. Albert Tauler)
2. PhD in Medicine and Translational Research (Coord. Julia Gonzalez)
3. PhD in Brain, Cognition and Behavior (Coord. Joan Lopez-Moliner)
4. PhD in Clinical Health Psychology (Coord. Jose Gutierrez Maldonado)
5. PhD in Biotechnology (Coord. Josefa Badia)
6. PhD in Drug Research, Development and Control (Coord M Luisa Perez)
7. MSCA-ITN Molecule-to-man pain network (PI: Dr. Xavier Gasull)
8. MSCA-ITN Training for Advanced Stem Cell Technologies in Neurology (Coord. Josep M. Canals).

These official programmes constitute an excellent opportunity for professional development in neurosciences for young researchers and talented students interested in research. Moreover, PhD students at UBneuro could also enjoy several actions promoted by our PhD Committee.

## Researchers

All researchers can benefit from **training grants**, to get training on specific technics, skills. Considering the interdisciplinary of our Institute this is a good solution to assist researchers needs.

All researchers can receive **personalized mentoring** on their career path and support on any application from UBneuro staff but also from UBneuro members. For instance, mentoring sessions on MSCA, INPhINIT, Junior Leader calls, Caixa Health have been given from fellows to candidates. This generates synergies among researchers. This program has been consolidated this year (see our [website](#)).

# UBneuro actions and activities

## 3) Support research at the frontiers of knowledge

### Scientific Advisory Board Meeting

UBneuro External SAB is composed by 5 prestigious scientists Kimmo Alho, Ernest Arenas, Mercedes Atienza, Carmen Sandi, Frederic Saudou (see Governing and Advisory Bodies section). The SAB meetings was held from the 24<sup>th</sup> to the 26<sup>th</sup> of November. The main aim of this meeting was to evaluate the performance of the Institute and assess on the future strategy, and to prepare the submission of the Maria de Maeztu award for the 2022-2025 period.

The event started with the institutional opening conducted by Dr. Joan Guàrdia (Rector of the UB), Dr. Antonio Solanas (Dean of Faculty of Psychology), and Dr. Albert Díaz-Guilera (Coordinator of UB Research Institutes). Director Jordi Alberch and the research promotor Cristina Pulido exposed the current status of the Institute, the main achievements up to date based on talent attraction and the creation of spin-offs. This was followed by a presentation of the research strategy for the next 4 years, including recruiting and international projects.

The morning of the second day was focused on young researchers' sessions divided in 4 sections based on different study area at the Institute of Neurosciences. The Chair of the session was Cristina de la Malla (Department of Cognition, Development and Educational Psychology). The session on "Pathophysiology of Nervous System" started with Sandra Acosta and her presentation "Deciphering



human brain development: from genomes to functions", and was followed by Gerard Callejo who talked about peripheral cellular and molecular mechanisms underlying chronic pain. In the section of "Experimental Neurology", Roser Sala presented statistical modelling and data analysis for neuroimaging, and Marina López focused her talk on neurocognitive markers of centralized chronic pain and depression across the lifespan. At "Cognitive and behavioural" section, Isabel García presented her work on obesity, binge eating, and food addiction. The last presentation on "Scientific technological platform" entitled "Remote control and imaging of neural activity" was conducted by Jordi Bonaventura. The last part of the morning session was a round table where the young investigators had the chance to formulate questions, request for advice, and discuss many different aspects of interest related with their present and future as investigators.

If the morning session was focused on young researchers, the afternoon session was for PhD students. The SAB and the PhD Committee did a short presentation, followed by parallel mentoring round tables with every member of the SAB.

The third day, the SAB presented their conclusions to the Board of Directors of the Institute of Neurosciences and provided very good recommendations about the future strategy based on strengths and weaknesses to ensure that we keep pushing the boundaries of neuroscience research.

# UBneuro actions and activities

## International Congresses Grants

In 2021, UBneuro awarded 27 congress grants for our researchers in order to register to congresses such as FENS, European Academy of Childhood Disability Annual Meeting, 7<sup>th</sup> International Conference on Behavioral Addictions, Alzheimer's Association International Conference (AAIC).

The aim of this programme is to promote the internationalisation of research and to support the career of young researchers, strengthening the international presence of the research groups from UBneuro.

## Barcelona Lecture Series (BLS) 2021

These open conferences offer a great opportunity for researchers and students to meet international distinguished neuroscientists, who present the latest advancements in their respective field of research. Below you can find the oral presentations that were held this year.

[More information](#)

[BLS 2021- Why is it to difficult to attend?: My view about what attention is and the cost of attending \(online\)](#)

18/03/2021

Juan Lupiáñez  
Universidad de Granada

[BLS 2021 – Haptic technology for haptic communication \(online\)](#)

29/04/2021

Myrthe Plaisier  
Eindhoven University of Technology

[BLS 2021 – Investigating changes in stimulus processing during reinforcement learning \(online\)](#)

13/05/2021

David Luque  
Universidad Autonoma de Madrid /  
Universidad de Málaga

[BLS 2021 – The neural mechanisms of music-induced pleasure: from correlational to casual evidence \(online\)](#)

27/05/2021

Ernest Mas Herrero  
Brainvitge – Institute of  
Neurosciences UB

[BLS 2021 – Rhythms of Attention \(online\)](#)

03/06/2021

Laura Dugué  
Integrative Neuroscience and  
Cognition Center CNRS – UMR 8002  
& Université de Paris

[BLS 2021 – Self-perceptions of ageing and their associations with cognitive, physical, and mental health and wellbeing \(online\)](#)

17/06/2021

Serena Sabatini  
University of Exeter

[BLS 2021 – Emotion processing in the amygdala and its impact on perception and awareness \(presential and online\)](#)

15/09/2021

Judith Domínguez-Borràs  
Brainlab – Institute of Neurosciences  
UB

# UBneuro actions and activities

## 4) Fostering synergies actions

### 10th International Meeting on Neuroacanthocytosis Syndromes

From 10 -12 March, we were proud to organise this Meeting where scientist, patients and families shared ideas, made connections in the pursuit of therapeutics for Neuroacanthocytosis Syndromes.

Thanks to the virtual format it was easy to talk between patients, researchers and caregivers so they could expose their points of view.

The participation was global. We had 168 participants from Europe (Belgium Czech Republic, Germany, United Kingdom, Italy, among others), America (Brasil, Canada, USA, Puerto Rico) and Asia (Thailand, South Korea, Iran, Japan, and Israel).



10th International Meeting on Neuroacanthocytosis Syndromes



BARCELONA MARCH 2021



March 2021  
10-12

Please join us in Barcelona, Spain, to meet scientists, patients and families, share ideas, and make new connections in the pursuit of therapeutics for Neuroacanthocytosis Syndromes.

Registration is now open at:  
[www.neuroacanthocytosis2021.com](http://www.neuroacanthocytosis2021.com)

Conference will take place online.



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## UBneuro actions and activities

### Jornada instituts UB: L'exploració (i explotació) de l'espai

This workshop held the 22 of June, was about different points of view of the space. The day began with a very close space project: the NewSpace strategy of Catalonia, an example of how space is already part of our daily lives.

Afterwards, the UB's research institutes gave a multidisciplinary view of space: the practical problems of space exploration, the science that derives from it, how it affects our lives and what economic factors surround it. UBneuro participated with the talk "El cervell a l'espai", by Jordi Alberch. [More information](#)

### Training the next generation of neuroscience leaders

On 15th of July, the Institute of Neurosciences of the University of Barcelona held a meeting for all young researchers to help them push their careers to the next level.

The day started with an introduction from the director of the Institute, Jordi Alberch, who empathised the importance of the next generation of researchers and how it is crucial to work together to push the boundaries of neuroscience research. Furthermore, the management team explained all the resources available for them and their peers. 9 young researchers exposed their research lines, and the day ended with 2 round tables full of knowledge. These was the first face-to-face activity after the COVID-19.



# UBneuro actions and activities

## V PhD Workshop – 25 November 2021

On the 25th of November 2021, UBneuro hosted the V annual PhD Workshop at Campus Mundet. The workshop session started with an opening ceremony by the PhD Committee, where they make a presentation of what is the PhD Committee. The workshop was concluded with four round tables (each session was led by one of our SAB members) where the PhD students had the opportunity to attend to the session that they were more interested. In this mentoring session the PhD students had the chance to interact with Senior Researchers from other institutions where they can mirror to in their future. They had the opportunity to ask them many things in relations with their scientific careers and their professional experience, to know how they arrive there. After the PhD Workshop, the PhD students enjoyed an Improvisational Leadership (by Performing Ideas), and they attended to an Improshow Event & beverage (by Planeta Impro) at the Mundet canteen.



# UBneuro actions and activities

## 5) Responsible Research and Innovation actions

### Open Access Actions

Peer-reviewed scientific research articles are published on gold open, or following the European Commission's strategy, opting for green open access when the gold open access is not achievable due to economical restriction. University of Barcelona has an institutional repository (<http://diposit.ub.edu>) publicly accessible to anyone with a research data collection (<http://hdl.handle.net/2445/56611>). Any researcher can upload datasets and get a unique handle as a permanent identifier. Moreover, data can be released using any of the required licenses (CC-BY, CC0). Inside the Digital Repository, the UBneuro has its own collection (<http://diposit.ub.edu/dspace/handle/2445/119894>).

In 2021, to consolidate our Open Access strategy inside an Open Science (OS) Framework **Open Access Grants** to publish on Open Access were offered to our researchers to promote gold open publications. Eight grants were awarded. Moreover, UBneuro had an active participation in OS working group from SOMMa.

### Gender Actions

The Institute takes active account of: i) Gender balance in decision-making processes; ii) Gender dimension in Research and Innovation (R&I) content; iii) Gender balance in Project teams at all levels. Our Institute is composed by **61% of women**. Our Institute works to provide equal opportunities to male and female researchers at all stages, paying attention to promote gender equality in all open vacancies, respecting the rules of the Code as laid out in the Charter and guaranteeing gender balance in the decision-making network.

In order to keep the awareness of the importance of gender consideration the Women in Neurosciences Symposium was organized, 11th of February 2021, with more than 300 attendances. The Brainlab research group was in charge of the organization. We encourage other groups to also organize this kind of actions.

# UBneuro actions and activities

## Outreach

During 2021, we have exponentially grown the impact of our outreach activities thanks to the Maria de Maeztu award. In addition, we were able not only to strengthen our programme but also start new initiatives and, above all, we received an EU grant (under the Marie Skłodowska-Curie actions) for the first time in this area with the project **"European Performing Science Night"**(EPSN), done together with the prestigious performing arts company la Fura dels Baus (Epiclab). We have kept working to bring science and art closer together with UBneuro's project **"NeuroArt"** and **"Meet the brains"**. We have started a new project named **"A peek into the brain"** in which we ask students and citizen "what they would like to know about the brain". UBneuro was awarded (10,000 €) for this initiative from the "Premis Barcelona 2020" programme from the Culture Institute of Barcelona (Ajuntament de Barcelona). UBneuro has engaged in several science communication initiatives such as World Brain Week, Escolab, Pint of Science, Science Festival, dissemination courses at Barcelona Civic Centres, and in organising specific workshops about both neuroscience in general and mental health for citizens, to make sure research results have a real and direct impact on society.

Thanks to the strengthening of our science communication and outreach program we have consolidated our collaborations and sponsorships with the Centre of Contemporary Culture of Barcelona, Museum of Contemporary Art of Barcelona, CosmoCaixa, Fundació la Caixa, Pasqual Maragall Foundation, Edinburgh University and Facebook VR, and we are in the process of establishing new collaborations with other institutions such as Novartis.

## 1. European Researcher's Night 2021

The European Performing Science Night (EPSN) is co-funded under the Marie Skłodowska-Curie actions. The European Performing Science Night it is a scientific event, where research groups will deploy experiments with a broad spectrum of civil society both online and face to face. La Fura dels Baus and Fundación Épica along five research partners will lead this event. From UBneuro, Lluís Fuentemilla did a workshop and a talk named "Estereotipos: ¿se pueden cambiar?" This event was held in different workshops and performances, in different days.

Bellow you can see a picture of the Institute of Neuroscience stand on September 25, in the Cultural Center l'Escorxador in Badalona, where they make exhibitions, interactive experiences, and talks aimed to promote the values of science and to demonstrate the impact and appeal of researchers' work, to motivate young people to embark on research careers.

[More information](#)



# UBneuro actions and activities

## 2. Meet the Brains

The Institute are its researchers, through them the Institute opens up to peers and society. We wanted to show to everybody our researchers and what they are investigating. With these short videos we wanted that our researchers felt part of the Institute. Also, we want to use the videos as an internal communication so all the crew could know what their coworkers are researching. Last but no least with this project we want to break the stereotype of an unapproachable scientist to the society.



Cristina Malagelada



Joan Lopez Moliner



Xavier Gasull



Maria Angeles Jurado

Link of the videos:

<https://www.youtube.com/playlist?list=PLk30SkIhJt5Kv8c7Yuzqhor78hBr2mAaL>

# UBneuro actions and activities

## 3. NeuroArt 2021

On March 2021, in the framework of the Brain Awareness week, we celebrated the four edition of the NeuroArt project, which aims to bridge the gap between science and art.

See the video of the project here <http://www.neurociencias.ub.edu/neuroart/>.

NeuroArt invites schools from all over Catalonia to explore different neuroscientific concepts through works of art. Our researchers went to diferents schools talking about their research and answering qüestions of the students about the brain. Besides more than 2,000 students directly involved in the NeuroArt project, we have reached an audience of more than 15,000 people online who voted for the different works of art.

This year we did the Award Gala online, a group of representatives from each school made a video explaining their works of art inspired by the nervous system.

The awarded works of art were:



### Neuromúsica: 1st Prize

With this work, the students of the 3r ESO of Institut Jaume Callís (Vic), want to relate music and brain, indicating how and in which parts the information in a piece of music is processed. The characteristics of the sound (frequency, intensity, harmony, etc.) are briefly explained and at the same time the parts of the brain affected are shown.



### Pèrdua de ma vida: 2nd Prize

The second prize went to the project *Pèrdua de ma vida* by students of 3r ESO of Jesús Maria Claudina (Barcelona). They wanted to represent the Alzheimer's disease. This is manifested by cognitive deterioration and behavioural disorders. They wanted to recreate two stages of the development of the disease playing with the visual and plàstic form.



### Llegir no és sempre fàcil: 3rd Prize

The 3rd prize went to other group of 3r ESO of Jesús Maria Claudina (Barcelona). This piece of art aims to represent dyslexia. Some of the members of the group have relatives who suffer dyslexia and have witnessed the difficulties they have. They wanted to give a voice to this disorder, as they believe that the difficulties they face are not always understood, especially at school, generating a lot of frustration.



### Electrobraç: 4th prize

The students of 3r ESO of Institut Jaume Callís (Vic) with the arm, wanted to explain how reflex actions work. For exemple, when we burn ourselves, from the moment where sensory neurons pick up the pain via the spinal cord until we move our arm away thanks to the impulse transmitted from a motor neuron to a muscle.

# UBneuro actions and activities

## 4. Una finestra al cervell

"What do you want to know about the brain?" This is the question that from the Institute of Neurosciences, we open to everyone! Through a transmedia strategy of scientific dissemination, we create multimedia content customised to the needs and concerns that you send us. An opportunity to bring the field of neuroscience closer to everyone, especially to the youngest ones.

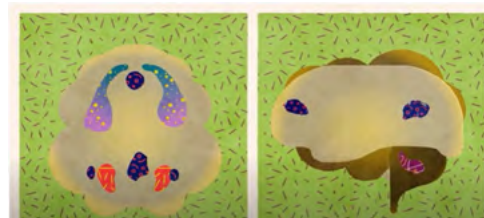
Link of the videos: <https://www.youtube.com/playlist?list=PLk30SkIhJt5IknFt512ZOWFpqjZas6lV1>



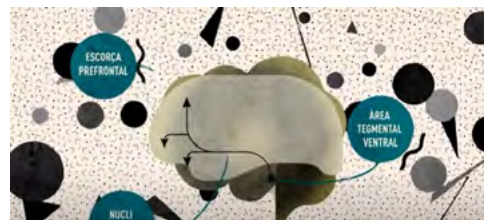
[How do we embed information in the brain?](#)



[Why do we cry?](#)



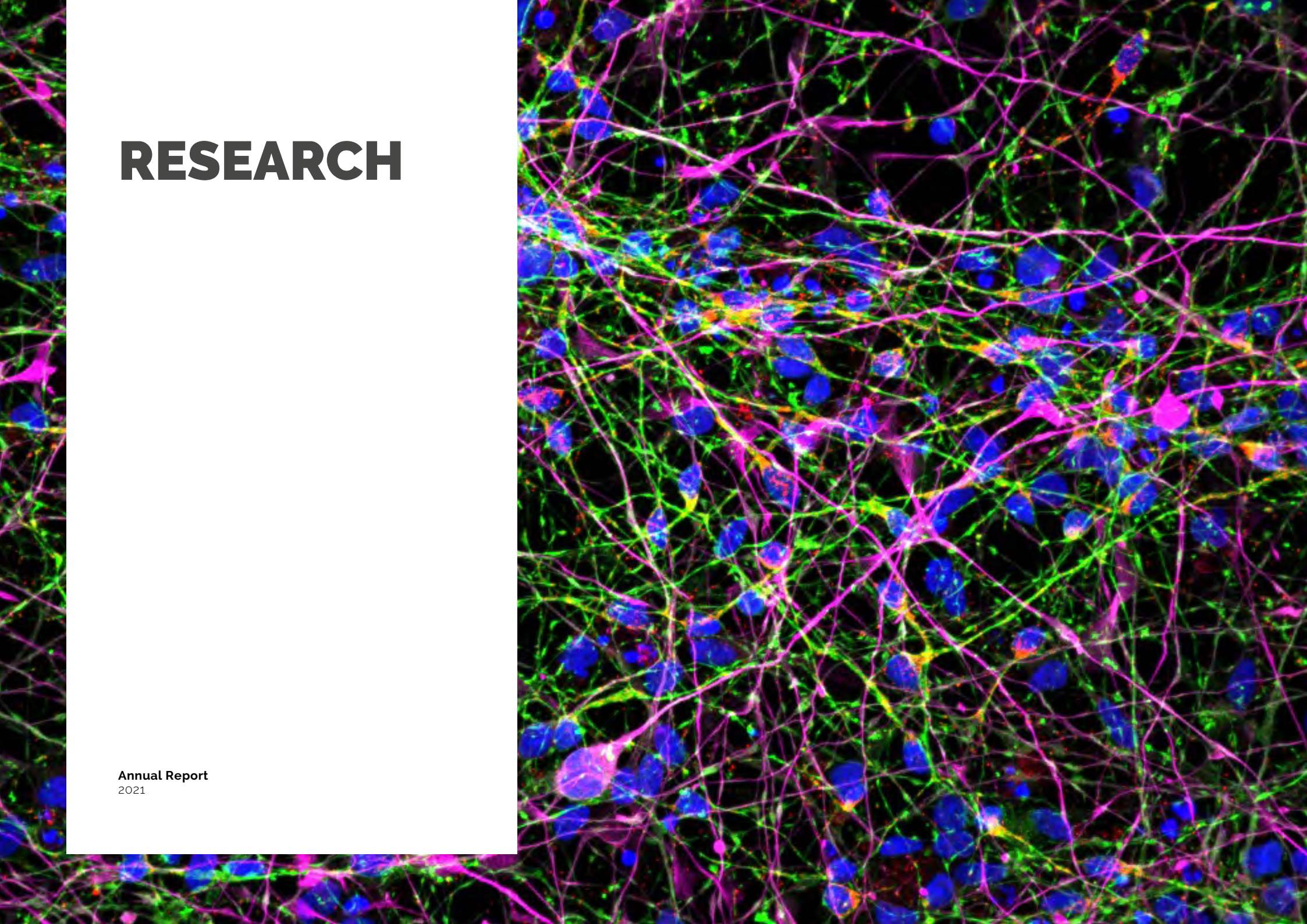
[Is it possible to know the personality from images obtained with fMRI?](#)



[How do drugs affect the brain?](#)

# RESEARCH

Annual Report  
2021





# Pathophysiology of Nervous System Diseases

## Research

# Pathophysiology of Nervous System Diseases



## THE STUDY OF THE PATHOPHYSIOLOGY OF NERVOUS SYSTEM DISEASES IS AN IMPORTANT CHALLENGE IN BIOMEDICINE TO DEVELOP NEW SUCCESSFUL THERAPIES.

Neurological and psychiatric disorders can disrupt molecular pathways, synapses, neuronal and glial subpopulations, and local circuits in specific brain regions, as well as higher-order neural networks. Therefore, research must range from the study of large-scale brain network alterations to the microscopic and/or genetic abnormalities. Improving our knowledge of the pathophysiology of these conditions will enable not only to identify new potential therapeutic targets but also biomarkers, whose usefulness can range from detecting diseases in very early stages more likely to respond to disease-modifying treatments than advanced stages, to differentiate among similar conditions and to monitor response to treatments.

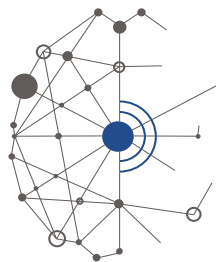
Research in this area focuses on defining the pathophysiological mechanisms involved in the loss of normal and neuronal plasticity related to these diseases. A deeper understanding of neuronal connectivity and dynamics, signaling molecules, cell-cell interaction and epigenetic factors in the nervous system will enable us to devise new pharmacological targets for therapeutic strategies to prevent or delay nervous system diseases.

Another therapeutic approach for nervous system disorders is neuroregenerative medicine. The institute is also interested in mimicking neural development on stem cells for replacing strategies as new therapies for diseases affecting the brain and spinal cord.

Thus, the current structure and expertise of the Institute of Neurosciences constitute the best environment to conduct multidisciplinary and translational research to find therapeutic approaches for motor and cognitive dysfunctions.

## FEATURED PROJECTS

- **In vitro Study of Neurodevelopment in Huntington's Disease.** CHDI Foundation, Inc. 600101. Josep M. Canals
- **In vivo reprogramming to rescue alterations in Huntington's disease.** Fundació 'La Caixa'. HR21-00622. Josep M. Canals
- **Training for Advanced Stem Cell Technologies in Neurology (ASCTN-Training).** European Union. MSCA-ITN-2018. 813851. Josep M. Canals
- **Papel de la proteína de matriz extracelular Reelina en plasticidad neural y en la enfermedad de Alzheimer.** Ministerio de Ciencia, Innovación y Universidades. PID2019-106764RB-C21. Eduardo Soriano
- **Dinámica de los agregados macromoleculares de heteroreceptores de dopamina-adenosina en esquizofrenia y trastornos neurodegenerativos.** Ministerio de Ciencia e Innovación. PID2020-118511RB-I00. Francisco Ciruela
- **Modulation of Tau seeding and pathology in tauopathies by BBB-nanocarriers, epitope selective vaccination and ectoPrP Tau receptor bodies (STOPTauPATHOL).** Fundació 'La Caixa'. HR18-00452. Jose Antonio del Rio
- **Nuevas aproximaciones para entender las funciones de la PrPC y miembros secretables de semaforinas durante el desarrollo del hipocampo y en neurotransmission.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-099773-B-I00. Jose Antonio del Rio.
- **Red Temática de Investigación Cooperativa en Salud - Terapia Celular.** Ministerio de Economía y Competitividad
- **Network Center for Biomedical Research in Neurodegenerative Diseases (CIBERNED)**
- **Network Center for Biomedical Research in Rare Diseases (CIBERER)**



### Pathophysiology of Nervous System Diseases

# Cell biology of neurodegeneration

## Principal investigators

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FERNANDO AGUADO

Neural and endocrine secretory pathways in normal and pathological conditions

FRANCESC X. SORIANO

Inter-organelle communication

## Members

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Sergi Casellas, Raquel Larramona, Guillem Rique, Irene Sanchez, Paula Tena

## Active projects

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- **ER-mitochondria contacts in neurodegeneration. Looking for a novel therapeutic approach.** Ministerio de Ciencia, Velux Stiftung. Project number 1262. Francesc X. Soriano.
- **Estudio del papel de Mfn2 en la regulación de programas transcriptionales inducidos por la actividad sináptica.** Ministerio de Ciencia, Innovación y Universidades. PID2020-119322GB-I00. Francesc X. Soriano.
- **Modulació de la senyalització retrògrada mitocondrial com a tractament de la síndrome de Leigh.** Fundació La Marató de TV3. 415/C/2020. Francesc X. Soriano.
- **Vesículas de centro denso en neuronas y astrocitos: mecanismos de exocitosis y su potencial uso como biomarcadores de neurodegeneración.** Ministerio de Ciencia, Innovación y Universidades. PID2019-107738RB-I00. Fernando Aguado.

## Selected publications

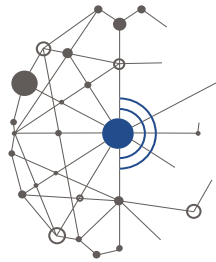
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- Barranco, N., Plá, V., Alcolea, D., Sánchez-Domínguez, I., Fischer-Colbrie, R., Ferrer, I., Lleó, A., & Aguado, F. (2021). Dense core vesicle markers in CSF and cortical tissues of patients with Alzheimer's disease. *Translational Neurodegeneration*, 10(1), 37. <https://doi.org/10.1186/s40035-021-00263-0>
- Casellas-Díaz, S., Larramona-Arcas, R., Riqué-Pujol, G., Tena-Morraja, P., Müller-Sánchez, C., Segarra-Mondejar, M., Gavalda-Navarro, A., Villarroja, F., Reina, M., Martínez-Estrada, O. M., & Soriano, F. X. (2021). Mfn2 localization in the ER is necessary for its bioenergetic function and neuritic development. *EMBO Reports*, 22(9), e51954. <https://doi.org/10.15252/embr.202051954>
- Coimbra-Costa, D., Garzón, F., Alva, N., Pinto, T., Aguado, F., Torrella, J. R., Carbonell, T., & Rama, R. (2021). Intermittent Hypobaric Hypoxic Preconditioning Provides Neuroprotection by Increasing Antioxidant Activity, Erythropoietin Expression and Preventing Apoptosis and Astroglialosis in the Brain of Adult Rats Exposed to Acute Severe Hypoxia. *International Journal of Molecular Sciences*, 22(10), 5272. <https://doi.org/10.3390/ijms22105272>

## Thesis

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- **Regulación de la bioenergética mitocondrial por Mfn2 mediante los contactos RE-mitocondria y su implicación en la fisiología neuronal.** Sergi Casellas. Supervisors: Francesc X. Soriano & Manuel Reina.



Pathophysiology  
of Nervous  
System Diseases

# Cellular and molecular basis of sensory disorders

## Principal investigators

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ALEJANDRO BARRALLO-GIMENO

Hair cell damage mechanisms in the zebrafish lateral line

JORDI LLORENS

Mechanisms and physiological impact of hair cell loss in the mammalian vestibular system

ANA MENDEZ

Mechanisms underlying the light response in photoreceptor cells of the retina, light adaptation and inherited blindness

## Members

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Mireia Borrajo, Alberto Maroto, Aida Palou, Xavier Vallve

## Active projects

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- **Adaptación de la retina a la luz e identificación de dianas terapéuticas para las cegueras hereditarias: IMPDH1 y metabolismo energético.** Ministerio de Ciencia e Innovación. PID2020-115431RB-I00. Ana Mendez.
- **A patient centered research: awareness of patients needs, clinical phenotyping and molecular parthenogenesis in Neurofibromatosis type 2.** Fundació La Marató de TV3. 126/C/2020. Jordi Llorens.

- **Bases celulares i Moleculars dels Trastorns Sensorials.**

Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR621. Jordi Llorens.

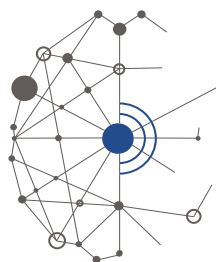
- **Respuesta molecular del sistema vestibular a la ototoxicidad crónica; identificación de mecanismo y desarrollo de modelos de análisis in vivo.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-096452-B-I00. Jordi Llorens i Alejandro Barrallo-Gimeno.

- **Vestibular Loss and Spatial Orientation.** Ministerio de Ciencia, Innovación y Universidades. PCI2020-120681-2. Jordi Llorens.

## Selected publications

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- Rompaey, V. Van, Liesenborghs, A., Goyvaerts, K., De Herdt, D., Verdoodt, D., Lammers, M., Heyning, P. Van de, Vanderveken, O., Szewczyk, K., Thys, S., Pintelon, I., Timmermans, J.P., Llorens, J., Deyn, P. De, Dam, D Van. (2021). Decreased Doublecortin (DCX) immunoreactivity in hippocampus after profound sensorineural hearing loss and vestibular dysfunction in adult mice. *B-Ent*, 17(4), 223–223. <https://doi.org/10.5152/b-ent.2021.21452>
- Greguske, E. A., Llorens, J., & Pyott, S. J. (2021). Assessment of cochlear toxicity in response to chronic 3,3'-iminodipropionitrile in mice reveals early and reversible functional loss that precedes overt histopathology. *Archives of Toxicology*, 95(3), 1003–1021. <https://doi.org/10.1007/s00204-020-02962-5>
- Maroto, A. F., Barrallo-Gimeno, A., & Llorens, J. (2021). Relationship between vestibular hair cell loss and deficits in two anti-gravity reflexes in the rat. *Hearing Research*, 410, 108336. <https://doi.org/10.1016/j.heares.2021.108336>



Pathophysiology  
of Nervous  
System Diseases

## Principal investigators

EDUARDO SORIANO  
Developmental genes and neural plasticity

MARTA PASCUAL  
Septohippocampal networks in Alzheimer's Disease

## Members

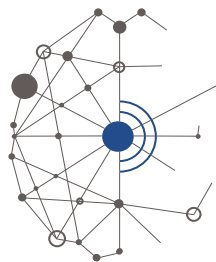
Ferran Burgaya, Fausto Alexander Ulloa, Jesus Mariano Ureña, Yasmina Manso, Antoni Parcerisas, Lluís Pujadas, Oriol Ros, Tiziana Cortrufo, Eva Davila, Katherine Herrera, Alba Ortega, Alba del Valle Vilchez, Alba Elias

## Active projects

- **Enfermedades neurodegenerativas.** Ministerio de Sanidad y Consumo. CB06/05/0098. Eduardo Soriano.
- **Integrative Platforms for Axon guidance.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2019 BP 00250. Eduardo Soriano.
- **Neurobiologia del Desenvolupament i la Regeneració Neuronal.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1280. Eduardo Soriano.
- **Papel de la proteína de matriz extracelular Reelina en plasticidad neural y en la enfermedad de Alzheimer.** Ministerio de Ciencia, Innovación y Universidades. PID2019-106764RB-C21. Eduardo Soriano.

## Selected publications

- Cotrufo, T., Andrés, R. M., Ros, O., Pérez-Brangulí, F., Muhaisen, A., Fuschini, G., Martínez, R., Pascual, M., Comella, J. X., & Soriano, E. (2012). Syntaxin 1 is required for DCC/Netrin-1-dependent chemoattraction of migrating neurons from the lower rhombic lip. *The European Journal of Neuroscience*, 36(9), 3152–3164. <https://doi.org/10.1111/j.1460-9568.2012.08259.x>
- Dávila-Bouziguet, E., Casóliba-Melich, A., Targa-Fabra, G., Galera-López, L., Ozaita, A., Maldonado, R., Ávila, J., Delgado-García, J. M., Gruart, A., Soriano, E., & Pascual, M. (2021). Functional protection in J20/VLW mice: a model of non-demented with Alzheimer's disease neuropathology. *Brain*, 145(2), 729–743. <https://doi.org/10.1093/brain/awab319>
- Hernaiz-Llorens, M., Martínez-Mármol, R., Roselló-Busquets, C., & Soriano, E. (2021). One Raft to Guide Them All, and in Axon Regeneration Inhibit Them. *International Journal of Molecular Sciences*, 22(9), 5009. <https://doi.org/10.3390/ijms22095009>
- Izquierdo-Villalba, I., Mirra, S., Manso, Y., Parcerisas, A., Rubio, J., Del Valle, J., Gil-Bea, F. J., Ulloa, F., Herrero-Lorenzo, M., Verdaguer, E., Benincá, C., Castro-Torres, R. D., Rebollo, E., Marfany, G., Auladell, C., Navarro, X., Enriquez, J. A., de Munain, A. L., Aragay, A. M., & Soriano, E. (2021). A novel Alex3/Gq protein complex regulating mitochondrial dynamics, dendritic complexity, and neuronal survival. *BioRxiv*. <https://doi.org/10.1101/2021.12.09.471902>
- Parcerisas, A., Ortega-Gascó, A., Hernaiz-Llorens, M., Odena, M. A., Ulloa, F., de Oliveira, E., Bosch, M., Pujadas, L., & Soriano, E. (2021). New Partners Identified by Mass Spectrometry Assay Reveal Functions of NCAM2 in Neural Cytoskeleton Organization. *International Journal of Molecular Sciences*, 22(14), 7404. <https://doi.org/10.3390/ijms22147404>
- Parcerisas, A., Ortega-Gascó, A., Pujadas, L., & Soriano, E. (2021). The Hidden Side of NCAM Family: NCAM2, a Key Cytoskeleton Organization Molecule Regulating Multiple Neural Functions. *International Journal of Molecular Sciences*, 22(18), 10021. <https://doi.org/10.3390/ijms221810021>
- Wang, Y., Bae, T., Thorpe, J., Sherman, M. A., Jones, A. G., Cho, S., Daily, K., Dou, Y., Ganz, J., Galor, A., Lobon, I., Pattni, R., Rosenbluh, C., Tomasi, S., Tomasini, L., Yang, X., Zhou, B., Akbarian, S., Ball, L. L., ... Network, B. S. M. (2021). Comprehensive identification of somatic nucleotide variants in human brain tissue. *Genome Biology*, 22(1), 92. <https://doi.org/10.1186/s13059-021-02285-3>



# Mechanisms of synaptic transmission

## Principal investigators

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JUAN BLASI

Study of the action of epsilon toxin on the nervous system

ARTUR LLOBET

Outside-in control of synaptic function; Study of synaptic disfunctions in the experimental model of *X. tropicalis* tadpoles

CARLES SOLSONA

Study of the action of epsilon toxin on the nervous system

## Members

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Beatrice Terni, Pablo Martinez, Marta Casas, Celia Velasco

## Active projects

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- **Laboratori de Neurobiologia Cel·lular i Molecular.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1017. Carles Maria Solsona.
- **Red de Investigación Transfronteriza en Enfermedades Priónicas Humanas y Animales (REDPRION).** European Union. EFA148/16 REDPRION. Juan Blasi
- **Regulación outside-in de la función presináptica por factores neuronales y gliales secretados.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-096948-B-I00. Artur Llobet

## Selected publications

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- Ortiz-Miguel, S., Miguel-Pérez, M., Navarro, J., Möller, I., Pérez-Bellmunt, A., Agullo, J. L., Ortiz-Sagrístà, J., Blasi, J., & Martinoli, C. (2021). Compartments of the antebrachial fascia of the forearm: clinically relevant ultrasound, anatomical and histological findings. *Surgical and Radiologic Anatomy: SRA*, 43(10), 1569–1579. <https://doi.org/10.1007/s00276-021-02736-3>
- Terni, B., & Llobet, A. (2021). Axon terminals control endolysosome diffusion to support synaptic remodelling. *Life Science Alliance*, 4(8). <https://doi.org/10.26508/lsa.202101105>

## Knowledge transfer & Innovation

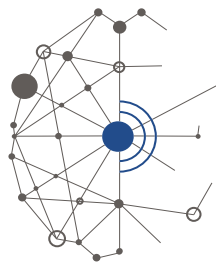
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- Extensímetro para estructuras biológicas. AVCRI243-E. Jaume Palou, Miquel Soler, Anna Nualart, Carles Solsona

## Thesis

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- **MAL-dependent generation of extracellular vesicles, a new role of epsilon toxin from *Clostridium perfringens*.** Merce Cases. Supervisors: Carles Solsona & Joan Blasi.



Pathophysiology  
of Nervous  
System Diseases

# Molecular and cellular neurobiotechnology

## Principal investigators

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JOSE ANTONIO DEL RIO

## Members

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Rosalina Gavin, Vanesa Gil, Arnau Hervera, Sara Martinez, Ana Lopez-Mengual, Francina Mesquida, Julia Sala, Karen Wells, Miriam Segura

## Active projects

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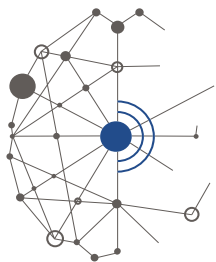
- **Bases cel·lulars i moleculars en neurodegeneració i neuroregeneració (CMBNN).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR648. Jose Antonio del Rio.
- **Modulation of Tau seeding and pathology in tauopathies by BBB-nanocarriers, epitope selective vaccination and ectoPrP Tau receptor bodies (STOPTauPATHOL).** Fundació 'La Caixa'. HR18-00452. Jose Antonio del Rio.
- **Molecular and cellular neurotechnology.** Ministerio de Sanidad y Consumo. CB06/05/1115. Jose Antonio del Rio.
- **Nuevas aproximaciones para entender las funciones de la PrPC y miembros secretables de semaforinas durante el desarrollo del hipocampo y en neurotransmisión.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-099773-B-I00. Jose Antonio del Rio.
- **Serveis científics i tècnics, autofinançament.** Fundació Privada Institut de Bioenginyeria de Catalunya. P1-L14-zzzzzzzz. Jose Antonio del Rio.

## Selected publications

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- Andrés-Benito, P., Carmona, M., Pirla, M. J., Torrejón-Escribano, B., Del Rio, J. A., & Ferrer, I. (2021). Dysregulated Protein Phosphorylation as Main Contributor of Granulovacuolar Degeneration at the First Stages of Neurofibrillary Tangles Pathology. *Neuroscience*, S0306-4522(21)00534-0. <https://doi.org/10.1016/j.neuroscience.2021.10.023>
- Castaño, O., López-Mengual, A., Reginensi, D., Matamoros-Angles, A., Engel, E., & Del Rio, J. A. (2021). Chemotactic TEG3 Cells' Guiding Platforms Based on PLA Fibers Functionalized With the SDF-1/CXCL12 Chemokine for Neural Regeneration Therapy. *Frontiers in Bioengineering and Biotechnology*, 9, 627805. <https://doi.org/10.3389/fbioe.2021.627805>
- Diaz-Lucena, D., Kruse, N., Thüne, K., Schmitz, M., Villar-Piqué, A., da Cunha, J., Hermann, P., López-Pérez, Ó., Andrés-Benito, P., Ladogana, A., Calero, M., Vidal, E., Riggert, J., Pineau, H., Sim, V., Zetterberg, H., Blennow, K., Del Rio, J. A., Marín-Moreno, A., Espinosa, J. C., ... Llorens, F. (2021). TREM2 expression in the brain and biological fluids in prion diseases. *Acta Neuropathologica*, 141(6), 841–859. <https://doi.org/10.1007/s00401-021-02296-1raq>
- Duran, J., Hervera, A., Markussen, K. H., Varea, O., López-Soldado, I., Sun, R. C., del Río, J. A., Gentry, M. S., & Guinovart, J. J. (2021). Astrocytic glycogen accumulation drives the pathophysiology of neurodegeneration in Lafora disease. *Brain*, 144(8), 2349–2360. <https://doi.org/10.1093/brain/awab110>
- Ferrer, I., Andrés-Benito, P., Ausín, K., Pamplona, R., del Rio, J. A., Fernández-Irigoyen, J., & Santamaría, E. (2021). Dysregulated protein phosphorylation: A determining condition in the continuum of brain aging and Alzheimer's disease. *Brain Pathology*, 31(6), e12996. <https://doi.org/10.1111/bpa.12996>

# Research



Pathophysiology  
of Nervous  
System Diseases

## Selected publications

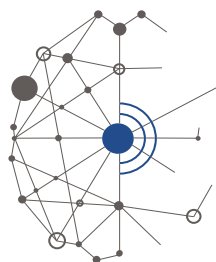
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- Lidón, L., Llaó-Hierro, L., Nuvolone, M., Aguzzi, A., Ávila, J., Ferrer, I., Del Río, J. A., & Gavín, R. (2021). Tau Exon 10 Inclusion by PrPC through Downregulating GSK3 Activity. *International Journal of Molecular Sciences*, 22(10), 5370. <https://doi.org/10.3390/ijms22105370>
- Mesquida-Veny, F., Del Río, J. A., & Hervera, A. (2021). Macrophagic and microglial complexity after neuronal injury. *Progress in Neurobiology*, 200, 101970. <https://doi.org/10.1016/j.pneurobio.2020.101970>
- Moya-Andérico, L., Vukomanovic, M., Cendra, M., Segura-Feliu, M., Gil, V., Del Río, J. A., & Torrents, E. (2021). Utility of *Galleria mellonella* larvae for evaluating nanoparticle toxicology. *Chemosphere*, 266, 129235. <https://doi.org/10.1016/j.chemosphere.2020.129235>

## Thesis

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- **Factores físicos y moleculares implicados en la migración celular y en el desarrollo de la corteza cerebral.** Ana López-Mengual. Supervisor: Jose Antonio del Rio.



Pathophysiology  
of Nervous  
System Diseases

# Molecular bases of rare brain diseases and channelopathies

## Principal investigators

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RAUL ESTEVEZ

## Members

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Aida Castellanos, Hector Gaitan, Marta Alonso, Laura Ferigle, Adria Pla, Efren Xicoy

## Active projects

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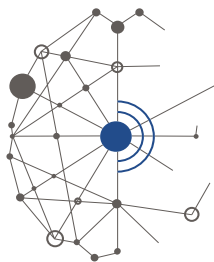
- **CIBERER. Enfermedades Raras.** Ministerio de Sanidad y Consumo. CB06/07/1003. Raul Estevez
- **Development of novel inhibitors of the chloride channel LRRC8/VRAC, a novel player in ischemia.** Fundació La Marató de TV3. Raul Estevez.
- **Fisiologia i patologia de la relació funcional Glia-Neurona.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1255. Raul Estevez.
- **Regulación de canales de cloruro en salud y enfermedad.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-093493-B-I00. Raul Estevez.
- 1 Confidential agreement.

## Selected publications

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- Alonso-Gardón, M., Elorza-Vidal, X., Castellanos, A., La Sala, G., Armand-Ugon, M., Gilbert, A., Di Pietro, C., Pla-Casillanis, A., Ciruela, F., Gasull, X., Nunes, V., Martínez, A., Schulte, U., Cohen-Salmon, M., Marazziti, D., & Estévez, R. (2021). Identification of the GlialCAM interactome: the G protein-coupled receptors GPRC5B and GPR37L1 modulate megalencephalic leukoencephalopathy proteins. *Human Molecular Genetics*, 30(17), 1649–1665. <https://doi.org/10.1093/hmg/ddab155>
- Alonso-Gardón, M., & Estévez, R. (2021). Split-Tobacco Etch Virus (Split-TEV) Method in G Protein-Coupled Receptor Interacting Proteins. *Methods in Molecular Biology* (Clifton, N.J.), 2268, 223–232. [https://doi.org/10.1007/978-1-0716-1221-7\\_15](https://doi.org/10.1007/978-1-0716-1221-7_15)
- Baldwin, K. T., Tan, C. X., Strader, S. T., Jiang, C., Savage, J. T., Elorza-Vidal, X., Contreras, X., Rüllicke, T., Hippenmeyer, S., Estévez, R., Ji, R. R., & Eroglu, C. (2021). HepaCAM controls astrocyte self-organization and coupling. *Neuron*, 109(15), 2427–2442.e10. <https://doi.org/10.1016/j.neuron.2021.05.025>
- Bosch, A., & Estévez, R. (2021). Megalencephalic Leukoencephalopathy: Insights Into Pathophysiology and Perspectives for Therapy. *Frontiers in Cellular Neuroscience*, 14, 627887. <https://doi.org/10.3389/fncel.2020.627887>
- Duncan, A. R., Polovitskaya, M. M., Gaitán-Peñas, H., Bertelli, S., VanNoy, G. E., Grant, P. E., O'Donnell-Luria, A., Valivullah, Z., Lovgren, A. K., England, E. M., Agolini, E., Madden, J. A., Schmitz-Abe, K., Kritzer, A., Hawley, P., Novelli, A., Alfieri, P., Colafati, G. S., Wiczorek, D., Platzer, K., ... Agrawal, P. B. (2021). Unique variants in CLCN3, encoding an endosomal anion/proton exchanger, underlie a spectrum of neurodevelopmental disorders. *American Journal of Human Genetics*, 108(8), 1450–1465. <https://doi.org/10.1016/j.ajhg.2021.06.003>

# Research



Pathophysiology  
of Nervous  
System Diseases

## Selected publications

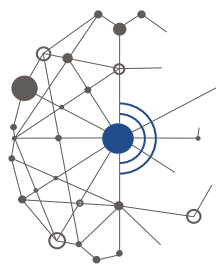
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- Gilbert, A., Elorza-Vidal, X., Rancillac, A., Chagnot, A., Yetim, M., Hingot, V., Deffieux, T., Boulay, A. C., Alvear-Perez, R., Cisternino, S., Martin, S., Taïb, S., Gelot, A., Mignon, V., Favier, M., Brunet, I., Declèves, X., Tanter, M., Estevez, R., Vivien, D., ... Cohen-Salmon, M. (2021). Megalencephalic leukoencephalopathy with subcortical cysts is a developmental disorder of the gliovascular unit. *eLife*, 10, e71379. <https://doi.org/10.7554/eLife.71379>
- Marcé-Grau, A., Elorza-Vidal, X., Pérez-Rius, C., Ruiz-Nel Lo, A., Sala-Coromina, J., Gabau, E., Estévez, R., & Macaya, A. (2021). Muscarinic acetylcholine receptor M1 mutations causing neurodevelopmental disorder and epilepsy. *Human Mutation*, 42(10), 1215–1220. <https://doi.org/10.1002/humu.24252>
- Xu, H., Isenmann, S., López-Hernández, T., Estévez, R., Lukacs, G. L., & Apaja, P. M. (2021). Control of membrane protein homeostasis by a chaperone-like glial cell adhesion molecule at multiple subcellular locations. *Scientific Reports*, 11(1), 18435. <https://doi.org/10.1038/s41598-021-97777-4>

## Thesis

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- **Anàlisi Bioquímica de l'interactoma de mlc1 i glialcam: impacte en la leucoencefalopatia megalencefàlica.** Marta Alonso. Supervisor: Raul Estevez.
- **Relació estructura-funció de les proteïnes implicades en la Leucoencefalopatia Megalencefàlica amb Quists subcorticals.** Efrén Xicoy. Supervisors: Raul Estevez & Ekaitz Errasti.



Pathophysiology  
of Nervous  
System Diseases

## Neural development

### Principal investigators

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SANDRA ACOSTA  
Functional neurogenomics

SOLEDAD ALCANTARA  
Biomimetic strategies for driving neural development and regeneration

ALBERT ORTEGA  
Human modeling of neurological disorders

### Members

---

Alba Aina Castells, Laura García, Andrea Martí, Adriana Modrego, Gisele Priscila Soares, Jose Pablo Soriano e Isabel Turpin

### Active projects

---

- **Artificial Intelligence applied to organoids for drug discovery.** Generalitat de Catalunya. 2019 llavor-121. Sandra Acosta.
- **Caracterización proteómica de los microambientes de la corteza cerebral humana durante el desarrollo: implicaciones evolutivas y clínicas.** Ministerio de Ciencia e Innovación. PID2020-114407RA-I00. Alberto Ortega.
- **Defining the spinal cord matrisome to design more effective ALS models and treatments.** Association Française contre les Myopathies. #23648. Alberto Ortega.
- **Modelado del control ambiental de la diferenciación de los progenitores neurales: un punto de encuentro entre los trastornos del desarrollo y la regeneración neural.** Ministerio de Ciencia e Innovación. PID2020-115748RB-I00. Soledad Alcantara.

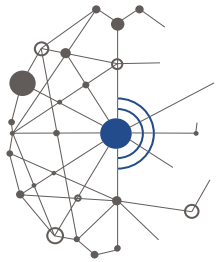
- **Molecular analysis of the non-cell autonomous effects in Down syndrome cortex using.** Fondation Jerome Lejeune. 1917. Sandra Acosta.
- **Neurodegeneration triggered by SARS-CoV-2: brain organoids as an analytical and predictive model (NeuroCOVID).** Fundació La Marató de TV3. 772/U/2021. Sandra Acosta.
- 2 Confidential agreement.

### Selected publications

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- Álvarez, Z., Kolberg-Edelbrock, A. N., Sasselli, I. R., Ortega, J. A., Qiu, R., Syrgiannis, Z., Mirau, P. A., Chen, F., Chin, S. M., Weigand, S., Kiskinis, E., & Stupp, S. I. (2021). Bioactive scaffolds with enhanced supramolecular motion promote recovery from spinal cord injury. *Science*, 374(6569), 848–856. <https://doi.org/10.1126/science.abh3602>
- Borsari, B., Villegas-Mirón, P., Pérez-Lluch, S., Turpin, I., Laayouni, H., Segarra-Casas, A., Bertranpetit, J., Guigó, R., & Acosta, S. (2021). Enhancers with tissue-specific activity are enriched in intronic regions. *Genome Research*, 31(8), 1325–1336. <https://doi.org/10.1101/gr.270371.120>
- Castells, A. A., Balada, R., Tristán-Noguero, A., O'Callaghan, M., Cortès-Saladelafont, E., Pascual-Alonso, A., García-Cazorla, À., Armstrong, J., & Alcántara, S. (2021). Unraveling Molecular Pathways Altered in MeCP2-Related Syndromes, in the Search for New Potential Avenues for Therapy. *Biomedicine*, 9(2), 148. <https://doi.org/10.3390/biomedicine9020148>

# Research



Pathophysiology  
of Nervous  
System Diseases

## Selected publications

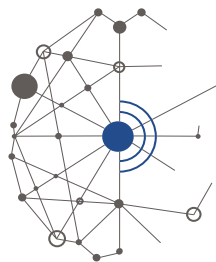
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- Farré, X., Molina, R., Barteri, F., Timmers, P., Joshi, P. K., Oliva, B., Acosta, S., Esteve-Altava, B., Navarro, A., & Muntané, G. (2021). Comparative Analysis of Mammal Genomes Unveils Key Genomic Variability for Human Life Span. *Molecular Biology and Evolution*, 38(11), 4948–4961. <https://doi.org/10.1093/molbev/msab219>
- Simkin, D., Marshall, K. A., Vanoye, C. G., Desai, R. R., Bustos, B. I., Piyevsky, B. N., Ortega, J. A., Forrest, M., Robertson, G. L., Penzes, P., Laux, L. C., Lubbe, S. J., Millichap, J. J., George, A. L., Jr., & Kiskinis, E. (2021). Dyshomeostatic modulation of Ca<sup>2+</sup>-activated K<sup>+</sup> channels in a human neuronal model of KCNQ2 encephalopathy. *eLife*, 10, e64434. <https://doi.org/10.7554/eLife.64434>
- Villegas-Mirón, P., Acosta, S., Nye, J., Bertranpetit, J., & Laayouni, H. (2021). Chromosome X-wide Analysis of Positive Selection in Human Populations: Common and Private Signals of Selection and its Impact on Inactivated Genes and Enhancers. *Frontiers in Genetics*, 12, 714491. <https://doi.org/10.3389/fgene.2021.714491>

## Knowledge transfer & Innovation

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- Dynamics within supramolecular IKVAV Matrices Enhance Functional Maturation of Human iPSCs-derived Neurons and Regeneration. Zaida Alvarez, Alberto Ortega, Kohei Sato, Evangelos Kiskinis, Samuel I. Stupp



### Pathophysiology of Nervous System Diseases

# Neuropharmacology, neuroepigenetics, neurodegeneration and ageing

## Principal investigators

---

- CHRISTIAN GRIÑAN-FERRE  
Neuroepigenetics in ageing and Alzheimer's disease
- GEMMA NAVARRO  
Neuropharmacology in drug addiction and neurodegeneration
- MERCE PALLAS  
Neuropharmacology in ageing and Alzheimer's disease
- CARME PELEGRI  
Polyglucosan structures and neo-epitopes in ageing and neurodegeneration
- JORDI VILAPLANA  
Biomarkers of neurodegeneration and brain ageing
- JAUME DEL VALLE  
Neuroimmune interactions at CNS interfaces

## Members

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Anna Maria Canudas, Elisabet Auge, Aina Bellver, Julia Companys, Julia Jarne-Ferrer, Jaume Lillo, Alejandro Lillo, Catalina Perez, M. Dolors Puigoriol, Iu Raich, Marta Riba, Rafael Rivas, Clara Romera, Iraida Tena, Fonteini Vasilopoulou, Irene Reyes, Joan Biel Rebassa

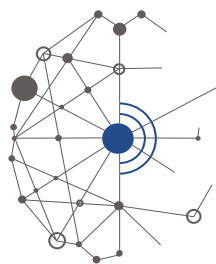
## Active projects

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- **Ajut per a la intensificació de les activitats de transferència per al curs 2021-22. Modalitat A.** Universitat de Barcelona. Christian Griñan.

- **Aplicació i avaluació d'un model híbrid de docència en aula inversa per promoure la millora de l'aprenentatge i de les competències específiques i transversals en Farmacologia i Terapèutica.** Institut de Ciències de l'Educació - Universitat de Barcelona. REDICE20-2381. Merce Pallas.
- **Efectos protectores del cannabidiol en ictus neonatal y de adulto: estudio preclínico detallado de los mecanismos moleculares de acción en un modelo de rata.** Ministerio de Ciencia e Innovación. SAF2017-84117-R. Gemma Navarro.
- **Enfermedades neurodegenerativas.** Ministerio de Sanidad y Consumo. CB06/05/0064. Gemma Navarro.
- **Estudio de la presencia de neo-epitopos en estructuras degenerativas cerebrales y de la existencia en el plasma de anticuerpos naturales dirigidos contra dichos neo-epitopos.** Ministerio de Economía y Competitividad. BFU2016-78398-P. Carme Pelegri i Jordi Vilaplana.
- **Examinando los cuerpos amiláceos del cerebro humano.** Ministerio de Ciencia, Innovación y Universidades. PID2020-115475GB-I00. Carme Pelegri i Jordi Vilaplana.
- **Mecanismos de acción de los cannabinoides sobre la propagación de agentes patogénicos en amiloidopatías y sinucleinopatía.** Ministerio de Ciencia e Innovación. PID2020-113430RB-I00. Gemma Navarro.
- **Modulación de la epóxido hidrolasa soluble (sEH) en cerebro y tejidos periféricos: papel del eje intestino-cerebro en la neurodegeneración.** Ministerio de Ciencia, Innovación y Universidades. PID2019-106285RB-C21. Merce Pallas.

# Research



Pathophysiology  
of Nervous  
System Diseases

## Active projects

- **Monitoring the onset and evolution of neuronal dysfunctions.** Alzheimer's Association. ARFD-17-503612. Gemma Navarro.
- **Validación de un candidato first in class inhibidor de la epóxido hidrolasa soluble para el tratamiento de la enfermedad de Alzheimer. Tratamiento y evaluación cognitiva.** Ministerio de Ciencia e Innovación. PDC2021-121096-C21. Merce Pallàs.
- 5 Confidential agreements.

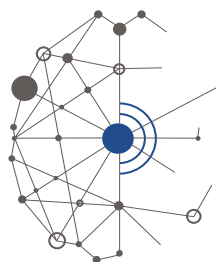
## Selected publications

- Codony, S., Calvó-Tusell, C., Valverde, E., Osuna, S., Morisseau, C., Loza, M. I., Brea, J., Pérez, C., Rodríguez-Franco, M. I., Pizarro-Delgado, J., Corpas, R., Griñán-Ferré, C., Pallàs, M., Sanfeliu, C., Vázquez-Carrera, M., Hammock, B. D., Feixas, F., & Vázquez, S. (2021). From the Design to the In Vivo Evaluation of Benzohomoadamantane-Derived Soluble Epoxide Hydrolase Inhibitors for the Treatment of Acute Pancreatitis. *Journal of Medicinal Chemistry*, 64(9), 5429–5446. <https://doi.org/10.1021/acs.jmedchem.0c01601>
- Franco, R., Reyes-Resina, I., & Navarro, G. (2021). Dopamine in Health and Disease: Much More Than a Neurotransmitter. *Biomedicines*, 9(2), 109. <https://doi.org/10.3390/biomedicines9020109>
- Griñán-Ferré, C., Bellver-Sanchis, A., Izquierdo, V., Corpas, R., Roig-Soriano, J., Chillón, M., Andres-Lacueva, C., Somogyvári, M., Söti, C., Sanfeliu, C., & Pallàs, M. (2021). The pleiotropic neuroprotective effects of resveratrol in cognitive decline and

Alzheimer's disease pathology: From antioxidant to epigenetic therapy. *Ageing Research Reviews*, 67, 101271. <https://doi.org/10.1016/j.arr.2021.101271>

- Griñán-Ferré, C., Bellver-Sanchis, A., Olivares-Martín, M., Bañuelos-Hortigüela, O., & Pallàs, M. (2021). Synergistic Neuroprotective Effects of a Natural Product Mixture against AD Hallmarks and Cognitive Decline in *Caenorhabditis elegans* and an SAMP8 Mice Model. *Nutrients*, 13(7), 2411. <https://doi.org/10.3390/nu13072411>
- Lillo, A., Lillo, J., Raïch, I., Miralpeix, C., Dosrius, F., Franco, R., & Navarro, G. (2021). Ghrelin and Cannabinoid Functional Interactions Mediated by Ghrelin/CB1 Receptor Heteromers That Are Upregulated in the Striatum From Offspring of Mice Under a High-Fat Diet. *Frontiers in Cellular Neuroscience*, 15, 786597. <https://doi.org/10.3389/fncel.2021.786597>
- Mallo-Abreu, A., Reyes-Resina, I., Azuaje, J., Franco, R., García-Rey, A., Majellaro, M., Miranda-Pastoriza, D., García-Mera, X., Jaspers, W., Gutiérrez-de-Terán, H., Navarro, G., & Sotelo, E. (2021). Potent and Subtype-Selective Dopamine D2 Receptor Biased Partial Agonists Discovered via an Ugi-Based Approach. *Journal of Medicinal Chemistry*, 64(12), 8710–8726. <https://doi.org/10.1021/acs.jmedchem.1c00704>
- Raïch, I., Rivas-Santisteban, R., Lillo, A., Lillo, J., Reyes-Resina, I., Nadal, X., Ferreiro-Vera, C., de Medina, V. S., Majellaro, M., Sotelo, E., Navarro, G., & Franco, R. (2021). Similarities and differences upon binding of naturally occurring 9-tetrahydrocannabinol-derivatives to cannabinoid CB1 and CB2 receptors. *Pharmacological Research*, 174, 105970. <https://doi.org/10.1016/j.phrs.2021.105970>

# Research



## Pathophysiology of Nervous System Diseases

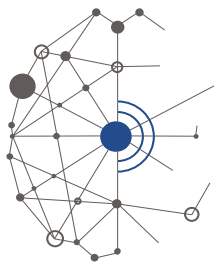
### Selected publications

- Riba, M., Augé, E., Tena, I., Del Valle, J., Molina-Porcel, L., Ximelis, T., Vilaplana, J., & Pelegrí, C. (2021). Corpora Amylacea in the Human Brain Exhibit Neopeptides of a Carbohydrate Nature. *Frontiers in Immunology*, 12, 618193. <https://doi.org/10.3389/fimmu.2021.618193>
- Riba, M., Del Valle, J., Augé, E., Vilaplana, J., & Pelegrí, C. (2021). From corpora amylacea to wasteosomes: History and perspectives. *Ageing Research Reviews*, 72, 101484. <https://doi.org/10.1016/j.arr.2021.101484>
- Rivas-Santisteban, R., Lillo, J., Muñoz, A., Rodríguez-Pérez, A. I., Labandeira-García, J. L., Navarro, G., & Franco, R. (2021). Novel Interactions Involving the Mas Receptor Show Potential of the Renin-Angiotensin system in the Regulation of Microglia Activation: Altered Expression in Parkinsonism and Dyskinesia. *Neurotherapeutics*, 18(2), 998–1016. <https://doi.org/10.1007/s13311-020-00986-4>
- Rivas-Santisteban, R., Lillo, A., Lillo, J., Rebassa, J. B., Contestí, J. S., Saura, C. A., Franco, R., & Navarro, G. (2021). N-Methyl-D-aspartate (NMDA) and cannabinoid CB2 receptors form functional complexes in cells of the central nervous system: insights into the therapeutic potential of neuronal and microglial NMDA receptors. *Alzheimer's Research & Therapy*, 13(1), 184. <https://doi.org/10.1186/s13195-021-00920-6>
- Rodríguez-Arévalo, S., Bagán, A., Griñán-Ferré, C., Vasilopoulou, F., Pallàs, M., Brocos-Mosquera, I., Callado, L. F., Loza, M. I., Martínez, A. L., Brea, J., Pérez, B., Molins, E., De Jonghe, S., Daelemans, D., Radan, M., Djikic, T., Nikolic, K., Hernández-Hernández, E., García-Fuster, M. J., García-Sevilla, J. A., ... Escolano, C. (2021). Benzofuranyl-2-imidazoles as imidazoline I2 receptor ligands for Alzheimer's disease. *European Journal of Medicinal Chemistry*, 222, 113540. <https://doi.org/10.1016/j.ejmech.2021.113540>
- Vasilopoulou, F., Rodríguez-Arévalo, S., Bagán, A., Escolano, C., Griñán-Ferré, C., & Pallàs, M. (2021). Disease-modifying treatment with I2 imidazoline receptor ligand LSL60101 in an Alzheimer's disease mouse model: a comparative study with donepezil. *British Journal of Pharmacology*, 178(15), 3017–3033. <https://doi.org/10.1111/bph.15478>
- Sarroca, S., Gatiús, A., Rodríguez-Farré, E., Vilchez, D., Pallàs, M., Griñán-Ferré, C., Sanfeliu, C., & Corpas, R. (2021). Resveratrol confers neuroprotection against high-fat diet in a mouse model of Alzheimer's disease via modulation of proteolytic mechanisms. *Journal of Nutritional Biochemistry*, 89, 108569. <https://doi.org/10.1016/j.jnutbio.2020.108569>

### Knowledge transfer & Innovation

- Compounds as soluble epoxide hydrolase inhibitors. UBTT0307d. Sandra Codony, Christian Griñán-Ferre, Merce Pallas, Santiago Vazquez
- Phenoxy cyclohexylurea derivatives for use in reducing accumulation of amyloid plaques and/or hyperphosphorylation of tau protein. UBTT0307a. Sandra Codony, Christian Griñán-Ferre, Rosana Leiva, Merce Pallas, Santiago Vazquez
- Synthetic I2 imidazoline receptor ligands for prevention or treatment of human brain disorders. UBTT0327. Maria Carmen Escolano, Merce Pallas, Christian Griñán-Ferre, Sonia Abas, Luis-Felipe Callado, Jesus A. Garcia
- Secreted splicing variant of klotho for treating bone disorders. UBTT0426-E. Joan Roig, Miguel Chillón, Assumpció Bosch, Merce Pallas, Christian Griñán-Ferre

# Research

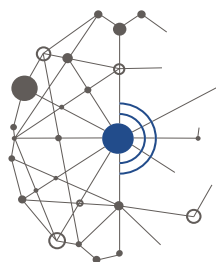


Pathophysiology  
of Nervous  
System Diseases

## Thesis

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- **Complejos del receptor sigma y de heterómeros de receptores acoplados a proteínas G en adicción y en control del apetito.** Mireia Casanovas. Supervisors: Gemma Navarro & Rafael Franco.
- **Expresión y funcionalidad de los heterómeros de GPCR en las enfermedades neurodegenerativas de Parkinson y Alzheimer.** Rafael Rivas-Santisteban. Supervisors: Gemma Navarro & Rafael Franco.
- **Modificaciones en la herencia epigenética inducidas por la dieta grasa revertidas por el resveratrol en el modelo murino SAMP8.** Vanesa Izquierdo. Supervisors: Christian Griñan-Ferre & Merce Pallas.
- **Targeting the I2 Imidazoline Receptors: the neuroprotective role of selective ligands in Alzheimer's Disease.** Foteini Vasilopoulou. Supervisors: Christian Griñan-Ferre & Merce Pallas.



## Pathophysiology of Nervous System Diseases

# Neurophysiology

## Principal investigators

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XAVIER ALTAFAJ

Neurobiology and translational medicine of the NMDA receptor

GERARD CALLEJO

Neurobiology of pain and painful disorders

NURIA COMES

Neurophysiology of ocular pain and itch

XAVIER GASULL

Regulation of sensory neuron's excitability and pain sensitivity

DAVID SOTO

Neurophysiology of ionotropic glutamate receptors

MAR PUIGDELLIVOL

Microglia biology in health and disease

## Members

---

Sara Abello, Aida Castellanos, Roberto Garcia, Arcadi Gual, Silvia Locubiche, Federico Miguez, Federico Ponente, Anna Pujol, Lenin Reyes, Ana Santos, Irene Pallas, Anna Priscilla Perez

## Active projects

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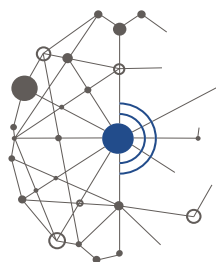
- **Comprehensive delineation and personalised medicine of GRIN-related disorders, a rare paediatric encephalopathy.** Ministerio de Ciencia, Innovación y Universidades. PI19/00348. Xavier Altafaj.

- **Fisiología de interactores de receptores AMPA (TARPs y CPT1C) en neuronas y glía.** Ministerio de Ciencia, Innovación y Universidades. PID2020-119932GB-I00. David Soto.
- **Medicina personalizada para las GRINpatías, una enfermedad neuropediátrica rara.** Fundación Española para la Ciencia y la Tecnología. 310351. David Soto.
- **Laboratori de Neurofisiologia.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR737. Xavier Gasull.
- **Molecule-to-man pain network (PAIN-Net).** European Union. MSCA-ITN-2016. 721841. Xavier Gasull.
- **Red Temática de Investigación Cooperativa en Salud – Enfermedades oculares.** Instituto de Salud Carlos III. Ministerio de Economía y Competitividad. RD16/0008/0014. Xavier Gasull.
- 2 Confidential agreement.

## Selected publications

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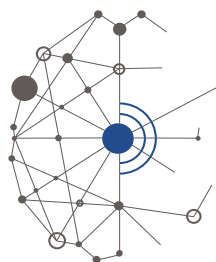
- Alonso-Gardón, M., Elorza-Vidal, X., Castellanos, A., La Sala, G., Armand-Ugon, M., Gilbert, A., Di Pietro, C., Pla-Casillan, A., Ciruela, F., Gasull, X., Nunes, V., Martínez, A., Schulte, U., Cohen-Salmon, M., Marazziti, D., & Estévez, R. (2021). Identification of the GlialCAM interactome: the G protein-coupled receptors GPRC5B and GPR37L1 modulate megalencephalic leukoencephalopathy proteins. *Human Molecular Genetics*, 30(17), 1649–1665. <https://doi.org/10.1093/hmg/ddab155>
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- Comes, N., Gasull, X., & Callejo, G. (2021). Proton Sensing on the Ocular Surface: Implications in Eye Pain. *Frontiers in Pharmacology*, 12, 773871. <https://doi.org/10.3389/fphar.2021.773871>
- García-Recio, A., Santos-Gómez, A., Soto, D., Julia-Palacios, N., García-Cazorla, À., Altafaj, X., & Olivella, M. (2021). GRIN database: A unified and manually curated repertoire of GRIN variants. *Human Mutation*, 42(1), 8–18. <https://doi.org/10.1002/humu.24141>
- Landa, J., Guasp, M., Miguez-Cabello, F., Guimarães, J., Mishima, T., Oda, F., Zipp, F., Krajcinovic, V., Fuhr, P., Honnorat, J., Titulaer, M., Simabukuro, M., Planagumà, J., Martínez-Hernández, E., Armangué, T., Saiz, A., Gasull, X., Soto, D., Graus, F., Sabater, L., ... GluK2 encephalitis study group (2021). Encephalitis with Autoantibodies against the Glutamate Kainate Receptors GluK2. *Annals of Neurology*, 90(1), 101–117. <https://doi.org/10.1002/ana.26098>
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- Milde, S., van Tartwijk, F. W., Vilalta, A., Hornik, T. C., Dundee, J. M., Puigdemívol, M., & Brown, G. C. (2021). Inflammatory neuronal loss in the substantia nigra induced by systemic lipopolysaccharide is prevented by knockout of the P2Y6 receptor in mice. *Journal of Neuroinflammation*, 18(1), 225. <https://doi.org/10.1186/s12974-021-02280-2>
- Puigdemívol, M., Milde, S., Vilalta, A., Cockram, T., Allendorf, D. H., Lee, J. Y., Dundee, J. M., Pampuščenko, K., Borutaite, V., Nuthall, H. N., Brelstaff, J. H., Spillantini, M. G., & Brown, G. C. (2021). The microglial P2Y6 receptor mediates neuronal loss and memory deficits in neurodegeneration. *Cell Reports*, 37(13), 110148. <https://doi.org/10.1016/j.celrep.2021.110148>
- Rezola, M., Castellanos, A., Gasull, X., & Comes, N. (2021). Functional Interaction Between Caveolin 1 and LRRC8-Mediated Volume-Regulated Anion Channel. *Frontiers in Physiology*, 12, 691045. <https://doi.org/10.3389/fphys.2021.691045>
- Santos-Gómez, A., Miguez-Cabello, F., Juliá-Palacios, N., García-Navas, D., Soto-Insuga, V., García-Peñas, J. J., Fuentes, P., Ibáñez-Micó, S., Cuesta, L., Cancho, R., Andreo-Lillo, P., Gutiérrez-Aguilar, G., Alonso-Luengo, O., Málaga, I., Hedrera-Fernández, A., García-Cazorla, À., Soto, D., Olivella, M., & Altafaj, X. (2021). Paradigmatic De Novo GRIN1 Variants Recapitulate Pathophysiological Mechanisms Underlying GRIN1-Related Disorder Clinical Spectrum. *International Journal of Molecular Sciences*, 22(23), 12656. <https://doi.org/10.3390/ijms222312656>
- Santos-Gómez, A., Miguez-Cabello, F., García-Recio, A., Locubiche-Serra, S., García-Díaz, R., Soto-Insuga, V., Guerrero-López, R., Juliá-Palacios, N., Ciruela, F., García-Cazorla, À.,

# Research



Pathophysiology  
of Nervous  
System Diseases

## Selected publications

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- Soto, D., Olivella, M., & Altafaj, X. (2021). Disease-associated GRIN protein truncating variants trigger NMDA receptor loss-of-function. *Human Molecular Genetics*, 29(24), 3859–3871. <https://doi.org/10.1093/hmg/ddaa220>
- Vilalta, A., Zhou, Y., Sevalle, J., Griffin, J. K., Satoh, K., Allendorf, D. H., De, S., Puigdemívol, M., Bruzas, A., Burguillos, M. A., Dodd, R. B., Chen, F., Zhang, Y., Flagmeier, P., Needham, L. M., Enomoto, M., Qamar, S., Henderson, J., Walter, J., Fraser, P. E., ... Brown, G. C. (2021). Wild-type sTREM2 blocks A aggregation and neurotoxicity, but the Alzheimer's R47H mutant increases A aggregation. *The Journal of Biological Chemistry*, 296, 100631. <https://doi.org/10.1016/j.jbc.2021.100631>

## Knowledge transfer & Innovation

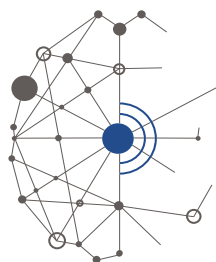
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- *Combinación nutracéutica y su uso para el tratamiento de trastornos neurológicos*. UBTTO421-E. Angeles Garcia, Alfonso Luis De Oyarzabal, Xavier Altafaj

## Thesis

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- **New insights into ionotropic glutamate receptors in physiological and pathological conditions**. Federico Miguez. Supervisors: David Soto & Xavier Altafaj.
- **Antagonistas de receptores ionotrópicos como potenciales terapias en la enfermedad de alzheimer**. Andreea Larisa. Supervisors: Santiago Vazquez & David Soto.
- **Enhanced recording paradigms and advanced analyses of peripheral nerve fibers**. Federico Ponente. Supervisor: Xavier Gasull.
- **NMDA receptor mutations associated with neurodevelopmental disorders: pathophysiological impact and personalized pharmacotherapy**. Ana Santos. Supervisors: Xavier Altafaj & David Soto.



### Pathophysiology of Nervous System Diseases

# Pharmacological strategies for neuroprotection

## Principal investigators

---

CARME AULADELL

(Prevention of neuronal death by apoptosis in neurodegenerative processes)

ANTONI CAMINS

(Therapeutic strategies for the treatment of Alzheimer's disease focused on cognitive improvement)

## Members

---

Monica Bullo, Oriol Busquets, Marina Carrasaco, Gemma Casadesus, Ruben Dario-Castro, Triana Espinosa, Miren Ettcheto, Jaume Folch, Andres Jimenez, Patricia R. Manzine, Jordi Olloquequi, Marta Riba, Ester Verdaguer

## Active projects

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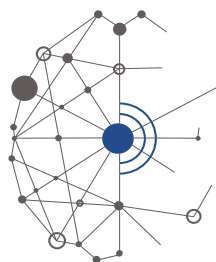
- **Enfermedades neurodegenerativas.** IMinisterio de Sanidad y Consumo. CB06/05/0024. Antoni Camins.
- **Grup de Recerca en Envelliment i Neurodegeneració.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR625. Carmen Auladell.

## Selected publications

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- Bonilla, L., Esteruelas, G., Ettcheto, M., Espina, M., García, M. L., Camins, A., Souto, E. B., Cano, A., & Sánchez-López, E. (2021). Biodegradable nanoparticles for the treatment of epilepsy: From current advances to future challenges. *Epilepsia open*, 10.1002/epi4.12567. Advance online publication. <https://doi.org/10.1002/epi4.12567>
- Busquets, O., Carrasco, M., Espinosa-Jiménez, T., Ettcheto, M., Verdaguer, E., Auladell, C., Bullò, M., Camins, A., Pinent, M., Rodríguez-Gallego, E., & Folch, J. (2021). GSPE pre-treatment protects against long-term cafeteria diet-induced mitochondrial and inflammatory affectations in the hippocampus of rats. *Nutritional neuroscience*, 1-11. Advance online publication. <https://doi.org/10.1080/1028415X.2021.1995118>
- Busquets, O., Parcerisas, A., Verdaguer, E., Ettcheto, M., Camins, A., Beas-Zarate, C., Castro-Torres, R. D., & Auladell, C. (2021). c-Jun N-Terminal Kinases in Alzheimer's Disease: A Possible Target for the Modulation of the Earliest Alterations. *Journal of Alzheimer's Disease: JAD*, 82(s1), S127-S139. <https://doi.org/10.3233/JAD-201053>
- Cano, A., Ettcheto, M., Espina, M., Auladell, C., Folch, J., Kühne, B. A., Barenys, M., Sánchez-López, E., Souto, E. B., García, M. L., Turowski, P., & Camins, A. (2021). Epigallocatechin-3-gallate PEGylated poly(lactic-co-glycolic) acid nanoparticles mitigate striatal pathology and motor deficits in 3-nitropropionic acid intoxicated mice. *Nanomedicine*, 16(1), 19-35. <https://doi.org/10.2217/nnm-2020-0239>
- Cano, A., Turowski, P., Ettcheto, M., Duskey, J. T., Tosi, G., Sánchez-López, E., García, M. L., Camins, A., Souto, E. B., Ruiz, A., Marquié, M., & Boada, M. (2021). Nanomedicine-based technologies and novel biomarkers for the diagnosis and treatment of Alzheimer's disease: from current to future

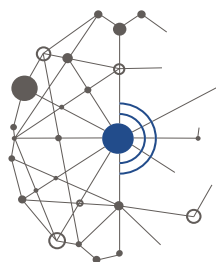
# Research



## Pathophysiology of Nervous System Diseases

### Selected publications

- challenges. *Journal of Nanobiotechnology*, 19(1), 122. <https://doi.org/10.1186/s12951-021-00864-x>
- Castro-Torres, R. D., Olloquequi, J., Etcheto, M., Caruana, P., Steele, L., Leighton, K. M., Ureña, J., Beas-Zarate, C., Camins, A., Verdaguer, E., & Auladell, C. (2021). Dual Mkk4 and Mkk7 Gene Deletion in Adult Mouse Causes an Impairment of Hippocampal Immature Granule Cells. *International Journal of Molecular Sciences*, 22(17), 9545. <https://doi.org/10.3390/ijms22179545>
  - Del Amo, L., Cano, A., Ettcheto, M., Souto, E. B., Espina, M., Camins, A., García, M. L., & Sánchez-López, E. (2021). Surface Functionalization of PLGA Nanoparticles to Increase Transport across the BBB for Alzheimer's Disease. *Applied Sciences*, 11(9). <https://doi.org/10.3390/app11094305>
  - Ettcheto, M., Cano, A., Sanchez-López, E., Verdaguer, E., Folch, J., Auladell, C., & Camins, A. (2021). Masitinib for the treatment of Alzheimer's disease. *Neurodegenerative Disease Management*, 11(4), 263–276. <https://doi.org/10.2217/nmt-2021-0019>
  - Ettcheto, M., Sánchez-Lopez, E., Cano, A., Carrasco, M., Herrera, K., Manzine, P. R., Espinosa-Jimenez, T., Busquets, O., Verdaguer, E., Olloquequi, J., Auladell, C., Folch, J., & Camins, A. (2021). Dexibuprofen ameliorates peripheral and central risk factors associated with Alzheimer's disease in metabolically stressed APP<sup>swE</sup>/PS1<sup>dE9</sup> mice. *Cell & Bioscience*, 11(1), 141. <https://doi.org/10.1186/s13578-021-00646-w>
  - García-Torra, V., Cano, A., Espina, M., Ettcheto, M., Camins, A., Barroso, E., Vazquez-Carrera, M., García, M. L., Sánchez-López, E., & Souto, E. B. (2021). State of the Art on Toxicological Mechanisms of Metal and Metal Oxide Nanoparticles and Strategies to Reduce Toxicological Risks. *Toxics*, 9(8), 195. <https://doi.org/10.3390/toxics9080195>
  - Gutierrez, L., Folch, A., Rojas, M., Cantero, J. L., Atienza, M., Folch, J., Camins, A., Ruiz, A., Papandreou, C., & Bulló, M. (2021). Effects of Nutrition on Cognitive Function in Adults with or without Cognitive Impairment: A Systematic Review of Randomized Controlled Clinical Trials. *Nutrients*, 13(11), 3728. <https://doi.org/10.3390/nu13113728>
  - Rao, K., Britton, G. B., Rocha Arrieta, L. L., Garcia-Cairasco, N., Lazarowski, A., Palacios, A., Camins Espuny, A., & Maccioni, R. B. (2021). Translational Research and Drug Discovery for Neurodegeneration: Challenges for Latin America. *Journal of Alzheimer's Disease: JAD*, 82(s1), S1–S4. <https://doi.org/10.3233/JAD-210245>
  - Rayatpour, A., Farhangi, S., Verdaguer, E., Olloquequi, J., Ureña, J., Auladell, C., & Javan, M. (2021). The Cross Talk between Underlying Mechanisms of Multiple Sclerosis and Epilepsy May Provide New Insights for More Efficient Therapies. *Pharmaceuticals*, 14(10), 1031. <https://doi.org/10.3390/ph14101031>



### Pathophysiology of Nervous System Diseases

# Neuropharmacology and pain

## Principal investigators

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ESTER ASO  
(Cannabinoids in brain)

JORDI BONAVENTURA  
(Translational Neuropharmacology)

FRANCISCO CIRUELA  
G-protein-coupled receptors (GPCRs) in Neurology)

VICTOR FERNANDEZ-DUENAS  
(Pain)

## Members

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Maria Laura Cuffi, Sebastian Videla, Pilar Hereu, Marc Lopez-Cano, Kristoffer Sahlholm, Josep Argerich, Hector Godoy, Laura Gomez-Acero, Nuria Sanchez-Fernandez, Laura Sarasola, Marta Valle-Leon, Salut Sanchez

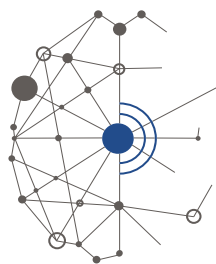
## Active projects

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- **Cannabinoid actions in the diseased brain.** (Iberoamerican Cannabinoid Research Network). Unión Iberoamericana de Universidades. UCM-02-2019. Ester Aso.
- **Contracte del Programa Ramon y Cajal 2019.** Ministerio de Economía y Competitividad. RYC-2019-027371-I. Francisco Ciruela.

- **Descifrando las acciones farmacológicas de la ketamina en los receptores de opioides.** Ministerio de Ciencia e Innovación. PID2020-117989RA-I00. Jordi Bonaventura.
- **Dinámica de los agregados macromoleculares de heteroreceptores de dopamina-adenosina en esquizofrenia y trastornos neurodegenerativos.** Ministerio de Ciencia e Innovación. PID2020-118511RB-I00. Francisco Ciruela.
- **Ecto-GPR37: a potential biomarker for Parkinson's disease.** Michael J. Fox Foundation for Parkinson's Research. MJFF-001051. Francisco Ciruela.
- **El complejo trans-sináptico formado por CB1-A2A y mGlu5 en el hipocampo como sustrato de los efectos terapéuticos de los cannabinoides en la enfermedad de Alzheimer.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-097773-A-I00. Ester Aso.
- **Neurofarmacologia i dolor.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1604. Francisco Ciruela.
- **Subvencions per a la formació de científics i tecnòlegs: modalitat personal investigador en formació (PIF-Salut) - PERIS -** Departament de Salut. Departament de Salut de la Generalitat de Catalunya. SLT017/20/000114. Francisco Ciruela.
- **Vulnerabilidad a los efectos psicóticos del THC durante la adolescencia: implicación de la interacción entre los receptores CB1, A2A y D2.** Ministerio de Sanidad, Servicios Sociales e Igualdad. 2020I041. Ester Aso.
- 1 Confidential agreement.

# Research

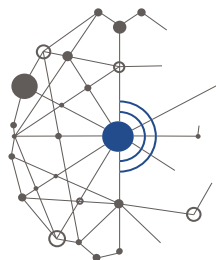


## Pathophysiology of Nervous System Diseases

### Selected publications

- Alonso-Gardón, M., Elorza-Vidal, X., Castellanos, A., La Sala, G., Armand-Ugon, M., Gilbert, A., Di Pietro, C., Pla-Casillanis, A., Ciruela, F., Gasull, X., Nunes, V., Martínez, A., Schulte, U., Cohen-Salmon, M., Marazziti, D., & Estévez, R. (2021). Identification of the GlialCAM interactome: the G protein-coupled receptors GPRC5B and GPR37L1 modulate megalencephalic leukoencephalopathy proteins. *Human Molecular Genetics*, 30(17), 1649–1665. <https://doi.org/10.1093/hmg/ddab155>
- Belluardo, N., Mudò, G., Di Liberto, V., Frinchi, M., Condorelli, D. F., Traversa, U., Ciruela, F., Ciccarelli, R., Di Iorio, P., & Giuliani, P. (2021). Investigating the Role of Guanosine on Human Neuroblastoma Cell Differentiation and the Underlying Molecular Mechanisms. *Frontiers in Pharmacology*, 12, 658806. <https://doi.org/10.3389/fphar.2021.658806>
- Bonaventura, J., Lam, S., Carlton, M., Boehm, M. A., Gomez, J. L., Solís, O., Sánchez-Soto, M., Morris, P. J., Fredriksson, I., Thomas, C. J., Sibley, D. R., Shaham, Y., Zarate, C. A., & Michaelides, M. (2021). Pharmacological and behavioral divergence of ketamine enantiomers: implications for abuse liability. *Molecular Psychiatry*, 26(11), 6704–6722. <https://doi.org/10.1038/s41380-021-01093-2>
- Casadó-Anguera, V., Moreno, E., Sánchez-Soto, M., Cai, N. S., Bonaventura, J., Homar-Ruano, P., Rubinstein, M., Cortés, A., Canela, E. I., Ferré, S., & Casadó, V. (2021). Heteromerization between 2A adrenoceptors and different polymorphic variants of the dopamine D4 receptor determines pharmacological and functional differences. Implications for impulsive-control disorders. *Pharmacological Research*, 170, 105745. <https://doi.org/10.1016/j.phrs.2021.105745>
- Godoy-Marín, H., Duroux, R., Jacobson, K. A., Soler, C., Colino-Lage, H., Jiménez-Sábado, V., Montiel, J., Hove-Madsen, L., & Ciruela, F. (2021). Adenosine A2A Receptors Are Upregulated in Peripheral Blood Mononuclear Cells from Atrial Fibrillation Patients. *International Journal of Molecular Sciences*, 22(7), 3467. <https://doi.org/10.3390/ijms22073467>
- Gomez, J. L., Bonaventura, J., Keighron, J., Wright, K. M., Marable, D. L., Rodriguez, L. A., Lam, S., Carlton, M. L., Ellis, R. J., Jordan, C. J., Bi, G. H., Solis, O., Pignatelli, M., Bannon, M. J., Xi, Z. X., Tanda, G., & Michaelides, M. (2021). Synaptic Zn<sup>2+</sup> potentiates the effects of cocaine on striatal dopamine neurotransmission and behavior. *Translational Psychiatry*, 11(1), 570. <https://doi.org/10.1038/s41398-021-01693-0>
- Hu, F., Morris, P. J., Bonaventura, J., Fan, H., Mathews, W. B., Holt, D. P., Lam, S., Boehm, M., Dannals, R. F., Pomper, M. G., Michaelides, M., & Horti, A. G. (2021). 18F-labeled radiotracers for in vivo imaging of DREADD with positron emission tomography. *European Journal of Medicinal Chemistry*, 213, 113047. <https://doi.org/10.1016/j.ejmech.2020.113047>
- Hüll, K., Fernández-Dueñas, V., Schönberger, M., López-Cano, M., Trauner, D., & Ciruela, F. (2021). Optical Control of Adenosine-Mediated Pain Modulation. *Bioconjugate Chemistry*, 32(9), 1979–1983. <https://doi.org/10.1021/acs.bioconjchem.1c00387>
- López-Cano, M., Filgaira, I., Nolen, E. G., Cabré, G., Hernando, J., Tosh, D. K., Jacobson, K. A., Soler, C., & Ciruela, F. (2021). Optical control of adenosine A<sub>3</sub> receptor function in psoriasis. *Pharmacological Research*, 170, 105731. <https://doi.org/10.1016/j.phrs.2021.105731>

# Research



## Pathophysiology of Nervous System Diseases

### Selected publications

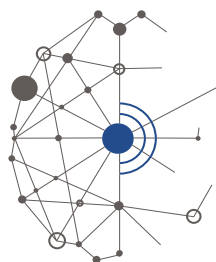
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- López-Cano, M., Font, J., Aso, E., Sahlholm, K., Cabré, G., Giraldo, J., De Koninck, Y., Hernando, J., Llebaria, A., Fernández-Dueñas, V., & Ciruela, F. (n.d.). Remote local photoactivation of morphine produces analgesia without opioid-related adverse effects. *British Journal of Pharmacology*, n/a(n/a). <https://doi.org/10.1111/bph.15645>
- Morató, X., Garcia-Esparcia, P., Argerich, J., Llorens, F., Zerr, I., Paslawski, W., Borràs, E., Sabidó, E., Petäjä-Repo, U. E., Fernández-Dueñas, V., Ferrer, I., Svenningsson, P., & Ciruela, F. (2021). Ecto-GPR37: a potential biomarker for Parkinson's disease. *Translational Neurodegeneration*, 10(1), 8. <https://doi.org/10.1186/s40035-021-00232-7>
- Yarur, H. E., Zegers, J., Vega-Quiroga, I., Novoa, J., Ciruela, F., Andres, M. E., & Gysling, K. (2021). Functional Interplay of Type-2 Corticotrophin Releasing Factor and Dopamine Receptors in the Basolateral Amygdala-Medial Prefrontal Cortex Circuitry. *The International Journal of Neuropsychopharmacology*, 24(3), 221–228. <https://doi.org/10.1093/ijnp/pyaa079>
- Valle-León, M., Callado, L. F., Aso, E., Cajiao-Manrique, M. M., Sahlholm, K., López-Cano, M., Soler, C., Altafaj, X., Watanabe, M., Ferré, S., Fernández-Dueñas, V., Menchón, J. M., & Ciruela, F. (2021). Decreased striatal adenosine A2A-dopamine D2 receptor heteromerization in schizophrenia. *Neuropsychopharmacology*, 46(3), 665–672. <https://doi.org/10.1038/s41386-020-00872-9>

### Thesis

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- **Adenosine Receptors in atrial fibrillation.** Hector Godoy. Supervisor: Francisco Ciruela.
- **Role of adenosine A2A and dopamine D2 receptor heteromers in schizophrenia.** Marta Valle. Supervisors: Francisco Ciruela.



Pathophysiology  
of Nervous  
System Diseases

## Principal investigators

JOSEP M. CANALS  
Stem cells and regenerative medicine

DANIEL DEL TORO  
In vivo reprogramming during cortex development

DANIEL TORNERO  
Neural stem cells and brain damage

## Members

Ainhoa Arcas, Silvia Artigas, Georgina Bombau, Felipe Chiappe, Mireia Galofre, Cinta Gomis, Anna-Christina Haeb, Cristina Herranz, Clelia Introna, Anna Lopez, Francisco J. Molina, Veronica Monforte, Claudia Peregrina, Unai Perpiña, Irene Porcar, Cristina Salado, Phil Sanders, Cristina Vila, Sofia Zaballa

## Active projects

- **Adquisició i puesta a punto de una bio-impresora 4D guiada por láser para la producción de medicamentos de terapias avanzadas (ATMPs) en condiciones GMP.** Ministerio de Ciencia e Innovación. EQC2021-006818-P. Josep Maria Canals.
- **Ajut per a la intensificació de les activitats de transferència per al curs 2021-22. Modalitat A.** Universitat de Barcelona. Josep Maria Canals.
- **Atorgament d'un ajut de la convocatòria del Programa d'Intensificació de l'Activitat Investigadora Internacional (2020-21).** Universitat de Barcelona. Josep Maria Canals.
- **Cèl·lules mare i medicina regenerativa.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1408. Josep Maria Canals.

- **Contracte del Programa Ramon y Cajal. Ministerio de Economía y Competitividad. RYC-2017-23486.** Josep Maria Canals.
- **Estudio de la implantación de las alteraciones del neurodesarrollo en la enfermedad de Huntington.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-099001-B-I00. Josep Maria Canals.
- **In vivo reprogramming to rescue alterations in Huntington's disease. Fundació 'La Caixa'. HR21-00622.** Josep Maria Canals.
- **Mejora de la integración funcional de progenitores neurales derivados de hiPSC.** Ministerio de Ciencia e Innovación. PID2020-118120RB-I00. Daniel Tornero.
- **Modelización de enfermedades neurodegenerativas. Ministerio de Ciencia e Innovación. EIN2020-112381.** Josep Maria Canals.
- **Nou protoCOL d'aïllament de MONòcits per aplicacions terapèutiques al costat del pacient (MONOCOL).** INNOTEC. ACE034/21/000039. ACCIÓ. Agència de Suport a l'Empresa Catalana. ACE034/21/000039. Josep Maria Canals.
- **Nuevos mecanismos de migración neuronal implicados en el plegamiento de la corteza cerebral.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-095580-A-100. Daniel del Toro.
- **Red Temática de Investigación Cooperativa en Salud - Terapia Celular.** Ministerio de Economía y Competitividad. RD16/0011/0012. Josep Maria Canals.
- **RICORDS-TERAV. Instituto de Salud Carlos III (ISCIII).** Ministerio de Ciencia e Innovación. RD21/0017/0020. Josep Maria Canals.
- **Training for Advanced Stem Cell Technologies in Neurology (ASCTN-Training).** European Union. MSCA-ITN-2018. 813851. Josep Maria Canals.
- 16 Confidential agreements.



# Experimental Neurology

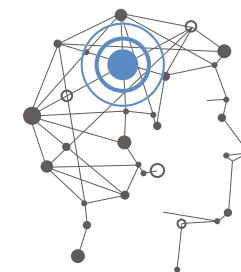
## Research

# Experimental Neurology

NEURODEGENERATIVE DISEASES ARE USUALLY LINKED WITH AGING. THUS, NOWADAYS THERE IS AN IMPORTANT INCREASE IN THESE DISORDERS WITH A STRONG SOCIAL AND ECONOMICAL IMPACT IN OUR SOCIETY.

Unfortunately, the majority of therapeutic interventions available are merely symptomatic, often with very limited response, whereas disease-modifying and neuroprotective or neuroregenerative treatments are only experimental with precedents in human clinical trials having been unsuccessful so far.

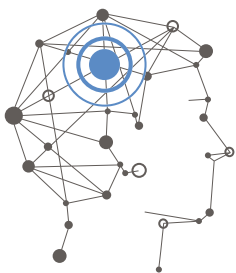
The research area of Experimental Neurology is focused on the study of the nervous system in normal conditions and during neurologic disorders. A close collaboration between basic neuroscientists and clinical neurologists is already established in the Institute of Neurosciences. The Institute, together with the university hospitals, provides a good environment to perform studies about the correlation between genetic markers, cerebrospinal spinal fluid biomarkers and structural, functional and molecular imaging in patients with movement disorders, dementia, autoimmune synaptic disorders and other neurological disorders. Furthermore, the study of the molecular and biological bases of Alzheimer's disease, Parkinson's disease, Huntington's chorea, and multiple sclerosis in preclinical stages can provide information for diagnosis, prevention and treatment for these neurological diseases.



## SELECTED PROJECTS

- **Mención de Excelencia Maria de Maetzu al Institut de Neurociències de la Universitat de Barcelona (UBNEURO).** Ministerio de Economía, Industria y Competitividad. MDM-2017-0729. Jordi Alberch
- **A Translational Model of Antibody-mediated Synaptic Disease: Symptoms, Neuronal Circuits, and the Mechanisms of Memory Loss and Recovery.** Fundació 'La Caixa'. HR17-00149. Josep Dalmau
- **Non-invasive dynamic neural control by laser-based technology (NEUROPA).** European Union. FETOPEN-01-2018-2019-2020. 863214. Merce Masana
- **Molecular contents and functional characterization of extracellular vesicles in plasma of Alzheimer's disease patients: analysis in response to the ambar treatment.** Grifols Worldwide Operations, Ltd. 310562. Eulalia Marti
- **Modulation of Tau seeding and pathology in tauopathies by BBB-nanocarriers, epitope selective vaccination and ectoPrP Tau receptor bodies (STOPTauPATHOL).** Fundació 'La Caixa'. HR18-00452. Isidre Ferrer
- **CoviD-19 and brain: cognition and mental health (DIANA).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2020PANDE00053. Carme Junque
- **To identify the convergent mechanisms activated by mutant huntingtin and the lack of VPS13A responsible for the selective neurodegeneration of striatal neurons to develop neuroprotective approaches.** Ministerio de Ciencia e Innovación. PID2020-119386RB-I00. Jordi Alberch & Manuel Rodríguez
- **Investigaciones en la encefalitis anti-NMDAR: nuevo test diagnóstico, papel de la inflamación en un modelo animal, y modulación alostérica de NMDAR como estrategia terapéutica.** Ministerio de Ciencia, Innovación y Universidades. PI20/00197. Josep Dalmau
- **Plataforma Traslacional para la AMS: Descubriendo mecanismos patológicos y nuevas dianas terapéuticas: PTrA-ADPT.** Instituto de Salud Carlos III. AC21\_2/00018. Yaroslau Compta
- **Network Center for Biomedical Research in Neurodegenerative Diseases (CIBERNED)**

## Research



### Experimental Neurology

# Clinical and experimental research in Parkinson's disease and other neurodegenerative movement disorders

## Principal investigators

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YAROSLAU COMPTA

## Members

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Ana Camara, Mario Ezquerra, Manel Fernandez, Ruben David Fernandez, Alicia Garrido, Laura Maragall, Maria J. Marti, Esteban Muñoz, Celia Painous, Sandra Perez, Almudena Sanchez, Pilar Santacruz, Eduard Tolosa, Francesc Valldeoriola

## Active projects

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- **Plataforma Traslacional para la AMS: Descubriendo mecanismos patológicos y nuevas dianas terapéuticas: PTra-ADPT.** Instituto de Salud Carlos III. AC21\_2/00018. Yaroslau Compta.
- **Psp registry: clinical cohort study with biomarkers study of prediagnostic cases and health education program in established disease.** Fundació La Marató de TV3. 202009-10. Yaroslau Compta.
- 3 Confidential agreements.

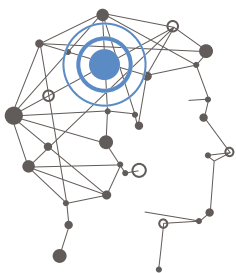
## Selected publications

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- Cámara, A., Compta, Y., Pérez-Soriano, A., Montagut, N., Baixauli, M., Maragall, L., Ludeña, E., Lopez de Los Reyes, J. C., Peri-Cusi, L., Fernández, N., Villote, S., Ahuir, M., Grau, A., Caballol, N., Buongiorno, M., Pont-Sunyer, C., Puente, V., Giraldo, D. M., de Fabregues, O., Garrido, A., ... Marti, M. J. (2021). Effects of COVID -19 pandemic and lockdown on people with multiple system atrophy participating in a therapeutic education program. *Parkinsonism & Related Disorders*, 86, 78–80. <https://doi.org/10.1016/j.parkreldis.2021.03.021>

- Esteller, D., Modreanu, R., Cerquera-Cleves, S. C., Sánchez-Gómez, A., Fernández, M., Cámara, A., & Compta, Y. (2021). Cross-sectional associations of cerebrospinal -synuclein, tau and amyloid- with dyskinesias, motor fluctuations, non-motor symptoms in a cohort of Parkinson's disease patients. *Journal of the Neurological Sciences*, 430, 120033. <https://doi.org/10.1016/j.jns.2021.120033>
- Guasp, M., Molina-Porcel, L., Painous, C., Caballol, N., Camara, A., Perez-Soriano, A., Sánchez-Gómez, A., Garrido, A., Muñoz, E., Marti, M. J., Valldeoriola, F., Grau, O., Gelpí, E., Respondek, G., Höglinger, G. H., & Compta, Y. (2021). Association of PSP phenotypes with survival: A brain-bank study. *Parkinsonism & Related Disorders*, 84, 77–81. <https://doi.org/10.1016/j.parkreldis.2021.01.015>
- Inguanzo, A., Segura, B., Sala-Llonch, R., Monte-Rubio, G., Abos, A., Campabadal, A., Uribe, C., Baggio, H. C., Marti, M. J., Valldeoriola, F., Compta, Y., Bargallo, N., & Junque, C. (2021). Impaired Structural Connectivity in Parkinson's Disease Patients with Mild Cognitive Impairment: A Study Based on Probabilistic Tractography. *Brain Connectivity*, 11(5), 380–392. <https://doi.org/10.1089/brain.2020.0939>
- Oltra, J., Campabadal, A., Segura, B., Uribe, C., Marti, M. J., Compta, Y., Valldeoriola, F., Bargallo, N., Iranzo, A., & Junque, C. (2021). Disrupted functional connectivity in PD with probable RBD and its cognitive correlates. *Scientific Reports*, 11(1), 24351. <https://doi.org/10.1038/s41598-021-03751-5>
- Sánchez-Gómez, A., Compta, Y., & Marti, M. J. (2021). Insulin-releasing or insulin-sensitizing drugs in Parkinson's disease? Choosing a pathway. *Parkinsonism & Related Disorders*, 93, 109–110. <https://doi.org/10.1016/j.parkreldis.2021.10.017>
- Sánchez-Gómez, A., Díaz, Y., Duarte-Salles, T., Compta, Y., & Marti, M. J. (2021). Prediabetes, type 2 diabetes mellitus and risk of Parkinson's disease: A population-based cohort study. *Parkinsonism & Related Disorders*, 89, 22–27. <https://doi.org/10.1016/j.parkreldis.2021.06.002>

## Research



Experimental  
Neurology

# Clinical research in Alzheimer's disease and other cognitive disorders

## Principal investigators

RAQUEL SANCHEZ-VALLE

## Members

Anna Antonell, Mircea Balasa, Sergi Borrego, Beatriz Bosch, Magda Castellvi, Jose Miguel Contador, Neus Falgàs, Guadalupe Fernandez, Albert Llado, Nuria Montagut, Agnes Perez, Lorena Rami, Oscar Ramos, Adria Tort

## Active projects

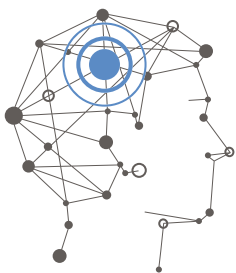
- **Demencias genéticas (enfermedad de Alzheimer, demencia frontotemporal y enfermedades priónicas genéticas): cambios longitudinales y diferencias en expresión y epigenéticas con formas esporádicas.** Ministerio de Ciencia, Innovación y Universidades. PI20/00448. Raquel Sanchez-Valle.
- **Demencias genéticas (enfermedad de Alzheimer, demencia frontotemporal y enfermedades priónicas genéticas): cambios longitudinales y diferencias en expresión y epigenéticas con formas esporádicas.** Fundació Clínic per a la Recerca Biomèdica. DN040718. Raquel Sanchez-Valle.
- **Diagnóstico precoz de la enfermedad de Alzheimer mediante el perfil de linfocitos citotóxicos y caracterización de alteraciones del sueño.** Instituto de Salud Carlos III. AC21\_2/00007. Raquel Sanchez-Valle.
- **DIAN-TU: Next generation prevention trial.** National Institutes of Health (NIH). 5R01AG053267-02. Raquel Sanchez-Valle.
- **DIAN-TU Primary prevention trial.** National Institutes of Health (NIH). 1U01AG059798-01. Raquel Sanchez-Valle.

- **Dominantly Inherited Alzheimer Network (DIAN).** National Institutes of Health (NIH). UF1 AG032438. Raquel Sanchez-Valle.
- **Genetic counseling in European universities: The case of neurodegenerative diseases.** Education, Audiovisual and Culture Executive Agency. KA220-HED-F1522753. Raquel Sanchez-Valle.
- **Understanding sleep-wake alterations in Alzheimer's Disease.** Alzheimer's Association. GBHIALZUK-21-723831. Raquel Sanchez-Valle.
- **Utilitat clínica i estudi cost-benefici dels actuals biomarcadors diagnòstics inous biomarcadors pronòstics en les demències d'inici primerenc.** Departament de Salut de la Generalitat de Catalunya. SLT008/18/00061. Raquel Sanchez-Valle.
- 16 Confidential agreements.

## Selected publications

- Barbier, M., Camuzat, A., Hachimi, K. E., Guegan, J., Rinaldi, D., Lattante, S., Houot, M., Sánchez-Valle, R., Sabatelli, M., Antonell, A., Molina-Porcel, L., Clot, F., Couratier, P., van der Ende, E., van der Zee, J., Manzoni, C., Camu, W., Cazeneuve, C., Sellal, F., Didic, M., ... Le Ber, I. (2021). SLITRK2, an X-linked modifier of the age at onset in C9orf72 frontotemporal lobar degeneration. *Brain*, 144(9), 2798–2811. <https://doi.org/10.1093/brain/awab171>
- Borrego-Écija, S., Turon-Sans, J., Ximelis, T., Aldecoa, I., Molina-Porcel, L., Povedano, M., Rubio, M. A., Gámez, J., Cano, A., Paré-Curell, M., Bajo, L., Sotoca, J., Clarimón, J., Balasa, M., Antonell, A., Lladó, A., Sánchez-Valle, R., Rojas-García, R., & Gelpi, E. (2021). Cognitive decline in amyotrophic lateral sclerosis:

# Research

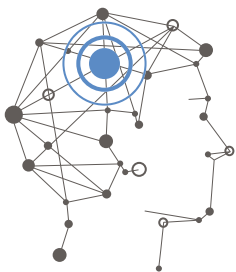


## Experimental Neurology

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- Neuropathological substrate and genetic determinants. *Brain Pathology*, 31(3), e12942. <https://doi.org/10.1111/bpa.12942>
- Contador, J., Guillén, N., Tort-Merino, A., Balasa, M., Martínez, N. F., Olives, J., Castellví, M., Juncà-Parella, J., Borrego-Écija, S., Bosch-Capdevila, B., Fernández-Villullas, G., Ramos-Campoy, O., Antonell, A., Sanchez-Valle, R., & Lladó, A. (2021). Impact of COVID-19 pandemic in an early-onset dementia clinic in Barcelona. *Alzheimer's & Dementia*, 17(S7), e052114. <https://doi.org/10.1002/alz.052114>
  - de Rojas, I., Moreno-Grau, S., Tesi, N., Grenier-Boley, B., Andrade, V., Jansen, I. E., Pedersen, N. L., Stringa, N., Zettergren, A., Hernández, I., Montreal, L., Antúnez, C., Antonell, A., Tankard, R. M., Bis, J. C., Sims, R., Bellenguez, C., Quintela, I., González-Perez, A., Calero, M., ... Ruiz, A. (2021). Common variants in Alzheimer's disease and risk stratification by polygenic risk scores. *Nature Communications*, 12(1), 3417. <https://doi.org/10.1038/s41467-021-22491-8>
  - Diaz-Lucena, D., Kruse, N., Thüne, K., Schmitz, M., Villar-Piqué, A., da Cunha, J., Hermann, P., López-Pérez, Ó., Andrés-Benito, P., Ladogana, A., Calero, M., Vidal, E., Riggert, J., Pineau, H., Sim, V., Zetterberg, H., Blennow, K., Del Río, J. A., Marín-Moreno, A., Espinosa, J. C., ... Llorens, F. (2021). TREM2 expression in the brain and biological fluids in prion diseases. *Acta Neuropathologica*, 141(6), 841–859. <https://doi.org/10.1007/s00401-021-02296-1>
  - Illán-Gala, I., Casaletto, K. B., Borrego-Écija, S., Arenaza-Urquijo, E. M., Wolf, A., Cobigo, Y., Goh, S., Staffaroni, A. M., Alcolea, D., Fortea, J., Blesa, R., Clarimon, J., Iulita, M. F., Brugalat-Serrat, A., Lladó, A., Grinberg, L. T., Possin, K., Rankin, K. P., Kramer, J. H., Rabinovici, G. D., ... Rosen, H. J. (2021). Sex differences in the behavioral variant of frontotemporal dementia: A new window to executive and behavioral reserve. *Alzheimer's & Dementia*, 17(8), 1329–1341. <https://doi.org/10.1002/alz.12299>
  - Malpetti, M., Jones, P. S., Tsvetanov, K. A., Rittman, T., van Swieten, J. C., Borroni, B., Sanchez-Valle, R., Moreno, F., Laforce, R., Graff, C., Synofzik, M., Galimberti, D., Masellis, M., Tartaglia, M. C., Finger, E., Vandenberghe, R., de Mendonça, A., Tagliavini, F., Santana, I., Ducharme, S., ... Genetic FTD Initiative (GENFI) (2021). Apathy in presymptomatic genetic frontotemporal dementia predicts cognitive decline and is driven by structural brain changes. *Alzheimer's & Dementia*, 17(6), 969–983. <https://doi.org/10.1002/alz.12252>
  - Molina-Martínez, P., Corpas, R., García-Lara, E., Cosín-Tomás, M., Cristófol, R., Kaliman, P., Solà, C., Molinuevo, J. L., Sánchez-Valle, R., Antonell, A., Lladó, A., & Sanfeliu, C. (2021). Microglial Hyperreactivity Evolved to Immunosuppression in the Hippocampus of a Mouse Model of Accelerated Aging and Alzheimer's Disease Traits. *Frontiers in Aging Neuroscience*, 12, 622360. <https://doi.org/10.3389/fnagi.2020.622360>
  - Montal, V., Vilaplana, E., Pegueroles, J., Bejanin, A., Alcolea, D., Carmona-Iragui, M., Clarimón, J., Levin, J., Cruchaga, C., Graff-Radford, N. R., Noble, J. M., Lee, J. H., Allegri, R., Karch, C. M., Laske, C., Schofield, P. R., Salloway, S., Ances, B., Benzinger, T., McDale, E., ... Dominantly Inherited Alzheimer Network (DIAN). (2021). Biphasic cortical macro- and microstructural changes in autosomal dominant Alzheimer's disease. *Alzheimer's & Dementia*, 17(4), 618–628. <https://doi.org/10.1002/alz.12224>
  - Pezzoli, S., Sánchez-Valle, R., Solanes, A., Kempton, M. J., Bandmann, O., Shin, J. I., Cagnin, A., Goldman, J. G., Merkitich, D., Firbank, M. J., Taylor, J. P., Pagonabarraga, J., Kulisevsky, J., Blanc, F., Verdolini, N., Venneri, A., & Radua, J. (2021). Neuroanatomical and cognitive correlates of visual

# Research

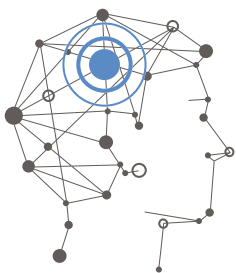


Experimental  
Neurology

## Selected publications

- hallucinations in Parkinson's disease and dementia with Lewy bodies: Voxel-based morphometry and neuropsychological meta-analysis. *Neuroscience and Biobehavioral Reviews*, 128, 367–382. <https://doi.org/10.1016/j.neubiorev.2021.06.030>
- Rojas, J. C., Wang, P., Staffaroni, A. M., Heller, C., Cobigo, Y., Wolf, A., Goh, S. M., Ljubenkova, P. A., Heuer, H. W., Fong, J. C., Taylor, J. B., Veras, E., Song, L., Jeromin, A., Hanlon, D., Yu, L., Khinikar, A., Sivasankaran, R., Kieloch, A., Valentin, M. A., ... ALLFTD and GENFI consortia (2021). Plasma Neurofilament Light for Prediction of Disease Progression in Familial Frontotemporal Lobar Degeneration. *Neurology*, 96(18), e2296–e2312. <https://doi.org/10.1212/WNL.0000000000011848>
  - Tort-Merino, A., Tarnanas, I., Bögler, M., Harms, R., Fernandez-Villullas, G., Juncà-Parella, J., Bosch, B., Lladó, A., Sanchez-Valle, R., & Balasa, M. (2021). ALTOIDA-iADL for the diagnosis of Mild Cognitive Impairment and early Alzheimer's disease. *Alzheimer's & Dementia*, 17(S12), e057982. <https://doi.org/10.1002/alz.057982>
  - Tsvetanov, K. A., Gazzina, S., Jones, P. S., van Swieten, J., Borroni, B., Sanchez-Valle, R., Moreno, F., Laforce, R., Jr, Graff, C., Synofzik, M., Galimberti, D., Masellis, M., Tartaglia, M. C., Finger, E., Vandenberghe, R., de Mendonça, A., Tagliavini, F., Santana, I., Ducharme, S., Butler, C., ... Genetic FTD Initiative, GENFI. (2021). Brain functional network integrity sustains cognitive function despite atrophy in presymptomatic genetic frontotemporal dementia. *Alzheimer's & Dementia*, 17(3), 500–514. <https://doi.org/10.1002/alz.12209>
  - Young, A. L., Bocchetta, M., Russell, L. L., Convery, R. S., Peakman, G., Todd, E., Cash, D. M., Greaves, C. V., van Swieten, J., Jiskoot, L., Seelaar, H., Moreno, F., Sanchez-Valle, R., Borroni, B., Laforce, R., Masellis, M., Tartaglia, M. C., Graff, C., ... Galimberti, D. (2021). Characterizing the Clinical Features and Atrophy Patterns of MAPT-Related Frontotemporal Dementia with Disease Progression Modeling. *Neurology*, 97(9), e941–e952. <https://doi.org/10.1212/WNL.00000000000012410>

## Research



### Experimental Neurology

# Mechanistic and therapeutic approaches in neurodegenerative disorders

## Principal investigators

VERONICA BRITO

Epitranscriptomic regulation in brain disorders

SILVIA GINES

Neuron and glia crosstalk in Huntington's disease

CRISTINA MALAGELADA

mTOR signaling dysregulation in neurodegenerative diseases

EULALIA MARTI

Non-coding RNAs regulatory networks in neurodegenerative diseases

ESTHER PEREZ NAVARRO

(Kinases and Phosphatases in neuronal function and dysfunction)

## Members

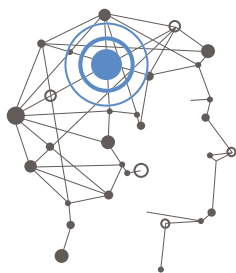
Ana Gamez, Genis Campoy, Carla Castany, Nadia Di Franco, Georgina Escaramis, Marc Espina, Anna Guisado, Marina Herrero, Laura Lopez, Maria Solaguren, Julia Solana, Leticia Perez, Anika Pupak

## Active projects

- **Ayuda para la Incorporación Estable de Doctores 2019.** Ministerio de Ciencia, Innovación y Universidades. IED2019-001065-I. Cristina Malagelada.

- **Astrocytes at the hub of neuronal dysfunction in Huntington's disease: Dissecting the role of ARMS/kidins 220 on astrocyte secretome.** European Huntington's disease Foundation. 1130\_201217. Silvia Gines.
- **Contracte del Programa Juan de la Cierva-Formació 2019.** Ministerio de Economía y Competitividad. FJCI2019-39633-I. Eulalia Marti.
- **Conveni de col·laboració en relació al finançament d'una recerca conjunta.** University Hospital Ulm. Silvia Gines.
- **Descifrando el papel de la metilación m6A del ARN como un nuevo nivel de regulación de la expresión génica en la patología de la enfermedad de Huntington.** Ministerio de Ciencia e Innovación. PID2020-116474RB-I00. Veronica Ines Brito.
- **CIBER de Epidemiología y Salud Pública.** Ministerio de Sanidad y Consumo. CB06/02/0058. Eulalia Marti.
- **Estudio de la función transneuronal de la proteína RTP801/REDD1 en la neuroinflamación en la enfermedad de Alzheimer.** Ministerio de Ciencia e Innovación. PID2020-119236RB-I00. Cristina Malagelada.
- **Exploring M6A modifications as critical modulators of mutant htt alternative splicing.** Hereditary Disease Foundation. Veronica Ines Brito.
- **Fragmentos de los tRNAs como mediadores de los procesos neurodegenerativos: implicaciones en la enfermedad de Huntington.** Ministerio de Ciencia e Innovación. PID2020-113953RB-I00. Eulalia Marti.
- **Gliotransmissors i receptors de cannabinoides en l'origen dels dèficits cognitius i de plasticitat sinàptica en la malaltia de Huntington.** Fundació La Marató de TV3. 30/C/2020. Silvia Gines.

# Research



## Experimental Neurology

### Active projects

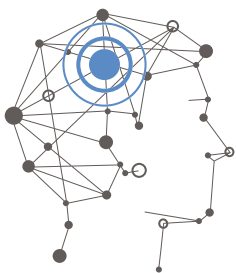
- **La enfermedad de Huntington como una laminopatía: interacción entre cerebro y la periferia.** Ministerio de Ciencia, Innovación y Universidades. PID2019-106447RB-I00. Esther Perez.
- **Phospho-proteome analysis of PBMCs in LRRK2 mutation carriers: expansion & validation of findings of the Barcelona LRRK2 Biorepository.** Michael J. Fox Foundation for Parkinson's research. MJFF-000858. Cristina Malagelada.
- **Transmitofagia entre astrocitos y neuronas: una nueva forma de comunicación entre neurona y glía en la enfermedad de Huntington?** Ministerio de Ciencia, Innovación y Universidades. RTI2018-094374-B-I00. Silvia Gines.
- 1 Confidential agreement.

### Selected publications

- Alcalá-Vida, R., Garcia-Forn, M., Castany-Pladevall, C., Creus-Muncunill, J., Ito, Y., Blanco, E., Golbano, A., Crespi-Vázquez, K., Parry, A., Slater, G., Samarajiwa, S., Peiró, S., Di Croce, L., Narita, M., & Pérez-Navarro, E. (2021). Neuron type-specific increase in lamin B1 contributes to nuclear dysfunction in Huntington's disease. *EMBO Molecular Medicine*, 13(2), e12105. <https://doi.org/10.15252/emmm.202012105>
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- Creus-Muncunill, J., Guisado-Corcoll, A., Venturi, V., Pantano, L., Escaramis, G., García de Herreros, M., Solaguren-Beascoa, M., Gámez-Valero, A., Navarrete, C., Masana, M., Llorens, F., Diaz-Lucena, D., Pérez-Navarro, E., & Martí, E. (2021). Huntington's disease brain-derived small RNAs recapitulate associated neuropathology in mice. *Acta Neuropathologica*, 141(4), 565–584. <https://doi.org/10.1007/s00401-021-02272-9>
- Fan, Y., Nirujogi, R. S., Garrido, A., Ruiz-Martínez, J., Bergareche-Yarza, A., Mondragón-Rezola, E., Vinagre-Aragón, A., Croitoru, I., Gorostidi Pagola, A., Paternain Markinez, L., Alcalay, R., Hickman, R. A., Düring, J., Gomes, S., Pratusевичute, N., Padmanabhan, S., Valldeoriola, F., Pérez Sisqués, L., Malagelada, C., Ximelis, T., ... Sammler, E. M. (2021). R1441G but not G2019S mutation enhances LRRK2 mediated Rab10 phosphorylation in human peripheral blood neutrophils. *Acta Neuropathologica*, 142(3), 475–494. <https://doi.org/10.1007/s00401-021-02325-z>
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- Nurm, K., Sepp, M., Castany-Pladevall, C., Creus-Muncunill, J., Tuvikene, J., Sirp, A., Vihma, H., Blake, D. J., Perez-Navarro,

# Research



## Experimental Neurology

### Selected publications

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- E., & Timmusk, T. (2021). Isoform-Specific Reduction of the Basic Helix-Loop-Helix Transcription Factor TCF4 Levels in Huntington's Disease. *eNeuro*, 8(5), eNEURO.0197-21.2021. <https://doi.org/10.1523/ENEURO.0197-21.2021>
- Pérez-Sisqués, L., Martín-Flores, N., Masana, M., Solana-Balaguer, J., Llobet, A., Romani-Aumedes, J., Canal, M., Campoy-Campos, G., García-García, E., Sánchez-Fernández, N., Fernández-García, S., Gilbert, J. P., Rodríguez, M. J., Man, H. Y., Feinstein, E., Williamson, D. L., Soto, D., Gasull, X., Alberch, J., & Malagelada, C. (2021). RTP801 regulates motor cortex synaptic transmission and learning. *Experimental Neurology*, 342, 113755. <https://doi.org/10.1016/j.expneurol.2021.113755>
  - Pérez-Sisqués, L., Sancho-Balsells, A., Solana-Balaguer, J., Campoy-Campos, G., Vives-Isern, M., Soler-Palazón, F., Anglada-Huguet, M., López-Toledano, M. Á., Mandelkow, E. M., Alberch, J., Giral, A., & Malagelada, C. (2021). RTP801/REDD1 contributes to neuroinflammation severity and memory impairments in Alzheimer's disease. *Cell Death & Disease*, 12(6), 616. <https://doi.org/10.1038/s41419-021-03899-y>
  - Pérez-Sisqués, L., Solana-Balaguer, J., Campoy-Campos, G., Martín-Flores, N., Sancho-Balsells, A., Vives-Isern, M., Soler-Palazón, F., Garcia-Forn, M., Masana, M., Alberch, J., Pérez-Navarro, E., Giral, A., & Malagelada, C. (2021). RTP801/REDD1 is Involved in Neuroinflammation and Modulates Cognitive Dysfunction in Huntington's Disease. *Biomolecules*, 12(1), 34. <https://doi.org/10.3390/biom12010034>
  - Torres, A. G., & Martí, E. (2021). Toward an Understanding of Extracellular tRNA Biology. *Frontiers in Molecular Biosciences*, 8, 662620. <https://doi.org/10.3389/fmolb.2021.662620>

### Knowledge transfer & Innovation

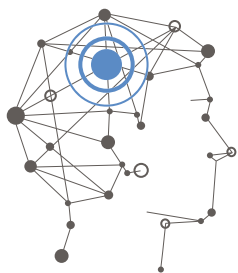
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- Method for predicting the onset of extrapyramidal symptoms (EPS) induced by an antipsychotic-based treatment. AVCRI196. Sergi Mas, Patricia Gasso, Cristina Malagelada, Miquel Bernardo, Amalia Lafuente
- Methods and pharmaceutical composition for the treatment of neurodegenerative disease. UBTT0329-E. Jean-Antoine Girault, Albert Giral, Veronica Brito, Silvia Gines

### Thesis

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- **Role of RTP801 in synaptic transmission and neuroinflammation in neurodegenerative diseases.** Leticia Perez-Sisques. Supervisor: Cristina Malagelada.



Experimental  
Neurology

## Neuroimaging in degenerative disorders

### Principal investigators

CARME JUNQUE

Structural connectivity and cognition in neurological and psychiatric disorders

MARINA LOPEZ

Pain and Emotion Neuroscience

BARBARA SEGURA

Functional connectivity and cognition in neurological and psychiatric disorders

ROSER SALA LLONCH

Statistical modeling and data analysis for neuroimaging

### Members

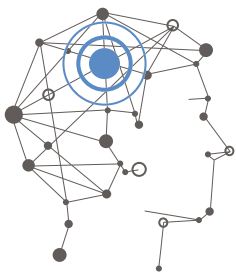
Alexandra Abos, Hugo Cesar Baggio, Nuria Bargallo, Anna Campabadal, Adria Casamitjana, Anna Inguanzo, Gemma Cristina Monte, Aida Niñerola, Javier Oltra, Agnes Perez, Raul Tudela, Carme Uribe

### Active projects

- **CogNition, emotion/behAvior, fUunctionaliTY and brain connectivity in recovered COVID-19 patientS (NAUTILUS).** Fundació La Marató de TV3. 93/U/2021. Barbara Segura.
- **CoviD-19 and brain: cogNition And meNtal heAlth (DIANA).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2020PANDE00053. Carmen Junque.

- **Efecto de la intervención cognitiva pre y post amiloide en la conectividad estructural y funcional en un modelo de rata transgénico de Alzheimer.** Ministerio de Economía y Competitividad. Pl18/00893. Guadalupe Soria.
- **Fenilcetonuria: de la infancia a los adultos a través del conectoma cerebral, cambios cardiovasculares, características metabólicas y de la microbiota intestinal.** Fundació La Marató de TV3. 18/C/2020. Carmen Junque.
- **Grup de recerca emergent en imatge per ressonància magnètica.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1003. Guadalupe Soria.
- **Identifying neural pathophysiology in juvenile fibromyalgia.** National Institutes of Health. 1R01AR074795-01A1 (Subaward 310178). Marina Lopez.
- **Localización de cambios cerebrales en la Enfermedad de Alzheimer utilizando métodos multimodales Bayesianos para establecer predicciones individuales.** Ministerio de Ciencia e Innovación. PID2020-118386RA-I00. Roser Sala.
- **Marcadores neurocognitivos de dolor crónico y depresión: una aproximación transdiagnóstica a la medicina de precisión.** Ministerio de Ciencia e Innovación (MICINN). PID2020-117327RB-I00. Marina Lopez.
- **Multimodal imaging in parkinsonisms: from the molecular synaptic pruning to the whole-brain connectomics (SYNPARK).** European Union. MSCA-IF-2019. 888692. Barbara Segura.
- **Neuropsicología.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR748. Carmen Junque.
- **Patrones cerebrales estructurales y funcionales asociados con diferentes fenotipos cognitivos y su progresión en trastornos de la conducta del sueño REM.** Ministerio de Ciencia, Innovación y Universidades. PID2020-114640GB-I00. Barbara Segura.
- **SPRINT: Signature for Pain Recovery IN Teens.** National Institutes of Health. 1R61NS114926-01 (Subaward 144386). Marina Lopez.

# Research



Experimental  
Neurology

## Selected publications

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- Campabadal, A., Segura, B., Junque, C., & Iranzo, A. (2021). Structural and functional magnetic resonance imaging in isolated REM sleep behavior disorder: A systematic review of studies using neuroimaging software. *Sleep Medicine Reviews*, 59, 101495. <https://doi.org/10.1016/j.smrv.2021.101495>
- Inguanzo, A., Sala-Llonch, R., Segura, B., Erostarbe, H., Abos, A., Campabadal, A., Uribe, C., Baggio, H. C., Compta, Y., Marti, M. J., Valldeoriola, F., Bargallo, N., & Junque, C. (2021). Hierarchical cluster analysis of multimodal imaging data identifies brain atrophy and cognitive patterns in Parkinson's disease. *Parkinsonism & Related Disorders*, 82, 16–23. <https://doi.org/10.1016/j.parkreldis.2020.11.010>
- Uribe, C., Junque, C., Gómez-Gil, E., Díez-Cirarda, M., & Guillamon, A. (2021). Brain connectivity dynamics in cisgender and transmen people with gender incongruence before gender affirmative hormone treatment. *Scientific Reports*, 11(1), 21036. <https://doi.org/10.1038/s41598-021-00508-y>

## Knowledge transfer & Innovation

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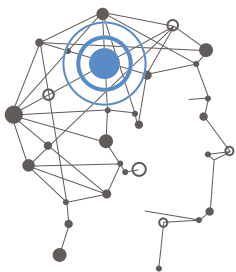
- Bicelas encapsulades en liposomes. Olga Lopez

## Thesis

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- **Subtypes in Parkinson's Disease and Dementia with Lewy bodies: MRI and neuropsychological profiles.** Anna Inguanzo. Supervisors: Carme Junque & Barbara Segura.

## Research



Experimental  
Neurology

# Neuronal network dysfunction in neurological and psychiatric disorders

## Principal investigators

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JORDI ALBERCH  
Neuronal connectivity in Huntington's disease and basal ganglia disorders

ALBERT GIRALT  
Hippocampal function in health and disease

MERCE MASANA  
Modulation of neuronal circuitry in brain disorders

MANUEL RODRIGUEZ  
Neuron-glia interactions in neurodegenerative disorders

## Members

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Carmen Andrade, Ivan Ballasch, Albert Coll, Sara Conde, Esther Garcia, Laura Lopez, Ened Rodriguez, Anna Sancho, Laia Sitja

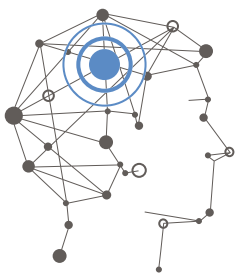
## Active projects

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- **Convocatòria del Programa d'Intensificació de l'Activitat Investigadora Internacional (2020-21).** Universitat de Barcelona. Merce Masana.
- **Convocatòria del Programa d'Intensificació de Transferència pel curs 2020-2021.** Universitat de Barcelona. Jordi Alberch.
- **Contracte del Programa Ramon y Cajal.** Ministerio de Economía y Competitividad. YC-2016-19466. Jordi Alberch.
- **Definiendo el rol de la familia Ikaros en la esquizofrenia.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-094678-A-I00. Albert Giralt.

- **CIBER en Enfermedades neurodegenerativas.** Ministerio de Sanidad y Consumo. CB06/05/0054. Jordi Alberch.
- **Fisiopatologia i Tractament de les Malalties Neurodegeneratives.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1095. Jordi Alberch.
- **Identificar los mecanismos convergentes activados por la huntingtina mutada y la falta de VPS13A responsables de la neurodegeneración selectiva de las neuronas estriatales par.** Ministerio de Ciencia e Innovación. PID2020-119386RB-I00. Jordi Alberch & Manuel Rodríguez.
- **Mención de Excelencia Maria de Maetzu al Institut de Neurociències de la Universitat de Barcelona (UBNEURO).** Ministerio de Economía, Industria y Competitividad. MDM-2017-0729. Jordi Alberch.
- **Non-invasive dynamic neural control by laser-based technology (NEUROPA).** European Union. FETOPEN-01-2018-2019-2020. 863214. Merce Masana.
- **School@Once Training European teachers to integrate health in the school day.** European Union. 210582. Manuel Jose Rodriguez.
- **Un puente volador entre el sistema immune y nervioso en la esquizofrenia.** Ministerio de Ciencia e Innovación. EIN2020-112425. Albert Giralt.
- **Una finestra al cervell.** Ajuntament de Barcelona. Jordi Alberch.
- 1 Confidential agreement.

# Research

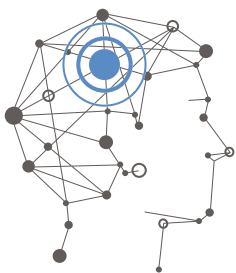


## Experimental Neurology

### Selected publications

- Creus-Muncunill, J., Guisado-Corcoll, A., Venturi, V., Pantano, L., Escaramís, G., García de Herreros, M., Solaguren-Beascoa, M., Gámez-Valero, A., Navarrete, C., Masana, M., Llorens, F., Diaz-Lucena, D., Pérez-Navarro, E., & Martí, E. (2021). Huntington's disease brain-derived small RNAs recapitulate associated neuropathology in mice. *Acta Neuropathologica*, 141(4), 565–584. <https://doi.org/10.1007/s00401-021-02272-9>
- de Pins, B., Mendes, T., Giralt, A., & Girault, J. A. (2021). The Non-receptor Tyrosine Kinase Pyk2 in Brain Function and Neurological and Psychiatric Diseases. *Frontiers in Synaptic Neuroscience*, 13, 749001. <https://doi.org/10.3389/fnsyn.2021.749001>
- Ding, K., Yang, J., Chin, M. K., Sullivan, L., Demirhan, G., Violant-Holz, V., Uvinha, R. R., Dai, J., Xu, X., Popeska, B., Mladenova, Z., Khan, W., Kuan, G., Balasekaran, G., Smith, G. A., & on Behalf of Global Community Health-Covid-Collaborative Research Team (2021). Mental Health among Adults during the COVID-19 Pandemic Lockdown: A Cross-Sectional Multi-Country Comparison. *International Journal of Environmental Research and Public Health*, 18(5), 2686. <https://doi.org/10.3390/ijerph18052686>
- Ding, K., Yang, J., Chin, M. K., Sullivan, L., Durstine, J. L., Violant-Holz, V., Demirhan, G., Oliveira, N., Popeska, B., Kuan, G., Khan, W., Dai, J., Xu, X., Mladenova, Z., Balasekaran, G., Smith, G. A., & on Behalf of Global Community Health-Covid-Collaborative Research Team (2021). Physical Activity among Adults Residing in 11 Countries during the COVID-19 Pandemic Lockdown. *International Journal of Environmental Research and Public Health*, 18(13), 7056. <https://doi.org/10.3390/ijerph18137056>
- García-García, E., Chaparro-Cabanillas, N., Coll-Manzano, A., Carreras-Caballé, M., Giralt, A., Del Toro, D., Alberch, J., Masana, M., & Rodríguez, M. J. (2021). Unraveling the Spatiotemporal Distribution of VPS13A in the Mouse Brain. *International Journal of Molecular Sciences*, 22(23), 13018. <https://doi.org/10.3390/ijms222313018>
- Masana, M., Rodríguez, M. J., & Alberch, J. (2021). Proceedings of the Tenth International Meeting on Neuroacanthocytosis Syndromes. Tremor and Other Hyperkinetic Movements, 11, 19. <https://doi.org/10.5334/tohm.622>
- Muñoz-Violant, S., Violant-Holz, V., Gallego-Jiménez, M. G., Anguera, M. T., & Rodríguez, M. J. (2021). Coping strategies patterns to buffer the psychological impact of the State of Emergency in Spain during the COVID-19 pandemic's early months. *Scientific Reports*, 11(1), 24400. <https://doi.org/10.1038/s41598-021-03749-z>
- Pérez-Sisqués, L., Martín-Flores, N., Masana, M., Solana-Balaguer, J., Llobet, A., Romani-Aumedes, J., Canal, M., Campoy-Campos, G., García-García, E., Sánchez-Fernández, N., Fernández-García, S., Gilbert, J. P., Rodríguez, M. J., Man, H. Y., Feinstein, E., Williamson, D. L., Soto, D., Gasull, X., Alberch, J., & Malagelada, C. (2021). RTP801 regulates motor cortex synaptic transmission and learning. *Experimental Neurology*, 342, 113755. <https://doi.org/10.1016/j.expneurol.2021.113755>
- Pérez-Sisqués, L., Sancho-Balsells, A., Solana-Balaguer, J., Campoy-Campos, G., Vives-Isern, M., Soler-Palazón, F., Anglada-Huguet, M., López-Toledano, M. À., Mandelkow, E. M., Alberch, J., Giralt, A., & Malagelada, C. (2021). RTP801/REDD1 contributes to neuroinflammation severity and memory impairments in Alzheimer's disease. *Cell Death & Disease*, 12(6), 616. <https://doi.org/10.1038/s41419-021-03899-y>

# Research



## Experimental Neurology

### Selected publications

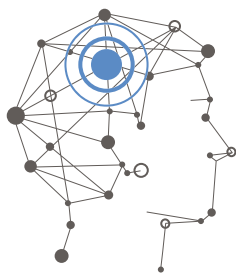
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- Pérez-Sisqués, L., Solana-Balaguer, J., Campoy-Campos, G., Martín-Flores, N., Sancho-Balsells, A., Vives-Isern, M., Soler-Palazón, F., Garcia-Forn, M., Masana, M., Alberch, J., Pérez-Navarro, E., Giralt, A., & Malagelada, C. (2021). RTP801/REDD1 Is Involved in Neuroinflammation and Modulates Cognitive Dysfunction in Huntington's Disease. *Biomolecules*, 12(1), 34. <https://doi.org/10.3390/biom12010034>
- Rejc, L., Gómez-Vallejo, V., Joya, A., Moreno, O., Egimendia, A., Castellnou, P., Ríos-Anglada, X., Cossío, U., Baz, Z., Passannante, R., Tobalina-Larrea, I., Ramos-Cabrer, P., Giralt, A., Sastre, M., Capetillo-Zarate, E., Košak, U., Knez, D., Gobec, S., Marder, M., Martin, A., ... Llop, J. (2021). Longitudinal evaluation of a novel BChE PET tracer as an early in vivo biomarker in the brain of a mouse model for Alzheimer disease. *Theranostics*, 11(13), 6542–6559. <https://doi.org/10.7150/thno.54589>
- Senis, E., Esgleas, M., Najas, S., Jiménez-Sábado, V., Bertani, C., Giménez-Alejandre, M., Escriche, A., Ruiz-Orera, J., Hergueta-Redondo, M., Jiménez, M., Giralt, A., Nuciforo, P., Albà, M. M., Peinado, H., Del Toro, D., Hove-Madsen, L., Götz, M., & Abad, M. (2021). TUNAR lncRNA Encodes a Microprotein that Regulates Neural Differentiation and Neurite Formation by Modulating Calcium Dynamics. *Frontiers in Cell and Developmental Biology*, 9, 747667. <https://doi.org/10.3389/fcell.2021.747667>
- Violant-Holz, V., Rodríguez-Silva, C., Carol, M., & Rodríguez, M. J. (2021). Impact of cocreation training capsules for preschool teachers on children's healthy habits: a pilot study conducted in Barcelona, Spain. *BMC Public Health*, 21(1), 2089. <https://doi.org/10.1186/s12889-021-12160-2>

### Knowledge transfer & Innovation

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- Cytes Biotechnologies. Spin off. Jordi Alberch, Josep M Canals
- Methods and pharmaceutical composition for the treatment of neurodegenerative disease. UBTT0329-E. Jean Antoine Girault, Albert Giralt, Veronica Brito, Silvia Gines



Experimental  
Neurology

## Neuropathology

### Principal investigators

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ISIDRO FERRER

### Members

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Pol Andres-Benito, Marta Barrachina

### Active projects

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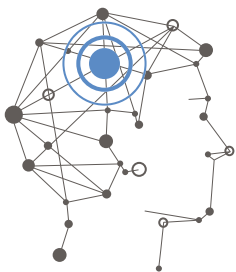
- **CIBER en Enfermedades Neurodegenerativas.** Ministerio de Sanidad y Consumo. CB06/05/0002. Isidro Ferrer.
- **Conveni específic pel projecte implicació de RNAs No Codificants (miRNAs) en l'esclerosi lateral amiotròfica.** ELA Research Foundation. PROJECTE ELA. Isidro Ferrer.
- **Modulation of Tau seeding and pathology in tauopathies by BBB-nanocarriers, epitope selective vaccination and ectoPrP Tau receptor bodies (STOPTauPATHOL).** Fundació 'La Caixa'. HR18-00452. Isidro Ferrer.
- 3 Confidential agreements.

### Selected publications

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- Álvarez-Marimon, E., Castillo-Michel, H., Reyes-Herrera, J., Seira, J., Aso, E., Carmona, M., Ferrer, I., Cladera, J., & Benseny-Cases, N. (2021). Synchrotron X-ray Fluorescence and FTIR Signatures for Amyloid Fibrillary and Nonfibrillary Plaques. *ACS Chemical Neuroscience*, 12(11), 1961–1971. <https://doi.org/10.1021/acscemneuro.1c00048>
- Barranco, N., Plá, V., Alcolea, D., Sánchez-Domínguez, I., Fischer-Colbrie, R., Ferrer, I., Lleó, A., & Aguado, F. (2021). Dense core vesicle markers in CSF and cortical tissues of patients with Alzheimer's disease. *Translational Neurodegeneration*, 10(1), 37. <https://doi.org/10.1186/s40035-021-00263-0>
- Benseny-Cases, N., Álvarez-Marimon, E., Aso, E., Carmona, M., Klementieva, O., Appelhans, D., Ferrer, I., & Cladera, J. (2021). In situ identification and G4-PPI-His-Mal-dendrimer-induced reduction of early-stage amyloid aggregates in Alzheimer's disease transgenic mice using synchrotron-based infrared imaging. *Scientific Reports*, 11(1), 18368. <https://doi.org/10.1038/s41598-021-96379-4>
- Blanco-Palmero, V. A., Rubio-Fernández, M., Antequera, D., Villarejo-Galende, A., Molina, J. A., Ferrer, I., Bartolome, F., & Carro, E. (2021). Increased YKL-40 but Not C-Reactive Protein Levels in Patients with Alzheimer's Disease. *Biomedicines*, 9(9), 1094. <https://doi.org/10.3390/biomedicines9091094>
- Diaz-Lucena, D., Kruse, N., Thüne, K., Schmitz, M., Villar-Piqué, A., da Cunha, J., Hermann, P., López-Pérez, Ó., Andrés-Benito, P., Ladogana, A., Calero, M., Vidal, E., Riggert, J., Pineau, H., Sim, V., Zetterberg, H., Blennow, K., Del Río, J. A., Marín-Moreno, A., Espinosa, J. C., ... Llorens, F. (2021). TREM2 expression in the brain and biological fluids in prion diseases. *Acta Neuropathologica*, 141(6), 841–859. <https://doi.org/10.1007/s00401-021-02296-1>

# Research



## Experimental Neurology

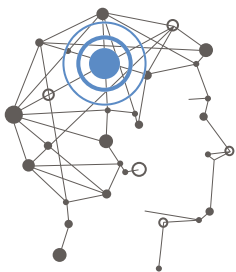
### Selected publications

- Ferrer, I., Andrés-Benito, P., Ausin, K., Pamplona, R., del Río, J. A., Fernández-Irigoyen, J., & Santamaría, E. (2021). Dysregulated protein phosphorylation: A determining condition in the continuum of brain aging and Alzheimer's disease. *Brain Pathology*, 31(6), e12996. <https://doi.org/10.1111/bpa.12996>
- Gujjarro, I. M., Garcés, M., Andrés-Benito, P., Marín, B., Otero, A., Barrio, T., Carmona, M., Ferrer, I., Badiola, J. J., & Monzón, M. (2021). Neuroimmune Response Mediated by Cytokines in Natural Scrapie after Chronic Dexamethasone Treatment. *Biomolecules*, 11(2), 204. <https://doi.org/10.3390/biom11020204>
- Jové, M., Cabré, R., Mota-Martorell, N., Martín-Garí, M., Obis, È., Ramos, P., Canales, I., Galo-Licon, J. D., Sol, J., Noguerras, L., Torres, P., Portero-Otín, M., Ayala, V., Ferrer, I., & Pamplona, R. (2021). Age-Related Changes in Lipidome of Rat Frontal Cortex and Cerebellum Are Partially Reversed by Methionine Restriction Applied in Old Age. *International Journal of Molecular Sciences*, 22(22), 12517. <https://doi.org/10.3390/ijms222212517>
- Lidón, L., Llaó-Hierro, L., Nuvolone, M., Aguzzi, A., Ávila, J., Ferrer, I., Del Río, J. A., & Gavín, R. (2021). Tau Exon 10 Inclusion by PrPC through Downregulating GSK3 Activity. *International Journal of Molecular Sciences*, 22(10), 5370. <https://doi.org/10.3390/ijms22105370>
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- Rossi, C., Fernández, A., Torres, P., Ramirez-Nuñez, O., Granado-Serrano, A. B., Fontdevila, L., Povedano, M., Pamplona, R., Ferrer, I., & Portero-Otín, M. (2021). Cell Stress Induces Mislocalization of Transcription Factors with Mitochondrial Enrichment. *International Journal of Molecular Sciences*, 22(16), 8853. <https://doi.org/10.3390/ijms22168853>

### Knowledge transfer & Innovation

- Mitochondrial markers of neurodegenerative diseases. AVCRI247-E. Marta Barrachina, Isidre Ferrer, Marta Blanch

## Research



Experimental  
Neurology

# Pathogenesis of immune-mediated neuronal disorders

## Principal investigators

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JOSEP DALMAU

Syndromes and mechanisms of paraneoplastic and autoimmune encephalitis

ALBERT SAIZ

Neuroimmunology and Multiple Sclerosis

## Members

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Jon Landa, Francesco Mannara, Eugenia Maria Martinez, Estibaliz Maudes, Gemma Olive, Paula Peixoto, Jesus Planaguma, Marija Radosevic, Maria Rodes, Myrna Rosenfeld, Lidia Sabater, Amirpasha Zamani

## Active projects

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- **A Translational Model of Antibody-mediated Synaptic Disease: Symptoms, Neuronal Circuits, and the Mechanisms of Memory Loss and Recovery.** Fundació 'La Caixa'. HR17-00149. Josep Dalmau.
- **Análisis multiescala de los autoanticuerpos contra el receptor NMDA en psicosis.** Instituto de Salud Carlos III. AC18/00009. Josep Dalmau.
- **Centro de Investigación Biomédica en Red de Enfermedades Raras(CIBERER).** Ministerio de Economía y Competitividad. CB15/00010. Josep Dalmau.
- **Contratos Juan Rodés.** Ministerio de Sanidad y Consumo. JR17/00012. Josep Dalmau.

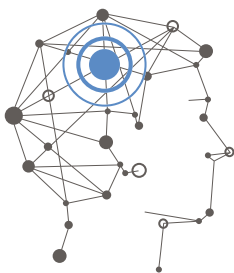
- **European Committee for treatment & research in multiple sclerosis.** ECTRIMS\_20\_CTFP\_01. Albert Saiz.
- **Eficàcia i efectes adversos neurològics de la vacunació contra la COVID-19 en pacients immunodeprimits per l'esclerosi múltiple.** Fundació La Marató de TV3. 202132-30. Albert Saiz.
- **Investigaciones en la encefalitis anti-NMDAR: nuevo test diagnóstico, papel de la inflamación en un modelo animal, y modulación alostérica de NMDAR como estrategia terapéutica.** Ministerio de Ciencia, Innovación y Universidades. PI20/00197. Josep Dalmau.
- **Subclinical activity in anti-LGI1 encephalitis: diagnostic test and prognostic implications.** Autoimmune Encephalitis Alliance. AEA\_CSG\_20\_01. Josep Dalmau.
- 19 Confidential agreements.

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- Beghi, E., Michael, B. D., Solomon, T., Westenberg, E., Winkler, A. S., & COVID-19 Neuro Research Coalition (2021). Approaches to understanding COVID-19 and its neurological associations. *Annals of Neurology*, 89(6), 1059–1067. <https://doi.org/10.1002/ana.26076>
- Comabella, M., Sastre-Garriga, J., Borrás, E., Villar, L. M., Saiz, A., Martínez-Yélamos, S., García-Merino, J. A., Pintea, R., Fissolo, N., Sánchez López, A. J., Costa-Frossard, L., Blanco, Y., Llufríu,

# Research

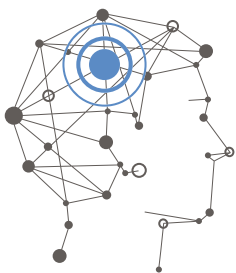


## Experimental Neurology

### Selected publications

- S., Vidal-Jordana, A., Sabidó, E., & Montalban, X. (2021). CSF Chitinase 3-Like 2 Is Associated With Long-term Disability Progression in Patients With Progressive Multiple Sclerosis. *Neurology Neuroimmunology & Neuroinflammation*, 8(6), e1082. <https://doi.org/10.1212/NXI.000000000001082>
- Dalmau, J., & Martinez-Hernandez, E. (2021). Author Response: Clinical Significance of Anti-NMDAR Concurrent With Glial or Neuronal Surface Antibodies. *Neurology*, 96(4), 188–189. <https://doi.org/10.1212/WNL.0000000000011359>
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  - Graus, F., Vogrig, A., Muñoz-Castrillo, S., Antoine, J.-C. G., Desestret, V., Dubey, D., Giometto, B., Irani, S. R., Joubert, B., Leypoldt, F., McKeon, A., Prüss, H., Psimaras, D., Thomas, L., Titulaer, M. J., Vedeler, C. A., Verschuuren, J. J., Dalmau, J., & Honnorat, J. (2021). Updated Diagnostic Criteria for Paraneoplastic Neurologic Syndromes. *Neurology, Neuroimmunology Neuroinflammation*, 8(4). <https://doi.org/10.1212/NXI.0000000000001014>
  - Guasp, M., Giné-Servén, E., Maudes, E., Rosa-Justicia, M., Martínez-Hernández, E., Boix-Quintana, E., Bioque, M., Casado, V., Módena-Ouarzi, Y., Guanyabens, N., Muriana, D., Sugranyes, G., Pacchiarotti, I., Davi-Loscós, E., Torres-Rivas, C., Ríos, J., Sabater, L., Saiz, A., Graus, F., ... Dalmau, J. (2021). Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis. *Neurology*, 97(1), e61 LP-e75. <https://doi.org/10.1212/WNL.0000000000012191>
  - Landa, J., Guasp, M., Míguez-Cabello, F., Guimarães, J., Mishima, T., Oda, F., Zipp, F., Krajinovic, V., Fuhr, P., Honnorat, J., Titulaer, M., Simabukuro, M., Planagumà, J., Martínez-Hernández, E., Armangué, T., Saiz, A., Gasull, X., Soto, D., Graus, F., Sabater, L., ... GluK2 encephalitis study group (2021). Encephalitis with Autoantibodies against the Glutamate Kainate Receptors GluK2. *Annals of Neurology*, 90(1), 101–117. <https://doi.org/10.1002/ana.26098>
  - Nosadini, M., Eyre, M., Molteni, E., Thomas, T., Irani, S. R., Dalmau, J., Dale, R. C., Lim, M., International NMDAR Antibody Encephalitis Consensus Group, Anlar, B., Armangué, T., Benseler, S., Cellucci, T., Deiva, K., Gallentine, W., Gombolay, G., Gorman, M. P., Hachohen, Y., Jiang, Y., Lim, B. C., ... Yeshokumar, A. K. (2021). Use and Safety of Immunotherapeutic Management of N-Methyl-d-Aspartate Receptor Antibody Encephalitis: A Meta-analysis. *JAMA Neurology*, 78(11), 1333–1344. <https://doi.org/10.1001/jamaneurol.2021.3188>
  - Nosadini, M., Thomas, T., Eyre, M., Anlar, B., Armangué, T., Benseler, S. M., Cellucci, T., Deiva, K., Gallentine, W., Gombolay, G., Gorman, M. P., Hachohen, Y., Jiang, Y., Lim, B. C., Muscal, E., Ndong, A., Neuteboom, R., Rostásy, K., Sakuma, H., Sharma, S., ... Dale, R. C. (2021). International Consensus Recommendations for the Treatment of Pediatric NMDAR Antibody Encephalitis. *Neurology Neuroimmunology & Neuroinflammation*, 8(5), e1052. <https://doi.org/10.1212/NXI.0000000000001052>
  - Papp, V., Magyari, M., Aktas, O., Berger, T., Broadley, S. A., Cabre, P., Jacob, A., Kira, J. I., Leite, M. I., Marignier, R., Miyamoto, K., Palace, J., Saiz, A., Sepulveda, M., Sveinsson, O., & Illes, Z. (2021). Worldwide Incidence and Prevalence of Neuromyelitis Optica: A Systematic Review. *Neurology*, 96(2), 59–77. <https://doi.org/10.1212/WNL.0000000000011153>

# Research



## Experimental Neurology

### Selected publications

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- Petit-Pedrol, M., Guasp, M., Armangue, T., Lavarino, C., Morales La Madrid, A., Saiz, A., Graus, F., & Dalmau, J. (2021). Absence of GluD2 Antibodies in Patients With Opsoclonus-Myoclonus Syndrome. *Neurology*, 96(7), e1082–e1087. <https://doi.org/10.1212/WNL.0000000000011410>
- Schanda, K., Peschl, P., Lerch, M., Seebacher, B., Mindorf, S., Ritter, N., Probst, M., Hegen, H., Di Pauli, F., Wendel, E.-M., Lechner, C., Baumann, M., Mariotto, S., Ferrari, S., Saiz, A., Farrell, M., Leite, M. I. S., Irani, S. R., Palace, J., ... Reindl, M. (2021). Differential Binding of Autoantibodies to MOG Isoforms in Inflammatory Demyelinating Diseases. *Neurology - Neuroimmunology Neuroinflammation*, 8(5). <https://doi.org/10.1212/NXI.0000000000001027>
- Sarmiento-Monroy, J. C., Espinosa, G., Londoño, M. C., Meira, F., Caballol, B., Llufríu, S., Carrasco, J. L., Moll-Udina, A., Quintana, L. F., Giavedoni, P., Ramírez, J., Inciarte-Mundo, J., Solana, E., Blanco, Y., Martínez-Hernández, E., Sepúlveda, M., Llorenç, V., Prieto-González, S., Espígol-Frigolé, G., Milisenda, J. C., ... Immunocovid Clinic (2021). A multidisciplinary registry of patients with autoimmune and immune-mediated diseases with symptomatic COVID-19 from a single center. *Journal of Autoimmunity*, 117, 102580. <https://doi.org/10.1016/j.jaut.2020.102580>
- Yeh, W. Z., Widyastuti, P. A., Van der Walt, A., Stankovich, J., Havrdova, E., Horakova, D., Vodehnalova, K., Ozakbas, S., Eichau, S., Duquette, P., Kalincik, T., Patti, F., Boz, C., Terzi, M., Yamout, B. I., Lechner-Scott, J., Sola, P., Skibina, O. G., Barnett, M., Onofri, M., ... MSBase Study Group (2021). Natalizumab, Fingolimod and Dimethyl Fumarate Use and Pregnancy-Related Relapse and Disability in Women with Multiple Sclerosis. *Neurology*, 96(24), e2989–e3002. <https://doi.org/10.1212/WNL.0000000000012084>
- Zrzavy, T., Endmayr, V., Bauer, J., Macher, S., Mossaheb, N., Schwaiger, C., Ricken, G., Winklehner, M., Glatzer, S., Breu, M., Wimmer, I., Kovacs, G. G., Risser, D. U., Klupp, N., Simonitsch-Klupp, I., Roetzer, T., Rommer, P., Berger, T., Gelpi, E., Lassmann, H., ... Höftberger, R. (2021). Neuropathological Variability within a Spectrum of NMDAR-Encephalitis. *Annals of Neurology*, 90(5), 725–737. <https://doi.org/10.1002/ana.26223>

### Knowledge transfer & Innovation

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- Diagnosis of a neurologic disease. AVCRI233-E. Josep Dalmau, Francesc Graus

### Thesis

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- **Aplicaciones de la telemedicina en el seguimiento clínico de pacientes con enfermedades autoinmunes del sistema nervioso central.** Nuria Sola-Valls. Supervisors: Albert Saiz & Yolanda Blanco.
- **Caracterización clínica y biológica de la neuromielitis óptica, e identificación de factores pronósticos.** Maria Sepulveda. Supervisors: Albert Saiz & Francesc Graus.
- **Investigations in animal models of antiNMDAR encephalitis.** Anna Garcia. Supervisor: Josep Dalmau.



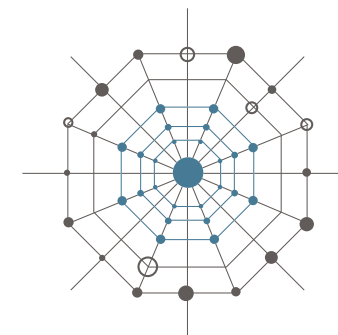
# Mental Health

# Research

## Mental Health

### PSYCHOTIC AND AFFECTIVE DISORDERS ARE AMONG THE MOST DISABLING MENTAL DISORDERS IN THE WORLD.

Depression, schizophrenia and bipolar disorder have a substantial economic impact in mental health and social services. They are a major contributor to increasing direct healthcare system costs (e.g., hospital inpatient stays, prescription drugs), direct social system costs (e.g., pensions, guardianship) and indirect costs (e.g., loss of productivity from unemployment, reduced work productivity among family caregiver). Recently, there has been a paradigm shift in the way we understand mental disorders, moving from pursuing a clinical remission (i.e., symptom-free periods) to a full recovery (i.e., good performance in everyday life). Under a multidisciplinary approach, the Institute actively embraces the challenge of advancing mental health knowledge around underlying neurobiological mechanisms, cognitive and daily life functioning, and new treatments and therapies in psychotic and affective disorders in childhood, adolescence, and adulthood.

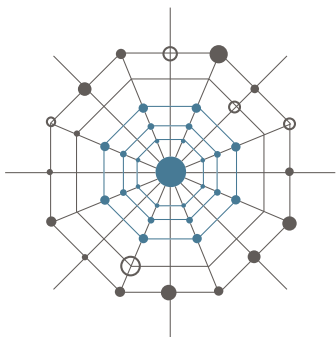


### PROJECTS

- **SYNCHROS: SYnergies for Cohorts in Health: integrating the ROLE of all Stakeholders.** European Union. 825884. Josep M. Haro
- **Remote Assessment of Disease and Relapse in Central Nervous System Disorders.** European Union. IMI2-2015-03-01. 115902. Josep M. Haro
- **A New Intervention for Implementation of Pharmacogenetics in Psychiatry.** European Union. 945151. Eduard Vieta
- **Improving the Preparedness of Health Systems to Reduce Mental Health and Psychosocial Concerns resulting from the COVID-19 Pandemic (RESPOND).** European Union. SC1-PHE-CORONAVIRUS-2020-2C. 101016127. Josep M. Haro
- **Xarxa d'Innovació de Noves Tecnologies en Salut Mental – TECSAM.** Departament d'Empresa i Coneixement. Generalitat de Catalunya. 2018 XARDI 00010. Josep M. Haro
- **Factores sociales, de estilo de vida, comorbilidad física y factores genéticos como causas de depresión en una población envejecida.** Ministerio de Ciencia, Innovación y Universidades. PI19/00088. Josep M. Haro
- **Step by step standing up a Barnahus in Catalonia: A simulation-based training program to avoid secondary victimization in the assessment and treatment of child sexual abuse (STEPS).** European Union. 881749. Noemi Pereda
- **Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative.** European Union. SC1-PM-02-2017. 754907-1. Eduard Vieta.
- **Network Center for Biomedical Research in Mental Health (CIBERSAM)**

## Research

# Bipolar disorders



Mental Health

## Principal investigators

EDUARD VIETA

## Members

Gerard Anmella, Antoni Benabarre, Derek Clougher, Giovanna Fico, Maria Florencia Forte, Marina Garriga, Anna Gimenez, Susana Gomes-da-Costa, Iria Grande, Jose Manuel Goikolea, Diego Hidalgo, Ester Jimenez, Ana Isabel Martinez, Laura Montejo, Andrea Murru, Isabella Pacchiarotti, Natalia Roberto, Maria Sague, Estela Salagre, Jose Sanchez, Maria Serra, Brisa Sole, Carla Torrent, Marc Valenti, Cristina Varo, Norma Verdolini

## Active projects

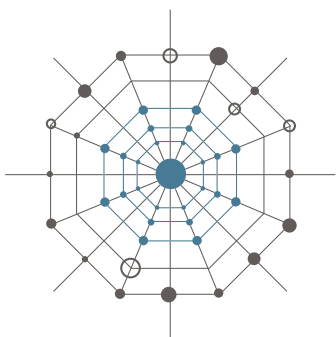
- **A New Intervention for Implementation of Pharmacogenetics in Psychiatry.** European Union. 945151. Eduard Vieta.
- **Early intervention to improve cognitive reserve in subjects at risk and early stages of psychosis.** Fundació Clínic. FCRB\_PB2\_2020. Eduard Vieta.
- **Estancia de formación en medicina de precisión en el trastorno bipolar. Creación de modelos predictivos de diagnóstico de trastorno bipolar y respuesta al tratamiento a partir de registros nacionales.** Instituto de Salud Carlos III. MV20/00018. Eduard Vieta.
- **Estudio sobre la eficacia de un abordaje psicológico para la potenciación de la reserva cognitiva en población bipolar con un primer episodio reciente.** Ministerio de Economía y Competitividad. Pl18/00805. Eduard Vieta.

- **Optimizing response to Li treatment through personalized evaluation of individuals with bipolar I disorder: the R-LiNK initiative.** European Union. SC1-PM-02-2017. 754907-1. Eduard Vieta.
- **Recovery with MIND/COVID-19: Development, feasibility and effectiveness of a smartphone application (PRESTOapp) for mental health problems in health workers during the COVID-19 pandemic.** Fundación Española de Psiquiatría y Salud Mental. FEPSM\_COVID19\_20\_1. Eduard Vieta.
- **Salud Mental (CIBERSAM).** Ministerio de Sanidad y Consumo. CB07/09/0004. Eduard Vieta.

## Selected publications

- Alonso, J., Vilagut, G., Mortier, P., Ferrer, M., Alayo, I., Aragón-Peña, A., Aragonès, E., Campos, M., Cura-González, I. D., Emparanza, J. I., Espuga, M., Forjaz, M. J., González-Pinto, A., Haro, J. M., López-Fresneña, N., Salazar, A., Molina, J. D., Orti-Lucas, R. M., Parellada, M., Pelayo-Terán, J. M., ... MINDCOVID Working group (2021). Mental health impact of the first wave of COVID-19 pandemic on Spanish healthcare workers: A large cross-sectional survey. *Revista de Psiquiatría y Salud Mental*, 14(2), 90–105. <https://doi.org/10.1016/j.rpsm.2020.12.001>
- Amare, A. T., Schubert, K. O., Hou, L., Clark, S. R., Papiol, S., Cearns, M., Heilbronner, U., Degenhardt, F., Tekola-Ayele, F., Hsu, Y. H., Shekhtman, T., Adli, M., Akula, N., Akiyama, K., Ardaur, R., Arias, B., Aubry, J. M., Backlund, L., Bhattacharjee, A. K., Bellivier, F., ... Baune, B. T. (2021). Association of polygenic score for major depression with response to lithium in patients with bipolar disorder. *Molecular Psychiatry*, 26(6), 2457–2470. <https://doi.org/10.1038/s41380-020-0689-5>

# Research

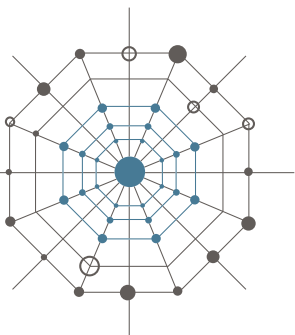


## Mental Health

### Selected publications

- Andlauer, T. F. M., Guzman-Parra, J., Streit, F., Strohmaier, J., González, M. J., Gil Flores, S., Cabaleiro Fabeiro, F. J., del Río Noriega, F., Perez, F. P., Haro González, J., Orozco Diaz, G., de Diego-Otero, Y., Moreno-Küstner, B., Auburger, G., Degenhardt, F., Heilmann-Heimbach, S., Herms, S., Hoffmann, P., Frank, J., ... Consortium, B. D. W. G. of the P. G. (2021). Bipolar multiplex families have an increased burden of common risk variants for psychiatric disorders. *Molecular Psychiatry*, 26(4), 1286–1298. <https://doi.org/10.1038/s41380-019-0558-2>
- Antonietta Furio, M., Popovic, D., Vieta, E., Stukalin, Y., Hagin, M., Torrent, C., Azorin, J. M., Angst, J., Bowden, C. L., Mosolov, S., Young, A. H., Perugi, G., & BRIDGE-II-Mix Study Group (2021). Characterization of rapid cycling bipolar patients presenting with major depressive episode within the BRIDGE-II-MIX study. *Bipolar Disorders*, 23(4), 391–399. <https://doi.org/10.1111/bdi.12994>
- Crovetto, F., Crispi, F., Casas, R., Martín-Asuero, A., Borràs, R., Vieta, E., Estruch, R., Gratacós, E., & IMPACT BCN Trial Investigators (2021). Effects of Mediterranean Diet or Mindfulness-Based Stress Reduction on Prevention of Small-for-Gestational Age Birth Weights in Newborns Born to At-Risk Pregnant Individuals: The IMPACT BCN Randomized Clinical Trial. *JAMA*, 326(21), 2150–2160. <https://doi.org/10.1001/jama.2021.20178>
- Kalman, J. L., Olde Loohuis, L. M., Vreeker, A., McQuillin, A., Stahl, E. A., Ruderfer, D., Grigoriu-Serbanescu, M., Panagiotaropoulou, G., Ripke, S., Bigdeli, T. B., Stein, F., Meller, T., Meinert, S., Pelin, H., Streit, F., Papiol, S., Adams, M. J., Adolfsson, R., Adorjan, K., Agartz, I., ... Ophoff, R. A. (2021). Characterisation of age and polarity at onset in bipolar disorder. *British Journal of Psychiatry*, 219(6), 659–669. <https://doi.org/10.1192/bjp.2021.102>
- Kessing, L. V., González-Pinto, A., Fagiolini, A., Bechdolf, A., Reif, A., Yildiz, A., Etain, B., Henry, C., Severus, E., Reininghaus, E. Z., Morken, G., Goodwin, G. M., Scott, J., Geddes, J. R., Rietschel, M., Landén, M., Manchia, M., Bauer, M., Martínez-Cengotitabengoa, M., Andreassen, O. A., ... Vieta, E. (2021). DSM-5 and ICD-11 criteria for bipolar disorder: Implications for the prevalence of bipolar disorder and validity of the diagnosis – A narrative review from the ECNP bipolar disorders network. *European Neuropsychopharmacology*, 47, 54–61. <https://doi.org/10.1016/j.euroneuro.2021.01.097>
- Kupka, R., Duffy, A., Scott, J., Almeida, J., Balanzá-Martínez, V., Birmaher, B., Bond, D. J., Brietzke, E., Chendo, I., Frey, B. N., Grande, I., Hafeman, D., Hajek, T., Hillegers, M., Kauer-Sant'Anna, M., Mansur, R. B., van der Markt, A., Post, R., Tohen, M., Tremain, H., ... Kapczinski, F. (2021). Consensus on nomenclature for clinical staging models in bipolar disorder: A narrative review from the International Society for Bipolar Disorders (ISBD) Staging Task Force. *Bipolar Disorders*, 23(7), 659–678. <https://doi.org/10.1111/bdi.13105>
- McAllister-Williams, R. H., Arango, C., Blier, P., Demyttenaere, K., Falkai, P., Gorwood, P., Hopwood, M., Javed, A., Kasper, S., Malhi, G. S., Soares, J. C., Vieta, E., Young, A. H., Papadopoulos, A., & Rush, A. J. (2021). Reconceptualising treatment-resistant depression as difficult-to-treat depression. *Lancet. Psychiatry*, 8(1), 14–15. [https://doi.org/10.1016/S2215-0366\(20\)30516-2](https://doi.org/10.1016/S2215-0366(20)30516-2)
- McWhinney, S. R., Abé, C., Alda, M., Benedetti, F., Bøen, E., Del Mar Bonnin, C., Borgers, T., Brosch, K., Canales-Rodríguez, E. J., Cannon, D. M., Dannlowski, U., Diaz-Zuluaga, A. M., Dietze, L., Elvsåshagen, T., Eyler, L. T., Fullerton, J. M., Goikolea, J. M., Gottermann, J., Grotegerd, D., Haarman, B., ... ENIGMA Bipolar Disorders Working Group (2021). Diagnosis of bipolar disorders

# Research



## Mental Health

### Selected publications

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- and body mass index predict clustering based on similarities in cortical thickness-ENIGMA study in 2436 individuals. *Bipolar Disorders*, 10.1111/bdi.13172. <https://doi.org/10.1111/bdi.13172>
- Pinzón-Espinosa, J., Valdés-Flrido, M. J., Riboldi, I., Baysak, E., Vieta, E., & EFPT Psychiatry Across Borders Working Group (2021). The COVID-19 Pandemic and Mental Health of Refugees, Asylum Seekers, and Migrants. *Journal of Affective Disorders*, 280(Pt A), 407–408. <https://doi.org/10.1016/j.jad.2020.11.029>
  - Sugranyes, G., de la Serna, E., Ilzarbe, D., Pariente, J. C., Borrás, R., Romero, S., Rosa, M., Baeza, I., Moreno, M. D., Bernardo, M., Vieta, E., & Castro-Fornieles, J. (2021). Brain structural trajectories in youth at familial risk for schizophrenia or bipolar disorder according to development of psychosis spectrum symptoms. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 62(6), 780–789. <https://doi.org/10.1111/jcpp.13321>
  - Writing Committee for the Attention-Deficit/Hyperactivity Disorder, Autism Spectrum Disorder, Bipolar Disorder, Major Depressive Disorder, Obsessive-Compulsive Disorder, and Schizophrenia ENIGMA Working Groups, Patel, Y., Parker, N., Shin, J., Howard, D., French, L., Thomopoulos, S. I., Pozzi, E., Abe, Y., Abé, C., Anticevic, A., Alda, M., Aleman, A., Alloza, C., Alonso-Lana, S., ... Paus, T. (2021). Virtual Histology of Cortical Thickness and Shared Neurobiology in 6 Psychiatric Disorders. *JAMA Psychiatry*, 78(1), 47–63. <https://doi.org/10.1001/jamapsychiatry.2020.2694>
  - Yatham, L. N., Chakrabarty, T., Bond, D. J., Schaffer, A., Beaulieu, S., Parikh, S. V., McIntyre, R. S., Milev, R. V., Alda, M., Vazquez, G., Ravindran, A. V., Frey, B. N., Sharma, V., Goldstein, B. I., Rej, S., O'Donovan, C., Tourjman, V., Kozicky, J. M., Kauer-Sant'Anna, M., Malhi, G., ... Post, R. (2021). Canadian Network for Mood and Anxiety Treatments (CANMAT) and International Society for Bipolar Disorders (ISBD) recommendations for the management of patients with bipolar disorder with mixed presentations. *Bipolar Disorders*, 23(8), 767–788. <https://doi.org/10.1111/bdi.13135>

### Knowledge transfer & Innovation

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- Premi Josep Trueta 2021. L'Acadèmia de Ciències Mèdiques i de la Salut de Catalunya i de Balears. Eduard Vieta.

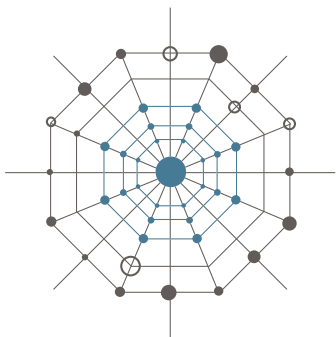
### Thesis

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- **Efectes d'un programa integrador de Teràpia cognitiva basada en mindfulness (MBCT), l'Psicoeducació i Rehabilitació funcional adaptat al Trastorn Bipolar.** Elia Valls. Supervisor: Eduard Vieta.
- **Intervención precoz de precisión en primeros episodios psicóticos: uso de modelos estadísticos avanzados para predecir el diagnóstico, la evolución funcional y el riesgo suicida tras un primer episodio psicótico.** Estela Salagre. Supervisor: Eduard Vieta.
- **La cognición social y emocional en el trastorno bipolar y la depresión: aspectos sociodemográficos, clínicos, neurocognitivos y de funcionamiento.** Cristina Varo. Supervisor: Eduard Vieta.
- **Prevenió dels problemes relacionats amb el consum d'alcohol a urgències.** Pol Bruguera. Supervisor: Eduard Vieta.

## Research

# Child and adolescent psychiatry and psychology



Mental Health

## Principal investigators

JOSEFINA CASTRO-FORNIELES

## Members

Susana Andres, Inmaculada Baeza, Ana Blazquez, Rosa Calvo, Patricia Camprodon, Itziar Flamarique, Blanca Garcia, Daniel Ilzarbe, Maria Luisa Lazaro, Sara Lera, Astrid Morer, Ana Encarnacion Ortiz, Olga Puig, Ana Perez, Maria Teresa Plana, Soledad Romero, Mireia Rosa, Pilar Santamarina, Elena de la Serna, Gisela Sugranyes

## Active projects

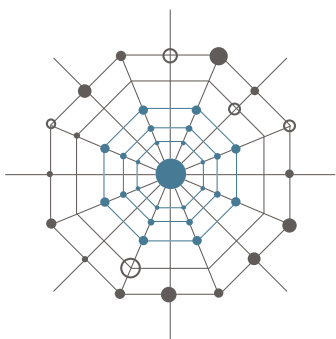
- **Características comunes y diferenciales en hijos de pacientes con esquizofrenia diagnosticados de TDAH, hijos de padres sanos diagnosticados de TDAH y controles.** Ministerio de Economía y Competitividad. PI18/00696. Josefina Castro-Fornieles.
- **Construcción de un modelo multimodal con capacidad diagnóstica y pronóstica en adolescentes con alto riesgo de psicosis: integración de factores genéticos, ambientales y de neuroimaging.** Ministerio de Economía y Competitividad. PI18/00976. Gisela Sugranyes.
- **Early intervention to improve cognitive reserve in subjects at risk and early stages of psychosis.** Fundació Clínic per a la Recerca Biomèdica. FCRB\_PB2\_2020. Josefina Castro-Fornieles.
- **Estudio longitudinal de una cohorte representativa: superando la heterogeneidad clínica y biológica en primeros episodios psicóticos.** Ministerio de Economía y Competitividad. PI 20/00654. Elena de la Serna.

- **Estudio longitudinal sobre marcadores nutricionales y de estrés en niños y adolescentes con síndrome de riesgo de psicosis y su capacidad predictiva de la transición a psicosis.** Ministerio de Economía y Competitividad. PI18/00242. Inmaculada Baeza.
- **Fenomenología y vías neuroinmunes de los comportamientos repetitivos y restrictivos.** Ministerio de Economía y Competitividad. PI19/01122. Luisa Lazaro.
- **Grup de recerca en psiquiatria i psicologia infantil clínic. (GRUPPIC).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR881. Josefa Castro-Fornieles.
- **Immune-mediated diseases of the synapse: symptoms, brain networks, and the link to human memory.** Ministerio de Economía y Competitividad. SGR17\_00881. Josefina Castro-Fornieles.
- **Influencia de las vacunas, biomarcadores infecciosos e inmunológicos y análisis de las redes transcriptoma-interactoma en el curso de los trastornos de tics: un estudio longitudinal (COURSE-CAT).** Ministerio de Economía y Competitividad. PI20/01056. Astrid Morer.

## Selected publications

- Baeza, I., de la Serna, E., Amoretti, S., Cuesta, M. J., Díaz-Caneja, C. M., Mezquida, G., Lobo, A., González-Pinto, A., Corripio, I., Vieta, E., Puig, O., Legido, T., Bioque, M., Garcia-Rizo, C., Bernardo, M., Castro-Fornieles, J., & PEPs Group (2021). Premorbid Characteristics as Predictors of Early Onset Versus Adult Onset in Patients With a First Episode of Psychosis. *Journal of Clinical Psychiatry*, 82(6), 21m13907. <https://doi.org/10.4088/JCP.21m13907>

# Research

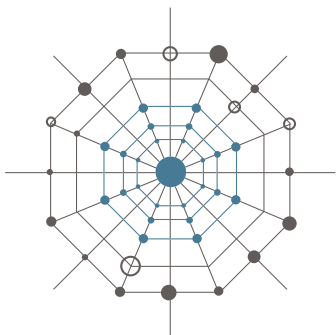


## Mental Health

### Selected publications

- Camprodón-Boadas, P., de la Serna, E., Baeza, I., Puig, O., Ilzarbe, D., Sugranyes, G., Borrás, R., & Castro-Fornieles, J. (2021). Cognitive reserve in patients with first-episode psychosis as outcome predictor at 5-year follow-up. *European Child & Adolescent Psychiatry*, 30(12), 1959–1967. <https://doi.org/10.1007/s00787-020-01668-4>
- Castro-Fornieles, J., de la Serna, E., Calvo, A., Pariente, J., Andrés-Perpiña, S., Plana, M. T., Romero, S., Flamarique, I., Gárriz, M., & Bargalló, N. (2021). Cortical thickness 20 years after diagnosis of anorexia nervosa during adolescence. *European Archives of Psychiatry and Clinical Neuroscience*, 271(6), 1133–1139. <https://doi.org/10.1007/s00406-019-00992-4>
- De la Serna, E., Ilzarbe, D., Sugranyes, G., Baeza, I., Moreno, D., Rodríguez-Toscano, E., Espliego, A., Ayora, M., Romero, S., Sánchez-Gistau, V., & Castro-Fornieles, J. (2021). Lifetime psychopathology in child and adolescent offspring of parents diagnosed with schizophrenia or bipolar disorder: a 2-year follow-up study. *European Child & Adolescent Psychiatry*, 30(1), 117–129. <https://doi.org/10.1007/s00787-020-01500-z>
- De la Serna, E., Puig, O., Mezquida, G., Moreno-Izco, L., Merchan-Naranjo, J., Amoretti, S., Ruiz, P., Gonzalez-Pinto, A., Molina-García, M., Corripio, I., Vieta, E., Baeza, I., Berge, D., Penadés, R., Sanchez-Torres, A., Cuesta, M. J., Bernardo, M., Castro-Fornieles, J., Madero, S., ... Group, T. P. (2021). Relationship between cognition and age at onset of first-episode psychosis: comparative study between adolescents, young adults, and adults. *European Child & Adolescent Psychiatry*. <https://doi.org/10.1007/s00787-021-01901-8>
- ENIGMA Clinical High Risk for Psychosis Working Group, Jalbrzikowski, M., Hayes, R. A., Wood, S. J., Nordholm, D., Zhou, J. H., Fusar-Poli, P., Uhlhaas, P. J., Takahashi, T., Sugranyes, G., Kwak, Y. B., Mathalon, D. H., Katagiri, N., Hooker, C. I., Smigielski, L., Colibazzi, T., Via, E., Tang, J., Koike, S., Rasser, P. E., ... HERNANUS, D. (2021). Association of Structural Magnetic Resonance Imaging Measures with Psychosis Onset in Individuals at Clinical High Risk for Developing Psychosis: An ENIGMA Working Group Mega-analysis. *JAMA Psychiatry*, 78(7), 753–766. <https://doi.org/10.1001/jamapsychiatry.2021.0638>
- Fortea, A., Batalla, A., Radua, J., van Eijndhoven, P., Baeza, I., Albajes-Eizaguirre, A., Fusar-Poli, P., Castro-Fornieles, J., De la Serna, E., Luna, L. P., Carvalho, A. F., Vieta, E., & Sugranyes, G. (2021). Cortical gray matter reduction precedes transition to psychosis in individuals at clinical high-risk for psychosis: A voxel-based meta-analysis. *Schizophrenia Research*, 232, 98–106. <https://doi.org/10.1016/j.schres.2021.05.008>
- Garcia-Delgar, B., Servera, M., Coffey, B. J., Lázaro, L., Openneer, T., Benaroya-Milshtein, N., Steinberg, T., Hoekstra, P. J., Dietrich, A., Morer, A., & EMTICS collaborative group (2021). Tic disorders in children and adolescents: does the clinical presentation differ in males and females? A report by the EMTICS group. *European Child & Adolescent Psychiatry*, 10.1007/s00787-021-01751-4. <https://doi.org/10.1007/s00787-021-01751-4>
- Guasp, M., Giné-Servén, E., Maudes, E., Rosa-Justicia, M., Martínez-Hernández, E., Boix-Quintana, E., Bioque, M., Casado, V., Módena-Ouarzi, Y., Guanyabens, N., Muriana, D., Sugranyes, G., Pacchiarotti, I., Davi-Loscós, E., Torres-Rivas, C., Ríos, J., Sabater, L., Saiz, A., Graus, F., ... Dalmau, J. (2021). Clinical, Neuroimmunologic, and CSF Investigations in First Episode Psychosis. *Neurology*, 97(1), e61 LP-e75. <https://doi.org/10.1212/WNL.0000000000012191>
- Ilzarbe, D., Baeza, I., de la Serna, E., Fortea, A., Valli, I., Puig, O., Masias, M., Borrás, R., Pariente, J. C., Dolz, M., Castro-Fornieles,

# Research



Mental Health

## Selected publications

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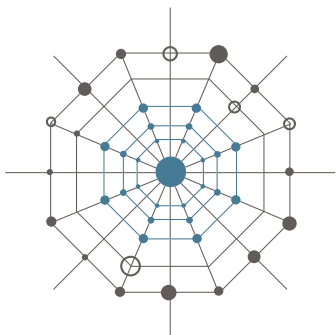
- J., & Sugranyes, G. (2021). Theory of mind performance and prefrontal connectivity in adolescents at clinical high risk for psychosis. *Developmental Cognitive Neuroscience*, 48, 100940. <https://doi.org/10.1016/j.dcn.2021.100940>
- Sugranyes, G., de la Serna, E., Ilzarbe, D., Pariente, J. C., Borràs, R., Romero, S., Rosa, M., Baeza, I., Moreno, M. D., Bernardo, M., Vieta, E., & Castro-Fornieles, J. (2021). Brain structural trajectories in youth at familial risk for schizophrenia or bipolar disorder according to development of psychosis spectrum symptoms. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 62(6), 780–789. <https://doi.org/10.1111/jcpp.13321>
  - Valli, I., Serna, E., Borràs, R., Ilzarbe, D., Baeza, I., Picouto, M. D., Baltasar, I., Moreno, D., Bernardo, M., Young, A. H., Vieta, E., Sugranyes, G., & Castro-Fornieles, J. (2021). Cognitive heterogeneity in the offspring of patients with schizophrenia or bipolar disorder: a cluster analysis across family risk. *Journal of Affective Disorders*, 282, 757–765. <https://doi.org/10.1016/j.jad.2020.12.090>
  - Via, E., Calvo, A., de la Serna, E., Blázquez, A., Lázaro, L., Andrés-Perpiñá, S., Plana, M. T., Flamarique, I., Martínez, E., Pariente, J., Moreno, E., Bargallo, N., & Castro-Fornieles, J. (2021). Longitudinal study in adolescent anorexia nervosa: evaluation of cortico-striatal and default mode network resting-state brain circuits. *European Child & Adolescent Psychiatry*, Oct 4. <https://doi.org/10.1007/s00787-021-01880-w>

## Thesis

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- **Brain functional correlates of theory of mind in neurodevelopmental disorders.** Daniel Ilzarbe. Supervisors: Josefina Castro & Gisela Sugranyes.
- **Psychotic symptoms in genetic-at-risk and bipolar disorder samples: prevalence and related variables.** Iria Mendez. Supervisors: Josefina Castro & Boris Birmaher.

## Research



Mental Health

# Epidemiology of mental health disorders and ageing

## Principal investigators

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JOSEP MARIA HARO

## Active projects

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- **EDHEN: European Health Data and Evidence Network.** European Health Data & Evidence Network. PFE00082. Josep M. Haro.
- **Factores sociales, de estilo de vida, comorbilidad física y factores genéticos como causas de depresión en una población envejecida.** Ministerio de Ciencia, Innovación y Universidades. PI19/00088. Josep M. Haro.
- **Impacte i factors de risc dels trastorns mentals.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1361. Josep M. Haro.
- **Improving the Preparedness of Health Systems to Reduce Mental Health and Psychosocial Concerns resulting from the COVID-19 Pandemic (RESPOND).** European Union. SC1-PHE-CORONAVIRUS-2020-2C. 101016127. Josep M. Haro.
- **MIO: Migration Impact On health.** Fundació 'La Caixa'. SR21-00779. Josep M. Haro.
- **PERsonalised Medicine Trials.** European Union. 874825. Josep M. Haro.
- **Remote Assessment of Disease and Relapse in Central Nervous System Disorders.** European Union. IMI2-2015-03-01. 115902. Josep M. Haro.

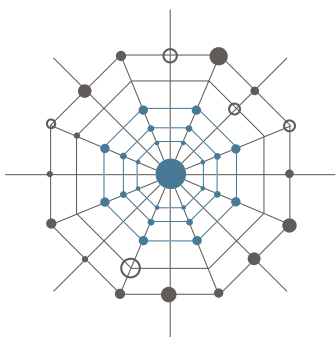
- **SYNCHROS: SYnergies for Cohorts in Health: integrating the Role of all Stakeholders.** European Union. 825884. Josep M. Haro.
- **Xarxa d'Innovació de Noves Tecnologies en Salut Mental – TECSAM.** Departament d'Empresa i Coneixement. Generalitat de Catalunya. 2018 XARDI 00010. Josep M. Haro.
- 4 Confidential agreements.

## Selected publications

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- Afa, A. B., Vila, È., MacDowell, K. S., Ormazabal, A., Leza, J. C., Haro, J. M., Artuch, R., Ramos, B., & Garcia-Bueno, B. (2021). Kynurenine pathway in post-mortem prefrontal cortex and cerebellum in schizophrenia: relationship with monoamines and symptomatology. *Journal of Neuroinflammation*, 18(1), 198. <https://doi.org/10.1186/s12974-021-02260-6>
- Ayuso-Mateos, J. L., Morillo, D., Haro, J. M., Olaya, B., Lara, E., & Miret, M. (2021). Changes in depression and suicidal ideation under severe lockdown restrictions during the first wave of the COVID-19 pandemic in Spain: a longitudinal study in the general population. *Epidemiology and Psychiatric Sciences*, 30, e49. <https://doi.org/10.1017/S2045796021000408>
- Cabello, M., Rico-Urbe, L. A., Martínez-Ávila, J. C., Sánchez-Niubò, A., Caballero, F. F., Borges, G., Mellor-Marsá, B., Haro, J. M., Prina, M., Koskinen, S., & Ayuso-Mateos, J. L. (2021). The role of ageing in the wish to be dead: disentangling age, period and cohort effects in suicide ideation in European population. *Epidemiology and Psychiatric Sciences*, 30, e17. <https://doi.org/10.1017/S2045796021000020>
- de la Torre-Luque, A., Lara, E., de la Fuente, J., Rico-Urbe, L. A., Caballero, F. F., Lopez-Garcia, P., Sanchez-Niubo, A., Bobak, M., Koskinen, S., Haro, J. M., & Ayuso-Mateos, J. L. (2021). Metabolic

# Research

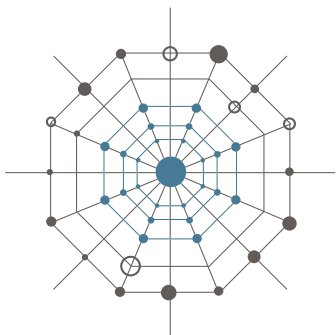


## Mental Health

### Selected publications

- dysregulation in older adults with depression and loneliness: The ATHLOS study. *Psychoneuroendocrinology*, 123, 104918. <https://doi.org/10.1016/j.psyneuen.2020.104918>
- Felez-Nobrega, M., Bort-Roig, J., Ma, R., Romano, E., Faires, M., Stubbs, B., Stamatakis, E., Olaya, B., Haro, J. M., Smith, L., Shin, J. I., Kim, M. S., & Koyanagi, A. (2021). Light-intensity physical activity and mental ill health: a systematic review of observational studies in the general population. *The international Journal of Behavioral Nutrition and Physical Activity*, 18(1), 123. <https://doi.org/10.1186/s12966-021-01196-7>
  - Felez-Nobrega, M., Haro, J. M., Stubbs, B., Smith, L., & Koyanagi, A. (2021). Moving more, ageing happy: findings from six low- and middle-income countries. *Age and Ageing*, 50(2), 488–497. <https://doi.org/10.1093/ageing/afaa137>
  - Fernández, D., Giné-Vázquez, I., Liu, I., Yucel, R., Nai Ruscone, M., Morena, M., García, V. G., Haro, J. M., Pan, W., & Tyrovolas, S. (2021). Are environmental pollution and biodiversity levels associated to the spread and mortality of COVID-19? A four-month global analysis. *Environmental Pollution*, 271, 116326. <https://doi.org/10.1016/j.envpol.2020.116326>
  - Jacob, L., Smith, L., Koyanagi, A., Haro, J. M., Konrad, M., Tanislav, C., & Kostev, K. (2021). Is there an association between multiple sclerosis and osteoarthritis in Germany? A retrospective cohort study of 8,600 patients from Germany. *Multiple Sclerosis Journal - Experimental, Translational and Clinical*, 7(2), 20552173211022784. <https://doi.org/10.1177/20552173211022784>
  - Lara, E., Martín-María, N., Miret, M., Olaya, B., Haro, J. M., & Ayuso-Mateos, J. L. (2021). Is there a combined effect of depression and cognitive reserve on cognitive function? Findings from a population-based study. *Psychology & Health*, 1–16. Advance online publication. <https://doi.org/10.1080/08870446.2021.1927030>
  - Martín-María, N., Lara, E., Cabello, M., Olaya, B., Haro, J. M., Miret, M., & Ayuso-Mateos, J. L. (2021). To be happy and behave in a healthier way. A longitudinal study about gender differences in the older population. *Psychology & Health*, 1–17. <https://doi.org/10.1080/08870446.2021.1960988>
  - Martínez-Hernaez, A., Bekele, D., Sabariego, C., Rodríguez-Laso, Á., Vorstenbosch, E., Rico-Urbe, L. A., Ayuso-Mateos, J. L., Sánchez-Niubò, A., Rodríguez-Mañas, L., & Haro, J. M. (2021). The Structural and Intercultural Competence for Epidemiological Studies (SICES) guidelines: a 22-item checklist. *BMJ Global Health*, 6(4), e005237. <https://doi.org/10.1136/bmjgh-2021-005237>
  - Mortier, P., Vilagut, G., Ferrer, M., Serra, C., Molina, J. D., López-Fresneña, N., Puig, T., Pelayo-Terán, J. M., Pijoan, J. I., Emparanza, J. I., Espuga, M., Plana, N., González-Pinto, A., Ortí-Lucas, R. M., de Salazar, A. M., Rius, C., Aragonès, E., Del Cura-González, I., Aragón-Peña, A., Campos, M., ... MINDCOVID Working Group (2021). Thirty-day suicidal thoughts and behaviors among hospital workers during the first wave of the Spain COVID-19 outbreak. *Depression and Anxiety*, 38(5), 528–544. <https://doi.org/10.1002/da.23129>
  - Nierenberg, A. A., Harris, M. G., Kazdin, A. E., Puac-Polanco, V., Sampson, N., Vigo, D. V., Chiu, W. T., Ziobrowski, H. N., Alonso, J., Altwajiri, Y., Borges, G., Bunting, B., Caldas-de-Almeida, J. M., Haro, J. M., Hu, C. Y., Kiejna, A., Lee, S., McGrath, J. J., Navarro-Mateu, F., Posada-Villa, J., ... WHO World Mental Health Survey Collaborators (2021). Perceived helpfulness of bipolar disorder treatment: Findings from the World Health Organization World Mental Health Surveys. *Bipolar Disorders*, 23(6), 565–583. <https://doi.org/10.1111/bdi.13066>

# Research



Mental Health

## Selected publications

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- Roest, A. M., de Vries, Y. A., Al-Hamzawi, A., Alonso, J., Ayinde, O. O., Bruffaerts, R., Bunting, B., Caldas de Almeida, J. M., de Girolamo, G., Degenhardt, L., Florescu, S., Gureje, O., Haro, J. M., Hu, C., Karam, E. G., Kiejna, A., Kovess-Masfety, V., Lee, S., McGrath, J. J., Medina-Mora, M. E., ... WHO World Mental Health Survey collaborators (2021). Previous disorders and depression outcomes in individuals with 12-month major depressive disorder in the World Mental Health surveys. *Epidemiology and Psychiatric Sciences*, 30, e70. <https://doi.org/10.1017/S2045796021000573>
- Smith, L., Jacob, L., Barnett, Y., Butler, L. T., Shin, J. I., López-Sánchez, G. F., Soysal, P., Veronese, N., Haro, J. M., & Koyanagi, A. (2021). Association between Food Insecurity and Sarcopenia among Adults Aged  $\geq 65$  Years in Low- and Middle-Income Countries. *Nutrients*, 13(6), 1879. <https://doi.org/10.3390/nu13061879>

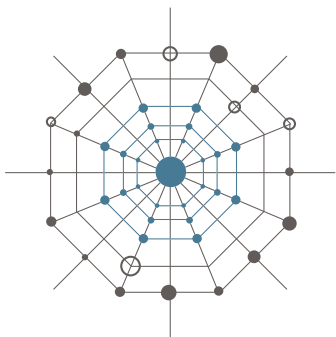
## Thesis

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- **Estudio de enfermedades crónicas de salud y funcionamiento en personas de mediana edad y mayores desde una perspectiva epidemiológica.** Ivet Bayes. Supervisor: Josep M. Haro.
- **Población sin hogar y salud mental: impacto del programa Primer la Llar.** Ines Campo. Supervisors: M<sup>a</sup> Assumpta Rigol & Josep M. Haro.

## Research

# Gerontology: Health and ageing



Mental Health

## Principal investigators

FELICIANO VILLAR

## Members

Montserrat Celdran, Cristina Portellano, Vanesa Viñas

## Active projects

- **Envejecer en los márgenes: hacia una visión más inclusiva del envejecimiento activo.** Ministerio de Ciencia, Innovación y Universidades. PID2020-116117GB-I00. Feliciano Villar.
- **Grup d'Investigació en Gerontologia.** Ministerio de Ciencia, Innovación y Universidades. 2017SGR768. Feliciano Villar.
- **Trayectorias asociadas al género en la exclusión de las relaciones sociales en la vejez y sus consecuencias para la salud y bienestar: una perspectiva de ciclo vital.** Ministerio de Ciencia, Innovación y Universidades. PCI2019-103627. Feliciano Villar.

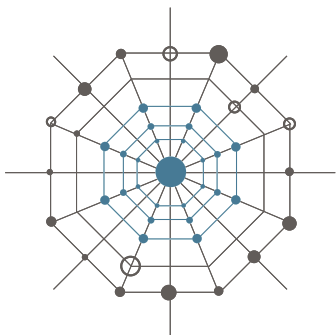
## Selected publications

- Cannella, V., Villar, F., Serrat, R., & Tulle, E. (2021). Psychosocial Aspects of Participation in Competitive Sports Among Older Athletes: A Scoping Review. *The Gerontologist*, gnab083. Advance online publication. <https://doi.org/10.1093/geront/gnab083>
- Celdrán, M., Serrat, R., & Villar, F. (2021). Post-Traumatic Growth among Older People after the Forced Lockdown for the COVID-19 Pandemic. *The Spanish Journal of Psychology*, 24, e43. <https://doi.org/10.1017/SJP.2021.40>

- Hansen, T., Kafková, M. P., Katz, R., Lowenstein, A., Naim, S., Pavlidis, G., Villar, F., Walsh, K., & Aartsen, M. (2021). Exclusion from Social Relations in Later Life: Micro- and Macro-Level Patterns and Correlations in a European Perspective. *International Journal of Environmental Research and Public Health*, 18(23), 12418. <https://doi.org/10.3390/ijerph182312418>
- Serrat, R., Chacur-Kiss, K., & Villar, F. (2021). Ageing Activisms: A Narrative Exploration of Older Adults' Experiences of Political Participation. *Sociological Research Online*. <https://doi.org/10.1177/13607804211025310>
- Serrat, R., Chacur-Kiss, K., & Villar, F. (2021). Breaking the win-win narrative: The dark side of older people's political participation. *Journal of Aging Studies*, 56, 100911. <https://doi.org/10.1016/j.jaging.2021.100911>
- Villar, F., Chacur, K., Celdrán, M., & Serrat, R. (2021). Managing apathy among people with dementia living in institutional settings: Staff's perceived gap between common and best practices. *Geriatric Nursing*, 42(3), 613–620. <https://doi.org/10.1016/j.gerinurse.2021.03.014>
- Villar, F., Serrat, R., & Pratt, M. (2021). Older age as a time to contribute: A scoping review of generativity in later life. *Ageing and Society*, 1-22. <https://doi.org/10.1017/S0144686X21001379>

## Research

# Interpersonal Violence



Mental Health

## Principal investigators

ANTONIO ANDRES-PUEYO

Assessment and management of risk of violence

DAVID GALLARDO

Neural basis of personality, situational perception, and violence

ALBERTO MAYDEU-OLIVARES

Structural equation modeling and item response theory

NOEMI PEREDA

Child and adolescent victimisation

SANTIAGO REDONDO ILLESCAS

Evaluation and treatment of offenders

ALVARO RODRIGUEZ-CARBALLEIRA

Psychological violence

## Members

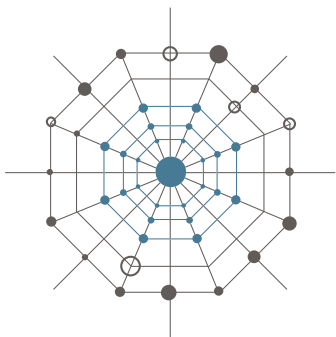
Carolina Andana, Emma Antelo, Diego Arias, Paola Bertomeu, Macia Buades, Miguel Burgaleta, Marta Codina, Jorge Escartin, David Gallardo, Ana Martina Greco, Jaume Hombrado, Guillermo Recio, David Saeteros, Omar Andres Saldaña, Laura Sicilia

## Active projects

• **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya.** Programa ICREA Academia 2016. Fundació Institució Catalana de Recerca i Estudis Avançats. Noemi Pereda.

- **Atorgament d'un ajut de la convocatòria del Programa d'Intensificació de Transferència pel curs 2020-2021.** David Gallardo.
- **Conveni de col·laboració per a la realització d'anàlisis estadístics i millores en instruments de valoració en el context penitenciari i d'execució penal.** Universitat Pompeu Fabra. Antonio Andres-Pueyo.
- **Conveni de col·laboració per al desenvolupament del projecte de recerca: 'Adolescents i situacions de risc durant l'estat d'alarma per Covid-19'.** Save the Children. Noemi Pereda.
- **Does violence beget violence? Victim-offender overlap in Spanish adolescents (SOCIAL RESEARCH 2021) (SR21-00381).** Fundació 'La Caixa'. SR21-00381. Noemi Pereda.
- **GEAV- Grup d'Estudis Avançats en Violència.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1140. Santiago Redondo.
- **Inferencias causales en modelos de ecuaciones estructurales: modelado del comportamiento violento.** Ministerio de Ciencia e Innovación. PID2020-119755GB-I00. David Gallardo.
- **Schools Against Victimisation from an Early age.** Education, Audiovisual and Culture Executive Agency (EACEA). 2018-1-ES01-KA201-050287. Noemi Pereda.
- **Step by step standing up a Barnahus in Catalonia: A simulation-based training program to avoid secondary victimization in the assessment and treatment of child sexual abuse (STEPS).** European Union. 881749. Noemi Pereda.
- 5 Confidential agreements.

# Research

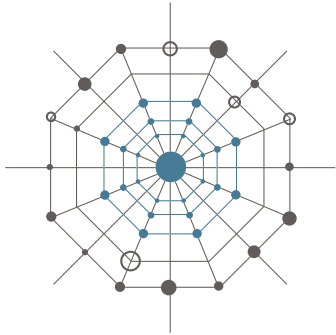


## Mental Health

### Selected publications

- Antelo, E., Saldaña, O., Guilera, G., & Rodríguez-Carballeira, Á. (2021). Psychosocial difficulties in survivors of group psychological abuse: Development and validation of a new measure using classical test theory and item response theory. *Psychology of Violence*, 11(3), 286–295. <https://doi.org/10.1037/vio0000307>
- Antelo, E., Saldaña, O., & Rodríguez-Carballeira, Á. (2021). The impact of group psychological abuse on distress: the mediating role of social functioning and resilience. *European Journal of Psychotraumatology*, 12(1), 1954776. <https://doi.org/10.1080/20008198.2021.1954776>
- Armstrong, B., Beets, M. W., Starrett, A., Brazendale, K., Turner-McGrievy, G., Saelens, B. E., Pate, R. R., Youngstedt, S. D., Maydeu-Olivares, A., & Weaver, R. G. (2021). Dynamics of sleep, sedentary behavior, and moderate-to-vigorous physical activity on school versus nonschool days. *Sleep*, 44(2). <https://doi.org/10.1093/sleep/zsaa174>
- Benavente, B., Díaz-Faes, D. A., Ballester, L., & Pereda, N. (2021). Commercial Sexual Exploitation of Children and Adolescents in Europe: A Systematic Review. *Trauma, Violence & Abuse*, 1524838021999378. Advance online publication. <https://doi.org/10.1177/1524838021999378>
- Codina, M., & Pereda, N. (2021). Characteristics and Prevalence of Lifetime Sexual Victimization Among a Sample of Men and Women with Intellectual Disabilities. *Journal of Interpersonal Violence*, 8862605211006373. <https://doi.org/10.1177/08862605211006373>
- Guerra, C., Pereda, N., & Guilera, G. (2021). Poly-Victimization and Coping Profiles: Relationship With Externalizing Symptoms in Adolescents. *Journal of Interpersonal Violence*, 36(3–4), 1865–1882. <https://doi.org/10.1177/0886260517744184>
- Gutiérrez, F., Aluja, A., Ruiz, J., García, L. F., Gárriz, M., Gutiérrez-Zotes, A., Gallardo-Pujol, D., Navarro-Haro, M. V., Alabèrnia-Segura, M., Mestre-Pintó, J. I., Torrens, M., Peri, J. M., Sureda, B., Soler, J., Pascual, J. C., Vall, G., Calvo, N., Ferrer, M., Oltmanns, J. R., & Widiger, T. A. (2021). Personality Disorders in the ICD-11: Spanish Validation of the PiCD and the SASPD in a Mixed Community and Clinical Sample. *Assessment*, 28(3), 759–772. <https://doi.org/10.1177/1073191120936357>
- Martínez-Catena, A., & Redondo, S. (2021). Treatment and Therapeutic Change of Individuals Imprisoned for Child Abuse in the Barcelona Study on Sex Offenders. *Journal of Interpersonal Violence*, 8862605211028310. <https://doi.org/10.1177/08862605211028310>
- Méndez-López, C., Pereda, N., & Guilera, G. (2021). Lifetime poly-victimization and psychopathological symptoms in Mexican adolescents. *Child Abuse & Neglect*, 112, 104883. <https://doi.org/10.1016/j.chiabu.2020.104883>
- Nivette, A. E., Zahnow, R., Aguilar, R., Ahven, A., Amram, S., Ariel, B., Burbano, M. J. A., Astolfi, R., Baier, D., Bark, H.-M., Beijers, J. E. H., Bergman, M., Breetzke, G., Concha-Eastman, I. A., Curtis-Ham, S., Davenport, R., Díaz, C., Fleitas, D., Gerell, M., ... Eisner, M. P. (2021). A global analysis of the impact of COVID-19 stay-at-home restrictions on crime. *Nature Human Behaviour*, 5(7), 868–877. <https://doi.org/10.1038/s41562-021-01139-z>
- Pereda, N., & Segura, A. (2021). Child sexual abuse within the Roman Catholic Church in Spain: A descriptive study of abuse characteristics, victims' faith, and spirituality. *Psychology of Violence*, 11(5), 488–496. <https://doi.org/10.1037/vio0000390>
- Saldaña, O., Rodríguez-Carballeira, Á., Almendros, C., & Guilera, G. (2021). Group Psychological Abuse and Psychopathological Symptoms: The Mediating Role of Psychological Stress. *Journal of*

# Research



Mental Health

## Selected publications

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- Interpersonal Violence, 36(11-12), NP6602–NP6623. <https://doi.org/10.1177/0886260518815710>
- Saldaña, O., Wu-Salmeron, O., Antelo, E., & Rodríguez-Carballeira, Á. (2021). The Negative Impact of Group Psychological Abuse on Life Satisfaction and Well-being. *Journal of Interpersonal Violence*, 8862605211042598. <https://doi.org/10.1177/08862605211042598>
  - Steenkamp, J.-B. E. M., & Maydeu-Olivares, A. (2021). An updated paradigm for evaluating measurement invariance incorporating common method variance and its assessment. *Journal of the Academy of Marketing Science*, 49(1), 5–29. <https://doi.org/10.1007/s11747-020-00745-z>

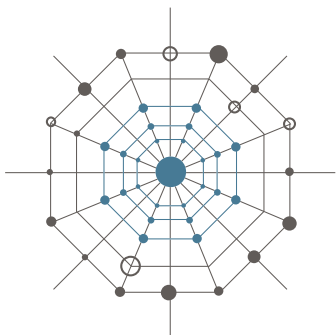
## Thesis

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- **Children and youth victimization: Detection and reporting from school staff members.** Ana Martina Greco. Supervisors: Noemi Pereda & Georgina Guitera.
- **Consecuencias psicosociales del abuso psicológico en grupos: delimitación, evaluación y factores explicativos.** Emma Antelo. Supervisors: Alvaro Rodríguez-Carballeira & Omar Saldaña.

## Research

# Measurement and research



Mental Health

## Principal investigators

M. TERESA ANGUERA  
Observational methodology

ROSER BONO  
Longitudinal data analysis: Monte Carlo simulation studies and empirical applications

JUANA GOMEZ-BENITO  
Functioning and recovery in mental health

GEORGINA GUILERA  
Development and validation of psychological tests

## Members

Juan Antonio Amador, Maria Teresa Barrios, Angela Berrio, Jorge Escartin, Estefania Daniela Guerrero, Teresa Kirchner, Ernesto Magallon, Laura Maldonado, Gomaa Said Mohamed Abdelhamid, Chuen Ann Chai

## Active projects

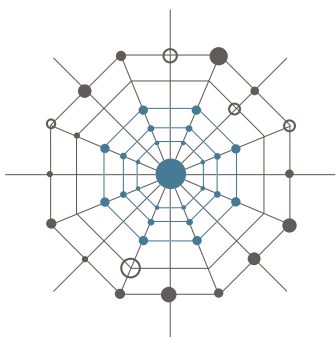
- **Aprenentatge en Línia, Ansietats Acadèmiques i Rendiment: Impacte de la Covid-19.** Institut de Ciències de l'Educació - Universitat de Barcelona. REDICE20-2520. Roser Bono.
- **Brain Living Lab. ACCIÓ.** Agència de Suport a l'Empresa Catalana. ACE012/20/000027. Juana Gomez-Benito.
- **Grup d'Estudis d'invariància dels instruments de mesura i anàlisi del canvi en els àmbits social i de la salut (GEIMAC).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1681. Juana Gomez-Benito.

- **Hacia la recuperación en personas diagnosticadas con trastorno mental severo: Definición, evaluación e intervención.** Ministerio de Ciencia, Innovación y Universidades. PID2019-109887GB-I00. Juana Gomez-Benito.
- **Impacto de la violación de los supuestos en el análisis de datos con medidas repetidas: simulación Monte Carlo y aplicaciones.** Ministerio de Ciencia e Innovación. PID2020-113191GB-I00. Roser Bono.
- **Nuevo enfoque de investigación en actividad física y deporte desde la perspectiva mixed methods.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-098742-B-C31. M. Teresa Anguera.
- **Research Group and innovation in designs (GRID). Technology and multimedia and digital application to observational designs.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1405. M. Teresa Anguera.
- **Xarxa en Tecnologies de la Salut.** Agència de Gestió d'Ajuts Universitaris i de Recerca | European Union. 2018 XARDI 00016. M. Teresa Anguera.
- 1 Confidential agreement.

## Selected publications

- Alvarado-Alvarez, C., Armadans, I., Parada, M. J., & Anguera, M. T. (2021). Unraveling the Role of Shared Vision and Trust in Constructive Conflict Management of Family Firms. An Empirical Study From a Mixed Methods Approach. *Frontiers in Psychology*, 12, 629730. <https://doi.org/10.3389/fpsyg.2021.629730>
- Antelo, E., Saldaña, O., Guilera, G., & Rodríguez-Carballeira, Á. (2021). Psychosocial difficulties in survivors of group

# Research

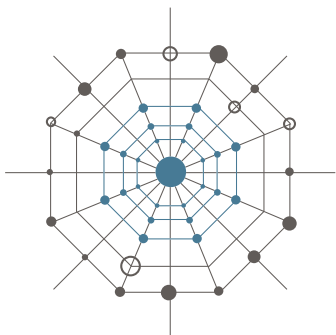


## Mental Health

### Selected publications

- psychological abuse: Development and validation of a new measure using classical test theory and item response theory. *Psychology of Violence*, 11(3), 286-295. <https://doi.org/10.1037/vio0000307>
- Barrios, M., Guilera, G., Nuño, L., & Gómez-Benito, J. (2021). Consensus in the delphi method: What makes a decision change? *Technological Forecasting and Social Change*, 163, 120484. <https://doi.org/10.1016/j.techfore.2020.120484>
  - Berrío, Á. I., Gómez-Benito, J., & Guilera, G. (2021). Differential Item Functioning in the WHODAS 2.0 Scale in Schizophrenia: An Application of the Rasch Trees Method Based on Demographic and Clinical Covariates. *Assessment*, 10731911211036746. <https://doi.org/10.1177/10731911211036746>
  - Bono, R., Alarcón, R., & Blanca, M. J. (2021). Report Quality of Generalized Linear Mixed Models in Psychology: A Systematic Review. *Frontiers in Psychology*, 12, 666182. <https://doi.org/10.3389/fpsyg.2021.666182>
  - Chacón-Moscoso, S., Sanduvete-Chaves, S., Lozano-Lozano, J. A., Portell, M., & Teresa Anguera, M. (2021). From randomized control trial to mixed methods: A practical framework for program evaluation based on methodological quality. *Anales de Psicología*, 37(3), 599-608. <https://doi.org/10.6018/analesps.470021>
  - García-Fariña, A., Jiménez Jiménez, F., & Anguera, M. T. (2021). Do Physical Education Teachers Use Socioconstructivist Communication Patterns in Their Classes? *Journal of Teaching in Physical Education*, 41(2), 301-310. <https://doi.org/10.1123/jtpe.2020-0213>
  - Isabel Núñez-Peña, M., & Bono, R. (2021). Math anxiety and perfectionistic concerns in multiple-choice assessment. *Assessment & Evaluation in Higher Education*, 46(6), 865-878. <https://doi.org/10.1080/02602938.2020.1836120>
  - Izquierdo, C., & Anguera, M. T. (2021). The Analysis of Interpersonal Communication in Sport from Mixed Methods Strategy: The Integration of Qualitative-Quantitative Elements Using Systematic Observation. *Frontiers in Psychology*, 12, 637304. <https://doi.org/10.3389/fpsyg.2021.637304>
  - López-Fernández, G., Barrios, M., & Gómez-Benito, J. (2021). The Maternal Attachment Inventory: Development and validation of a short form. *Journal of Advanced Nursing*, 77(7), 3046-3057. <https://doi.org/10.1111/jan.14812>
  - Maldonado-Murciano, L., Pontes, H. M., Barrios, M., Gómez-Benito, J., & Guilera, G. (2021). Psychometric Validation of the Spanish Gaming Disorder Test (GDT): Item Response Theory and Measurement Invariance Analysis. *International Journal of Mental Health and Addiction*, 1-19. Advance online publication. <https://doi.org/10.1007/s11469-021-00704-x>
  - Nuño, L., Barrios, M., Vancampfort, D., Rojo, E., Gómez-Benito, J., & Guilera, G. (2021). Functioning in schizophrenia: a Delphi study covering the perspective of physiotherapists. *Disability and Rehabilitation*, 43(26), 3733-3740. <https://doi.org/10.1080/09638288.2020.1748729>
  - Nuño, L., Guilera, G., Rojo, E., Gómez-Benito, J., & Barrios, M. (2021). An Integrated Account of Expert Perspectives on Functioning in Schizophrenia. *Journal of Clinical Medicine*, 10(18), 4223. <https://doi.org/10.3390/jcm10184223>
  - Sagastui, J., Herrán, E., & Anguera, M. T. (2021). Adult intervention levels in young children's free play: an observational study on how Pikler educators combine the instrumental and relational dimensions of their educational activity. *European Journal of Psychology of Education*. <https://doi.org/10.1007/s10212-021-00560-2>

# Research



Mental Health

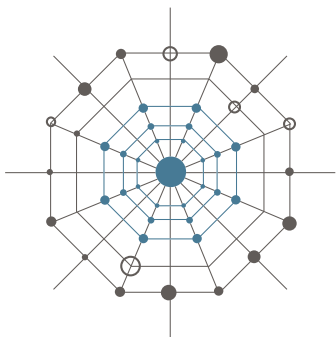
## Thesis

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- **Análisis de la motivación materna y estudio de las relaciones afectivas entre madre e hijos en la lactancia materna prolongada.** Gemma Lopez. Supervisors: Maria Teresa Barrios & Juana Gomez-Benito.
- **Análisis del clima motivacional y funcionamiento psicológico en contextos de práctica físico-deportiva.** Miriam Crespillo. Supervisors: Antonio Hernandez-Mendo, M. Teresa Anguera & Rafael Reigal.
- **Aproximación mixed methods en deportes colectivos desde técnicas estadísticas robustas.** Ruben Maneiro. Supervisors: M. Teresa Anguera & Jose Luis Losada.
- **Autorregulación emocional en la cotidianidad de la vida escolar: Observación sistemática en aulas con estudiantes chilenos de 10 a 12 años.** Marina Alarcon. Supervisors: M. Teresa Anguera & Paula Samper.
- **Children and youth victimization: Detection and reporting from school staff members.** Ana Martina Greco. Supervisors: Noemi Pereda & Georgina Guilera.
- **Seguiment de parelles infèrtils amb fills nats amb tècniques de reproducció assistida mitjançant observació indirecta.** Nuria Camps. Supervisors: M. Teresa Anguera & Merce Mitjavila.
- **The mutual regulation processes during the psychodynamic psychotherapy of depression: An observational study of communicative acts in the construction in the construction of the early therapeutic alliance.** Luca Del Giacco. Supervisors: M. Teresa Anguera & Silvia Salcuni.
- **Validation of the Egyptian WAIS-IV: An IRT approach and Mokken scale analysis.** Gomma Said Mohamed Abdelhamid. Supervisor: Juana Gomez-Benito.

## Research

# Schizophrenia



Mental Health

## Principal investigators

MIQUEL BERNARDO

## Members

Silvia Amoretti, Miquel Bioque, Rosa Catalan, Clemente Garcia, Gisela Mezquida, Eduardo Parellada, Rafael Penades, Merce Torra

## Active projects

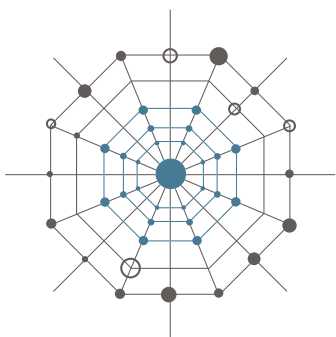
- **Biomarcadores de pérdida sináptica, daño neuronal e inflamación en líquido cefalorraquídeo y sangre periférica en pacientes con un primer episodio psicótico.** FIS-ISCIII. PI20/01066. Miquel Bernardo Co-IP. Miquel Bioque.
- **Cellular, molecular, genètic and cognitive-behavioral characterization of the antiapoptotic effect of clozapine and glutamate inhibitors in a postnatal ketamine animal model of schizophrenia.** Fundació Clínic per a la recerca Biomèdica. FCRB\_PB2\_2018. Eduardo Parellada.
- **El efecto de los eventos perinatales en los primeros episodios psicóticos.** FIS-ISCIII. PI20/00661. Clemente Garcia.
- **Estudio convergente en modelo celular, animal y humano del efecto y mecanismos de acción de la clozapina e inhibidores de glutamato en los síntomas negativos-cognitivos de la esquizofrenia.** FIS-ISCIII. PI18/01005. Eduardo Parellada.
- **Identificación y caracterización del valor predictivo de la reserva cognitiva en el curso evolutivo y respuesta en terapéutica en personas con un primer episodio psicótico.** Departament de Salut. Generalitat de Catalunya. SLT006/17/00345. Miquel Bernardo.

- **Rehabilitación cognitiva en la esquizofrenia: variación genética en los genes BDNF (Val66Met) y COMT (Val158Met) como posible modulador de la respuesta al tratamiento.** FIS-ISCIII . PI17/00872 . Rafael Penades.
- 5 Confidential agreements.

## Selected publications

- Ajnakina, O., Rodriguez, V., Quattrone, D., di Forti, M., Vassos, E., Arango, C., Berardi, D., Bernardo, M., Bobes, J., de Haan, L., Del-Ben, C. M., Gayer-Anderson, C., Jongsma, H. E., Lasalvia, A., Tosato, S., Llorca, P. M., Menezes, P. R., Rutten, B. P., Santos, J. L., Sanjuán, J., ... EU-GEI WP2 Group (2021). Duration of Untreated Psychosis in First-Episode Psychosis is not Associated With Common Genetic Variants for Major Psychiatric Conditions: Results From the Multi-Center EU-GEI Study. *Schizophrenia Bulletin*, 47(6), 1653–1662. <https://doi.org/10.1093/schbul/sbab055>
- Amoretti, S., Mezquida, G., Rosa, A. R., Bioque, M., Cuesta, M. J., Pina-Camacho, L., Garcia-Rizo, C., Barcones, F., González-Pinto, A., Merchán-Naranjo, J., Corripio, I., Vieta, E., Baeza, I., Cortizo, R., Bonnín, C. M., Torrent, C., Bernardo, M., & PEPs Group (2021). The functioning assessment short test (FAST) applied to first-episode psychosis: Psychometric properties and severity thresholds. *European Neuropsychopharmacology*, 47, 98–111. <https://doi.org/10.1016/j.euroneuro.2021.02.007>
- Amoretti, S., Rabelo-da-Ponte, F. D., Rosa, A. R., Mezquida, G., Sánchez-Torres, A. M., Fraguas, D., Cabrera, B., Lobo, A., González-Pinto, A., Pina-Camacho, L., Corripio, I., Vieta, E., Torrent, C., de la Serna, E., Bergé, D., Bioque, M., Garriga, M., Serra, M., Cuesta, M. J., Bernardo, M., ... PEPs

# Research

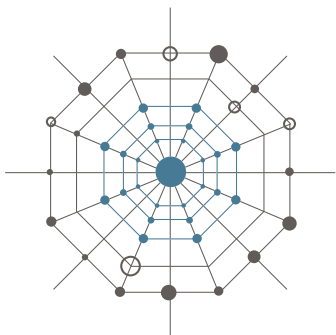


## Mental Health

### Selected publications

- Group (2021). Cognitive clusters in first-episode psychosis. *Schizophrenia Research*, 237, 31–39. <https://doi.org/10.1016/j.schres.2021.08.021>
- Amoretti, S., Verdolini, N., Mezquida, G., Rabelo-da-Ponte, F. D., Cuesta, M. J., Pina-Camacho, L., Gomez-Ramiro, M., De-la-Cámara, C., González-Pinto, A., Díaz-Caneja, C. M., Corripio, I., Vieta, E., de la Serna, E., Mané, A., Solé, B., Carvalho, A. F., Serra, M., & Bernardo, M. (2021). Identifying clinical clusters with distinct trajectories in first-episode psychosis through an unsupervised machine learning technique. *European Neuropsychopharmacology*, 47, 112–129. <https://doi.org/10.1016/j.euroneuro.2021.01.095>
  - Bernardo, M., Rico-Villademoros, F., García-Rizo, C., Rojo, R., & Gómez-Huelgas, R. (2021). Real-World Data on the Adverse Metabolic Effects of Second-Generation Antipsychotics and Their Potential Determinants in Adult Patients: A Systematic Review of Population-Based Studies. *Advances in Therapy*, 38(5), 2491–2512. <https://doi.org/10.1007/s12325-021-01689-8>
  - Gassó, P., Rodríguez, N., Martínez-Pinteño, A., Mezquida, G., Ribeiro, M., González-Peñas, J., Zorrilla, I., Martínez-Sadurni, L., Rodríguez-Jimenez, R., Corripio, I., Sarró, S., Ibáñez, A., Usall, J., Lobo, A., Moren, C., Cuesta, M. J., Parellada, M., González-Pinto, A., Berrocoso, E., Bernardo, M., ... 2EPs Group (2021). A longitudinal study of gene expression in first-episode schizophrenia; exploring relapse mechanisms by co-expression analysis in peripheral blood. *Translational Psychiatry*, 11(1), 539. <https://doi.org/10.1038/s41398-021-01645-8>
  - González-Blanco, L., García-Portilla, M. P., Gutiérrez, M., Mezquida, G., Cuesta, M. J., Urbiola, E., Amoretti, S., Barcones, F., González-Pinto, A., Pina-Camacho, L., Corripio, I., Vieta, E., Baeza, I., Toll, A., Sáiz, P. A., Bobes, J., Bernardo, M., & PEPs Group (2021). Impact of previous tobacco use with or without cannabis on first psychotic experiences in patients with first-episode psychosis. *Schizophrenia Research*, 236, 19–28. <https://doi.org/10.1016/j.schres.2021.07.017>
  - Martínez-Pinteño, A., Gassó, P., Prohens, L., Segura, A. G., Parellada, M., Saiz-Ruiz, J., Cuesta, M. J., Bernardo, M., Lafuente, A., Mas, S., & Rodríguez, N. (2021). Identification of EP300 as a Key Gene Involved in Antipsychotic-Induced Metabolic Dysregulation Based on Integrative Bioinformatics Analysis of Multi-Tissue Gene Expression Data. *Frontiers in Pharmacology*, 12, 729474. <https://doi.org/10.3389/fphar.2021.729474>
  - Mezquida, G., Fernández-Egea, E., Treen, D., Mané, A., Bergé, D., Savulich, G., García-Álvarez, L., García-Portilla, M. P., Bobes, J., Bernardo, M., & García-Rizo, C. (2021). Difficulties in delivery and depressive symptomatology in schizophrenia. Dificultades en el parto y sintomatología depresiva en la esquizofrenia. *Revista de Psiquiatría y Salud Mental*, 14(1), 66–68. <https://doi.org/10.1016/j.rpsm.2019.12.002>
  - Molina-García, M., Fraguas, D., Del Rey-Mejias, Á., Mezquida, G., Sánchez-Torres, A. M., Amoretti, S., Lobo, A., González-Pinto, A., Andreu-Bernabeu, Á., Corripio, I., Vieta, E., Baeza, I., Mané, A., Cuesta, M., de la Serna, E., Payá, B., Zorrilla, I., Arango, C., Bernardo, M., Rapado-Castro, M., ... Parellada, M. (2021). The Role of Premorbid IQ and Age of Onset as Useful Predictors of Clinical, Functional Outcomes, and Recovery of Individuals with a First Episode of Psychosis. *Journal of Clinical Medicine*, 10(11), 2474. <https://doi.org/10.3390/jcm10112474>
  - Pignon, B., Lajnef, M., Kirkbride, J. B., Peyre, H., Ferchiou, A., Richard, J. R., Baudin, G., Tosato, S., Jongsma, H., de Haan, L., Tarricone, I., Bernardo, M., Velthorst, E., Braca, M., Arango, C., Arrojo, M., Bobes, J., Del-Ben, C. M., Di Forti, M., Gayer-Anderson, C., ... Schürhoff, F. (2021). The Independent Effects of Psychosocial Stressors on Subclinical Psychosis: Findings From

# Research



## Mental Health

### Selected publications

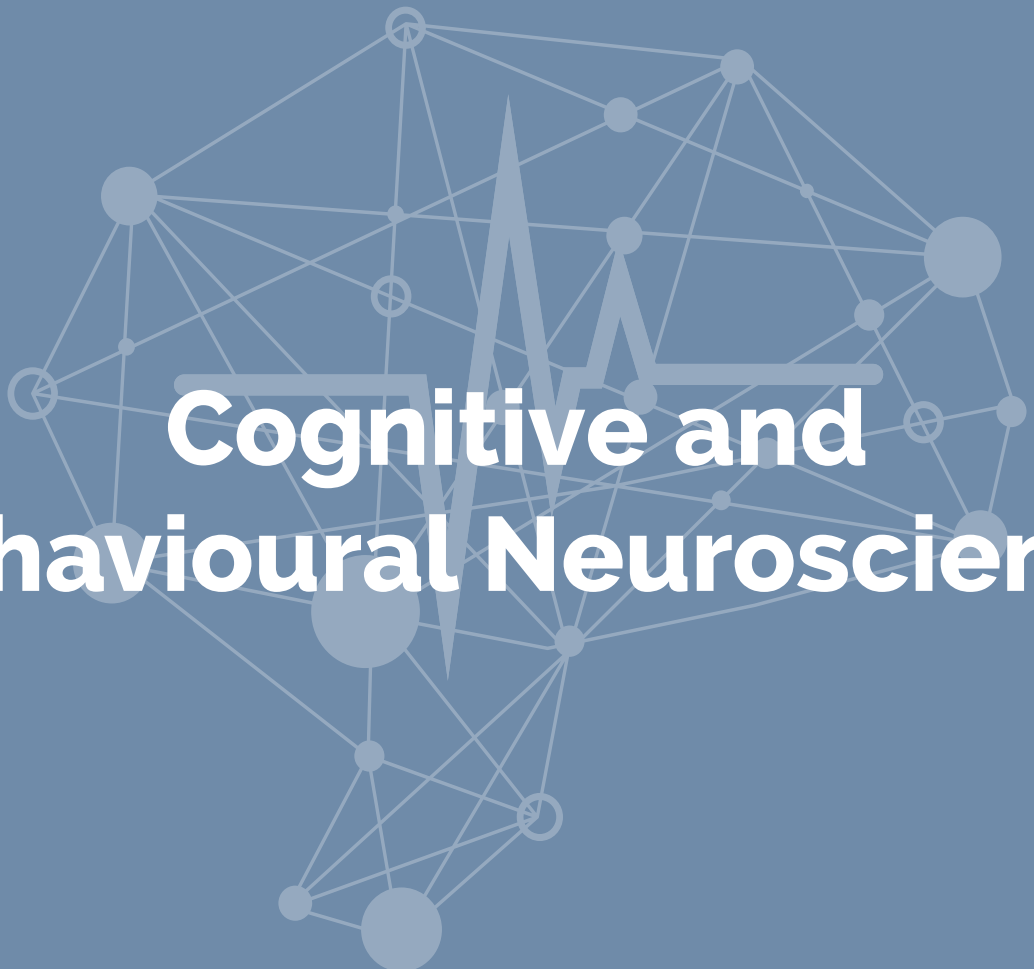
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- the Multinational EU-GEI Study. *Schizophrenia Bulletin*, 47(6), 1674–1684. <https://doi.org/10.1093/schbul/sbab060>
- Salagre, E., Grande, I., Jiménez, E., Mezquida, G., Cuesta, M. J., Llorente, C., Amoretti, S., Lobo, A., González-Pinto, A., Carballo, J. J., Corripio, I., Verdolini, N., Castro-Fornieles, J., Legido, T., Carvalho, A. F., Vieta, E., Bernardo, M., & PEPs Group (2021). Trajectories of suicidal ideation after first-episode psychosis: a growth mixture modeling approach. *Acta Psychiatrica Scandinavica*, 143(5), 418–433. <https://doi.org/10.1111/acps.13279>
  - Tripoli, G., Quattrone, D., Ferraro, L., Gayer-Anderson, C., Rodriguez, V., La Cascia, C., La Barbera, D., Sartorio, C., Seminerio, F., Tarricone, I., Berardi, D., Szöke, A., Arango, C., Tortelli, A., Llorca, P. M., de Haan, L., Velthorst, E., Bobes, J., Bernardo, M., Sanjuán, J., ... Di Forti, M. (2021). Jumping to conclusions, general intelligence, and psychosis liability: findings from the multi-centre EU-GEI case-control study. *Psychological Medicine*, 51(4), 623–633. <https://doi.org/10.1017/S003329171900357X>
  - Velthorst, E., Mollon, J., Murray, R. M., de Haan, L., Germeys, I. M., Glahn, D. C., Arango, C., van der Ven, E., Di Forti, M., Bernardo, M., Guloksuz, S., Delespaul, P., Mezquida, G., Amoretti, S., Bobes, J., Saiz, P. A., García-Portilla, M. P., Santos, J. L., Jiménez-López, E., ... Study, E.-G. H. R. (2021). Cognitive functioning throughout adulthood and illness stages in individuals with psychotic disorders and their unaffected siblings. *Molecular Psychiatry*, 26(8), 4529–4543. <https://doi.org/10.1038/s41380-020-00969-z>

### Knowledge transfer & Innovation

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- Method for predicting the onset of extrapyramidal symptoms (EPS) induced by an antipsychotic-based treatment. AVCRI196



# Cognitive and Behavioural Neuroscience

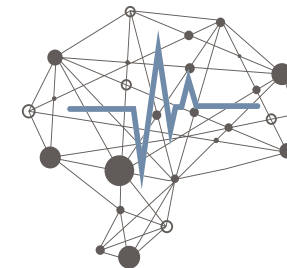
# Research

## Cognitive and behavioural neuroscience

THIS AREA FOCUS ON THE CEREBRAL CIRCUITS, NETWORKS, PROCESSES AND COMPUTATIONAL MECHANISMS THAT UNDERPIN A PLETHORA OF FUNCTIONS, SUCH AS PERCEPTION, ATTENTION, MEMORY, LANGUAGE, DECISION MAKING, EMOTION AND THE CONTROL OF ACTION, TO NAME A FEW

These functions are at the essence of cognition and give rise to the uniqueness of our human nature, a rich mental activity that can even generate the subjective phenomenon of consciousness.

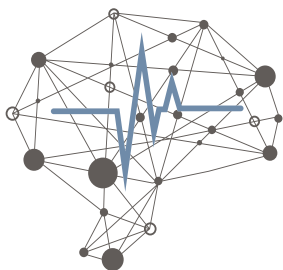
Research at the Institute of Neurosciences pushes boundaries of existing knowledge in areas such as language, music, auditory perception, sensorimotor and cognitive decision-making, and neuropsychology. The Institute has contributed important findings regarding in the genetic determinants of speech sounds encoding, language acquisition and musical anhedonia, the brain connectivity in the preterm born baby and neurobehavioural plasticity after early brain injury, addictions, and the abnormal control of reward in obesity.



### PROJECTS

- **Moments in Time in Immersive Virtual Environments (MoTIVE).** European Union. ERC-2016-ADG. 742989. ERC Advanced Grant. Mel Slater
- **Healthy minds from 0-100 years: Optimising the use of European brain imaging cohorts (Lifebrain).** European Union. SC1-PM-04-2016. 732592. David Bartres-Faz
- **Multiple-level predictors of resilience during the COVID-19 pandemic. Lessons towards a precision preventive medicine.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2020PANDE00043. David Bartres-Faz
- **Estudio de los cambios cerebrales inducidos por estimulación cerebral no invasiva, como predictores del estado de salud cerebral futuro en personas de edad avanzada.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-095181-B-C21. David Bartres-Faz
- **Caracterización de la respuesta de seguimiento de frecuencia (RSF) en recién nacidos como posible biomarcador de desarrollo neurocognitivo.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-094765-B-I00. Carles Escera
- **Characterization and modulation of brain networks to promote brain resilience for the COVID-19 pandemic.** Fundació La Marató de TV3. 592/U/2021. David Bartres-Faz
- **The Ethics of Digital Immersive Experiences.** Ministerio de Ciencia e Innovación. PID2020-117108RB-I00. Mel Slater
- **Playing and Singing for the Recovering Brain: Efficacy of Enriched Social-Motivational Musical Interventions in Stroke Rehabilitation.** Fundació La Marató de TV3. 201729.30. Antonio Rodriguez-Fornells
- **Motivación y recompensa intrínseca asociada a la adquisición del conocimiento: evidencias neuronales.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-099859-B-I00. Antonio Rodriguez-Fornells
- **Caracterización de la adicción y la patología dual. Eficacia de la cronoterapia coayuvante en pacientes con respuesta parcial.** Ministerio de Ciencia, Innovación y Universidades. PID2020-117767GB-I00. Ana Adan

## Research



### Cognitive and Behavioural Neuroscience

# Brain Plasticity and connectivity: Language, memory and reward

## Principal investigators

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LAURA BOSCH  
Precursors to language: attention, speech perception and word learning skills

TONI CUNILLERA  
Cognitive basis underlying eating behavior

RUTH DE DIEGO-BALAGUER  
Brain mechanisms of language learning

LLUIS FUENTEMILLA  
Dynamics of memory formation

MIREIA HERNANDEZ  
Neurolinguistics, Multilingualism and Cognition

JOSEP MARCO-PALLARES  
Brain mechanisms of learning and reward

FERRAN PONS  
Language acquisition and cognitive development

ANTONIO RODRIGUEZ-FORNELLS  
Learning and Brain Plasticity

## Members

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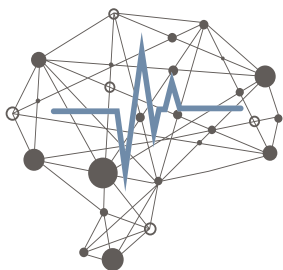
Marc Ballester, Joan Birules, Barbara Braida, David Cucurell, Josue Garcia, Alba Gomez, Paula Lopez, Ernest Mas, Marta Marques, Berta Nicolas, Alexis Perez, Brian Quintero, Marta Ramon, Joan Rodriguez, Ludovico Saint-Amour di Channaz, Carlota Saumell, Jessica Sanchez, Emma Segura, Joana Sierpowska, Joan Tarrida, Xiongho Wu

## Active projects

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- **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya. Programa ICREA Academia 2018.** Fundació Institució Catalana de Recerca i Estudis Avançats. Josep Marco.
- **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya. Programa ICREA Academia 2018.** Fundació Institució Catalana de Recerca i Estudis Avançats. Lluís Fuentemilla.
- **Atendiendo al ritmo: predicción temporal y atención selectiva en el aprendizaje del lenguaje.** Ministerio de Economía y Competitividad. BFU2017-87109-P. Ruth de Diego.
- **Ayuda para la Incorporación Estable de Doctores 2019.** Ministerio de Ciencia, Innovación y Universidades. IED2019-001050-I. Josep Marco.
- **Ayuda para la Incorporación Estable de Doctores 2019.** Ministerio de Ciencia, Innovación y Universidades. IED2019-001156-I. Lluís Fuentemilla.
- **Cognición estructurada en eventos.** Ministerio de Ciencia, Innovación y Universidades. PID2019-111199GB-I00. Lluís Fuentemilla.
- **Contracte del Programa Juan de la Cierva-Incorporació 2018.** Ministerio de Economía y Competitividad. IJC2018-037818-I. Antonio Rodriguez.
- **Contracte del Programa Ramon y Cajal.** Ministerio de Economía y Competitividad. RYC-2016-19477. Antonio Rodriguez.
- **Contratos post-doctorales de investigación (Sara Borrell).** Instituto de Salud Carlos III. CD19/00093. Josep Marco.

# Research

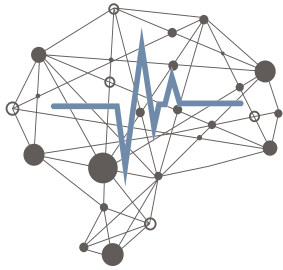


## Cognitive and Behavioural Neuroscience

### Active projects

- **Conveni de col·laboració per a la realització del projecte 'Influència de l'entrenament musical d'alt nivell integrat al programa escolar en els mecanismes de plasticitat cerebral i les habilitats d'aprenentatge de noves llengües'.** Escola IPSI. Antonio Rodriguez.
- **Conveni de col·laboració per a la realització del projecte 'Influència de la formació i l'exposició musical en la plasticitat cerebral i les capacitats d'aprenentatge del llenguatge'.** Escola Virolai. Antonio Rodriguez.
- **EUROPEAN PERFORMING SCIENCE NIGHT (EPSN 2021).** European Union. 101036143-EPSN 2021. Lluís Fuentemilla.
- **Exploring the multisensory dimensionality of short and long-term memories.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017BP\_00213. Lluís Fuentemilla.
- **Grup Cognició i Plasticitat Cerebral.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1573. Antonio Rodriguez.
- **Información y Curiosidad como fuentes de recompensa en humanos: Mecanismos oscilatorios y neuronales.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-098032-B-I00. Josep Marco-Pallares.
- **La influencia de la información probabilística sobre estructura argumental en el procesamiento de verbos y comprensión de oraciones.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-094891-A-I00. Mireia Hernandez.
- **Linguistic Economy through transfer Source Selectivity (LESS): A neurocognitive investigation of linguistic transfer in multilingualism.** Research Council of Norway. 326487-FORSKER21. Ruth de Diego.
- **Motivación y recompensa intrínseca asociada a la adquisición del conocimiento: evidencias neuronales.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-099859-B-I00. Antonio Rodriguez.
- **Perception of rhythm and language learning: A better comprehension of audio-motor integration (AMI).** Minciencias. PCB-COLFUTURO-2021. Ruth de Diego.
- **Playing and Singing for the Recovering Brain: Efficacy of Enriched Social-Motivational Musical Interventions in Stroke Rehabilitation.** Fundació La Marató de TV3. 201729.30. Antonio Rodriguez.
- **Pròrroga del conveni de col·laboració per una recerca sobre cognició i percepció de llengües en nens.** Fundació Privada Betània-Patmos. Ferran Pons.
- **Sara Borrell 2019.** Instituto de Salud Carlos III. CD19/00177. Antonio Rodriguez.
- **The Adapting Brain: Preparing for Parenthood.** Fundação BIAL. 184/20. Lluís Fuentemilla.
- **THE UNCHARTED BRAIN TERRITORY - The(pre) Supplementary Motor Area and its role in language cognitive control in health and neurodegeneration.** European Commission through its H2020 Marie Skłodowska-Curie action COFUND and "la Caixa" Foundation. LCF/BQ/PI21/11830014. Ruth de Diego.
- **Variabilidad en el procesamiento audiovisual del habla en la infancia: rol de la experiencia lingüística, maduración neurológica y capacidad sensorial.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-097487-B-I00. Ferran Pons.
- 2 Confidential agreements.

# Research



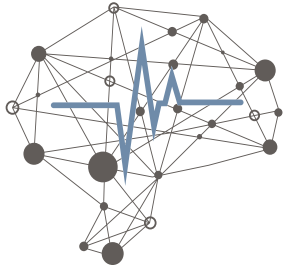
## Cognitive and Behavioural Neuroscience

### Selected publications

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- Alejandro, R. J., Packard, P. A., Steiger, T. K., Fuentemilla, L., & Bunzeck, N. (2021). Semantic Congruence Drives Long-Term Memory and Similarly Affects Neural Retrieval Dynamics in Young and Older Adults. *Frontiers in Aging Neuroscience*, 13, 683908. <https://doi.org/10.3389/fnagi.2021.683908>
- Ara, A., & Marco-Pallarés, J. (2021). Different theta connectivity patterns underlie pleasantness evoked by familiar and unfamiliar music. *Scientific Reports*, 11(1), 18523. <https://doi.org/10.1038/s41598-021-98033-5>
- Boned, J., Cardona, G., Jefferies, E., & Hernández, M. (2021). The influence of language dominance and domain-general executive control on semantic context effects. *Language, Cognition and Neuroscience*, 36(7), 867–884. <https://doi.org/10.1080/23273798.2021.1892784>
- De Paepe, A. E., Ara, A., Garcia-Gorro, C., Martinez-Horta, S., Perez-Perez, J., Kulisevsky, J., Rodriguez-Dechicha, N., Vaquer, I., Subira, S., Calopa, M., Muñoz, E., Santacruz, P., Ruiz-Idiago, J., Mareca, C., de Diego-Balaguer, R., & Camara, E. (2021). Gray Matter Vulnerabilities Predict Longitudinal Development of Apathy in Huntington's Disease. 36(9), 2162–2172. <https://doi.org/10.1002/mds.28638>
- Elmer, S., Valizadeh, S. A., Cunillera, T., & Rodriguez-Fornells, A. (2021). Statistical learning and prosodic bootstrapping differentially affect neural synchronization during speech segmentation. *NeuroImage*, 235, 118051. <https://doi.org/10.1016/j.neuroimage.2021.118051>
- François, C., Garcia-Alix, A., Bosch, L., & Rodriguez-Fornells, A. (2021). Signatures of brain plasticity supporting language recovery after perinatal arterial ischemic stroke. *Brain and Language*, 212, 104880. <https://doi.org/10.1016/j.bandl.2020.104880>
- León-Cabrera, P., Pagonabarraga, J., Moris, J., Martínez-Horta, S., Marín-Lahoz, J., Horta-Barba, A., Bejr-Kasem, H., Kulisevsky, J., & Rodríguez-Fornells, A. (2021). Neural signatures of predictive language processing in Parkinson's disease with and without mild cognitive impairment. *Cortex*, 141, 112–127. <https://doi.org/10.1016/j.cortex.2021.03.032>
- Lopez-Gamundi, P., Yao, Y. W., Chong, T. T., Heekeren, H. R., Mas-Herrero, E., & Marco-Pallarés, J. (2021). The neural basis of effort valuation: A meta-analysis of functional magnetic resonance imaging studies. *Neuroscience and Biobehavioral Reviews*, 131, 1275–1287. <https://doi.org/10.1016/j.neubiorev.2021.10.024>
- Meyer, G. M., Marco-Pallarés, J., Boulinguez, P., & Sescousse, G. (2021). Electrophysiological underpinnings of reward processing: Are we exploiting the full potential of EEG?. *NeuroImage*, 242, 118478. <https://doi.org/10.1016/j.neuroimage.2021.118478>
- Nicolás, B., Wu, X., Garcia-Arch, J., Dimiccoli, M., Sierpowska, J., Saiz-Masvidal, C., Soriano-Mas, C., Radeva, P., & Fuentemilla, L. (2021). Behavioural and neurophysiological signatures in the retrieval of individual memories of recent and remote real-life routine episodic events. *Cortex*, 141, 128–143. <https://doi.org/10.1016/j.cortex.2021.04.006>
- Orpella, J., Mas-Herrero, E., Ripollés, P., Marco-Pallarés, J., & de Diego-Balaguer, R. (2021). Language statistical learning responds to reinforcement learning principles rooted in the striatum. *PLoS Biology*, 19(9), e3001119. <https://doi.org/10.1371/journal.pbio.3001119>

# Research



Cognitive  
and Behavioural  
Neuroscience

## Selected publications

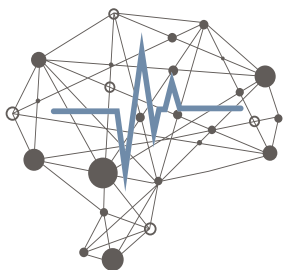
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- Vaquero, L., Ramos-Escobar, N., Cucurell, D., François, C., Putkinen, V., Segura, E., Huotilainen, M., Penhune, V., & Rodríguez-Fornells, A. (2021). Arcuate fasciculus architecture is associated with individual differences in pre-attentive detection of unpredicted music changes. *NeuroImage*, 229, 117759. <https://doi.org/10.1016/j.neuroimage.2021.117759>
- Yousuf, M., Packard, P. A., Fuentemilla, L., & Bunzeck, N. (2021). Functional coupling between CA3 and laterobasal amygdala supports schema dependent memory formation. *NeuroImage*, 244, 118563. <https://doi.org/10.1016/j.neuroimage.2021.118563>

## Thesis

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- **Theta Synchronization Correlates of Musical Pleasure.** Alberto Ara. Supervisor: Josep Marco Pallares



### Cognitive and Behavioural Neuroscience

# Neuropsychology

## Principal investigators

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ANA ADAN  
Addiction and dual disorders

DAVID BARTRES-FAZ  
Brain health and neuromodulation

MARIA ANGELES JURADO  
Obesity and neuroimaging

MARIA MATARO  
Healthy ageing and cerebrovascular disease

ROSER PUEYO  
Cerebral palsy and neuroimaging

JOSEP M SERRA-GRABULOSA  
Neural basis of learning difficulties

## Members

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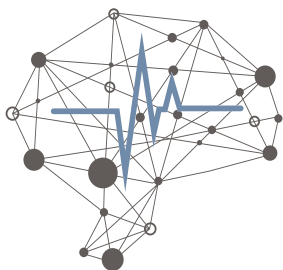
Kilian Amadeus Abellaneda, Mar Ariza, Julia Ballester, Adria Bermudo, Montse Blasco, Maria del Rocio Cabello, Xavier Caldu, Alba Castells, Isabel Garcia, Maria Garcia-Galant, Noemi Lamontja, Olga Laporta, Sandra Luis, Juan Pablo Martin, Julia Miralbell, Lidia Mulet, Jonatan Emanuel Ottino, Ruben Perellon, Xavier Prats, Anna Prunell, Laura Rio Francesca Roig, Cristina Sanchez, Juan Jose Soriano, Lidia Vaque

## Active projects

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- **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya. Programa ICREA Academia 2018.** Fundació Institució Catalana de Recerca i Estudis Avançats. Maria Mataro.
- **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya.** Programa ICREA Academia 2019. Fundació Institució Catalana de Recerca i Estudis Avançats. David Bartres.
- **Caracterización de la adicción y la patología dual. Eficacia de la cronoterapia coadyuvante en pacientes con respuesta parcial.** Ministerio de Ciencia, Innovación y Universidades. PI. D2020-117767GB-I00. Ana Adan.
- **Characterization and modulation of brain networks to promote brain resilience for the COVID-19 pandemic.** Fundació La Marató de TV3. 592/U/2021. David Bartres.
- **Conveni de col·laboració per l'execució del projecte "Barcelona Brain Health Initiative (BBHI).** Fundació Privada Institut de Neurorehabilitació Guttmann. David Bartres.
- **Covid-19 and brain: cognition And mental health (DIANA).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2020PANDE00053. Carme Junque.
- **Efectes de teràpies combinades d'exercici, mindfulness i estimulació cognitiva en la cognició i la neuroplasticitat en pacients amb ictus isquèmic crònic.** Fundació La Marató de TV3. Maria Mataro.
- **Estudio de los cambios cerebrales inducidos por estimulación cerebral no invasiva, como predictores del estado de salud cerebral futuro en personas de edad avanzada.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-095181-B-C21. David Bartres.

# Research



## Cognitive and Behavioural Neuroscience

### Active projects

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- **Guías basadas en la evidencia y consensuadas para la evaluación neuropsicológica de las personas con parálisis cerebral grave y parálisis cerebral discinética.** Ministerio de Ciencia e Innovación. PID2020-117163RB-I00. Maria Del Roser Pueyo.
- **Healthy minds from 0-100 years: Optimising the use of European brain imaging cohorts (Lifebrain).** European Union. SC1-PM-04-2016. 732592. David Bartres.
- **Inflamación, estrés y microbiota como mediadores entre la obesidad y el funcionamiento cerebral durante la adolescencia.** Ministerio de Economía y Competitividad. PSI2017-86536-C2-1-R. Maria Angeles Jurado.
- **Multiple-level predictors of resilience during the COVID-19 pandemic. Lessons towards a precision preventive medicine.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2020PANDE00043. David Bartres.
- 5 Confidential agreements.

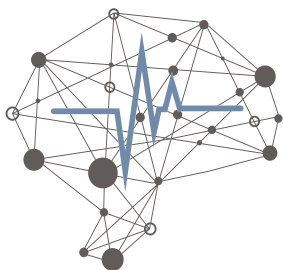
### Selected publications

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- Abellaneda-Pérez, K., Vaqué-Alcázar, L., Perellón-Alfonso, R., Solé-Padullés, C., Bargalló, N., Salvador, R., Ruffini, G., Nitsche, M. A., Pascual-Leone, A., & Bartrés-Faz, D. (2021). Multifocal Transcranial Direct Current Stimulation Modulates Resting-State Functional Connectivity in Older Adults Depending on the Induced Current Density. *Frontiers in Aging Neuroscience*, 13, 725013. <https://doi.org/10.3389/fnagi.2021.725013>
- Adan, A., & Torrens, M. (2021). Special Issue: Diagnosis and Management of Addiction and Other Mental Disorders (Dual Disorders). *Journal of Clinical Medicine*, 10(6), 1307. <https://doi.org/10.3390/jcm10061307>

- Alves Braga de Oliveira, M., de Mendonça Filho, E. J., Carissimi, A., Lima Dos Santos Garay, L., Scop, M., Ruschel Bandeira, D., Gutiérrez Carvalho, F., Mathur, S., Epifano, K., Adan, A., Frey, B. N., & Hidalgo, M. P. (2021). The Revised Mood Rhythm Instrument: A Large Multicultural Psychometric Study. *Journal of Clinical Medicine*, 10(3), 388. <https://doi.org/10.3390/jcm10030388>
- Arrona-Palacios, A., Díaz-Morales, J. F., Parra-Robledo, Z., & Adan, A. (2021). Sleep and Depressive Symptoms in the Morningness/Eveningness-Suicidal Ideation Relationship Depend on School Shift in Mexican Adolescents. *Journal of Clinical Medicine*, 10(20), 4681. <https://doi.org/10.3390/jcm10204681>
- Castells-Sánchez, A., Roig-Coll, F., Dacosta-Aguayo, R., Lamonja-Vicente, N., Sawicka, A. K., Torán-Monserrat, P., Pera, G., Montero-Alía, P., Heras-Tebar, A., Domènech, S., Via, M., Erickson, K. I., & Mataró, M. (2021). Exercise and Fitness Neuroprotective Effects: Molecular, Brain Volume and Psychological Correlates and Their Mediating Role in Healthy Late-Middle-Aged Women and Men. *Frontiers in Aging Neuroscience*, 13, 615247. <https://doi.org/10.3389/fnagi.2021.615247>
- Fjell, A. M., Grydeland, H., Wang, Y., Amlie, I. K., Bartres-Faz, D., Brandmaier, A. M., Düzel, S., Elman, J., Franz, C. E., Håberg, A. K., Kietzmann, T. C., Kievit, R. A., Kremen, W. S., Krogsrud, S. K., Kühn, S., Lindenberger, U., Macia, D., Mowinckel, A. M., Nyberg, L., Panizzon, M. S., ... Walhovd, K. B. (2021). The genetic organization of longitudinal subcortical volumetric change is stable throughout the lifespan. *eLife*, 10, e66466. <https://doi.org/10.7554/eLife.66466>
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# Research



## Cognitive and Behavioural Neuroscience

### Selected publications

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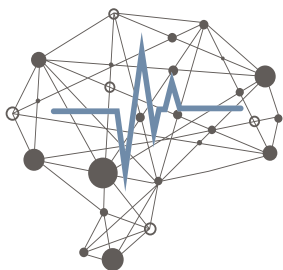
- Adults beyond genetic risk. *Sleep*, 44(11), zsab110. <https://doi.org/10.1093/sleep/zsab110>
- Lamonja-Vicente, N., Dacosta-Aguayo, R., López-Olóriz, J., Prades-Senovilla, L., Roig-Coll, F., Castells-Sánchez, A., Soriano-Raya, J. J., Clemente, I., Miralbell, J., Barrios, M., López-Cancio, E., Cáceres, C., Arenillas, J. F., Millán, M., Torán, P., Pera, G., Fores, R., Alzamora, M. T., Mataró, M., & Vía, M. (2021). Sex-Specific Protective Effects of APOE 2 on Cognitive Performance. *The Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 76(1), 41–49. <https://doi.org/10.1093/gerona/glaa247>
  - Nyberg, L., Magnussen, F., Lundquist, A., Baaré, W., Bartrés-Faz, D., Bertram, L., Boraxbekk, C. J., Brandmaier, A. M., Drevon, C. A., Ebmeier, K., Ghisletta, P., Henson, R. N., Junqué, C., Kievit, R., Kleemeyer, M., Knights, E., Kühn, S., Lindenberger, U., Penninx, B., Pudas, S., ... Fjell, A. M. (2021). Educational attainment does not influence brain aging. *Proceedings of the National Academy of Sciences of the United States of America*, 118(18), e2101644118. <https://doi.org/10.1073/pnas.2101644118>
  - Pascual-Leone, A., & Bartres-Faz, D. (2021). Human Brain Resilience: A Call to Action. *Annals of Neurology*, 90(3), 336–349. <https://doi.org/10.1002/ana.26157>
  - Pascual-Leone, A., Cattaneo, G., Macià, D., Solana, J., Tormos, J. M., & Bartrés-Faz, D. (2021). Beware of Optimism Bias in the Context of the COVID-19 Pandemic. *Annals of Neurology*, 89(3), 423–425. <https://doi.org/10.1002/ana.26001>
  - Prat, G., Marquez-Arrico, J. E., Río-Martinez, L., Navarro, J. F., & Adan, A. (2021). Premorbid functioning in schizophrenia spectrum disorders with comorbid substance use: A systematic review. *Progress in Neuro-Psychopharmacology & Biological Psychiatry*, 110, 110310. <https://doi.org/10.1016/j.pnpb.2021.110310>
  - Serrano-Serrano, A. B., Marquez-Arrico, J. E., Navarro, J. F., Martínez-Nicolas, A., & Adan, A. (2021). Circadian Characteristics in Patients under Treatment for Substance Use Disorders and Severe Mental Illness (Schizophrenia, Major Depression and Bipolar Disorder). *Journal of Clinical Medicine*, 10(19), 4388. <https://doi.org/10.3390/jcm10194388>
  - Vaqué-Alcázar, L., Mulet-Pons, L., Abellana-Pérez, K., Solé-Padullés, C., Cabello-Toscano, M., Macià, D., Sala-Llonch, R., Bargalló, N., Solana, J., Cattaneo, G., Tormos, J. M., Pascual-Leone, A., & Bartrés-Faz, D. (2021). tDCS-Induced Memory Reconsolidation Effects and Its Associations With Structural and Functional MRI Substrates in Subjective Cognitive Decline. *Frontiers in Aging Neuroscience*, 13, 695232. <https://doi.org/10.3389/fnagi.2021.695232>
  - Vidal-Pineiro, D., Wang, Y., Krogsrud, S. K., Amlie, I. K., Baaré, W., Bartres-Faz, D., Bertram, L., Brandmaier, A. M., Drevon, C. A., Düzel, S., Ebmeier, K., Henson, R. N., Junqué, C., Kievit, R. A., Kühn, S., Leonardsen, E., Lindenberger, U., Madsen, K. S., Magnussen, F., Mowinckel, A. M., ... Fjell, A. (2021). Individual variations in 'brain age' relate to early-life factors more than to longitudinal brain change. *eLife*, 10, e69995. <https://doi.org/10.7554/eLife.69995>

### Knowledge transfer & innovation

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- Neurekelab. Spin off. Josep Maria Serra-Grabulosa

## Research



### Cognitive and Behavioural Neuroscience

# Quantitative psychology

## Principal investigators

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JOAN GUARDIA-OLMOS  
Quantitative psychology

## Members

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Maria De Les Salines, Cristina Castañe, Montserrat Colell, Ruth Dolado, Laia Farras, Elisabet Gimeno, David Leiva, Marc Montala, Maribel Pero, Vicenç Quera, Rumen Rumenov, Francesc Salvador, Antonio Solanas

## Active projects

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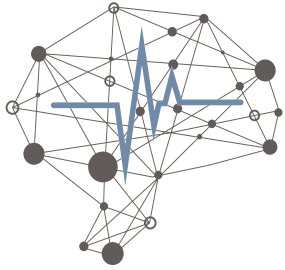
- **Doctorats industrials 2019. Empresa: Consorci Sant Gregori.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2019DI69. Joan Guardia.
- **Indicadores estadísticos para el estudio de redes de conectividad cerebral en registros de resonancia magnética funcional (fMRI) y su aplicación para el diagnóstico del deterioro cognitivo.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-095829-B-I00. Joan Guardia.
- **Psicología Cuantitativa.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR269. Joan Guardia.
- 3 Confidential agreements.

## Selected publications

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- Cañete-Massé, C., Carbó-Carreté, M., Figueroa-Jiménez, M. D., Oviedo, G. R., Guerra-Balic, M., Javierre, C., Però-Cebollero, M., & Guàrdia-Olmos, J. (2021). Confirmatory factor analysis with missing data in a small sample: cognitive reserve in people with Down Syndrome. *Quality & Quantity*. <https://doi.org/10.1007/s11135-021-01264-x>
- Cañete-Massé, C., Carbó-Carreté, M., Però-Cebollero, M., & Guàrdia-Olmos, J. (2021). Task-Related Brain Connectivity Activation Functional Magnetic Resonance Imaging in Intellectual Disability Population: A Meta-Analytic Study. *Brain Connectivity*, 11(10), 788–798. <https://doi.org/10.1089/brain.2020.0911>
- Delfa-Lobato, L., Guàrdia-Olmos, J., & Feliu-Torruella, M. (2021). Benefits of Cultural Activities on People With Cognitive Impairment: A Systematic Review. *Frontiers in Psychology*, 12, 762392. <https://doi.org/10.3389/fpsyg.2021.762392>
- Figueroa-Jiménez, M. D., Cañete-Massé, C., Carbó-Carreté, M., Zarabozo-Hurtado, D., & Guàrdia-Olmos, J. (2021). Structural equation models to estimate dynamic effective connectivity networks in resting fMRI. A comparison between individuals with Down syndrome and controls. *Behavioural Brain Research*, 405, 113188. <https://doi.org/10.1016/j.bbr.2021.113188>
- Figueroa-Jimenez, M. D., Carbó-Carreté, M., Cañete-Massé, C., Zarabozo-Hurtado, D., Però-Cebollero, M., Salazar-Estrada, J. G., & Guàrdia-Olmos, J. (2021). Complexity Analysis of the Default Mode Network Using Resting-State fMRI in Down Syndrome: Relationships Highlighted by a Neuropsychological Assessment. *Brain Sciences*, 11(3), 311. <https://doi.org/10.3390/brainsci11030311>
- Méndez-López, C., Pereda, N., & Guilera, G. (2021). Lifetime poly-victimization and psychopathological symptoms in

# Research

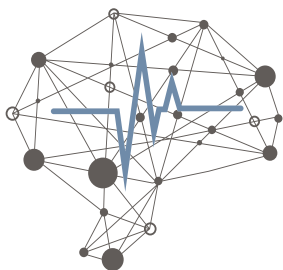


Cognitive  
and Behavioural  
Neuroscience

## Selected publications

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- Mexican adolescents. *Child Abuse & Neglect*, 112, 104883. <https://doi.org/10.1016/j.chiabu.2020.104883>
- Oviedo, G. R., Garcia-Retortillo, S., Carbó-Carreté, M., Guerra-Balic, M., Balagué, N., Javierre, C., & Guàrdia-Olmos, J. (2021). Cardiorespiratory Coordination During Exercise in Adults with Down Syndrome. *Frontiers in Physiology*, 12, 704062. <https://doi.org/10.3389/fphys.2021.704062>
  - Pérez-González, A., Vilajoana-Celaya, J., & Guàrdia-Olmos, J. (2021). Alzheimer's Disease Caregiver Characteristics and Their Relationship with Anticipatory Grief. *International Journal of Environmental Research and Public Health*, 18(16), 8838. <https://doi.org/10.3390/ijerph18168838>



### Cognitive and Behavioural Neuroscience

## Principal investigators

CARLES ESCERA  
Neural mechanisms of speech encoding and auditory perception

JUDITH DOMINGUEZ-BORRAS  
Emotion interactions with perception and attention: amygdala function

MARIA ISABEL NUÑEZ-PEÑA  
Numerical cognition and math anxiety

IRIA SANMIGUEL  
Motor-sensory interactions and predictive processing

MARC VIA  
Cognitive neurogenetics

## Members

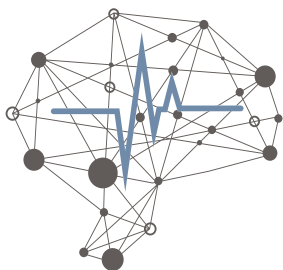
Raquel Aparicio, Sonia Arenillas, Trisia Cinca, Concepcion Clemente, Maria Jose Corral, Jordi Costa, Marta Font, Belen Gonzalez, Samantha Lopez, Konstantina Paraskevoudi, Giannina Puddu, Marta Puertollano, Teresa Ribas, Stefanie Sturm, Jose Valenzuela

## Active projects

- **The sound of special places: exploring rock art soundscapes and the sacred (ARTSOUNDSCAPES).** European Union. ERC-2017-ADG. 787842 – ERC Advanced Grant. Carles Escera
- **Ajut per incentivar i consolidar la recerca d'excel·lència ja existent a les universitats públiques de Catalunya.** Programa ICREA Academia 2020. Fundació Institució Catalana de Recerca i Estudis Avançats. Carles Escera.
- **Brainlab-Grup de Recerca en Neurociència Cognitiva.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR974. Carles Escera.

- **Caracterización de la respuesta de seguimiento de frecuencia (RSF) en recién nacidos como posible biomarcador de desarrollo neurocognitivo.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-094765-B-I00. Carles Escera.
- **Contracte del Programa Juan de la Cierva-Formació 2018.** Ministerio de Economía y Competitividad. FJCI-2018-36034. Carles Escera.
- **Contracte del Programa Juan de la Cierva-Incorporació 2018.** Ministerio de Economía y Competitividad. IJC2018-037374-I. Carles Escera.
- **Control ejecutivo en personas con ansiedad a las matemáticas: Inhibición, flexibilidad cognitiva y respuesta al error.** Ministerio de Ciencia, Innovación y Universidades. PID2020-117140GB-I00. Maria Isabel Nuñez-Peña.
- **Estudio de la vía subcortical humana para el procesamiento de amenaza auditiva.** Ministerio de Ciencia, Innovación y Universidades. PID2020-116311GA-I00. Judith Dominguez.
- **Papel de los genes y de factores epigenéticos en la modulación de potenciales cerebrales asociados al procesamiento del lenguaje y de la música.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-099013-A-I00. Marc Via.
- **Speech in Preverbal Infants with Growth Restriction: a Marker of Neurocognitive Development.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2018 BP 00025. Carles Escera.
- **Trastornos del espectro alcohólico fetal (TEAF): Identificación precoz y biomarcadores de riesgo para alteraciones neurocognitivas mediante el potencial de seguimiento de frecuencia (PSF).** Fundación Alicia Koplowitz. Carles Escera.

# Research



## Cognitive and Behavioural Neuroscience

### Selected publications

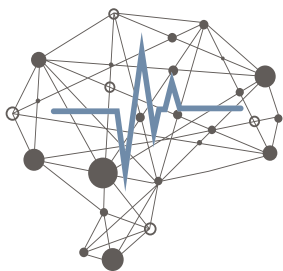
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- Arenillas-Alcón, S., Costa-Faidella, J., Ribas-Prats, T., Gómez-Roig, M. D., & Escera, C. (2021). Neural encoding of voice pitch and formant structure at birth as revealed by frequency-following responses. *Scientific Reports*, 11(1), 6660. <https://doi.org/10.1038/s41598-021-85799-x>
- Baus, C., Ruiz-Tada, E., Escera, C., & Costa, A. (2021). Early detection of language categories in face perception. *Scientific Reports*, 11(1), 9715. <https://doi.org/10.1038/s41598-021-89007-8>
- Castells-Sánchez, A., Roig-Coll, F., Dacosta-Aguayo, R., Lamónja-Vicente, N., Sawicka, A. K., Torán-Monserrat, P., Pera, G., Montero-Alía, P., Heras-Tebar, A., Domènech, S., Via, M., Erickson, K. I., & Mataró, M. (2021). Exercise and Fitness Neuroprotective Effects: Molecular, Brain Volume and Psychological Correlates and Their Mediating Role in Healthy Late-Middle-Aged Women and Men. *Frontiers in Aging Neuroscience*, 13, 615247. <https://doi.org/10.3389/fnagi.2021.615247>
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- Font-Alaminos, M., Ribas-Prats, T., Gorina-Careta, N., & Escera, C. (2021). Emergence of prediction error along the human auditory hierarchy. *Hearing Research*, 399, 107954. <https://doi.org/10.1016/j.heares.2020.107954>
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- Lamónja-Vicente, N., Dacosta-Aguayo, R., López-Oloriz, J., Prades-Senovilla, L., Roig-Coll, F., Castells-Sánchez, A., Soriano-Raya, J. J., Clemente, I., Miralbell, J., Barrios, M., López-Cancio, E., Cáceres, C., Arenillas, J. F., Millán, M., Torán, P., Pera, G., Fores, R., Alzamora, M. T., Mataró, M., & Via, M. (2021). Sex-Specific Protective Effects of APOE 2 on Cognitive Performance. *Journals of Gerontology. Series A, Biological Sciences and Medical Sciences*, 76(1), 41–49. <https://doi.org/10.1093/geron/glaa247>
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- Nowak, K., Costa-Faidella, J., Dacewicz, A., Escera, C., & Szlag, E. (2021). Altered event-related potentials and theta oscillations index auditory working memory deficits in healthy aging. *Neurobiology of Aging*, 108, 1–15. <https://doi.org/10.1016/j.neurobiolaging.2021.07.019>
- Núñez-Peña, M. I., Colomé, À., & González-Gómez, B. (2021). The Spatial-Numerical Association of Response Codes (SNARC) effect in highly math-anxious individuals: An ERP study. *Biological Psychology*, 161, 108062. <https://doi.org/10.1016/j.biopsycho.2021.108062>
- Paraskevoudi, N., & SanMiguel, I. (2021). Self-generation and sound intensity interactively modulate perceptual bias, but not perceptual sensitivity. *Scientific Reports*, 11(1), 17103. <https://doi.org/10.1038/s41598-021-96346-z>
- SanMiguel, I., Costa-Faidella, J., Lugo, Z. R., Vilella, E., & Escera, C. (2021). Standard Tone Stability as a Manipulation of Precision in the Oddball Paradigm: Modulation of Prediction Error Responses to Fixed-Probability Deviants. *Frontiers in Human Neuroscience*, 15, 734200. <https://doi.org/10.3389/fnhum.2021.734200>

### Thesis

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- **Detection of abnormal neural encoding of speech sounds at birth using the frequency- following response.** Teresa Ribas-Prats. Supervisor: Carles Escera.



### Cognitive and Behavioural Neuroscience

## Virtual reality

### Principal investigators

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FRANCISCO JOSE EIROA-OROSA  
Citizenship, identity and mental health

GUILLEM FEIXAS  
Intervention in clinical and health psychology

JOSE GUTIERREZ-MALDONADO  
Virtual Reality applications of new technologies in clinical and health psychology

MEL SLATER  
Virtual environments in psychology and cognitive neuroscience

### Members

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Maria Belen Aguirre, Miquel Alabemía, Domna Banakou, Alejandro Beacco, Carlos Cabreira, Marta Ferrer, Adela Fuste, Jaime Gallego, Helena Garcia, Ileana Alexandra Ghita, Alexis Andreu Gracia, Tania Jonhson, Esen Küçüktütüncü, Sergio Macho, Francisco Manuel Macia, Danilo Orlando Moggia, Ramon Oliva, Joana Margarita Pla, Joan Ribas, Jose Ruiz, Mavi Sanchez, Irene Sanjuan, Carmen Saldaña, Gizem Senel, Victor Suarez, Helena Vall, Ferran Vilalta

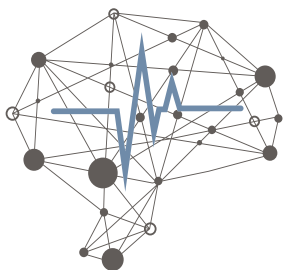
### Active projects

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- **Atorgament d'un ajut de la convocatòria del Programa d'Intensificació de Transferència pel curs 2020-2021.** Universitat de Barcelona. Guillem Feixas.
- **Contracte del Programa Ramon y Cajal.** Ministerio de Economía y Competitividad. RYC2018-023850. Guillem Feixas.
- **Conveni de col·laboració en relació al projecte de recerca 'Anàlisi de constructes personals en els trastorns psicòtics'.** Parc Sanitari Sant Joan de Déu. Guillem Feixas.

- **Conveni de col·laboració per al desenvolupament de diverses accions relacionades amb les estratègies de salut mental i adiccions, en consonància amb el Pla de Salut de Catalunya.** Departament de Salut de la Generalitat de Catalunya. Francisco Jose Eiroa-Orosa.
- **GRID CONSULTOR (GRIDCON): A 3D Tool for the Exploration of Professional. 2019 LLAV 00023.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2019 LLAV 00023. Guillem Feixas.
- **Grup d'investigació sobre aplicacions de realitat virtual i altres noves tecnologies en psicologia clínica i de la salut (VR-PSY Lab).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1693. Jose Gutierrez-Maldonado.
- **Intervenció en psicologia clínica i de la salut.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR642. Guillem Feixas.
- **Modificación del sesgo atencional, mediante realidad virtual, para la mejora del tratamiento de la anorexia nerviosa.** Ministerio de Ciencia, Innovación y Universidades. PID2019-108657RB-I00. Jose Gutierrez.
- **Moments in Time in Immersive Virtual Environments (MoTIVE).** European Union. ERC-2016-ADG. 742989 – ERC Advanced Grant. Mel Slater.
- **Psicoteràpia para jóvenes con depresión moderada: ¿Puede la realidad virtual aumentar su eficacia?.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-094294-B-I00. Guillem Feixas.
- **The Ethics of Digital Immersive Experiences.** Ministerio de Ciencia e Innovación. PID2020-117108RB-I00. Mel Slater.
- 5 Confidential agreements.

# Research



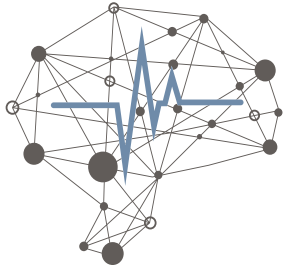
## Cognitive and Behavioural Neuroscience

### Selected publications

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- Beacco, A., Oliva, R., Cabreira, C., Gallego, J., & Slater, M. (2021). Disturbance and Plausibility in a Virtual Rock Concert: A Pilot Study. 2021 IEEE Virtual Reality and 3D User Interfaces (VR), 538–545. <https://doi.org/10.1109/VR50410.2021.00078>
- Eiroa-Orosa, F. J., Lomascolo, M., & Tosas-Fernández, A. (2021). Efficacy of an Intervention to Reduce Stigma Beliefs and Attitudes among Primary Care and Mental Health Professionals: Two Cluster Randomised-Controlled Trials. *International Journal of Environmental Research and Public Health*, 18(3), 1214. <https://doi.org/10.3390/ijerph18031214>
- Gorisse, G., Senel, G., Banakou, D., Beacco, A., Oliva, R., Freeman, D., & Slater, M. (2021). Self-observation of a virtual body-double engaged in social interaction reduces persecutory thoughts. *Scientific Reports*, 11(1), 23923. <https://doi.org/10.1038/s41598-021-03373-x>
- Hernández-Serrano, O., Ghiță, A., Fernández-Ruiz, J., Monrás, M., Gual, A., Gacto, M., Porrás-García, B., Ferrer-García, M., & Gutiérrez-Maldonado, J. (2021). Determinants of Cue-Elicited Alcohol Craving and Perceived Realism in Virtual Reality Environments among Patients with Alcohol Use Disorder. *Journal of Clinical Medicine*, 10(11), 2241. <https://doi.org/10.3390/jcm10112241>
- Llobera, J., Beacco, A., Oliva, R., Senel, G., Banakou, D., & Slater, M. (2021). Evaluating participant responses to a virtual reality experience using reinforcement learning. *Royal Society Open Science*, 8(9), 210537. <https://doi.org/10.1098/rsos.210537>
- Porrás-García, B., Ferrer-García, M., Serrano-Troncoso, E., Carulla-Roig, M., Soto-Usera, P., Miquel-Nabau, H., Olivares, L., Marnet-Fiol, R., Santos-Carrasco, I. M., Borszewski, B., Díaz-Marsá, M., Sánchez-Díaz, I., Fernández-Aranda, F., & Gutiérrez-Maldonado, J. (2021). AN-VR-BE. A Randomized Controlled Trial for Reducing Fear of Gaining Weight and Other Eating Disorder Symptoms in Anorexia Nervosa through Virtual Reality-Based Body Exposure. *Journal of Clinical Medicine*, 10(4), 682. <https://doi.org/10.3390/jcm10040682>
- Rovira, A., Southern, R., Swapp, D., Campbell, C., Zhang, J. J., Levine, M., & Slater, M. (2021). Bystander Affiliation Influences Intervention Behavior: A Virtual Reality Study. *SAGE Open*. <https://doi.org/10.1177/21582440211040076>
- Sanchez-Moscona, C., & Eiroa-Orosa, F. J. (2021). Training mental health peer support training facilitators: a qualitative, participatory evaluation. *International Journal of Mental Health Nursing*, 30(1), 261–273. <https://doi.org/10.1111/inm.12781>
- Seinfeld, S., Zhan, M., Poyo-Solanas, M., Barsuola, G., Vaessen, M., Slater, M., Sanchez-Vives, M. V., & de Gelder, B. (2021). Being the victim of virtual abuse changes default mode network responses to emotional expressions. *Cortex*, 135, 268–284. <https://doi.org/10.1016/j.cortex.2020.11.018>
- Slater, M., & Banakou, D. (2021). The Golden Rule as a Paradigm for Fostering Prosocial Behavior With Virtual Reality. *Current Directions in Psychological Science*, 30(6), 503–509. <https://doi.org/10.1177/09637214211046954>
- Slater, M. (2021). Beyond Speculation About the Ethics of Virtual Reality: The Need for Empirical Results. *Frontiers in Virtual Reality*, 2(August), 1–4. <https://doi.org/10.3389/frvir.2021.687609>

# Research



Cognitive  
and Behavioural  
Neuroscience

## Knowledge transfer & Innovation

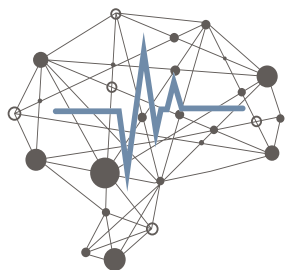
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- Methods and systems for gradual exposure to a fear. UBTT0345. Mel Slater
- Motor training. AVCRI263-E. Mavi Sanchez, Mel Slater
- Physiological response. AVCRI264-E. Mavi Sanchez, Mel Slater, Jorge Arroyo
- Mind and Identity SL,UB . Spin off. Guillem Feixas
- Virtual Bodyworks. Spin off. Mel Slater

## Thesis

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- **AN-VR-BE: Development of virtual reality-based exposure techniques for improving anorexia nervosa treatment.** Bruno Porras. Supervisors: Jose Gutierrez-Maldonado & Marta Ferrer.
- **Incongruent Views of Quality of Life between Patients and Physicians: A Mixed-Methods Enquiry.** Alicia Georghiades. Supervisor: Francisco Jose Eiroa-Orosa.
- **La eficacia de la hipnosis como coadyuvante en el circuito perioperatorio de banda gástrica ajustable.** Priscila Saldival. Supervisor: Guillem Feixas.



# Vision and control of action

## Principal investigators

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JOAN LOPEZ-MOLINER  
Optic flow, visual motion, sensori-motor  
decision-making, Perception and action

JAVIER RODRIGUEZ-FERREIRO  
Reasoning, language and learning

HANS SUPER  
Fixational eye movements and cognitive processing

MATTHIAS SVEN KEIL  
Computational modeling biologically inspired image  
and video processing, networks and complex systems

CRISTINA DE LA MALLA  
Eye movements, sensori-motor decision-making, perception and  
action)

DANIEL LINARES  
Decision making in complex environments & psychophysics

## Members

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Maria del Carmen Aguilera, Borja Aguado, Itxaso Barberia, Jaume Boned, Angels Colome, Marta Natalia Torres, Elisabet Tubau

## Active projects

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- **Actualización del espacio 3D a partir del flujo óptico.**  
Ministerio de Ciencia, Innovación y Universidades. PID2020-114713GB-I00. Joan Lopez-Moliner.
- **Fundamento cognitivo de las creencias pseudocientíficas.**  
Ministerio de Ciencia, Innovación y Universidades. PID2019-106102GB-I00. Javier Rodriguez-Ferreiro.

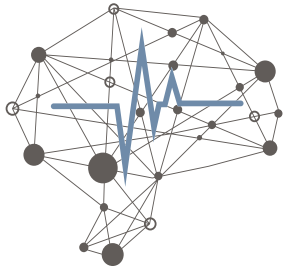
- **Interrupción de la predicción del movimiento visual.**  
Ministerio de Ciencia, Innovación y Universidades. PID2020-116400GA-I00. Cristina de la Malla.
- **Prevención del disconfort visual mediante el ajuste del contenido espectral dinámico en realidad virtual.** Ministerio de Ciencia e Innovación. PDC2021-121090-I00. Joan Lopez.
- **Sincronización de movimientos oculares y sincronización de las neuronas.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-096074-B-I00. Hendrik Anne Super.
- **Un Estudio Computacional de mecanismos de codificación predictiva para la percepción visual del movimiento.** Ministerio de Ciencia, Innovación y Universidades. PGC2018-099506-B-I00. Matthias Sven Keil.
- **Visió i Control de l'Acció (VISCA).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR48. Joan Lopez-Moliner.

## Selected publications

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- Aguado, B., & López-Moliner, J. (2021). Flexible viewing time when estimating time-to-contact in 3D parabolic trajectories. *Journal of Vision*, 21(4), 9. <https://doi.org/10.1167/jov.21.4.9>
- Aguado, B., & López-Moliner, J. (2021). Gravity and Known Size Calibrate Visual Information to Time Parabolic Trajectories. *Frontiers in Human Neuroscience*, 15(August), 1–19. <https://doi.org/10.3389/fnhum.2021.642025>
- Aguilera, M., & Rodríguez-Ferreiro, J. (2021). Differential Effects of Schizotypy Dimensions on Creative Personality and Creative Products. *Creativity Research Journal*, 33(2), 202–208. <https://doi.org/10.1080/10400419.2020.1866895>

# Research



## Cognitive and Behavioural Neuroscience

### Selected publications

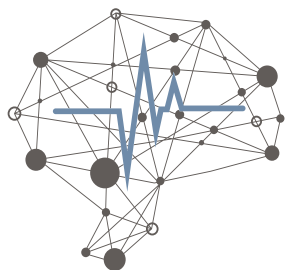
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- Jörges, B., La Scaleia, B., López-Moliner, J., Lacquaniti, F., & Zago, M. (2021). Perceptual judgments of duration of parabolic motions. *Scientific Reports*, 11(1), 7108. <https://doi.org/10.1038/s41598-021-86428-3>
- Jovanovic, L., López-Moliner, J., & Mamassian, P. (2021). Contrasting contributions of movement onset and duration to self-evaluation of sensorimotor timing performance. *European Journal of Neuroscience*, 54(3), 5092–5111. <https://doi.org/10.1111/ejn.15378>
- Lerer, A., Supèr, H., & Keil, M. S. (2021). Dynamic decorrelation as a unifying principle for explaining a broad range of brightness phenomena. *PLoS Computational Biology*, 17(4), e1007907. <https://doi.org/10.1371/journal.pcbi.1007907>
- López-Moliner, J., & de la Malla, C. (2021). Motion-in-depth effects on interceptive timing errors in an immersive environment. *Scientific Reports*, 11(1), 21961. <https://doi.org/10.1038/s41598-021-01397-x>
- Rodríguez-Ferreiro, J., & Barberia, I. (2021). Believers in pseudoscience present lower evidential criteria. *Scientific Reports*, 11(1), 24352. <https://doi.org/10.1038/s41598-021-03816-5>
- Rodríguez-Ferreiro, J., Vadillo, M. A., & Barberia, I. (2021). Debiasing Causal Inferences: Over and Beyond Suboptimal Sampling. *Teaching of Psychology*. <https://doi.org/10.1177/00986283211048394>

### Knowledge transfer & Innovation

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- Measuring and improving attention. UBTT0410. Hendrik Anne Super
- Method of Measuring Attention. AVCRI147. Hendrik Anne Super
- Braingaze. Spin off. Hendrik Anne Super



# Artificial Intelligence

## Principal investigators

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PETIA RADEVA  
Machine learning, computer vision, medical imaging

## Members

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Simone Balocco, Oliver Diaz, Karim Lekadir, Bhalaji Nagarajan,  
Ricardo Jorge Rodrigues

## Active projects

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- **An intelligent tool based on Deep learning for Food Intake monitoring of Elderly (Logmeal4Shape).** European Union. Petia Radeva.
- **Atorgament d'un ajut de la convocatòria del Programa d'Intensificació de l'Activitat Investigadora Internacional (2020-21).** Universitat de Barcelona. Petia Radeva.
- **Computer Vision and Machine Learning at the University of Barcelona (CVMLUB).** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2017SGR1742. Petia Radeva.
- **Contracte del Programa Juan de la Cierva-Formació 2019.** Ministerio de Economía y Competitividad. FJC2019-040039-I. Petia Radeva.
- **Contracte del Programa Ramon y Cajal.** Ministerio de Economía y Competitividad. RYC-2015-17183. Petia Radeva.
- **Doctorats industrials 2018. Empresa: Abante & Pongiluppi SL.** Agència de Gestió d'Ajuts Universitaris i de Recerca. 2018DI039. Petia Radeva.
- **Greenhabit365.** European Union. 21105. Petia Radeva.

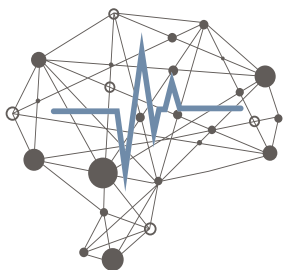
- **LogMeal's SmartTray: Self-checkout system for self-service restaurants (Innovadors).** Agència de Gestió d'Ajuts Universitaris i de Recerca. Exp. 2019 INNOV 00069. Petia Radeva.
- **LOOMING FACTORY.** Departament d'Empresa i Coneixement. Generalitat de Catalunya. Ref. 001-P-001643. Petia Radeva.
- **Más allá de la Precisión de los Modelos: Icerteza, Explicabilidad y Aprendizaje Entre-modal.** Ministerio de Ciencia, Innovación y Universidades. RTI2018-095232-B-C21. Petia Radeva.
- 9 Confidential agreements.

## Selected publications

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- Das, M., Gupta, D., Radeva, P., & Bakde, A. M. (2021). Optimized CT-MR neurological image fusion framework using biologically inspired spiking neural model in hybrid l1 - l0 layer decomposition domain. *Biomedical Signal Processing and Control*, 68, 102535. <https://doi.org/10.1016/j.bspc.2021.102535>
- Das, M., Gupta, D., Radeva, P., & Bakde, A. M. (2021). Multi-scale decomposition-based CT-MR neurological image fusion using optimized bio-inspired spiking neural model with meta-heuristic optimization. *International Journal of Imaging Systems and Technology*, 31(4), 2170-2188. <https://doi.org/10.1002/ima.22575>
- Diaz, O., Kushibar, K., Osuala, R., Linardos, A., Garrucho, L., Igual, L., Radeva, P., Prior, F., Gkontra, P., & Lekadir, K. (2021). Data preparation for artificial intelligence in medical imaging: A comprehensive guide to open-access platforms and tools. *Physica Medica: PM: an International Journal Devoted to the Applications of Physics to Medicine and Biology : Official Journal of the Italian Association of Biomedical Physics (AIFB)*, 83, 25-37. <https://doi.org/10.1016/j.ejmp.2021.02.007>

# Research



## Cognitive and Behavioural Neuroscience

### Selected publications

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- Glavan, A., Matei, A., Radeva, P., & Talavera, E. (2021). Does our social life influence our nutritional behaviour? Understanding nutritional habits from egocentric photo-streams. *Expert Systems with Applications*, 171, 114506. <https://doi.org/10.1016/j.eswa.2020.114506>
- Matei, A., Glavan, A., Radeva, P., & Talavera, E. (2021). Towards Eating Habits Discovery in Egocentric Photo-Streams. *IEEE Access*, PP, 1. <https://doi.org/10.1109/ACCESS.2021.3053175>
- Ortiz-Maldonado, V., Rives, S., Castellà, M., Alonso-Saladríguez, A., Benítez-Ribas, D., Caballero-Baños, M., Baumann, T., Cid, J., García-Rey, E., Llanos, C., Torrebadell, M., Villamor, N., Giné, E., Díaz-Beyá, M., Guardia, L., Montoro, M., Català, A., Faura, A., González, E. A., Español-Rego, M., ... Delgado, J. (2021). CART19-BE-01: A Multicenter Trial of ARI-0001 Cell Therapy in Patients with CD19+ Relapsed/Refractory Malignancies. *Molecular Therapy: the Journal of the American Society of Gene Therapy*, 29(2), 636–644. <https://doi.org/10.1016/j.jymthe.2020.09.027>
- Pezzano, G., Díaz, O., Ripoll, V. R., & Radeva, P. (2021). CoLe-CNN+: Context learning - Convolutional neural network for COVID-19-Ground-Glass-Opacities detection and segmentation. *Computers in Biology and Medicine*, 136, 104689. <https://doi.org/10.1016/j.compbimed.2021.104689>
- Pezzano, G., Ribas Ripoll, V., & Radeva, P. (2021). CoLe-CNN: Context-learning convolutional neural network with adaptive loss function for lung nodule segmentation. *Computer Methods and Programs in Biomedicine*, 198, 105792. <https://doi.org/10.1016/j.cmpb.2020.105792>
- Sarker, M. M. K., Rashwan, H. A., Akram, F., Singh, V. K., Banu, S. F., Chowdhury, F. U. H., Choudhury, K. A., Chambon, S., Radeva, P., Puig, D., & Abdel-Nasser, M. (2021). SLSNet: Skin lesion segmentation using a lightweight generative adversarial network. *Expert Systems with Applications*, 183. <https://doi.org/10.1016/j.eswa.2021.115433>

### Knowledge transfer & Innovation

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- ALGecko Technologies. Spin off. Petia Radeva.

### Thesis

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- **Deep Multimodal Learning for Egocentric Storytelling and Food Analysis.** Marc Bolaños. Supervisor: Petia Radeva.

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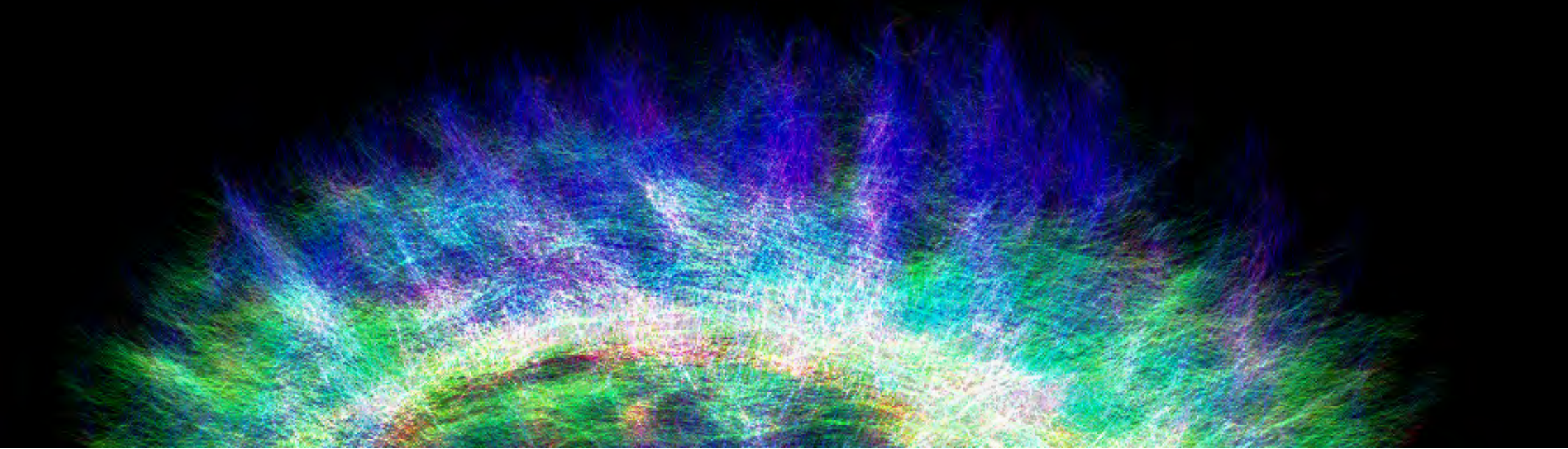
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## Images

All images are courtesy of Roser Sala from the Statistical modeling and data analysis for neuroimaging group, Daniel del Toro from the In vivo reprogramming during cortex development group, Daniel Tornero from the Neural stem cells and brain damage group and Albert Giralt from the Hippocampal function in health and disease group.



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