

THE INSTITUTE

The Institute of Neurosciences of the University of Barcelona is a frontrunner in international neuroscience research, being one of the few institutes in the world that investigates the brain at every level. UBneuro was created 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.

As a university research Institute, we support training of the neuroscience research workforce and disseminate timely and accurate information about neurological and mental disorders to the research community, physicians, patient associations and the public.

The Institute has been awarded with the **Maria de Maeztu Unit of Excellence** accreditation, and gathers more than 400 researchers from the University of Barcelona. We encourage and welcome collaboration with international research groups and organisations.



- 76% National Projects
- 24% International Projects
- 87% Public Funding
- 13% Private Funding



4 Research Professors

5 Academia Professors



European Research Council

2 Advanced Grant



3 Postdoctoral Fellowships

Total members 411



60% Women
40% Men



Institut de Neurociències
UNIVERSITAT DE BARCELONA

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UNIVERSITAT DE BARCELONA

Institute of Neurosciences of the University of Barcelona

ANNUAL REPORT 2022



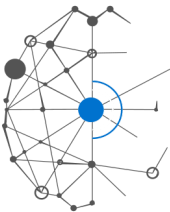
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EXCELENCIA
MARÍA
DE MAEZTU

Research Areas

Pathophysiology of Nervous System Diseases



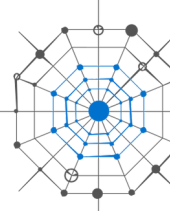
Here we focus on defining the pathophysiological mechanisms involved in the loss of normal and neuronal plasticity related to these diseases. A deeper understanding of neuronal connectivity and dynamics, signaling molecules, cell-cell interaction and epigenetic factors in the nervous system will enable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

Experimental Neurology



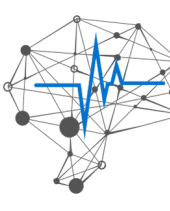
This area is focused on the study of the nervous system in normal conditions and during neurologic disorders. This includes studies about the correlation between genetic markers, cerebrospinal fluid biomarkers and structural, functional and molecular imaging in patients with movement disorders, dementia, autoimmune synaptic disorders and other neurological diseases.

Mental Health



Under a multidisciplinary approach, the Institute actively embraces the challenge of advancing mental health knowledge around underlying neurobiological mechanisms, cognitive and daily life functioning. It also focuses on developing new treatments and therapies in psychotic and affective disorders in childhood, adolescence, and adulthood

Cognitive and Behavioural Neuroscience



The focus is on the cerebral circuits, networks, processes and computational mechanisms that underpin a plethora of functions, such as perception, attention, memory, language, decision making, emotion... 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.

Outstanding Publications in 2022

1

Dávila-Bouzigué, E; Casóliba-Melich, A; Targa-Fabra, G; Galera-López, L; Ozaita, A; Maldonado, R; Avila, J; Delgado-García, J. M; Gruart, A; Soriano, E; & Pascual, M. (2022). **Functional protection in J20/VLW mice: a model of non-demented with Alzheimer's disease neuropathology.** BRAIN: 145(2), 729-743
<http://dx.doi.org/10.1093/brain/awab319>

2

Akkermans, O; Delloye-Bourgeois, C; Peregrina, C; Carrasquero-Ordaz, M; Kokolaki, M; Berbeira-Santana, M; Chavent, M; Reynaud, F; Raj, R; Agirre, J; Aksu, M; White, ES; Lowe, E; Ben Amar, D; Zaballa, S; Huo, JD; Pakos, I; McCubbin, PTN; Comoletti, D; Owens, RJ; Robinson, CV; Castellani, V; del Toro, D; Seiradake, E (2022). **GPC3-Unc5 receptor complex structure and role in cell migration.** CELL: 185(21), 3931-3949
<http://dx.doi.org/10.1016/j.cell.2022.09.025>

3

Gao, L; Meiring, J. C. M; Varady, A; Ruider, I. E; Heise, C; Wranik, M; Velasco, C. D; Taylor, J. A; Terni, B; Weinert, T; Standfuss, J; Cabernard, C. C; Llobet, A; Steinmetz, M. O; Bausch, A. R; Distel, M; Thorn-Seshold, J; Akhmanova, A; & Thorn-Seshold, O. (2022). **In Vivo Photocontrol of Microtubule Dynamics and Integrity, Migration and Mitosis, by the Potent GFP-Imaging-Compatible Photoswitchable Reagents SBTubA4P and SBTub2M.** JOURNAL OF THE AMERICAN CHEMICAL SOCIETY: 144(12), 5614-5628
<https://doi.org/10.1021/jacs.2c01020>

4

Parameswaran, J; Goicoechea, L; Planas-Serra, L; Pastor, A; Ruiz, M; Calingasan, N. Y; Guilera, C; Aso, E; Boada, J; Pamplona, R; Portero-Otin, M; de la Torre, R; Ferrer, I; Casasnovas, C; Pujol, A; & Fourcade, S. (2022). **Activating cannabinoid receptor 2 preserves axonal health through GSK-3 β /NRF2 axis in adrenoleukodystrophy.** ACTA NEUROPATHOLOGICA: 144(2), 241-258
<http://dx.doi.org/10.1007/s00401-022-02451-2>

5

Haddad-Tóvolli, R; Ramírez, S; Muñoz-Moreno, E; Milà-Guasch, M; Miquel-Río, L; Pozo, M; Chivite, I; Altirriba, J; Obri, A; G. Gómez-Valadés, A; Toledo, M; Eyre, E; Bortolozzi, A; Valjent, E; Soria, G; & Claret, M. (2022). **Food craving-like episodes during pregnancy are mediated by accumbal dopaminergic circuits.** NATURE METABOLISM: 4, 424-434 (2022)
<https://doi.org/10.1038/s42255-022-00557-1>

6

Riba, M; del Valle, J; Molina-Porcel, L; Pelegri, C; Vilaplana, J (2022). **Wasteosomes (*corpora amylacea*) as a hallmark of chronic glymphatic insufficiency.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA: 119(48)
<http://dx.doi.org/10.1073/pnas.2211326119>

7

Vílchez-Acosta, A; Manso, Y; Cárdenas, A; Elias-Tersa, A; Martínez-Losa, M; Pascual, M; Alvarez-Dolado, M; Nairn, AC; Borrell, V; Soriano, E (2022). **Specific contribution of Reelin expressed by Cajal-Retzius cells or GABAergic interneurons to cortical lamination.** PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA: 119(37)
<https://www.pnas.org/doi/full/10.1073/pnas.2120079119>

8

Chelban, V; Nikram, E; Perez-Soriano, A; Wilke, C; Foubert-Samier, A; Vijiaratnam, N; Guo, T; Jabbari, E; Olufodun, S; Gonzalez, M; Senkevich, K; Laurens, B; Péran, P; Rascol, O; Le Traon, AP; Todd, EG; Costantini, AA; Alikhwan, S; Tariq, A; Ng, BL; Muñoz, E; Painous, C; Compta, Y; Junque, C; Segura, B; Zhelcheska, K; Wellington, H; Schöls, L; Jaunmuktane, Z; Kobylecki, C; Church, A; Hu, MTM; Rowe, JB; Leigh, PN; Massey, L; Burn, DJ; Pavese, N; Foltynie, T; Pchelina, S; Wood, N; Heslegrave, AJ; Zetterberg, H; Bocchetta, M; Rohrer, JD; Marti, MJ; Synofzik, M; Morris, HR; Meissner, WG; Houlden, H (2022). **Neurofilament light levels predict clinical progression and death in multiple system atrophy.** BRAIN: 145(12), 4398-4408
<http://dx.doi.org/10.1093/brain/awac253>

Outstanding Projects Granted in 2022

2,000,000 €

Institut de Neurociències de la Universitat de Barcelona (UBneuro) CEX2021-001159-M | Ministerio de Ciencia e Innovación (MICINN)
Jordi Alberch

798,345 €

Antibody-mediated NMDA receptor encephalitis: symptoms, biomarkers, and mechanisms of the prolonged recovery stage HR22-00221 | Fundació 'La Caixa'
Josep Dalmau

587,189 €

Reducing the impact of major environmental challenges on mental health (environMENTAL) 101057429 | European Union
Melvyn Slater

444,837 €

Desarrollo de un ecosistema digital de salud mental para entornos laborales CPP2021-008590 | Ministerio de Ciencia e Innovación (MICINN)
David Gallardo

386,900 €

Métodos in vitro alternativos humanos para el estudio de enfermedades neurodegenerativas PLEC2022-009401 | Ministerio de Ciencia e Innovación (MICINN)
Josep Maria Canals

363,000 €

Conocimientos estructurales y moleculares de las proteínas de MLC que regulan canales de cloruro astrocitarios: Búsqueda de terapias para MLC y epilepsia PID2021-126246NB-I00 | Ministerio de Ciencia e Innovación (MICINN)
Raul Estevez

351,488 €

A new target for the treatment of acute and chronic itch LF-OC-22-001114 | LEO FOUNDATION
Xavier Gasull

339,338 €

A human-centred factory for a future technological sustainable development driven by arts (MUSAE) 101070421 | European Union
Petia Ivanova

287,980 €

Identificación de nuevos mecanismos presinápticos usados para aumentar la fuerza sináptica y compensar disfunciones del sistema nervioso PID2021-124536NB-I00 | Ministerio de Ciencia e Innovación (MICINN)
Artur Llobet

236,561 €

Salud Mental (CIBERSAM) CB07/09/0004 | Ministerio de Sanidad y Consumo
Eduard Vieta