

Molecular Physiology of the Synapse



Coordinator

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Members

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Main Lines of Research

- ▶ Molecular and cellular analyses of the vertebrate synapse.
- ▶ Molecular and cellular dysfunctions underlying intellectual disability and autism.
- ▶ Research into animal models of mental and behavioural disorders.
- ▶ Development of new biochemical methods to study the synapse.

Challenges

- ▶ Characterize the molecular roots of cognition and behaviour.
- ▶ Identify the synaptic molecules and mechanisms involved in mental and behavioural disorders, mainly intellectual disabilities and autism spectrum disorders.
- ▶ Identify drugs which might help treat mental and behavioural disorders.
- ▶ Study the reversibility after birth of neurodevelopmental disorders affecting cognition.

Collaborations

Collaborations with other IIB Sant Pau Groups

- ▶ Neurobiology of Dementias (PI: Alberto Lleó)
- ▶ Oncogenesis and Antitumour Drugs (PI: Ramón Mangués)
- ▶ Molecular Bases of Disease (PI: Pablo Fuentes-Prior)
- ▶ Neurosurgery (PI: Joan Molet)

External Collaborations

- ▶ Prof. Seth GN Grant. University of Edinburgh, UK.
- ▶ Dr. Noboru Komiyama. University of Edinburgh, UK.
- ▶ Dr. Gavin Rumbaugh. Scripps Research Institute, USA.
- ▶ Dr. Richard Emes. University of Nottingham, UK.
- ▶ Dr. Maksym Kopanitsa. Charles River Laboratories, Finland.
- ▶ Dr. Hector Escribà. Sorbonne Universités, UPMC Univ Paris 06, CNRS, France.

- ▶ Dr. Nael Nadif-Kasri. Radboud University, The Netherlands.
- ▶ Dr. Jyoti S. Choudhari. The Wellcome Trust Sanger Institute, UK.
- ▶ Dr. Mark Collins. University of Sheffield, UK.
- ▶ Dra. Àngels García-Cazorla. Hospital Sant Joan de Déu, Barcelona.
- ▶ Dra. Nerea Roher. Universitat Autònoma de Barcelona, Bellaterra.
- ▶ Dr. Jordi García Fernández. Universitat de Barcelona, Barcelona.
- ▶ Dr. Carles Sindreu. Universitat de Barcelona, Barcelona.
- ▶ Dr. David Soto. Universitat de Barcelona, Barcelona.
- ▶ Dr. Xavier Altafaj. Bellvitge Biomedical Research Institute (IDIBELL), Barcelona
- ▶ Dra. Liset Menéndez de la Prida. Instituto Cajal, Madrid.
- ▶ Dr. Angel Barco. Instituto de Neurociencias, Alicante.
- ▶ Dr. Andres Ozaita. Universitat Pompeu Fabra, Barcelona.

Active Grants

- ▶ Gemma Gou Alsina. Contratos Predoctorales para la Formación de Doctores 2013 BES-2013-063720. Ministerio de Economía y Competitividad. Duration: 2013-2017. 83,900.00 €.
- ▶ Alejandro Bayés Puig. Red para el estudio de la sinapsis en el contexto de la disfunción cognitiva SAF2014-52624-REDT. Ministerio de Economía y Competitividad. Duration: 2014-2017. 32,000.00 €.
- ▶ Alejandro Bayés Puig. Looking into the dynamics of synaptic molecular machines to learn about the basis of cognition and intellectual disability BFU2015-69717-P. Ministerio de Economía y Competitividad. Duration: 2016-2019. 156,800.00 €.
- ▶ Alejandro Bayés Puig. Targeted nanoconjugates for the selective elimination of stem cells in disseminated cancer PIE15/00028. Instituto de Salud Carlos III. Duration: 2016-2018. 93,448.00 €.
- ▶ Alejandro Bayés Puig. Subvenciones del Programa Ramón y Cajal concedidas por la Resolución 05/12/2011. RYC-2011-08391. Ministerio de Economía y Competitividad. Duration: 2012-2017. 168,600.00 €.

Note: Total amount granted to PI. It does not include indirect costs.

Grants Awarded in 2017

- ▶ Gemma Gou Alsina. Estudio de los mecanismos moleculares de la sinapsis implicados en procesos cognitivos y en la discapacidad cognitiva no sindrómica. EEBB-I-17-11996. Ministerio de Economía y Competitividad. Duration: 2017-2017. 6,280.00 €.
- ▶ Alejandro Bayés Puig. Synaptic Dysfunction in Intellectual Disability Caused by SYNGAP1. Translational Research to Develop Human Models and Advance Pharmacological Treatments. AC17/00005. Instituto de Salud Carlos III. Duration: 2018-2020. 123,500.00 €.
- ▶ Alejandro Bayés Puig. Ayudas para la incorporación estable de doctores 2017. IEDI-2017-00822. Ministerio de Economía y Competitividad. Duration: 2018-2020. 100,000.00 €.

Note: Total amount granted to PI. It does not include indirect costs.

Awards

- ▶ F1000 recommended our publication: Àlex Bayés, Mark O Collins, Rita Reig-Viader, Gemma Gou, David Goulding, Abril Izquierdo, Jyoti S Choudhary, Richard D Emes and Seth GN Grant. Evolution of complexity in the zebrafish synapse proteome. Nature Communications 2017 Mar 2; 8: 14613.

Books or chapters with ISBN

- ▶ Rita Reig-Viader and Àlex Bayés. Quantitative In-Depth profiling of the Postsynaptic Density Proteome to Understand the Molecular Mechanisms Governing Synaptic Physiology and Pathology. Current Proteomic Approaches Applied to Brain Function. 2017 Human Press, Springer Protocols. ISBN 978-1-4939-7119-0.

*TIF: 12.353 **MIF: 12.353

Scientific Production

Bayes A., Collins M.O., Reig-Viader R., Gou G., Goulding D., Izquierdo A., Choudhary J.S., Emes R.D., Grant S.G.N., Evolution of complexity in the zebrafish synapse proteome (2017) NAT COMMUN, 8.
IF: 12.353