

## Mara Dierssen

Group leader, Cellular and Systems Neurobiology

Systems Biology Program, CRG

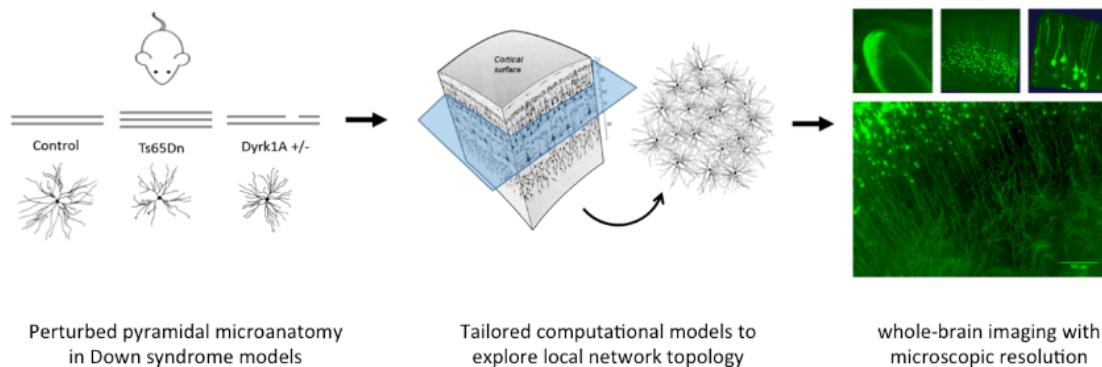
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## Goals & Highlights

The Dierssen lab is centered on understanding cognition and behavior and their perturbation in intellectual disability. Our main question is:

*What are the changes in neuronal architecture and connectivity that disrupt cortical and hippocampal function, in genetic cognitive disorders? In other words, what is the multi-scale link from molecular alterations to impaired cognition and behavior?*



We are an interdisciplinary team of physicists, bioinformaticians and experimental biologists, and we focus on **data collection** (behavior, 3D imaging, genomic data) of many variables of the system (longitudinal behavioral analysis, population based analysis in neuronal networks, gene expression patterns). We take advantage of **computer modeling and bioinformatics analysis** (gene networks, neuronal network modeling, etc.) to tackling classical unresolved questions in the field, such as: (a) pathological disturbances of structural optimality in single cell and neuronal networks, (b) genomic dependence of cognitive disturbances, (c) identification of predictive non-invasive biomarkers, (d) discovery of pro-cognitive therapies.

## Highlights

Dr. Dierssen has made important contributions to the understanding of Down syndrome pathology and other genetic mental illnesses. She uncovered specific neuronal network disturbances and candidate genes in intellectual disability and psychiatric disorders, and made significant contributions to disentangle their underlying mechanisms. Based on our results, we discovered the first drug treatment

that is efficacious in improving cognition in Down syndrome and Fragile X syndrome. Her work has led to 155 publications including some in high-profile journals (see publication list) such as *Lancet Neurology*, *Neuropsychopharmacology*, *The Journal of Neuroscience*, *Scientific Reports* or *eLife*, most of which I am senior author with an exponential increase in the number of citations that reached 5.098 (h index 2018: **43**). Her main discoveries include:

1. The discovery of the lack of a stable structural trace of **experience-dependent neuroplasticity** a fundamental mechanism involved in learning and memory Down syndrome brains (*Cerebral Cortex*, 2003; *Lancet Neurology*, 2010). This discovery led to new hypothesis in the field (*Nature Review Neuroscience* 2012)

2. She narrowed down the genetic dependency of Down syndrome neuronal and learning phenotypes. Specifically, we found that *in vivo* overexpression of **Dyrk1A, recapitulates Down syndrome phenotypes at different levels** (*Human Molecular Genetics* 2001, *American Journal of Human Genetics*, 2008, *Cerebral Cortex* 2012, *The Journal of Neuroscience*, 2016 Comment in: <http://neurosciencenews.com/cerebral-cortex-down-syndrome-3972/>)

3. She discovered **new candidate genes involved in mental illnesses**. Specifically we discovered the involvement of **NTRK3 gene in panic disorder** and of the **CHRNA5/A3/B4 genomic cluster in nicotine and alcohol abuse** (*Human Molecular Genetics* 2008, *Drug Alcohol Dependency*, 2012, *Acta Neuropathologica*, 2014, *Journal of Neuroscience* 2013, *Neuropsychopharmacology*, 2017)

4. She discovered the **first successful pro-cognitive treatment for Down syndrome**, which rescues cognitive phenotypes and also increases functional brain connectivity, (*Lancet Neurology*, 2017. See comment in: <http://www.sciencemediacentre.org/expert-reaction-to-downs-syndrome-and-green-tea-compound/>). We also contributed to new molecular targets for the treatment of Fragile X (*Nature Medicine*, 2013)

5. Her lab developed a **high-throughput phenotypic cluster** that has concentrated in developing new phenotyping strategies and tools. This has led to a number of very productive collaborations along the years (*Neuron*, 2013; *Elife*, 2018; *Science Report*, 2017 etc.)

## Education

1985	Degree in Medicine, University of Cantabria, Santander, Spain
1986	Master Thesis in Neuropharmacology University of Cantabria
1989	PhD in Neurosciences, University of Cantabria
1990-1993	Postdoctoral at Autonomous University of Barcelona (UAB)
1991	Diploma Radioactive Autonomous University of Barcelona

## Professional experience

1993 - 1997	Assistant Professor/Group leader, University of Cantabria (Spain)
1997 - 2001	Senior researcher, Institute of Oncology Research-IRO, Barcelona

1997 - 2006 Professor (Psychophysiology). Ramón Llull University, Barcelona  
2002 - 2007 Junior Group leader, Centre for Genomic Regulation-CRG, Barcelona  
2005 - 2015 Director of the Associated Unit for Behavioral Research (National Biotechnology Center-CSIC)  
2007 - Group leader, Centre for Genomic Regulation-CRG, Barcelona, Spain  
2007 - Group leader, Centre for Biomedical Research on Rare Diseases, Spain

## Honors and Awards

2017 Trifermed Social Impact of Healthcare Award  
2017 BigVang Medal  
2016 Distinguished Alumni of the University of Cantabria  
2016 Best Ideas Award for the clinical trial in Down syndrome  
2014 David and Hillie Mahoney Award  
2013 Ramón Trías Fargas Award  
2013 & 1987 Dr. A Esteve Foundation Award  
2010 Sisley-Lejeune Award  
**2008 Premi Nacional de Pensament i Cultura Científica**  
2008 Laura Iglesias award for women in science  
2004 Jerome Lejeune Foundation Prize  
2003 & 2008 Ramón Trias Fargas Award for Down syndrome research  
2002 & 2009 Jaime Blanco Award at Down syndrome research

## Selected Publications

Dr. Dierssen has a total record of 155 cited 5098 times to an **h-index of 43 (see full list at the end of the document)**

### 1. Disease mechanisms of intellectual disability

Ruiz-Mejias M; ...; **Dierssen M**. Overexpression of Dyrk1A, a Down Syndrome Candidate, Decreases Excitability and Impairs Gamma Oscillations in the Prefrontal Cortex. **The Journal of Neuroscience**. (2016) 36(13):3648-59

Pujol J, ... **Dierssen M**, de la Torre R. Anomalous brain functional connectivity contributing to poor adaptive behavior in Down syndrome. **Cortex**. (2014) 64C:148-156. Co-corresponding

Pons-Espinal M ... **Dierssen M** Environmental enrichment rescues DYRK1A activity and hippocampal adult neurogenesis in TgDyrk1A. **Neurobiology of Disease** 60,18-31, 2013

Martinez de Lagrán M, ... **Dierssen M**. Dyrk1A Influences Neuronal Morphogenesis Through Regulation of Cytoskeletal Dynamics in Mammalian Cortical Neurons. **Cerebral Cortex**. 22(12): 2867- 77, 2012

**Dierssen M**, Down syndrome: the brain in trisomic mode. **Nature Review Neuroscience** 13(12): 844-58, 2012

**Dierssen M**, Lott I; Down syndrome: neurological complications and cognition. **The Lancet Neurology**, 9: 623-33, 2010

**Dierssen M** et al. Alterations of neocortical pyramidal cell phenotype in the Ts65Dn mouse model of Down syndrome: effects of environmental enrichment **Cerebral Cortex** 13, 758-64, 2003

## 2. Disease mechanisms of psychiatric disorders

D'Amico D, .. **Dierssen M**. Infralimbic Neurotrophin-3 Infusion Rescues Fear Extinction Impairment in a Mouse Model of Pathological Fear. **Neuropsychopharmacology**. (2017) 42(2):462-472.

Espinosa-Carrasco J, ... **Dierssen M**. Time-course and dynamics of obesity-related behavioral changes induced by energy-dense foods in mice. **Addiction Biology** (2018) Jan 10. doi: 10.1111/adb.12595. [Epub ahead of print]

Santos M, D'Amico D, Spadoni O, Amador-Arjona A, Stork O, **Dierssen M**. Hippocampal Hyperexcitability Underlies Enhanced Fear Memories in TgNTRK3, a Panic Disorder Mouse Model. **Journal of Neuroscience** 33(38): 15259-71, 2013

Molas S, Gener T, Güell J, Martín M, Ballesteros-Yáñez I, Sanchez-Vives MV, **Dierssen M**. Hippocampal changes produced by overexpression of the human CHRNA5/A3/B4 gene cluster may underlie cognitive deficits rescued by nicotine in transgenic mice. **Acta Neuropathol Commun**. 2(1): 147, 2014

Del Pino I, ...**Dierssen M**, Canals S, Marín O, Rico B. Erbb4 Deletion from Fast-Spiking Interneurons Causes Schizophrenia-like Phenotypes. **Neuron**. 2013 79(6):1152-68.

Sahún I ... **Dierssen M**, Gruart A Dissociation between CA3-CA1 synaptic plasticity and associative learning in TgNTRK3 transgenic mice. **Journal of Neuroscience** 27, 2253-60, 2007. (Co-corresponding)

## 3. Translational research

De la Torre R... **Dierssen, M**. "Safety and efficacy of the combination of cognitive training and epigallocatechin-3-gallate for cognitive improvement in adults with Down syndrome: a double-blind randomised controlled trial". (2016) **The Lancet Neurology**, 15(8):801-810.

Busquets-Garcia, M. Gomis-González, T. Guegan, C. Agustín-Pavón, A. Pastor, R. de la Torre, **M. Dierssen**, R. Maldonado, A. Ozaita, Targeting the endocannabinoid system in the treatment of fragile X syndrome. **Nature Medicine** 9(5): 603-7, 2013

De la Torre R, ... **Dierssen M**. Epigallocatechin-3-gallate, a DYRK1A inhibitor, rescues cognitive deficits in Down syndrome mouse models and in humans. **Mol Nutr Food Res**. 58(2):278-88, 2014

Pujol J, ... **Dierssen M**, de la Torre R. Anomalous brain functional connectivity contributing to poor adaptive behavior in Down syndrome. **Cortex** 64C: 148-156, 2014 (Co-corresponding)

## Books and chapters (selected)

San Cristobal, B, Tastekin, I, **Dierssen M** Computational Models: how do they help to understand neurological diseases? En: Gerlai, R., Crusio, W. eds. Molecular-Genetic Techniques for Brain and Behavior Research, Elsevier. 2018

**M. Dierssen** and R. De la Torre Eds. Down Syndrome From Understanding the Neurobiology to Therapy, Progress in Brain Research, 197. Elsevier, 2012

## Ongoing funding

Organization	Coordinator	Funding (Group/Project)	Period
EU-JPND	Dierssen	150.000€ / 1.676.474€	2018-2020
Marató TV3	Martin (UPF)	132.813€ / 398.646€	2017-2020
AGAUR	Dierssen	20.000€	2018-2019
CDTI	Dierssen	119.900€	2014-2018
Jerome Lejeune F.	Dierssen	40.000€	2016-2018
MINECO	Dierssen	387.200€	2016-2019
EU-Era NET Neuron	Ladurner (UM)	110.000€ / 1.407.868€	2014-2017
Jerome Lejeune F	Dierssen	40.000€	2013-2015
MINECO	Dierssen	338.800€ / 439.230€	2014/2016
FECYT	Dierssen	19.672€	2015/2016
AFMTéléthon	Bardoni (IPMC)	46.800€ / 164.000€	2013-2016
FRAXA Foundation	Dierssen	74.000€	2013-2015

## Previous funding

2017-2020	Computational modelling of learning and memory neuronal networks. Ministerio de Economía y Competitividad (BES-2016-077416) I.P.- Mara Dierssen	88.250€
2014-2018	Elucidation of the mechanism of action of EGCG on the cognitive phenotype in Down syndrome mouse model. Ministerio de Economía y Competitividad (SVP-2013-068022) I.P.- Mara Dierssen Sotos	83.900€
2011-2013	Spanish Ministry of Health (PI11/00744). La inhibición de sobreexpresión de Dyrk1a como estrategia terapéutica para mejorar rendimiento cognitivo y prevenir el desarrollo de la Enfermedad de Alzheimer en pacientes con el Síndrome de Down. Role: CoPI	275.000€
2011-2013	Spanish Ministry of Education and Science (SAF2010-16427), Terapia "sináptica" para los trastornos cognitivos: hacia la identificación de nuevas dianas para la intervención farmacológica.	270.000€ Role: PI
2010-2012	Fondation Jerome Lejeune, Synaptic drugs for cognitive disorders: identifying new targets for pharmacological intervention.	30.000€ Role: PI
2009-2011	ERA-NET E-Rare (EU/FIS PS09102673) Targeting Rho-signalling, a new therapeutic avenue in fragile X syndrome (CureFXS).	167.000€ Role: PI- Coordinator
2009-2011	Marató TV3 Neregulin/ErbB4 signaling pathways and development of cortical inhibitory circuits: implications for the ethiology of schizophrenia.	348.000€ Role: Investigator
2009-2011	Reina Sofia Foundation (FP006/09) Análisis funcional de la interaccion DREAM-DYRK1A en modelos murinos de EA y síndrome de Down.	95.000€ Role: PI
2009-2011	Spanish Ministry of Health (FIS PI082038) Modelos animales para trastornos neuropsiquiaticos relacionados con la conducta compulsiva.	116.281€ Role: PI
2008-2009	Spanish Ministry of Education and Science (SAF2007-31093-E) ModF2_Aneuploidy: understanding gene dosage imbalance in human	

- health using genetics, functional genomics and systems biology.  
40.000€ *Role:*
- 2007-2010 PI Spanish Ministry of Education and Science (SAF2007-60827) Papel de las isoformas del receptor de neurotrofina 3 (TrkC) en los procesos de memoria y aprendizaje relacionados con la adicción.  
144.595€
- Role: PI*
- 2008-2011 Role of two isoforms of the high affinity receptor for NT-3 in learning and memory processes involved in drug abuse *Spanish Ministry of Education and Science* 119.500 €
- 2007 Pathogenesis of the similarities and differences of the cognitive patter of Williams and Down syndromes. *CIBERER, Spanish Ministry of Health* 24.000 €
- 2007-2009 Implication of Dyrk1A, a candidate gene for Down syndrome, in Alzheimer's type pathology and characterization of the neuropathological and cognitive effects of cytotoxic protofibrils from peptides derived of natural amyloid proteins in Dyrk1A mouse models. *Marató TV3 Foundation* 92.850,50 €
- 2007-2009 Molecular bases of the functional roles of TrkC receptor isoforms in hippocampal learning and memory processes *Ramón Areces Foundation* 110.000 €
- 2006-2009 Phenotypical characterization of animal models for neuropsychiatric disorders related to compulsive behavior. *PHECOMP (European Union FP6-2005-LIFESCIHEALTH-6)*. 140.010 €
- 2006–2010 Understanding gene dosage imbalance in human health using genetics, functional genomics and systems biology. *ANEUPLOIDY (European Union FP6-2005-LIFESCIHEALTH-6)* 560.237 € Coordinator: S.E. Antonarakis. PI Work package: M. Dierssen
- 2004-2007 Phenotypic characterization of mouse models of anxiety disorders: predisposition to drug abuse. *Spanish Ministry of Education and Science. (SAF2004-0280)* 92.000,00 €
- 2004-2007 Mouse models for the study of the trophic hypothesis of drug abuse. *Spanish Ministry of Science and Technology (GEN2003-20651-C06-03)* 138.000 €
- 2004-2006 Development and analysis of the efficacy of therapeutic interventions on the cognitive alteration of Down syndrome in murine models *Jerôme Lejeune Foundation* 32.000 €
- 2003-2006 Network: Mouse models of Central Nervous System disorders *Catalan Autonomous Government DURSI (CIRIT 2000XT/00083 and 2003 XT / 00093)* 32.000 €
- 2002-2005 Behavioral and pharmacological characterization of mouse models of NTRK3 overexpression *Spanish Ministry of Education and Science (SAF2001-1231)*. 82.939,67 €
- 2002-2005 Mouse models of overexpression of A3 (CHRNA3), A5 (CHRNA5) and B4 (CHRNA4) nicotinic receptor. *Marató TV3 Foundation*, 87.146,76 €
- 2002-2003 Development and analysis of the efficacy of therapeutic interventions on the cognitive alteration of Down syndrome murine models *Jerôme Lejeune Foundation* 38.000 €

2000-2002 Implication of Dyrk1A (Minibrain) in learning deficits associated with Down syndrome and their neuromorphological correlates: morphological and chemical characteristics of the pyramidal neuron of the cerebral cortex. *Jerôme Lejeune Foundation* 32.000 €

2000-2002 Validation of mouse models of MMU16 overexpression as neurodegenerative models, and gene therapy strategies. *Spanish Ministry of Health (FIS 00/0795)* 63.000 €

### **Co-investigator with significant contribution**

As a co-investigator I have participated in the following projects with significant contribution: FP5- QLG1-CT-2002-00816. J.M.-Delabar-X. Estivill and FP6 framework, X. Estivill from the Spanish Ministry of Education and Science SAF2002-00799, Xavier Estivill, European Union (CEC -DOCE-Call Identifier QoL-2001-3-15) La Caixa Foundation and Ministry of Health of the Spanish Government

### *Personnel funding/short stages*

2013-2017 PhD fellowship CONACyT to Marcos Quevedo  
2014-2017 PhD fellowship Severo Ochoa to Mireia Ortega  
2012-2015 PhD fellowship, AGAUR (FI 2012) to Jose Antonio Espinosa. Development of new computational methods for comparison and analysis of longitudinal data in mouse models of addiction.  
2012 Support for Visit of Prof Jorge Busciglio Estancias de profesores e investigadores extranjeros de acreditada experiencia, en régimen de año sabático, en centros espanyoles, Ministerio de Educación (SAB2011-0107) Therapeutic potential of trombospondin 1 in Down syndrome phenotypes.  
2012 Europe research stay to Georgios Stefos. Alexander von Humboldt Foundation, Germany. Effects of DYRK1A and RCAN1 on NGF-induced upregulation of plasminogen activation inhibitor-1 in neurons.  
2011-2016 PhD fellowship FPI, MICINN (BES-2011-045391) to Silvina Catuara. Terapia sináptica para los trastornos cognitivos: hacia la identificación de nuevas dianas para la intervención farmacológica.  
2010-2016 PhD fellowship la Caixa to Débora Viecili Costa Masini. Efficacy of Rho signalling molecules to treat FXS related phenotypes.  
2010 Support for short stage of Carla Obradors AGAUR - (2009 BE2 00075)  
2009-2013 PhD fellowship la Caixa to Davide D'Amico. Fear memories in TgNtrk3 mice, a model of panic disorder.  
2009-2010 Support for Visit of Prof John Crabbe (OSHU). Genetic and Epigenetic factors in alcohol use disorders Agencia de gestió d'ajuts universitaris (AGAUR).  
2008-2011 PhD fellowship to Susanna Molas Ministerio de Educación y Ciencia. CSIC (JAEPRe\_07\_00571). The role of NACHRs subunit in nicotine abuse and cognitive phenotypes.  
2008 -2010 Support for the post-doctoral project of Monica Santos Fundaçao para a Ciência e a Tecnologia (SFRH/BPD/28555/2006\_MJPinto). Chromatin remodelling and plasticity of the nervous system: study of the synapse structure and proteome in a mouse model of Rett syndrome.  
2008-2009 Leonardo Da Vinci fellowship to support the master student Ornella Spadoni with the project "Understanding the impact of panic attacks on brain systems involved in the pathophysiology of panic disorder".  
2007-2010 PhD fellowship to Carla Obradors AGAUR (2007FI 00690\_Carla Obradors ) Influence of the dysregulation of NTRK3 (TrkC) on the connectivity and the functionality of the cerebral cortex.

- 2007-2008 Support for short stage of Arqué Fusté, Glòria AGAUR (2007BE-100116\_GArque). Cortical dysgenesis in Down syndrome.
- 2007 Support for short stage of Trutzel, Annette Caroline. Study of the amyloidogenic potential of toxic species of Tau in mouse models of Alzheimer's Disease EUROPEAN COMMISSION, (D/2006/PL-62013-2S).
- 2006-2009 IBRO International Travel Grant 2006 to Maria Martinez (IBRO\_2006\_Maria Martinez ) to Martínez de Lagrán Cabredo, María

### Previous to 2007

GRUPS CONSOLIDATS DE RECERCA

DURSI. Referencia: SGR0500008

Entidades participantes: CRG

**Xavier Estivill, Cristina Fillat, Mara Dierssen Sotos, Susana de la Luna, Mariona Arbonés**

Número de investigadores participantes: 5

Phenotypical characterisation of animal models for neuropsychiatric disorders related to compulsive behaviour

European Commission. PHECOMP Referencia: LSHM-CT-2007-037669

Entidades participantes: CRG

01-OCT-2006 30-SET-2009

Cuantía de la subvención: 140.010€

**I.P.- Mara Dierssen Sotos**

Número de investigadores participantes: 5

Understanding gene dosage imbalance in human health using genetics, functional genomics and systems biology.

European Commission. Referencia: 037627-AnEUplody

Entidades participantes: 15

01-SET-2006 30-AGO-2010

Cuantía de la subvención: 515.733€ €

**Coordinator: S.E. Antonarakis. I.P. Work package Mara Dierssen Sotos**

Número de investigadores participantes: 13 (del mismo centro)

Caracterización fenotípica de modelos murinos de trastornos de ansiedad: respuestas emocionales y predisposición a fenómenos de drogodependencia.

Ministerio de Ciencia y Tecnología. Referencia: SAF2004-02808

Entidades participantes: CRG

2004-2007

Cuantía de la subvención: 92.000€

**I.P.- Mara Dierssen Sotos**

Número de investigadores participantes: 4

Modelos Murinos para el estudio de la hipótesis trófica del abuso de sustancias: Perfiles de expresión génica

Ministerio de Ciencia y Tecnología. GEN2003-20651-C06-03

Entidades participantes: CRG

2004-2007

Cuantía de la subvención: 138.000€

**I.P.- Mara Dierssen Sotos**

Número de investigadores participantes: 4

Development and analysis of the efficacy of therapeutic interventions on the cognitive alteration of Down syndrome in murine models.

Fundación Jérôme Lejeune

Entidades participantes: CRG

2004-2006

Cuantía de la subvención: 32.000€



I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: 6

Modelos murinos de sobreexpresión de los receptores nicotínicos A3 (*CHRNA3*), A5 (*CHRNA5*) y B4 (*CHRNA4*), contenidos en la mutación genómica DUP25, implicada en el trastorno de pánico y los trastornos fobicos

Fundació Marató TV3

Cuantía de la subvención: 87.146,76€

Entidades participantes: CRG

2002-2005

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: 4

Efectos de la sobreexpresión de genes en el Síndrome de Down y en el trastorno de ansiedad y estudio de la predisposición a la Trisomía 21 y la Mutación Genómica DUP25

Ministerio de Ciencia y Tecnología. Referencia: SAF2002-00799

Entidades participantes:

2002-2005

Cuantía de la subvención: 370.300€

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

Understanding the chronic neurological alterations of Down Syndrome and their associated Phenotypes and development of molecular Targets for their correction European Commission. Referencia: QLRT-2001-00816

Entidades participantes:

2002-2005

Cuantía subvención: 337.500,85€

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

1.

2. Development and análisis of the efficacy of therapeutic interventions on the cognitive alteration of Down syndrome murine models

Fundación Jérôme Lejeune. Referencia: JMLM/CD/03-123

Entidades participantes:

2002-2003

Cuantía de la subvención: 38.000€

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

Caracterización conductual y farmacológica de modelos murinos de sobreexpresión del gen NTRK3 en el trastorno de pánico y los trastornos fóbicos

Ministerio de Ciencia y Tecnología. Referencia: SAF2001-1231

Entidades participantes:

2001-2004

Cuantía de la subvención: 82.939,67€

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

Sobreexpresión y haploinsuficiencia de Dyrk1A (minibrain) en el retraso mental y el déficit de atención/hiperactividad

Fundació La Marató de TV3

Entidades participantes:

2001 – 2003

Cuantía de la subvención: 57.320,04€

I.P.- **Mariona Arbonés**

Número de investigadores participantes: ND

Implication of Dyrk1A (Minibrain) in learning deficits associated with Down syndrome and their neuromorphological correlates: morphological and chemical characteristics of the pyramidal neuron of the cerebral cortex.

Fundación Jérôme Lejeune. Referencia: 03/3639

Entidades participantes:

2000-2003

Cuantía de la subvención: 23.000€

I.P.- **Xavier Estivill/Mara Dierssen Sotos**

Número de investigadores participantes: ND

Caracterització de BACE2, una possible beta secretasa de APP: generació d'un transgènic de sobreexpressió de BACE2 com un model de malaltia d'Alzheimer

Fundació La Caixa

Cuantía de la subvención: 87.266,91€

Entidades participantes:

2000-2003

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

Validación de modelos murinos de sobreexpresión génica en el cromosoma 16 murino como modelos de neurodegeneración y aproximaciones farmacológicas mediante oligonucleótidos antisentido.

Ministerio de Sanidad FIS. Referencia: 00/0795

Entidades participantes:

2000-2002

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

Desenvolupament i caracterització de models murins de sobreexpressió de gens continguts en la mutació genòmica DUP25, implicada en trastorns de ansietat (pànic).

Fundació La Marató de TV3

Entidades participantes:

1999-2002

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

Estudio genéticos moleculares y funcionales del síndrome de Down y del trastorno de pánico/ansiedad.

Ministerio de educación y ciencia. Referencia: SAF99-0092-C02-01

Entidades participantes: ND

1999-2002

I.P.- **Xavier Estivill Palleja**

Número de investigadores participantes: ND

Modelos murinos de síndrome de Down: caracterización neurológica de transgénicos de sobreexpresión y knockouts de Mnb y Dscr1

Fundación Marcelino Botín

Entidades participantes: ND

1999-2000

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

Murine models for Down syndrome. Development and functional analysis of mouse models for human chromosome 21 genes involved in Down syndrome.

European Comission. Referencia: CEC/BIOMED2 BMH4-CT98-3039

Entidades participantes: ND

1998-2001

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

Estudio de la función y expresión de nuevos genes del cromosoma 21: desarrollo de animales transgénicos para el estudio del síndrome de Down.

Ministerio de educación y ciencia. Referencia: DGCYT PM95-0106-CO2-01

Entidades participantes: ND

1996-1999

I.P.- **Xavier Estivill Pallejà**

Número de investigadores participantes: ND

Influencia de los factores ambientales sobre la función cerebral en animales no seleccionados y con alteraciones genéticas del desarrollo: un análisis funcional, neuroquímico y ultraestructural

Fundación Ramón Areces

Entidades participantes: ND

1995-1998

I.P.- **Jesús Flórez Beledo**

Número de investigadores participantes: ND

Trisomía 21 (síndrome de Down): Estudio neurobiológico e inmunológico y estrategias terapéuticas en un modelo murino, la trisomía 16 parcial

Ministerio de educación y ciencia. Referencia: DGCYT PB94-1063-C02-01

Entidades participantes: ND

1995-1998

I.P.- **Jesús Flórez Beledo**

Número de investigadores participantes: ND

Unidad de Investigación sobre el desarrollo y el envejecimiento: biología, conducta y educación

Fundación Marcelino Botín

Entidades participantes: ND

1995-1997

I.P.- **Jesús Flórez Beledo**

Número de investigadores participantes: ND

## Funding for dissemination activities, networks and congresses

Congreso Bienal Sociedad Española de Neurociencias

MINECO

Cuantía de la subvención: 12.000€

I.P.- **Mara Dierssen Sotos**

Congreso FENS 2012

SAF2012-05895-E

Cuantía de la subvención: 80.000€

I.P.- **Juan Lerma/Mara Dierssen Sotos**

Brain awareness week 2010

FENS

01-Ene-2010

Cuantía de la subvención: 1.000€

Feria Científica: Las Ilusiones del Cerebro

FECYT

01-Jun-2010 31-DIC-2010

Cuantía de la subvención: 14.000€

I.P.- **Mara Dierssen Sotos**

Setmana del Cervell 2010  
Institut de Cultura de Barcelona (ICUB). Ajuntament de Barcelona  
01-Jun-2010 31-DIC-2010 Quantía de la subvención: 9.000€  
I.P.- **Mara Dierssen Sotos**

BCNBRAIN  
Actuacions En L'àmbit De La Divulgació Científica (ACDC) 2010  
01-Ago-2010 31-DIC-2010 Quantía de la subvención: 8.000€  
I.P.-**Mara Dierssen Sotos**

XIII Congreso Bienal De La Sociedad Española De Neurociencia  
SAF2009-05895-E Quantía de la subvención: 15.000€  
I.P.-**Mara Dierssen Sotos**

Fira Científica: Les il·lusions del cervell.  
Institut de Cultura de Barcelona (ICUB). Ajuntament de Barcelona  
01-Jun-2009 31-DIC-2009 Quantía de la subvención: 8.000€  
I.P.- **Mara Dierssen Sotos**

Feria Científica: Las Ilusiones del Cerebro  
FECYT  
01-Jun-2009 31-DIC-2009 Quantía de la subvención: 15.000€  
I.P.- Mavi Sánchez Vives

Scientific Meeting on Down Syndrome: Research, Clinics and Education. "Down syndrome a multidisciplinary perspective"  
Fundación Jérôme Lejeune  
17-DIC-2008 12-FEB-2009 Quantía de la subvención: 13.000€  
I.P.- **Mara Dierssen Sotos**

Art en els límits del cervell.  
Institut de Cultura de Barcelona (ICUB). Ajuntament de Barcelona  
01-ENE-2008 31-DIC-2008 Quantía de la subvención: 3.000€  
I.P.- **Mara Dierssen Sotos**

Arte en los limites del cerebro: un juego de sensación, percepción y creación  
Fundacion Española para la Ciencia y la Tecnología. (FECYT )  
01-ENE-2008 31-DIC-2008 Quantía de la subvención: 6.000€  
I.P.- **Mara Dierssen Sotos**

Identificació i caracterització de noves dianes terapèutiques en malalties neurològiques i psiquiàtriques.

Area de Neurofarmacología. ICIN  
Entidades participantes: ND  
01-ENE-2005 31-DIC-2008  
**IP: Mara Dierssen**  
Número de investigadores participantes: ND

Investigación en red de enfermedades neurológicas  
Instituto de Salud Carlos III (C03/06)  
Entidades participantes: ND  
2003-2006 Quantía de la subvención: 30.849,02€  
I.P.- **Mara Dierssen Sotos**  
Número de investigadores participantes: ND

Red de Centros de Genética Clínica y Molecular "Integración de la Investigación Clínica, Molecular y Epidemiológica en Genética"

Instituto de Salud Carlos III FIS. Redes Temáticas de Investigación Cooperativa

Entidades participantes: ND

2003-2005

Cuantía de la subvención: 40.100€

I.P.- **Luis Pérez-Jurado**

Número de investigadores participantes: ND

Models animals d'enfermetat relacionada amb el sistema nerviós central

DURSI Referencia: 2003 XT / 00093

Entidades participantes: ND

2003-2005

Cuantía de la subvención: 12.000€

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

Xarxa temàtica de models murins d'enfermetat del SNC

CIRIT Referencia: 2000XT/00083

Entidades participantes: ND

I.P.- **Mara Dierssen Sotos**

Número de investigadores participantes: ND

7th Annual Meeting of the International Behavioural and Neural Genetics Society

Agencia de gestió d'ajuts universitaris (AGAUR)

Referencia: 2005ARCS100104

28-ABR-2005 31-DIC-2005

Cuantía de la subvención: 2.000€

I.P.- **Mara Dierssen Sotos**

Congreso IBANGS

International Behavioural and Neural Genetics Society (IBANGS)

01-ENE-2005 31-DIC-2008

Cuantía de la subvención:

23.829,19€

I.P.- **Mara Dierssen Sotos**

Sociedad Española de Neurociencia (SENC)

01-ENE-2005 31-DIC-2008

Cuantía de la subvención: 1.200€

I.P.- **Mara Dierssen Sotos**

The Role of the Cerebral Cortex in Cognitive Ability: what we know and where we go

Fundación Jérôme Lejeune

2004

Cuantía de la subvención: 3.000€

I.P.- **Mara Dierssen Sotos**

IBANGS Annual Meeting Support

National Institute of Health- National Institute on Alcohol Abuse and Alcoholism (NIH-NIAAA)

2002-2006

I.P.- **John Crabbe-Mara Dierssen Sotos**

International Meeting on Chromosome 21 and Down syndrome

Fundación Jérôme Lejeune

2002

I.P.- **Mara Dierssen Sotos**

International Meeting on Chromosome 21 and Down syndrome

Real Patronato de Atención a la Discapacidad

2002

I.P.- **Mara Dierssen Sotos**

International Meeting on Chromosome 21 and Down syndrome  
National Institute of Health-National Institute of Allergy and Infectious Diseases (NIH-NIAAD)

2002

I.P.- **Mara Dierssen Sotos**

International Meeting on Chromosome 21 and Down syndrome  
MICYT Acciones Especiales

2002

I.P.- **Mara Dierssen Sotos**

## Societies (selected)

2017	President of the Trisomy 21 Research Society ( <a href="http://www.t21rs.org">www.t21rs.org</a> )
2013-2015	President of the Spanish Neuroscience Society
2014	Member of the Academia Europaea
2014-	Chair of the Woman in Neuroscience Committee of the Society for Neuroscience
2014-	Member of the "Woman in Science" Commission of the Catalan Government (Comissió Dona I Ciència)
2013-	Member of the Professional Development Committee of the Society for Neuroscience
2013-	Member of the Rigor in Science Committee of the Society for Neuroscience
2010 - 2012	Executive Committee Member of FENS (Federation of European Neuroscience Societies)
2010 -	Member of EDAB (European DANA Alliances for the Brain)
2010 -	Committee Member of COSCE (Confederation of Spanish Science Societies)
2008 -	Member of Barcelona Science Culture Council
2007 - 2009	Vice-president Spanish Society of Neuroscience
2005 -	Member of Barcelona Culture Institute Board of Directors
2003 - 2006	President International Behavioural and Neural Genetics Society
2002 -	Member of the Council of FENS (Federation of Neuroscience Association Societies)

## Technology Transfer

**Patent:** Transgenic mice and overexpression model of gene NTRK3 (TRKC) based thereon for the study and monitoring of treatments of anxiety, depression and related psychiatric diseases. WO 01/06848 A1 and P9901674

**Patent:** Compounds for the treatment of neurodegenerative diseases, P201130033

**Exploitation License** 2008-2018 "Mouse/Rat immobilization system". PANLAB/Harvard: 6% royalties

**Exploitation License** 2008-2018 "Electrified radial arm maze". PANLAB/Harvard: 6% royalties

**Agreement (2018-):** Development of a commercial EGCG formula (Font-Up) in collaboration with Grand Fontaine Laboratories

Method and sonification software and system adaptation of the scalp EEG headsets (Technology Readiness Levels, TRLs, 2-3)

Agreement with ORDESA Laboratories for the development and testing of new nutraceutical products 2015-2020

Agreement with PROUS Laboratories for testing new products for neurodegenerative diseases 2013-

Agreement with Ordesa, SA Ministerio de Industria Universidad de Cantabria: Influencia de los ácidos grasos poliinsaturados en el desarrollo cerebral 1996-1999  
I.P.- Miguel García-Fuentes

## Contracts

Chronic effects of JRP655 for Alzheimer's like defects of cognition

PROUS

Entidades participantes: CRG

2013-2015

Cuantía de la subvención: 20.290€

I.P.- **Mara Dierssen Sotos**

Acute effects of JRP655 in a mouse model for Fragil X Syndrome (FXS)

PROUS

Entidades participantes: CRG

2013-2015

Cuantía de la subvención: 8.333€

I.P.- **Mara Dierssen Sotos**

## Scientific Advisory Boards/Evaluation panels

**Panels:** ANEP, European Research Council, Human Brain Project, ESF College of Expert Reviewers, LonDownS Consortium (Wellcome Trust, UK), European Mouse Mutant Archive (EMMA), Spanish Ministry, ANR-France, Finland Science Foundation, National Polish Science Foundation Panel Expert for European Union (FP6 Call), Scientific evaluation panel of AGAUR (Autonomous Government of Catalonia), Scientific evaluation panel of Consejo Nacional de Ciencia y Tecnología of Argentina (CONCYT) and Sistema Nacional de Ciencia y Tecnología –SINCYT, Scientific evaluation panel of the National Evaluation Agency, Spanish Ministry of Education and Science, Scientific evaluation panel of the Instituto Carlos III, Spanish Ministry of Health

**SAB** Institut Paris-Saclay (France), Strasbourg (France), Institut Guttman, Fundació Sant Joan de Déu, Barcelona (Spain) 2WAYS, EU-Fundació Catalana per la Recerca, Barcelona (Spain)

**Scientific Council:** Jerome Lejeune Foundation, Paris (France), Fundació Catalana Síndrome de Down Barcelona (Spain), Down España (Spain) Federación Española de Enfermedades Raras (Spain), Barcelona Science Council Barcelona (Spain) Fundació Bofill (Spain), DANA Alliances Europe

## Editorial activity

Editorial Board of Acta Neuropathologica, Associate Editor Genes, Brain and Behaviour, Reviewer Editor Frontiers in Neurosciences, Reviewer Editor Frontiers Genetics of Complex Traits, Section Editor Amino Acids, Senior Editor Down Syndrome Research and Practice, Associate Editor, BMC Neuroscience

**Reviewer “ad hoc”** for more than 25 international journals (Nature Neuroscience, Journal of Neuroscience, PNAS, PlosONE, Human Molecular Genetics, Elife, Cerebral Cortex, Brain etc.)

## Teaching Activity (Selected)

Assistant Professor University of Cantabria

Professor of the University Ramón Llull

Professor of the Master in Neurociencias, University of Barcelona-University Pompeu Fabra

Professor of Cellular and Molecular Pathology, University Pompeu Fabra

Professor of the Master in Neurociencias, of the Autonomous University of Barcelona

Professor of the PhD Program in Health and Life Sciences. Genetics and Disease

Professor of the International Postgraduate Program, Life and Health Sciences, Universidade do Minho, Instituto de Investigação em Ciências da Vida e Saúde, Braga, Portugal

Professor of the PENS/Blackwell International summer school Stress, Drug Addiction and Eating Disorders, Dubrovnick

European Neuropathology Course (Organizer). Genomic Regulation Center. 2007

Mouse Phenotyping Course (Organizer). Master in Science and Laboratory Animal Welfare. Autonomous University of Barcelona. Government of Catalonia. 2007

1<sup>st</sup> Stereology Course (Organizer). Genomic Regulation Center. 2007

EMBO International training course, Montevideo, Uruguay. 2005-2007

Summer Neuroscience Course. University of Basque Country. San Sebastián 2007

Summer Course El Escorial, Autonomous University of Madrid, Spain, 2006

FENS Hertie Winter School. Kitzbühel, Austria, 2004

Summer International Course. Fòrum de las Culturas. Pompeu Fabra University, Barcelona, Spain 2004

Master de Comunicació Científica Pompeu Fabra University

PhD Program in Neurosciences, Autonomous University of Barcelona. Biochemistry and Molecular Biology Program and Psychobiology Department Program

PhD Program in Health and Life Sciences. Pompeu Fabra University, Barcelona

Pregraduate Course “Molecular Pathology”. Pompeu Fabra University, Barcelona

Doctorate Course UAM-Centro Nacional de Biotecnología, Madrid, Spain

Graduate Course (Psychophysiology, Professor in charge), Ramón Llull University

## Doctoral Theses

1. **Nuria M. Vivas Sabido**. (PhD 1993) Acción de la tacrina sobre el deterioro cognitivo durante el envejecimiento: influencia del sistema beta-adrenérgico. Universidad Autónoma de Barcelona
2. **Carmela Baamonde Calzada** (PhD 1995) Efecto protector de cambios ambientales selectivos postnatales sobre las alteraciones cognoscitivas asociadas al envejecimiento: correlaciones funcionales neuroquímicas y neuromorfológicas Universidad de Cantabria
3. **Salvador García Calatayud** (PhD 1994) Influencia de una dieta de composición variable en ácidos grasos poliinsaturados en el periodo perinatal sobre diferentes aspectos del desarrollo cerebral Co-supervisor: Miguel García-Fuentes Universidad de Cantabria



4. **Iria Flavia Vallina López-Dóriga** (PhD 1996) Caracterización conductual y neuroquímica de un modelo murino de Síndrome de Down (Ts65Dn) Universidad de Cantabria
5. **Carmen Martínez-Cué** (PhD 2001) Disminución de los déficits cognitivos de modelos murinos de desarrollo patológico mediante programas de estimulación temprana Universidad de Cantabria
6. **X. Altafaj** (PhD 2003). Generation and characterization of transgenic Dyrk1A mice Co-supervisor: Dr. C. Fillat, E. Marti University of Barcelona
7. **M. Martínez de Lagrán** (PhD 2006). Neurodegenerative processes in Dyrk1A mouse models. University of Barcelona **Doctorate Award** 2006
8. **Ignasi Sahún** (PhD 2006). Characterization of transgenic NTRK3 mice as model of panic disorder. Autonomous University of Barcelona
9. **Amador-Arjona A.** (PhD 2008). Susceptibility to stress in a mouse model of panic disorder. University of Barcelona
10. **Arqué G.** (PhD 2008). Role of Dyrk1A in CNS development: implications in Down syndrome. University of Barcelona
11. **Gallego X.** (PhD 2008). NTRK3 as genetic interface in anxiety and drug abuse. University of Barcelona
12. **Azcona G.** (PhD 2009). Engineering DYRK1A overdosage yields Down syndrome-characteristic cortical splicing aberrations. Universidad del País Vasco, Campus de Lejona
13. **Obradors C.** (PhD 2011). Role of TrkC isoforms dysregulation in CNS development. University of Barcelona
14. **Molas S.** (PhD 2012). Nicotine addiction phenotypes in a BAC transgenic mouse model overexpressing the CHRNA5/A3/B4 genomic cluster. University Pompeu Fabra
15. **D'Amico D.** (PhD 2013) Fear memories in TgNtrk3 mice, a model of panic disorder. University Pompeu Fabra
16. **Pons Espinal M.** (PhD 2013) Role of DYRK1A in hippocampal neuroplasticity: implications for Down syndrome University Pompeu Fabra
17. **Silvina Catuara.** Neuroplasticity-targeted therapy for Down syndrome: a translational approach. Cum Laude, UPF 2016
18. **Laura Xicota.** ER-beta receptors (ER- $\beta$ ) as therapeutic targets for the improvement of cognitive performance in diseases leading to intellectual disability. Cum Laude, UPF 2016
19. **Jose Antonio Espinosa.** Development of new computational methods for comparison and analysis of longitudinal data in mouse models of addiction, Cum Laude, UPF 2016
20. **Marta Fructuoso.** Compulsive food seeking behavior in intellectual disability. Cum Laude, University of Barcelona 2017. Selected for **Extraordinary Award**
21. **Marcos Quevedo.** Neural correlates of conscious perception in epilepsy patients. Cum Laude, UPF 2017
22. **Linus Manubens.** Modelling the effect of DYRK1A over-expression on neuronal structure and connectivity of Ts65Dn, a Down syndrome mouse model. Cum Laude, UPF 2018
23. **Mireia Ortega.** Elucidation of the mechanism of action of EGCG on the cognitive phenotype in TgDyrk1A Down Syndrome mice model. Cum Laude, UPF 2018

#### **Master Theses**

1. Antolin B. (Master Thesis 2007). Pompeu Fabra University. "Effect of environmental enrichment on adult neurogenesis in a Dyrk1A overexpressing mice"
2. Pinacho R. (master Thesis 2008). Pompeu Fabra University. "Characterization of neurogenesis in a murine model overexpressing Dyrk1A (TgDyrk1A)"

3. Trutzel A. (Master Thesis 2008). University of Heidelberg. "Implication of, BACE2 a candidate gene for Down syndrome, in Alzheimer's type pathology".
4. Spadoni O. (Master Thesis 2009). University of Bologna "Understanding the impact of panic attacks on brain systems involved in the pathophysiology of panic disorder"
5. Aliagas S. (Master Thesis 2010). University of Barcelona. "Study of the role of DREAM on neuritogenesis"
6. Vila G. (Master Thesis 2010) University of Barcelona. "Synaptic plasticity in a mouse model of nicotine dependence".
7. Vilaro M. (Master Thesis 2010) University of Barcelona. Characterization of the cerebral cortex of the adult murine model of anxiety and panic disorder
8. Clusella S. (Master Thesis 2010) University of Barcelona. "T" maze as a tool to validate the disparity potential, an endophenotype of murine models of schizophrenia
9. Fernandez Vargas I. (Master Thesis 2010) University of Barcelona. "Development of Bioinformatics tools for longitudinal phenotypic analysis. Application to complex disorders"
10. Leo Pascual. (Master Thesis 2010) University of Barcelona. Cerebellar phenotypes in a mouse model of Down syndrome
11. Reis Faleiro M. (Master Thesis 2011). Stony brook University, NY "Overexpression Of Dyrk1a In The Olfactory Bulb In Mice Model Is Involved In Olfactory Impairment Of Down Syndrome Individuals"
12. Güell Bosch J (Master Thesis 2012) University of Barcelona. Overexpression of the human CHRNA5/A3/B4 cluster alters hippocampal structural plasticity
13. Sara Padrell (Master Thesis 2012) University of Barcelona. "Characterization of the PTPR-TrkC pathway: role of TrkC as a synaptogenic molecule in the TgNTRK3 mouse model"
14. Aida Regi (Master Thesis 2012) University Politechnic of Catalunya. "New biocomputational tools for the analysis of behavior"
15. Victoria Brugada (Graduate Thesis 2012) University Pompeu Fabra. Brain morphological differences in Fragile X Syndrome mouse model
16. Sala J. (Graduate Thesis 2013) University of Barcelona. "Activation of GABAergic cells upon acute nicotine administration"
17. Conejo Gonzalez C. (Undergraduate student 2013) University Pompeu Fabra. "Influence of odour on feeding behaviour and nutrient decision-making"
18. Bautista Perpinya M. (Undergraduate student 2013) Maastricht University. "Appetitive odors modulate feeding patterns of highly-palatable foods in C57BL/6 mice"
19. Blasco Perez B. (Graduate Thesis 2013) University of Barcelona.
20. Freixas Brosa R. ((Master Thesis 2013). University Pompeu Fabra. "Alzheimer's disease biomarkers in Down syndrome"
21. Alemany González M. (Master Thesis 2014) "Study of therapeutic effect of new environmental and pharmacological targets in Down syndrome murine models"
22. C. Obradors (DEA 2007). Role of NTRK3 dysregulation in CNS development. University of Barcelona
23. B. Antolin (Master 2007). Environmental enrichment in Down syndrome mouse models. Pompeu Fabra University
24. A. Trutzel (Master Thesis 2007). Implication of, BACE2 a candidate gene for Down syndrome, in Alzheimer's type pathology and characterization of the neuropathological and cognitive effects of cytotoxic protofibrils from peptides derived of natural amyloid proteins in AD mouse models. University of Heidelberg
25. A. Amador-Arjona (DEA 2005). Susceptibility to stress in a mouse model of panic disorder. University of Barcelona
26. G. Arqué (DEA 2005). Role of Dyrk1A in CNS development: implications in Down syndrome. University of Barcelona

27. *X. Gallego* (DEA 2005). NTRK3 as genetic interface in anxiety and drug abuse. University of Barcelona
28. *I. Sahún* (DEA 2004). Characterization of transgenic NTRK3 mice. Autonomous University of Barcelona
29. *M. Martínez de Lagrán* (DEA 2003). Phenotypic characterization of Dyrk1A models. University of Barcelona

## Professional Careers of Former Dierssen Students (only since 2014)

### Postdoctoral fellows

### Actual position

<b>Thomas Gener</b> (France, 2011- 15).	Postdoc in Computational Neuroscience at IMIM Hospital del Mar
<b>Monica Santos</b> (Portugal, 2011-15)	Junior Group Leader, Otto-von-Guericke-Universität, Magdeburg, Germany
<b>Ricardo Gómez</b> (Spain, Juan de la Cierva 2015-2016)	Postdoc associate in computational Neuroscience in La Laguna
<b>Ruggero Gerolamo</b> (Italy, 2016-2017)	Postdoc Theoretical Neuroscience at Institut de Biologie of Ecole Normale Superior, Paris

### Predocctoral Students

### Actual position

<b>Silvina Catuara</b> (Argentina, FPI, 2011-2015).	Jansen Pharmaceutical, Paris, France
<b>Jose Antonio Espinosa</b> (Spain, FPU Catalan Government fellow 2012-2015)	Junior postdoc at CRG
<b>Laura Xicota</b> (Spain, 2011-2016)	Postdoctoral researcher Institut du Cerveau et de la Moelle épinière CNRS, Paris
<b>Marcos Quevedo</b> (México, Shared PhD with Rodrigo Rocamora (Hospital del Mar), CONACYT fellow, 2014-2017)	Neurologist, Institut Dexeus
<b>Linus Manubens</b> (Spain, PhD FI fellowship 2013-2018)	Junior postdoc at IMIM
<b>Mireia Ortega</b> (Spain, PhD Severo Ochoa fellowship 2014-2018)	Lab manager at IDIBAPS, Barcelona
<b>Marta Fructuoso</b> (Spain, CRG fellow, 2012-2017)	Postdoc at ICM, Paris Institute for Brain and Spinal Cord, Paris
<b>Marcin Gorny</b> (Poland, Severo Ochoa fellowship 2016-2017)	Hard Game, Knox Media Hub, SL
<b>Jordi Sala</b> (Spain, 2016-2017).	University of Vic
<b>Ibrahim Tastekin</b> (Turkey, 2016-2018)	Champalimaud Neuroscience Programme, Portugal
<b>Davide D'Amico</b> (Italy, 2011-2014)	CEO Z-Clinics

## Organization of International Meetings (selected last 10 years)

- Chair VII Forum of the Federation of European Neurosciences Societies, Barcelona 2012 (7.000 attendees)
- Chair Biennial Meeting Spanish Neuroscience Society, Granada 2015
- Chair European Down Syndrome Consortium, ECNP. Brussels, 2014
- Program Committee of the Cajal Winter Conferences, Salamanca 2014

Program Committee Expert Workshop on the Biology of Chromosome 21 Washington 2013  
Chair TEDx BCN Deciphering the mind codes, Barcelona 2012  
Chair Principles of information processing in neural systems: how mind emerges from brain. B-Debates, Barcelona 2012  
Chair Program Committee of the Jérôme Lejeune-International Conference. Paris, 2011.  
Chair Organizing Committee Down Syndrome Research Meeting. Down syndrome Research and Treatment Foundation, San Diego, USA, 2010  
Chair Organizing Committee symposium "Down Syndrome: A multidisciplinary Perspective". Society for Neuroscience 2010  
Chair Organizing Committee "Congreso bianual de la Sociedad Española de Neurociencias" (SENC). Tarragona, Septiembre 2009.  
Chair Organizing Committee symposium "Down Syndrome: A multidisciplinary Perspective". Diciembre 2008  
Program Committee Expert Workshop on the Biology of Chromosome 21 Genes: Towards Gene-phenotype Correlations in Down syndrome. Washington 2007  
Symposium organizer Spanish Society of Neurosciences, Valencia, Spain 2007  
Symposium organizer Federation of European Neurosciences Societies Forum Vienna, Austria 2006  
Organizer of the International Neurosciences Seminar Foundation Duques de Soria - Spanish Neurosciences Society, Soria, Spain 2006  
Organizer of the VII Annual Meeting of the International Behavioural and Neural Genetics Society, Sitges, Spain 2005

## Invited Lectures

**2014** Plenary Lecture. Meeting of the French Society of Neuroscience, Montpellier Neuroscience Institute CNR (National Research Council); University of Valencia, IPMC - CNRS Nice; CaixaForum Madrid; Institut de Recerca Germans Trias i Pujol (IGTP); V Jornadas Red Olfativa Española, Asturias; Scuola Normale, University of Pisa; Universidad Mayor Chile; Biotech Annual Congress, BAC2014; FENS, Milan 2014; Gordon Research Conference on the Neurobiology of Brain Disorders; Instituto Cajal, Madrid, E-Rare Symposium, Rome

**2015** Plenary Lecture 12th Polish Neuroscience Society; Plenary Lecture 17th International Fragile X and Early-Onset Cognitive Disorders, Strasbourg; Invited Lecture, Trisomy 21 Research Society, Paris; Gencodys Conference 2015 "Integrative Networks in Intellectual Disability", Crete, Greece; Facultat Biologia (UB), Barcelona; Gender Sensitive Research" 28th ECNP Congress; Minisymposium speaker at Neuroscience 2015, Chicago

**2016** Conference-Debate Nature Pub Group Madrid; TEDEX, Amposta; University of Vic; Plenary Lecture, Academia Europaea, Cardiff; European Parliament, Strasbourg; CORBI courses University of A Coruña; UAB, Barcelona; From molecules to systems: neuropathology, Universidad Internacional Menéndez Pelayo;

**2017** 4th International Seminar on Behavioral Methods, Poland; 29th ECNP Congress, Vienna; Nanyang Technological University, Singapore; Universitat de Lleida; Babraham Institute - EU Life Lecture; V Simposio CERU London; 30th ECNP Congress of Applied and Translational Neuroscience; 42nd FEBS Congress, Israel; FENS regional Meeting, Hungary; Magister Lesson Hospital Universitario Ramón y Cajal,

Madrid; Plenary Lecture II Congreso Nacional de Jóvenes Investigadores en Biomedicina, Valencia; Real Sociedad Menendez Pelayo, Santander

#### **Other (selected)**

Plenary Lecture Down syndrome Conference, México (2013)  
Seminar Wellcome Trust, Cambridge, UK (2011)  
International Conferences Jerome Lejeune Paris (2011)  
Seminar Institut Clinique de la Souris (ICS), Université de Strasbourg (2010)  
Minisymposium 40<sup>th</sup> Meeting of the Society for Neuroscience. San Diego, (2010)  
MIND Institute, UC Davies, Sacramento, California, USA (2010)  
Plenary Lecture, Monod Conferences, Roscoff (2010)  
PECB Invited Lectures, Institut d'Investigació Biomèdica de Bellvitge (2009)  
Plenary Lecture 5th International meeting on cryptic chromosomal rearrangements in mental retardation and autism. Troina, Italy (2009)  
Plenary Lecture University of Padova, Italy (2008)  
5th International meeting on cryptic chromosomal rearrangements in mental retardation and autism. Troina, Italy, April 17-18, 2009  
University of Padova, Italy, October, 2008  
Universidade do Minho, Instituto de Investigação em Ciências da Vida e Saúde, Braga, Portugal 2007, 2010  
Expert Workshop on the Biology of Chromosome 21. Washington, 2007.  
The Hebrew University, Jerusalem, June 2007.  
*Plenary lecture* First International Conference Synapses-Memory-Drug, Addiction and Pain. University of Toronto, Canada 2006  
*Invited talk* Otto-von-Guericke-Universität Magdeburg, Germany, 2006  
*Symposium* FENS Forum 2006 Vienna, Austria 2006  
*Invited talk*, Society of Biology, University of Barcelona, Spain, 2005  
*Symposium* 5th International Conference on Methods and Techniques in Behavioural Research Wageningen, The Netherlands, 2005  
*Invited talk* 6th Transgenesis Technology Meeting 2005, Barcelona, Spain, 2005

## **Publications**

1. D'Amico D, .. Dierssen M. Infralimbic Neurotrophin-3 Infusion Rescues Fear Extinction Impairment in a Mouse Model of Pathological Fear. **Neuropsychopharmacology**. (2017) 42(2):462-472.
2. Ruiz-Mejias M; ...; Dierssen M. Overexpression of Dyrk1A, a Down Syndrome Candidate, Decreases Excitability and Impairs Gamma Oscillations in the Prefrontal Cortex. **The Journal of Neuroscience**. (2016) 36(13):3648-59
3. Espino Gaurch M, ... Dierssen M, Varela-Nieto I, Gasparini P, Palacín M, Nunes V. Mutations in L-type amino acid transporter-2 support SLC7A8 as a novel gene involved in Age-Related Hearing Loss. **Elife**. 2018 Jan 22; 7. pii: e31511.
4. Espinosa-Carrasco J, ... Dierssen M. Time-course and dynamics of obesity-related behavioral changes induced by energy-dense foods in mice. **Addiction Biology** (2018) Jan 10. doi: 10.1111/adb.12595. [Epub ahead of print]

5. Burokas A, ...Dierssen M, Maldonado R. Extinction and reinstatement of an operant responding maintained by food in different models of obesity. **Addict Biol.** 2017 Dec 28. doi: 10.1111/adb.12597. [Epub ahead of print]
6. Fourcade S... Dierssen M, Ferrer I, Villarroya F, Pamplona R, Vaquero A, Portero-Otín M, Pujol A. Loss of SIRT2 leads to axonal degeneration and locomotor disability associated with redox and energy imbalance. **Aging Cell.** 2017 Oct 5. doi: 10.1111/accel.12682. [Epub ahead of print]
7. Fructuoso M, ... Dierssen M. Increased levels of inflammatory plasma markers and obesity risk in a mouse model of Down syndrome. **Free Radic Biol Med.** 2017 114:122-130
8. Gómez-Grau M, ... Dierssen M, Vilageliu L, Grinberg D. New murine Niemann-Pick type C models bearing a pseudoexon-generating mutation recapitulate the main neurobehavioural and molecular features of the disease. **Science Reports.** 2017 7:41931.
9. Fenoll R, Pujol J, Esteba-Castillo S, de Sola S, Ribas-Vidal N, García-Alba J, Sánchez-Benavides G, Martínez-Vilavella G, Deus J, **Dierssen M**, Novell-Alsina R, de la Torre R. "Anomalous White Matter Structure and the Effect of Age in Down Syndrome Patients". **Journal of Alzheimer's Disease.** 2017;57(1):61-70
10. Gómez-Grau M, Albaigès J, Casas J, Auladell C, **Dierssen M**, Vilageliu L, Grinberg D. "New murine Niemann-Pick type C models bearing a pseudoexon-generating mutation recapitulate the main neurobehavioural and molecular features of the disease". **Scientific Reports.** 2017 Feb 7;7:41931
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### **Libros y capítulos de libro**

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