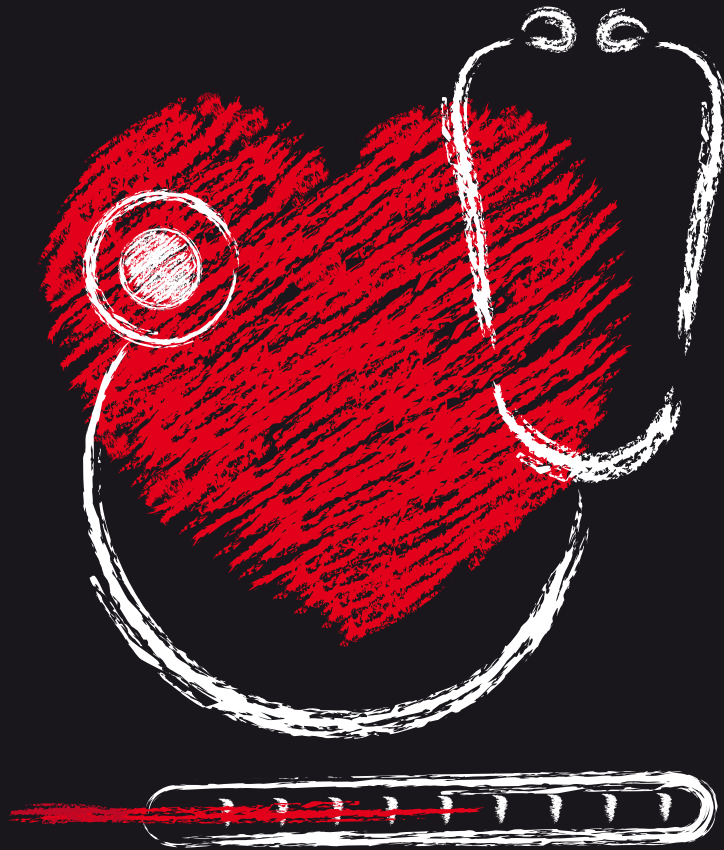


report 2013



research

science

innovation

commitment



Index

Introduction	3
Governing and advisory bodies	4
Services and infrastructures	5
Financial resources management	5
Consolidated research groups	
Developmental cancer	6
Low-prevalence genetically-based neurological disorders in paediatrics	12
Etiopathogeny and treatment of severe mental disorders	21
Adult-age disorders originating in the foetal period or in the early years of life	30
Infectious diseases and systemic inflammatory response in paediatrics	38
Research and innovation in surgery	45
Healthcare technologies and results in primary care and mental health	47
Emerging research groups	
Influence of the environment on child and adolescent welfare	50
Clinical and epidemiologic research on high-prevalence disorders	51
Research groups under formation	
Research on nursing, education and society	54
Impact factor	57
Activities	57
Scientific seminars	58



Introduction

The year 2013 Report of the Sant Joan de Déu Research Foundation covers the work carried out by an outstanding group of professionals who have endeavoured to produce new knowledge. The results presented here would not have been possible without the contributions of many different professionals: physicians, basic researchers, technicians, advanced degree holders from diverse fields, nursing personnel and administrative staff, among others.

The Foundation's job is set within the framework of the activity of the Hospitaller Order of St. John of God which, with its spirit of hospitality and its universal character, seeks to shelter, care for and help people, especially those who are most vulnerable and those with problems involving social integration or health.

The mission of the Foundation is to contribute to the improvement of the health and welfare of people, fostering, supporting and coordinating research and innovation at the centres of the Order of St. John of God in accordance with its values, striving to achieve efficiency and to carry out its tasks through networked operation while bearing in mind at all times our ethical commitment and our scientific and social outlook.

The Foundation's research is organised around our consolidated research groups, on which further information is provided in this report, and our emerging groups and groups under training, which are also listed in this document. Our research covers seven areas of knowledge, primarily within the fields of maternal and children's health and of mental health although some groups are also researching in other fields, notably including that of socially vulnerable populations.

In the year 2013, a total of 153 research projects were carried out, 139 of which received funding from Spanish entities and 14 from international entities. Likewise, 74 clinical trials and 48 post-observational studies were conducted. The biobanks of our two hospitals (Sant Joan de Déu Healthcare Park and Hospital Sant Joan de Déu) continue to form part of the Biobank RETICS (Thematic Network for Cooperative Health Research) of the Carlos III Health Institute. Special mention should be made of our research groups' firm will to foster networking, as is made patent by their membership in cooperative research structures promoted by the Carlos III Health Institute. We have formed part of the CIBERs (Biomedical Network Research Centres) for Rare Diseases, Diabetes and Mental Health, respectively. We have also formed part of RedIAPP (thematic networks for primary healthcare), of SAMiD (Network for Maternal-Child Health and Development), and of iTEMAS (innovation in medical and healthcare technologies). In addition to promoting collaborations at national level, we are strengthening our international cooperation: for example, we are present in the European Innovation Partnership on Active and Healthy Ageing (EIP-AHA), we participate in the European COST network in the field of social sciences and humanities, and we lead another COST network in the field of Forensic Psychiatry. Within the European context, it may be noted that we participate in various initiatives, including a total of 13 projects of the 7th Framework Programme and of the SANCO Public Health Programme, both of which are promoted by the European Commission. We would also note that one Marie Curie Reintegration Grant project has been started, as well as 11 FIS projects awarded by the Carlos III Health Institute, which include one Río Hortega grant, one Sara Borrell contract, and two intensification programmes.

While the Foundation continues to focus on the transfer of knowledge, innovation has continued to be an area of special importance and interest. In addition to the patents which it already holds, the Foundation has been working over the course of the year to obtain patents for five new inventions.

All this has entailed a significant increase in the funds devoted to research. This year the Foundation's budget totalled about 5.9 million euros and we achieved a total impact factor of 849 points.

We do not wish to conclude these words without expressing our gratitude to the people who have made all this activity possible. Firstly, we wish to thank the people who have suffered illnesses and their families for helping us to achieve a better understanding of health problems by cooperating on our projects. We are also especially thankful for the help we have received from the Foundation's donors and volunteers who, since with their effort and contributions they provide us with resources that are essential to further research. Their support lends added value to our endeavours as it goes to show that our work has a bearing and an impact on society.

Emili Bargalló Angerri
Director of the Foundation



Governing and advisory bodies

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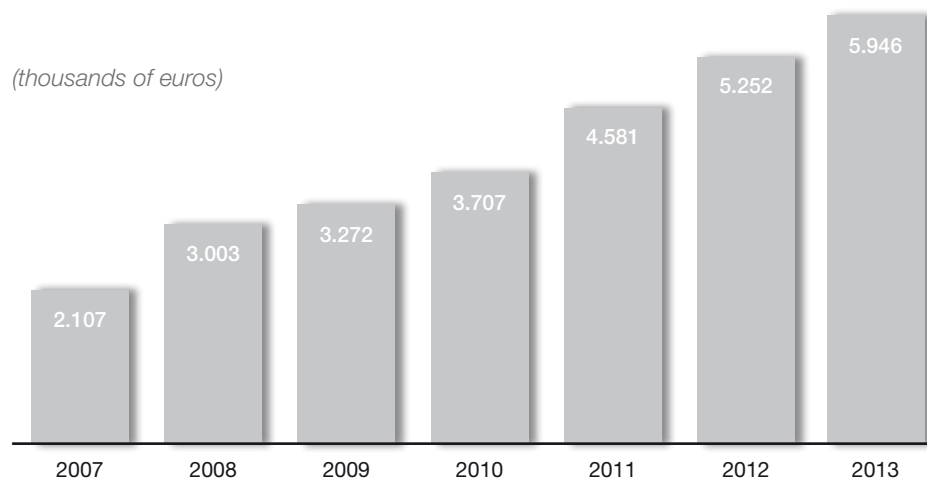
Services and infrastructures

The Sant Joan de Déu Research Foundation makes available to its researchers a set of fundamental services and infrastructures for the performance of their projects.

In order to facilitate high-level research, the Foundation offers its professionals technical, scientific and support services as well as the most suitable infrastructures required to carry out their work:

- Methodological and statistical support
- Neurological tissue bank, paediatric biological tissues bank and tumour bank
- Library
- Animal housing facility
- Molecular diagnosis laboratory
- Sequencing unit

Financial resources management





Consolidated research groups

Developmental cancer

This group is devoted to clinical and translational research on developmental tumours. Its main goals are: 1) the development of the molecular and cellular biology techniques required for the diagnosis and monitoring of patients affected by developmental tumours, and 2) research on improvements in the diagnosis, prognostic capacity and treatment of developmental tumour patients.

Research team

Coordinator	Dr. Jaume Mora
Laboratory lead researchers	Guillermo Chantada, M. ^a Inmaculada Hernandez, Mireia Camós, Carmen de Torres, Cinzia Lavarino and Ángel M. Carcaboso
Clinical lead researchers	Ruben Berruoco, Albert Català, Ofelia Cruz, Veronica Celis, Andreu Parareda, Susana Rives, Héctor Salvador, Montserrat Torredadell and Andres Morales
Post-doctoral researchers	Carla Casalà, Estel Gil, Gemma Mayol, Sara Sanchez, Silvia Mateo and Carlos Rodríguez
Pre-doctoral researchers	Nerea Castrejón, Soledad Gómez, Nagore Gené, Guillem Pascual, Carles Monterrubio, Roberta Malatesta and Nerea Vega
Laboratory and tumour bank technicians	Eva Rodriguez, Isadora Lemos and Noelia Salvador

Research lines

Preclinical pharmacology and drug release in solid tumours

Dr. Ángel Montero Carcaboso

Search for new pharmacological treatments in solid tumours (neuroblastoma, diffuse intrinsic pontine glioma/ DIPG, Ewing's sarcoma, retinoblastoma). Study of chemotherapy agent penetration in preclinical models of solid tumours. Development of preclinical models of disorders (neuroblastoma, DIPG, rhabdomyosarcoma, Ewing's sarcoma, retinoblastoma) from biobank samples. Development of new systems of chemotherapy release in solid tumours.

Leukaemia and non-malignant blood disorders

Dr. Mireia Camós Guijosa

The main goal of this research line is to deepen our knowledge of the etiopathogeny and molecular bases of paediatric blood disorders and to succeed in translating into clinical practice new diagnostic, prognostic and therapeutic tools for dealing with them. Research has been started on the role of the haematopoietic stem cell regulatory pathways in infants under 12 months of age with acute leukaemia.



Prognostic molecular markers in neuroblastoma

Dr. Cinzia Lavarino

Development of molecular biomarkers allowing precise objective classification of neuroblastic tumours with differing clinical behaviour. Identification of treatment response markers; study of chemoresistance mechanisms in neuroblastoma; characterization of genetic and epigenetic mechanisms involved in tumorigenesis of neuroblastoma and study of modulation mechanisms of gene expression.

New therapeutic targets in neuroblastoma

Dr. Carmen de Torres

Analysis of expression and function of the calcium-sensing receptor (CaSR) and parathyroid hormone-related peptide (PTHrP) in neuroblastoma. Evaluation of genetic and epigenetic mechanisms controlling their expression. Examination of the therapeutic potential of regulating these molecular targets.

Translational research in neuroblastoma and Ewing's sarcoma

Dr. Jaume Mora

Study of the phenotypic and genotypic characterization of the various clinical subtypes. Research on the existence of tumoral or progenitor stem cells. Improvement of the treatment of patients through preclinical pharmacology studies. Development and evaluation of new treatment protocols for Ewing's sarcoma.

Translational research on central nervous system tumours

Dr. Ofelia Cruz and Dr. Andrés Morales

Development and evaluation of new treatment protocols. Definition of the prognostic characteristics of the various paediatric gliomas. Characterization of molecular changes involved in paediatric brain tumours (gliomas, DIPG, medulloblastomas, ependymomas and others).

Integral treatment of patients with retinoblastoma

Dr. Andreu Parareda and Dr. Guillermo Chantada

Integral treatment of retinoblastoma patients, with special emphasis on treatment with intra-arterial chemotherapy (IAC). Treatments with various protocols of induction or post-surgery systemic chemotherapy, depending on the histological criteria of risk and treatment with chemotherapy. Medium- and long-term monitoring of patients with RTB background and especially of those treated with IAC.

Active projects

- Search, validation and clinical translation of new therapeutic targets based on the study of genomics and integrative proteomics in Ewing's sarcoma. Scientific Foundation of the Spanish Cancer Association (AECC). 2013-2018. LR: Jaume Mora.
- The International Neuroblastoma Research Collaborative (INBRC) 2013. LR: Brian Kushner. Research team: Jaume Mora and Stephen Lewis. Immunotherapy with a KLH conjugated trivalent vaccine containing GD2-lactone, GD3-lactone and polysialic acid given with OPT-821 for relapsed/recurrent high risk neuroblastoma. \$500,000. 2013-2015
- AECC Foundation 2012. Grant of the advanced training in oncology programme, to Dr. Lucas Krauel. Mentor: Jaume Mora. British Council School. 2012-2013.
- CHD5, PAFAH1B1 and NME1: Markers for prognosis and prediction of therapeutic response in neuroblastoma. Chemoresistance mechanisms. PI11/02661. Carlos III Health Institute. 2012-2014. LR: Cinzia Lavarino.
- CHD5, PAFAH1B1 and NME1: Markers for prognosis and prediction of therapeutic response in neuroblastoma. Chemoresistance mechanisms. BR201102. Hospital Sant Joan de Déu – Esplugues. 2012-2015. LR: Cinzia Lavarino.



- Chemotherapy of neuroblastoma. Marie Curie Fellowship PIRG08-GA-2010-276998 European Commission. 2011-2015. LR: Angel M. Carcaboso.
- Limited distribution of drugs in tumoral microenvironment as the cause of chemoresistance in neuroblastoma. Call for proposals: National R&D&I Programme, Fundamental Research Projects Subprogramme 2011; Category A: Young Researcher. Ministry of Science and Innovation. 2012-2014. LR: Ángel M. Carcaboso.
- Study of molecular pathways regulating haematopoietic progenitor cells in paediatric leukaemias with rearrangement of gene MLL. PI12/02417. Carlos III Health Institute. 2013-2015. LR: Mireia Camós.
- Study of molecular pathways regulating haematopoietic progenitor cells in paediatric leukaemias with rearrangement of gene MLL. BR201202. Hospital Sant Joan de Déu. 2013-2016. LR: Mireia Camós.
- Preclinical study of the effectiveness of inhibitor TG101348 in ex vivo cells of acute lymphoblastic leukaemia: evaluation of the disease in vivo in immunodeficient mice. Foundation for Biomedical Research of La Princesa University Hospital (FIBHUP). 2013-2014. LR: Mireia Camós.
- Evaluation of the calcium-sensing receptor as a new tumour-suppressing gene and therapeutic target in neuroblastoma. Private Foundation CELLEX. 2011-2013. LR: Carmen de Torres.
- Preclinical and translational pharmacology in neuroblastoma. Call for proposals: Grants for oncology researchers 2010; Category B: Return. AECC-2010. Scientific Foundation of the Spanish Cancer Association. 2010-2014. Researcher: Ángel M. Carcaboso. Project director: Jaume Mora.
- Multi-centre study on the treatment of tumours of the Ewing's sarcoma family in children and young adults. Fero Foundation. 2009-. LR: Jaume Mora.
- Research group on developmental tumours. Agency for the Management of University and Research Grants (AGAUR). (2009SGR436). 2010-2014. LR: Jaume Mora.
- Research on Ewing's sarcoma. Pablo Ugarte Association. 2011-. LR: Jaume Mora.
- Limited drug distribution to tumour microenvironment as a mechanism of chemoresistance in neuroblastoma. BBVA Foundation. 2012-2014. LR: Ángel M. Carcaboso.
- Molecular mechanisms involved in the development of paediatric leukaemias. Scientific Foundation of the Spanish Cancer Association (AECC). 2012-2015. LR: Mireia Camós.
- Neuroblastoma NEN. Association of Families and Friends of Patients with Neuroblastoma. 2012-. LR: Cinzia Lavarino.
- Chemotherapy directed with nanoparticles coated with antineuroblastoma antibodies. PRI-AIBAR-2011-0977. Ministry of Science and Innovation. 2011-2013. LR: Ángel M. Carcaboso.
- Biobanks RETICS HSJD – Paediatric bank. RD09/0076/00057. Carlos III Health Institute. 2010-2014. LR: María Victoria Cusí.

Clinical trials

- Chimeric recombinant monoclonal antibody CH 14.18. SIOPENRNET002. 2013-. LR: Jaume Mora Graupera.
- Prospective multi-centre uncontrolled phase III clinical trial of intensive chemotherapy, surgery and radiotherapy in tumours of the Ewing's sarcoma family in children, adolescents and adults. GEIS-21. 2011-. LR: Jaume Mora.
- Open single-arm phase II trial with irinotecan in combination with cisplatin in paediatric patients with poor prognosis gliomas. HSJD-GLIOMAS-IC. 2009-. LR: Ofelia Cruz.
- Prospective multi-centre phase II trial with gemcitabine and rapamycin in second line for metastatic osteosarcoma. GEIS 29. EC11-444 OSTEOSARC. 2013-. LR: Jaume Mora.
- Single-centre open non-randomised phase II trial of intra-arterial chemotherapy with melphalan for treatment of retinoblastoma (RTB) in advanced intraocular phase. LR: Andreu Parareda.



- Randomised open comparative dose-search phase 1/2 combined study to evaluate the effectiveness and safety of plerixafor together with standard regimes for mobilization of haematopoietic stem cells in peripheral blood, and subsequent collection by apheresis vs. standard regimes alone for mobilization in paediatric patients from 2 to <18 years of age with solid tumours meeting the requirements for autologous transplantations. MOZ15609. 2011-. LR: Susana Rives.
- Multi-centre adaptive randomised open pharmacodynamic and pharmacokinetic phase IB study of oseltamivir (Tamiflu®) in the treatment of influenza in immunocompromised children and adolescents, from 0 to 18 years, with confirmed influenza infection. NV25719. 2014-. LR: Rubén Berrueco.
- Phase II clinical trial to evaluate the safety and tolerability of nebulized amphotericin B lipid complex (Albecet) for prophylaxis of invasive pulmonary aspergillosis during prolonged neutropaenia in paediatric patients with acute leukaemia. EC10-173. Ministry of Health and Social Policy. 2011-2013. LR: Jesús Estella Aguado.
- Phase I/II study of sunitinib in young patients with advanced digestive stroma tumour. A6181196. 2013-. LR: Ofelia Cruz.
- Comparative multi-centre open randomised phase 3 study of TH-302 in combination with doxorubicin vs. doxorubicin alone in subjects with unresectable or metastatic locally advanced soft tissue sarcoma. LR: Jaume Mora.
- Active comparator-controlled randomised partly masked phase IV study to evaluate the pharmacokinetics/pharmacodynamics, safety and tolerability of fosaprepitant in paediatric patients for prevention of emetic chemotherapy-induced nausea and vomiting (CINV). 0517-029. 2013-. LR: Jaume Mora.
- Randomised open comparative multi-centre phase II study of bevacizumab treatment in paediatric patients with recently diagnosed high-grade supratentorial glioma. BO25041. 2012-. LR: Ofelia Cruz.
- Phase II study of ipilimumab in children and adolescents (from 12 to <18 years) with unresectable malignant melanoma in stage III or stage IV, previously treated or untreated. CA184-178. 2013-. LR: Ofelia Cruz.
- Controlled randomised open multi-centre phase III study to evaluate the safety and effectiveness of oral LDE225 vs. temozolomide in patients with relapsed medulloblastoma with Hh pathway activated. CL-DE225C2301. 2013-. LR: Ofelia Cruz.
- Intergroup study for children and adolescents with non-Hodgkin's B lymphoma or lymphoblastic B-cell leukaemia; evaluation of effectiveness and safety of rituximab in high-risk patients. IGR2009/1593/Inter-B-N-HL ritux 2010. 2012-. LR: Verónica Celis.
- First intergroup international study of classic Hodgkin's lymphoma in children and adolescents. Euro-net-PHL-C1. 2012-. LR: Ofelia Cruz.

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- Berrueco R, Rives S, Català A, Toll T, Gene A, Ruiz A, Badosa R, Claramonte MA, Estella J, Urrea M. Prospective surveillance study of blood stream infections associated with central venous access devices (port-type) in children with acute leukemia: an intervention program. *J Pediatr Hematol Oncol* 2013. 35: -0. FI: 0,973(Q3)
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Patents

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- National 201030942: Method for prognosis of developmental tumours and use of gene methylation inhibitors for their treatment. Owner: Hospital Sant Joan de Déu. Inventor: Carmen de Torres.
- National/European P201231207 (2012): Use of cinacalcet for treatment of neuroblastic tumours. Owner: Hospital Sant Joan de Déu. Inventor: Carmen de Torres.
- European Patent Application 12162338.3-1219. Nonwoven membrane as drug delivery system. Date 30/03/2012. Owners: Hospital Sant Joan de Déu and Polytechnic University of Catalonia (UPC). Inventors: Àngel Montero Carcaboso, José Antonio Tornero García and Joan Bertrán Llavina.
- National 2013: Method of prognosis of neuroblastic tumours. Owner: Hospital Sant Joan de Déu. Inventor: Carmen de Torres.

Supervised Thesis

- Gemma Mayol Ricart. Expression pattern of three genes as prognostic prediction marker in neuroblastoma. Transcriptional regulation mechanisms and function of selected genes. Cellular Biology Department, University of Barcelona. Supervision: Dr. Jaume Mora and Dr. Cinzia Lavarino. Barcelona, 21 March 2013.
- Carla Casalà Albacete. Analysis of the expression and function of the calcium-sensing receptor in developmental tumours. Cellular Biology Department, University of Barcelona. Supervision: Dr. Carmen de Torres. Barcelona 12 July 2013.



Low-prevalence genetically-based neurological disorders in paediatrics

This group researches inborn errors of the intermediate and energetic metabolism, neurometabolic disorders of expression in the central nervous system, and neuromuscular and neurogenetic disorders. This involves patient-oriented research since diagnostic and treatment-related aspects are primarily considered, although other more basic aspects of research are dealt with through cell cultures and the search for new biochemical/genetic markers and pathophysiologic mechanisms. This research group is integrated in the Centre for Biomedical Network Research on Rare Diseases (CIBERER).

Since 2005, it has developed various research lines connected with the diagnosis, treatment and study of the pathophysiological mechanisms of genetically-based rare diseases. This progression has consolidated Hospital Sant Joan de Déu as a reference centre for some of these diseases, such as phenylketonuria. Moreover, Sant Joan de Déu's Neuropaediatrics Service is a national reference for the study and treatment of rare diseases in the paediatric age. The situation at present is very appropriate for the development of various lines of research in collaboration with reference centres and basic research institutions.

Research team

Coordinators Dr. Jaume Campistol and Dr. Rafael Artuch

Researchers Judith Armstrong, Rafael Artuch, Jaume Campistol, Mercedes Casado, Jaume Colomer, Héctor Díez, Carme Fons, Àngels García-Cazorla, Rosa Gassió, Maria Julieta González, Cecília Jiménez-Mallebrera, Loreto Martorell, Raquel Montero, Andrés Nascimiento, M.^a del Mar O'Callaghan, Aida Ormazabal, Carlos Ortez, Belén Pérez, Mercè Pineda, Pilar Poo, Mercedes Serrano, Cristina Sierra and M.^a Antonia Vilaseca

Laboratory technicians and research support personnel Jordi Genovès, Edgar Gerotina, Juan Moreno, Montserrat Naudó, Sonia Paco, Rosa Maria Puig, Montserrat Quintana, M. Ángeles Rodríguez, Alba Tristán, Nuria Brandi, Andrea Palacio, Marc Turon, Laura Callejón and Carlos Javier Rodríguez

Research lines

PKU and other intermediate metabolism defects

Dr. Jaume Campistol

The fact that our hospital institution is a reference centre for phenylketonuria in Catalonia has allowed us to study in depth the pathophysiological mechanisms involved in this disease in our patients and to test new treatments aimed to improve their metabolic control and neurologic prognosis. Our studies have led to the conclusion that some neuropsychological and neurological alterations are associated, on the one hand, with metabolic control, and on the other with antioxidant deficiencies. We have begun new treatments (with tetrahydrobiopterin) on our patients with phenylketonuria that have provided a better metabolic control and the possibility of freeing them from the special diet they were following. The monitoring of this treatment will be an important subject of study for the next three years. With respect to other disorders of the intermediate metabolism, mention should be made of our work on disorders of the metabolism of homocysteine and other amino acids, primarily addressed to characterising new disorders and new phenotypic presentations.

Specific goals:

In connection with phenylketonuria, we will carry out the FIS project called "Study of biochemical markers of dopaminergic and serotonergic neurotransmission in relation to neurological and neuropsychological alterations in phenylketonuria" (LR: Dr. Campistol). In this study we seek to investigate whether it is possible to evaluate the state of neurotransmission in the central nervous system by means of the analysis of biomarkers in peripheral fluids (blood and urine) and their correlation with clinical evolution as well as with the response of the various treatments available to phenylketonuria patients.



With respect to other disorders, we hope to be able to identify new defects of the intermediate metabolism and new clinical and biochemical phenotypes. The advances in massive sequencing tests will make it possible to achieve this goal. We have already obtained our first result: the identification of two patients with a new disorder of catabolism of the branched-chained amino acids; this is the second description of this disorder (García Cazorla et al., *Hum Mut* 2014, in press).

Our transfer activities: Aside from our purely scientific activities, which will be made known through the usual media (publications, presentations at conferences), the aspects more closely applied to society will be disseminated through the platform www.guiametabolica.org, just as has been previously explained.

Internationalisation activities: At the present time, our internationalisation activity is of appropriate scope since we are involved in the DG-SANCO project for the registering of patients with intoxication disorders (our group's LR: Dr. García-Cazorla). In this project we are in charge of entering the data of all the patients of the collaborating hospitals in Spain.

It should be pointed out that our group and the Hospital Vall d'Hebron group are the two reference centres designated by the Government of Catalonia to follow up the newborn patients detected in the expanded early diagnosis programme, which got underway in February 2013. Additionally, the CSUR (Reference Centres, Services and Units of the Spanish Health System) audit to accredit the Metabolic Disorders Unit as a national reference centre was carried out on for 27 February 2014.

Mitochondrial energy metabolism and ataxias

Dr. Rafael Artuch and Dr. María del Mar O'Callaghan

In this research line we have analysed the clinical and biochemical aspects of childhood mitochondrial encephalomyopathies due to the change of oxidative phosphorylation, and the effect of treatment with various therapies. This research line has been possible thanks to stable collaborations with reference centres within the context of the CIBERER network and the development of research projects financed and coordinated by FIS. We have developed a research line for the diagnosis of primary and secondary deficiencies of coenzyme Q. This research line has been possible thanks to the grant of three consecutive FIS projects for the investigation of this subject.

Specific goals:

Development of the FIS project called "Phenotypic and molecular characterisation of the coenzyme Q deficiency syndrome". This project, which is coordinated with the research group of Pablo de Olavide University (UPO) in Sevilla, covers aspects of patient-oriented research (improvement of diagnostic tools, treatments with new drugs) and aspects of basic science relating to the development and phenotyping of mouse models with coenzyme Q deficiency. In this project, the activity of greatest importance is the analysis of the exome of 10 families with disorders of unknown origin who have in common a coenzyme Q deficiency. By means of this massive sequencing study, we hope to be able to identify new disorders.

Our transfer activities —aside from our scientific studies, which will be made known through the usual media: publications, presentations at conferences, meetings— will cover the aspect most closely applied to society through the use of the platform www.guiametabolica.org, just as we have previously explained. After conducting a clinical trial with ubiquinol (a new form of coenzyme Q), it is planned to request the EMA to grant the orphan designation for this drug.

Lastly, with respect to the internationalisation of our activity, it is planned to apply for a European project on coenzyme Q deficiencies in human pathology within the framework of the call for proposals Horizon 2020.

Applied research on neuromuscular disorders

Dr. Cecilia Jiménez-Mallebrera and Dr. Andrés Nascimiento

Our research lines are currently focused on two main areas:

1. Muscular dystrophies, including Duchenne muscular dystrophy (DMD) and congenital muscular dystrophies (CMD), with special attention to the role of the extracellular matrix and collagen VI in muscular dystrophies, and to the study of fibrosis and the proliferation of the adipose tissue.
2. The second group of disorders that we investigate is that relating to mitochondrial myopathies of nuclear origin, with special attention to mitochondrial DNA depletion syndromes.
3. Lastly, as a transverse activity, we are working on the development of biomarkers in serum and tissues (soluble factors and microRNA) for the diagnosis of these disorders and the monitoring of clinical trials.



In both cases, by means of high-performance techniques such as microarrays, bioinformatics and cell models, the gene expression footprint of patients' muscle has been determined in comparison to healthy muscle. This has allowed the identification of new pathophysiological mechanisms and diagnostic markers for these disorders.

In collaboration with the University of Barcelona and CIBERDEM, we have described a new function for collagen VI in the regulation of glucose metabolism in muscle cells and adipocytes. This finding forms the basis of a pending patent.

The general goals of this research line for the next three years are:

1. To deepen our knowledge of the pathophysiology of children's neuromuscular disorders with a view to identifying possible therapeutic targets.
2. To improve pathological and molecular diagnosis. To obtain a precise genetic diagnosis in all patients and to identify new candidate genes.
3. To facilitate research through the collection of tissues and cells, through cooperation with other centres and through the training of technical and research personnel.

Our transferability plans are reflected in the two patents for which we have applied (PCT/EP2013/074038 and P201231787), as mentioned above.

Internationalisation plans: Participation in the European TREAT-NMD network (www.treat-nmd.eu). Through this network, to which Dr. Jiménez-Mallebrera has belonged since 2012, we have plans to participate in various actions, such as a COST action (www.exonskipping.eu) and a research project on new biomarkers (Bio-NMD, www.bio-nmd.eu).

Neurometabolic disorders with expression in the CNS

Dr. Ángels García-Cazorla and Dr. Aida Ormazabal

We have been studying these metabolic disorders since 2003 while collaborating with various centres in Spain, Portugal, Greece, Argentina, Turkey and India, among other countries. We basically study dopamine and serotonin disorders and, since quite recently, GABA disorders. From the clinical standpoint, patients show severe encephalopathies that are detected by the specific study of this neurotransmitter in cerebrospinal fluid (CSF). Our main goal is diagnosis with a very strong focus on therapy since many of these disorders have a treatment that can improve or normalise the patient's clinical condition. Likewise, our translational research presents some interesting aspects, including the incorporation of studies on CSF proteomics and on cell lines with deficiencies involving tyrosine hydroxylase (a rate-limiting enzyme in dopamine synthesis), which are analysed by different cell biology and electrophysiology techniques. We have been able to include these new procedures in our research thanks to the establishment in recent years of our laboratory for the study of neuron synapses in paediatric neurologic disorders, primarily conceived for research on synaptic metabolism.

Consequently, we are working most actively in this research line on the following aspects:

- Study of neurotransmitters (dopamine, serotonin and GABA) and pterins: primary and secondary changes.
- Analysis of synaptic proteins and neuronal growth factors.
- Cell model of tyrosine hydroxylase disorder.

Internationalisation goals and activities for the next three years:

1. Development of the FIS project called "Biomarkers of cerebral neurotransmission alteration in paediatric encephalopathies of genetic origin: studies on patients and on a cellular model", which will be under performance until 2015. This project includes clinical, biochemical, electrophysiological and molecular studies aimed to provide a better understanding of neurotransmission defects in childhood.
2. Development of an international research project called "Connecting the Growing Brain". The main idea behind this project is to connect various aspects of paediatric neurology which are currently fragmented, posing an obstacle to a more holistic comprehension of brain disorders in paediatric patients. On the basis of what the rare neurometabolic disorders teach us and the model that they provide, it will be attempted to connect such disorders with other more prevalent ones (for example, Parkinson's, Alzheimer) through the study of synaptic communication systems (the neurotransmitters and proteins involved). The project has a website which is under construction at the present time but which already conveys the basic ideas on which it is based: www.connectingthegrowingbrain.com. In order to achieve financing for this ambitious project, we will apply for funds from the European Union within the framework of the call for proposals Horizon 2020, in addition to submitting it to the INTERCIBER call for projects, which has recently been announced.



3. Moreover, we will take part in an action of European scope coordinated by Dr. Thomas Opladen of the Kinder- und Jugendmedizin Zentrum of Heidelberg (Germany) involving a register of patients with inborn errors of neurotransmitter metabolism (INTD database).
4. Lastly, we are working on the "Inherited NeuRoMetabolic Diseases Information Network" project (see the chapter on financed projects).

Vitamin-sensitive movement disorders

Dr. Belén Pérez-Dueñas and Dr. Mercedes Casado

The researchers of the Neuronal Development and Metabolic Disorders Group belong to the Unit for Assistance on Movement Disorders Caused by Rare Diseases. This unit, which is formed by specialists of Hospital Sant Joan de Déu and Hospital Clínic de Barcelona, seeks to be designated a reference unit of the Spanish National Health System. In the last 5 years, the group has devoted itself to a research line on vitamin-sensitive movement disorders. These are defects in genes responsible for the transport, synthesis and processing of vitamins. The disorders of this type affect the developing central nervous system and may produce processes of acute and/or progressive encephalopathy, mitochondrial energetic deficit and brain myelination disorders. Their identification is a priority since the early administration of large doses of vitamins may bring about a spectacular improvement in patients. This research line has been possible thanks to the performance of the following research projects financed by FIS:

- Study of defects in the transport and metabolism of thiamine associated with recurrent encephalopathies in childhood.
- Cerebral folate deficiency.
- Relation to neurotransmitters and follow-up of treatment with folinic acid.

Goals for the next three years:

1. To develop the FIS project on thiamine defects called "Study of defects in the transport and metabolism of thiamine associated with recurrent encephalopathies in childhood" (see the Projects section). Identification of new clinical phenotypes, study of biomarkers in blood and cerebrospinal fluid for early diagnosis, and studies of expression of cellular transporters of thiamine in brain tissue and in cell cultures.
2. Identification of Spanish patients with deficit of pantothenate kinase (an enzyme involved in the metabolism of vitamin B5, also called pantothenic acid), and design and validation of a checklist to evaluate the clinical severity and progression of the disorder. This project is under development and is currently looking for funding. It is a project in collaboration with the Spanish Association of Patients with Neurodegeneration with Brain Iron Accumulation (NBIA).
3. Transfer and internationalisation activities: Creation of a national register of patients with these disorders as the two national centres that also study this type of disorders (IBC- Hospital Clínic de Barcelona and CEDEM-Autonomous University of Madrid) will take part as collaborators in this project. The patients who are identified in this project will also be registered in the European database on neurometabolic disorders (iNTD database).

Neuronal development disorders: Rett syndrome

Dr. Judith Armstrong and Dr. Mercè Pineda

The Rett Syndrome (RTT) Group at Hospital Sant Joan de Déu has a long record in both the clinical and genetic fields in connection with this disorder. Our research line is based on the detection of mutations in patients' genes related to the disorder and on the search for new genes and the improvement of techniques for the detection and location of new target tissues for the diagnosis of RTT. Several therapeutical trials have also been carried out and an internationally validated clinical evaluation checklist unrelated to age has been developed which allows phenotype-genotype correlations to be established in patients.

We have started a research line aimed to detect targets for pharmacological therapy on a parallel basis in cell lines, iPS cells and transgenic mice. In it, a study is made of two recurrent mutations in Rett patients: c.763C>T (p.Arg255X) and c.916C>T (p.Arg306Cys).

Since 2007, we have promoted studies on gene, protein and pharmacology in connection with this disorder, in which genetic diagnosis will be essential to their success. The group belongs to the European Research Council's RettDatabase Network and to the IRSF Research Council.



Projects

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- Application of global gene expression analysis and functional genomics to the study of the physiopathology, treatment and diagnosis of pediatric myopathies. CP09/00011. Carlos III Health Institute. 2010-2016. LR: Cecilia Jiménez-Mallebrera.
- Biomarkers of cerebral neurotransmission alteration in paediatric encephalopathies of genetic origin: studies on patients and on a cellular model. PI12/01951. Carlos III Health Institute. 2013-2015. LR: M. Àngels García Cazorla.
- Phenotypic and molecular characterisation of coenzyme Q deficiency syndrome. PI11/02350. Carlos III Health Institute. 2012-2014. LR: Rafael Artuch.
- Phenotypic and molecular characterisation of coenzyme Q deficiency syndrome. FI12/00580. Carlos III Health Institute. 2012-2016. LR: Rafael Artuch.
- Río Hortega Contract, candidate: Mireia Tondo. CM10/00095. Carlos III Health Institute. 2011-2014. LR: Rafael Artuch.
- Río Hortega Contract, candidate: Marta Molero. CM12/00011. Carlos III Health Institute. 2013-2014. LR: Rafael Artuch.
- Study of defects in the transport and metabolism of thiamine associated with recurrent encephalopathies in childhood. PI12/02010. Carlos III Health Institute 2013-2015. LR: Belén Pérez-Dueñas.
- Study of biochemical markers of dopaminergic and serotonergic neurotransmission in relation to neurological and neuropsychological changes in phenylketonuria. PI12/01469. Carlos III Health Institute. 2013-2015. LR: Jaume Campistol.
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- Neuropsychological rehabilitation in children with moderate or severe TBI. Randomised study: conference addressed to parents, to children via robotics and control group. 111330. La Marató de TV3 Foundation. 2012-2015. LR: M.^a Pilar Poo Argüelles.
- New perspectives on muscular dystrophies: the role of collagen VI, intramuscular adipose tissue and intermediate metabolism. Implications for future diagnosis and treatments. PI10/00177. Carlos III Health Institute. 2011-2014. LR: Cecilia Jiménez-Mallebrera.
- Role of collagen VI in muscular homeostasis: regulation of the size of muscle fibre and of metabolism of glucose and fatty acids. BR201201. Hospital Sant Joan de Déu – Esplugues. 2013-2016. LR: Cecilia Jiménez-Mallebrera.
- Programme for Intensification of Research Activity in the Spanish National Health System 2012. INT12/329. Carlos III Health Institute. 2013-2014. LR: Rafael Artuch.



Clinical trials

- Open study for patients previously treated with ataluren (PTC124®) with dystrophinopathy due to terminator mutation. PTC124-GD-019-DMD. 2012-. LR: Jaume Colomer.
- Open extension study to evaluate the long-term safety, tolerability and effectiveness of GSK2402968 in subjects with Duchenne muscular dystrophy. DMD114349. 2012-. LR: Jaume Colomer.
- Phase III trial on the efficiency and safety of ataluren (PTC124®) in patients with dystrophinopathy due to terminator mutation. PTC124-GD-020-DMD. 2009-. LR: Andrés Nascimento.
- Long-term open multi-centre follow-up study to evaluate the safety and efficiency of brivaracetam as adjuvant treatment in paediatric patients with epilepsy. N01266. 2012-. LR: Francesc Sanmartí.
- Single treatment arm, open multi-centre study to evaluate the pharmacokinetics, safety and efficiency of the administration of brivaracetam as adjuvant treatment in patients from ≥ 1 month to < 16 years of age with epilepsy. N01263. 2012-. LR: Francesc Sanmartí.
- Clinical investigation to evaluate the efficiency of the Mimos cushion in the prevention of postural plagiocephaly in newborns. PLG2012-01. 2013-. LR: Josep M. Costa.
- CRAD study.
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- KOGNITO study.

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Supervised Thesis

- Ana Roche. Rett Syndrome: new genes and genotype-phenotype relationship. University of Barcelona. Supervision: Judith Armstrong and Dr. Mercè Pineda. Presentation on 20 December 2013.

Networks

- Centre for Biomedical Network Research on Rare Diseases (CIBERER). Ministry of Economy and Competitiveness. Carlos III Health Institute.
- European Treat-NMD Network.



Etiopathogeny and treatment of severe mental disorders

Schizophrenia, the most representative and one of the most discapacitating of all the severe mental disorders, affects about 1% of the population. It has been estimated 2.8% of the population is affected by severe mental disorders. This research group is engaged in studies on people who suffer severe mental disorders and it forms a multidisciplinary team with members from the areas of psychiatry, psychology, nursing, biology, social assistance and others. The field of study is of broad scope, extending from gene expression factors to psychosocial interventions. The group belongs to the Mental Health Biomedical Network Research Centre (CIBERSAM), financed by the Carlos III Health Institute.

Research team

Coordinators Dr. Judith Usall and Dr. Josep Maria Haro

Researchers José Ángel Alda, Itziar Alonso, Susana Araya, Belén Arranz, María Elena Blanco, Gildas Brebion, Anna Butjosa, Claudia Caprile, Emma Casas, Daniel Cruz, Montse Dolz, Gemma Escartín, Gemma Escuder, Aida Farreny, Alexandrina Foix, Pablo Fuentealba, Montserrat Fusté, Josep Maria Haro, Sergio Herrera, Elena Huerta, Raquel Iniesta, Marcia Irazabal, Fernando Lacasa, Raquel López, María Ángeles Mairena, Francisco Martínez, Josep Lluís Matalí, Iria Meléndez, Alfonso Monje, Rubén Moreno, Jordi Navarra, Christian Núñez, Carla Obradors, Susana Ochoa, Beatriz Olaya, Trini Peláez, Jaume Perales, María Dolores Picouto, Belén Ramos, Mercedes Roca, Iñigo Romero, Luis San, Bernardo Sánchez, Eduardo Serrano, Christian Stephan-Otto, Judith Usall and Victòria Villalta

Predoctoral researchers Noé Garín, Elvira Lara, Ramon Nogueira, Raquel Pinacho, Philipp Schustek and Jordina Tor

Postdoctoral researchers Estrella Ferreira, Sara Rodríguez and Stefano Tyrovolas

Statistician Jaume Aguado

Laboratory technicians Joel García and Núria Villalmanzo

Support personnel Adriana Berengueras and María Victoria Moneta

Genetics undergraduate interns Gemma Riquelme and Elia Vila Andreu

Assistants Marta Coromina, Ruth Cunill, Jorge Cuevas, Nuria del Cacho, María Jose Escandell, Isidre Ferrer, Mar García, Mercedes García, Grace Gill, Carla Jané, Guillermo López, Jose Ramon Martin, Javier Meana, Eva Miquel, Marta Pardo, Beatriz del Pino, Marta Puig, Stephanie Sammut, Núria Sebastián, Sarabel Solis, Salvador Soto, Charles Spence, Elsa Valdizán, Sonia Vilamala and Judit Villén

Research lines

Clinical, cognitive and psychosocial bases of severe mental disorders

Dr. Susana Ochoa

The evaluation of the clinical, psychosocial and neuropsychological characteristics of people with a severe mental disorder will allow us to identify more precisely the treatment needs in each case.

The main goal of this line is to evaluate the various clinical, social and neuropsychological aspects, among others, of the people who begin to manifest the first episodes of severe mental disorder. In order to carry out good evaluations in these areas, though, suitable measuring instruments must be available. In this respect, the group's aims are:



- To determine the clinical and social or neuropsychological functioning variables that have the greatest effect on the negative evolution of the disorder for the purpose of preventing deterioration.
- To study the clinical, social and neuropsychological differences between the various severe mental disorders.
- To develop suitable measuring instruments for the evaluation of persons with a severe mental disorder.

Epidemiology

Dr. Josep M. Haro

The interest of this research line lies in determining the impact (prevalence and disability) of mental disorders in the general population and the health care received by the persons who suffer such disorders. Epidemiologic studies are necessary for the planning and management of resources and to evaluate the existence and impact of factors associated with the possibility of suffering a mental disorder. The various projects of this line are focused on the adult population, the child and adolescent population, and elderly people. The group's aims are:

1. To determine the prevalence of mental disorders in the adult and in the child and adolescent populations.
2. To study the sociodemographic characteristics and the risk factors associated with mental disorders.
3. To analyse the way that the healthcare services attend to people with mental health problems.
4. To determine the impact of mental health problems on quality of life and disability.
5. To analyse the relation between ageing and neuropsychiatric disorders.

Mental health interventions

Dr. Judith Usall

The current pharmacological and psychological treatments are not effective in all the people who suffer schizophrenia. This research group conducts clinical trials on the treatment of resistant schizophrenia or schizophrenia with predominant negative pharmacological or psychological symptoms. Four clinical trials have been carried out independently of the pharmaceutical industry, with financing from public bodies and from private foundations (Stanley Foundation). Gender- and sex-sensitive psychopharmacology is also taken into consideration in the research that is conducted.

Basic perception, attention and action processes

Dr. Jordi Navarra

The goal of this research line is to describe certain normal and dysfunctional perception and attention processes (such as schizophrenia). Specifically, studies are conducted to determine which brain mechanisms allow (1) reduction of the asynchrony between sensory information (visual and auditory, for example) in relation to a specific event, (2) encoding of sensory information in an integrated or independent way, (3) selection of one language or another according to context, and (4) coordination of sensory and motor information during the performance of a movement. The group's aims are:

1. To describe the cognitive and neurophysiological bases of adaptation to asynchrony between signals of different sensory modalities.
2. To research the sensory information filtering and integration mechanisms in schizophrenia.
3. To describe the role of the perception of faces in the selection and inhibition of languages in bilingual persons.
4. To study the role of sensory motor information integration during the performance of movements in phenylketonuria.

Molecular psychiatry

Dr. Belén Ramos

The research is focused on understanding how the molecular failures in severe mental disorders allow the development of changes in the dendritic tree, contributing to neuron connectivity disorders in schizophrenia patients.

The dendritic pattern plays an important role in the transmission of information to the nervous system and it is altered in mental pathology. The neurodevelopment hypothesis postulates that specific abnormalities in the course of development could be responsible for connectivity failures and the subsequent triggering of the disorder in the adult. Despite this, the pathologic mechanisms are still far from being understood. It has been proposed that changes in gene expression contribute to the development and therapy of these disorders. Preliminary studies, including our own research, suggest that the deregulation of transcription factor Sp4, which is essential in dendritic development, could be partly involved in the pathogenesis and the therapeutic action mechanisms of psychiatric disorders through control of the dendritic pattern. We are exploring this hypothesis



in post mortem human brains of psychiatric patients and we are extending it to other transcriptional regulators which have yet to be determined, basing ourselves on quantitative proteomic large-scale analysis and gene expression analysis. Moreover, this research line is also based on the study of dendritic development in neurons as a model for understanding the pathologic mechanisms that lead to aberrant dendritic trees in psychiatric disorders and for determining whether psychotropic drugs can modulate dendritic trees. The group's aims are:

- To identify new altered transcriptional regulators and cellular effectors in the brain of schizophrenia patients.
- To study transcription factor Sp4 and new factors in post mortem human brains of psychiatric patients and their association with specific symptoms.
- To study the effect, in mental disorders, of pharmacologic treatments and altered molecular markers on dendritic development by means of gene silence.
- To identify peripheral biomarkers in early psychotic episodes.

Mental disorders in childhood and adolescence

Dr. Luis San

In recent decades, the importance of mental disorders not only for patients but also for society has come to be clearly recognised.

The ultimate goal of the research on child and adolescent psychiatry, of course, is to improve clinical practice. Consequently, the relationship between these two perspectives should be increased in order to optimise daily practice and to prioritise a type of research that answers questions helping to improve diagnoses and treatments. To this end, it is necessary to promote research that embraces different basic and clinical disciplines. Of special importance in this respect are development neuropsychology, genetics, neuroimaging, neurobiology, therapeutics, epidemiology and prevention.

Projects

- Multimedia adaptation of REPYFLEC cognitive remediation treatment for persons with schizophrenia. Sant Joan de Déu Social Institution (OSSJD). 2013-. LR: Aida Farreny Seró.
- Motor alterations underlying attention deficit hyperactivity disorder (ADHD): diagnostic implications. Alicia Kopolowitz Foundation. 2013-2015. LR: Jordi Navarra Ordoño.
- An age-friendly city for a successful ageing. Recercaixa 2011. Fundació "la Caixa". 2011-2014. LR: Josep Maria Haro.
- I3 Contracting Grant Jordi Navarra. Ministry of Science and Innovation (MINECO). 2013-2016. LR: Jordi Navarra.
- Predoctoral grants for research training 2010. Beneficiary: Raquel Pinacho García. FI10/00177. Carlos III Health Institute (FIS). 2010-2014. LR: Josep Maria Haro.
- FI-DGR predoctoral grants. Beneficiary: Ramón Nogueira Mañas. Functional connectivity and decoding in neuronal circuits of the primary visual cortex and the hippocampus. Agency for the Management of University and Research Grants (AGAUR). 2013-2016. LR: Rubén Moreno.
- Predoctoral grant – Basque Government, Department of Education and Universities. 2012-2015. LR: Iñigo Romero.
- Mental Health CIBER. CB07/09/0028. Carlos III Health Institute (FIS). 2008-. LR: Josep Maria Haro.
- Post FSE-Río Hortega contract. Beneficiary: Montserrat Fuste. CM10/00074. Carlos III Health Institute (FIS). 2011-2014. LR: Josep Maria Haro.
- Doctor training contract. Beneficiary: Laura Puigcerver. Ministry of Economy and Competitiveness (MINECO). 2013. LR: Jordi Navarra.
- ISCIII - Sara Borrell Postdoctoral contracts. CD12/00429. Carlos III Health Institute (FIS). 2013-2015. LR: Josep Maria Haro.
- COST - Time In Mental activity: theoretical, behavioral, bioimaging and clinical perspectives (TIMELY). TD0904. European Commission. 2010-2014. LR: Jordi Navarra.



- Courage in Europe. Collaborative Research on AGEing in Europe. FP7-223071. European Commission. 2009-2013. LR: Josep Maria Haro.
- Computational neuroscience. RYC-2010-05952. Ministerio de Ciencia e Innovación (MINECO). 2011-2016. LR: Ruben Moreno.
- Clinical and neurobiological determinants of second schizophrenia episodes. Longitudinal study of first psychotic episodes. PI11/01348. Carlos III Health Institute (FIS). 2012-2014. LR: Judit Usall.
- Drawing neuronal circuits without seeing them. PIRG08-GA-2010-276795. European Commission. 2011-2015. LR: Ruben Moreno.
- Secondary sexual, reproductive and osteopaenic effects in hyperprolactinaemia for use of antipsychotics. Gender differences. AR201201. Sant Joan de Déu Healthcare Park – Mental Health Services. 2012-2013. Beneficiary: Elena Rubio. LR: Judit Usall.
- Efficiency of Metacognitive Training (MCT) on symptoms, metacognition and social and neuropsychological functioning in short-term course psychosis patients. PI11/01347. Carlos III Health Institute (FIS). 2012-2014. LR: Susana Ochoa.
- EIP AHA COMMITTEE. European Commission. 2013-. IP: Josep Maria Haro.
- Health condition, quality of life and welfare in ageing: a longitudinal study. PI12/01490. Carlos III Health Institute (FIS). 2013-2014. LR: Josep Maria Haro Abad.
- Study of hallucinations from a neurofunctional and cognitive standpoint. PI10/02479. Carlos III Health Institute (FIS). 2011-2014. LR: Gildas Brebion.
- Longitudinal multi-centre study on clinical, cognitive and neuroimaging characteristics in children and adolescents with psychosis risk syndrome. PI11/02684 Carlos III Health Institute (FIS). 2012-2014. LR: Montserrat Dolz.
- Clinical and neuropsychological factors associated with the response to second-generation antipsychotics in children and adolescents diagnosed with a first episode of early-onset schizophrenia spectrum. EC10-175. Ministry of Health and Social Policy. 2011-2014. LR: Luis San.
- Predoctoral grants for research training 2009. Beneficiary: Jaime Perales. FI09/00754. Carlos III Health Institute (FIS). 2010-2014. LR: Josep Maria Haro.
- FPI - Christian Núñez Luánez. BES-2011-049969. Ministry of Science and Innovation (MINECO). 2011-2015. LR: Pablo Fuentealba.
- Research group on severe mental disorders. 2009SGR1180. Agency for the Management of University and Research Grants (AGAUR). 2009-2013. LR: Josep Maria Haro.
- Towards an objective diagnosis of ADHD. Agrupació Mútua Foundation. 2012-2013. LR: Jordi Navarra.
- Hallucinations and Source Memory Impairment in Schizophrenia Patients and Non-Clinical Individuals. CP09/00292. Carlos III Health Institute (FIS). 2010-2016. LR: Gildas Brebion.
- Impact of chronic health disorders and of psychiatric disorders on disability and quality of life in elderly patients. FPU12/05661. Ministry of Education. 2013-2017. Beneficiary: Noé Garin Escrivá. LR: Josep Maria Haro.
- Industex for Dr. Belén Ramos. Sant Joan de Déu Social Institution (OSSJD). 2012-. LR: Belén Ramos.
- MARATONE Mental Health Training through Research Network in Europe. 316795. European Commission. 2013-2017. LR: Josep Maria Haro.
- Prolactin levels in patients with a first psychotic episode without antipsychotic treatment with secondary sexual and reproductive effects. Cross-sectional and follow-up study after three months. Residence completion grant of Sant Joan de Déu Healthcare Park. 2013-2014. LR: Judith Usall i Rodié. Beneficiary: Núria del Cacho Ortega.
- Functional organisation of synaptic circuits in the thalamus-hippocampus system. BFU2010-19146. Ministry of Science and Innovation (MINECO). 2011-2014. LR: Pablo Fuentealba.



- Prevalence of sleep disorders in children and adolescents with recent diagnosis of attention deficit hyperactivity disorder and its relation to iron metabolism. PI11/02009. Carlos III Health Institute (FIS). 2012-2014. LR: José Ángel Alda.
- Providing support on the design, application and analysis for research projects based on neuroimaging techniques, which usually share the goal of identifying the neurofunctional bases of various mental processes. PTA2011-4983-I. Ministry of Science and Innovation (MINECO). 2012-2014. Beneficiary: Christian Stephan-Otto. LR: Josep Maria Haro.
- Transcriptional regulation by psychoactive drugs in rat neurons and astrocytes. Collaboration agreement with IPROTEOS, SA. 2013-2014. LR: Belén Ramos.
- Synaptic reorganisation of the amygdala-hippocampus circuit during stress. PRI-PIBIN-2011-1086. Ministry of Science and Innovation (MINECO). 2012-2014. LR: Pablo Fuentealba.
- BioBanks RETICS Sant Joan de Déu Healthcare Park (PSSJD) - Neurological Tissues Bank. RD09/0076/00104. Carlos III Health Institute (FIS). 2010-2013. LR: Mercedes Roca.
- Spatial recoding of sound. PSI2012-39149. Ministry of Economy and Competitiveness (MINECO). 2013-2015. LR: Jordi Navarra.
- The debate is scheduled in 2 days with four round tables about the following topics: Built environment and social networks; Ageing, mental health and dementia; Multi-morbidity; Active and healthy ageing. (Biocat) Fundació Privada BioRegió de Catalunya. 2013-2013. LR: Josep Maria Haro.
- The pathologies of the social brain: a neurofunctional approach to social disability in autism, paranoia and social anxiety. 090810. Fundació La Marató de TV3. 2010-2013. LR: Victoria Villalta.

Clinical trials

- A 6-month double-blind, placebo-controlled study of efficacy of raloxifene as an adjuvant treatment for negative symptoms of schizophrenia in postmenopausal women. 10T-1392. The Stanley Medical Research Institute. 2011-2013. LR: Judit Usall.
- 6-month double-blind placebo-controlled clinical trial of the effectiveness of raloxifene as an adjuvant treatment for negative symptoms of schizophrenia in postmenopausal women. FSJD-RAL-2010. 2011-. LR: Judith Usall.
- Multi-centre open phase 4 study of safety during two years of treatment with lisdexamfetamine dimesylate in children and adolescents from 6 to 17 years with attention deficit hyperactivity disorder (ADHD). SPD489-404. 2009-. LR: J. Ángel Alda.

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Supervised Thesis

- M. A. Mairena. Oscillations in response times and their relation to inattention measures in children with attention deficit hyperactivity disorder. Faculty of Psychology, Autonomous University of Madrid. Grade: Cum laude. Madrid, 16/12/2013.
- M. D. Picouto. Psychological adaptation and biological stress markers in children after intensive care hospitalisation. Faculty of Medicine, University of Alcalá. Grade: Cum laude. Madrid, 14/10/2013.

Networks

- Centre for Biomedical Research on Mental Health (CIBERSAM). Ministry of Economy and Competitiveness (MINECO). Carlos III Health Institute.



Adult-age disorders originating in the foetal period or in the early years of life

This group is engaged in the study of the biological bases of the effects of the anomalies, disorders and treatments in children. Specifically, research is conducted on the relation between growth retardation and endocrine metabolic changes, the future consequences of prenatally diagnosed anomalies and their prevention, and ovary transplantation as a method of preserving ovarian function. This group forms part of the Diabetes and Associated Metabolic Disorders Biomedical Network Research Centre CIBER (CIBEREDM), financed by the Carlos III Health Institute. It has the following aims:

1. Early detection of risk groups:

- To identify new genetic and environmental factors that predispose to the absence of postnatal weight and height recovery in children with LBW. Newborn cohort.
- To identify new genetic and environmental factors that predispose to quick weight recovery and/or development of excess weight in the first 12 months of life. DNA methylation patterns. Candidate genes: TNF, MCR4 and others. Newborn cohort.
- To detect early changes in psychoneurologic development in children with LBW and their relation to the type of food received in the early months of life. Newborn cohort.
- To identify early markers of cardiovascular risk and of chronic inflammation in patients of paediatric age with LBW background (adipokines: total adiponectin, high molecular weight [HMW] adiponectin, visfatin, osteocalcin, TNF, osteopontin, vaspin, carotid diameter) and their relation to total and visceral adiposity. School-aged cohort.
- To determine the prevalence of insulin resistance and of metabolic syndrome in paediatric patients with LBW. School-aged cohort.
- To determine the effects of growth hormone treatment on subcutaneous and visceral fat deposits in patients with LBW without postnatal weight and height recovery. School-aged cohort.

2. Early prevention of endocrine metabolic changes associated with quick and excessive postnatal weight recovery:

- To implement environmental (mainly alimentary) measures aimed to prevent the rapid increase of weight in the first 4 months of life. This objective includes the comparison of the effects of breastfeeding with those of two commercial isocaloric formulas (standard and protein-enriched) on postnatal growth pattern, body composition (measured by a dual energy X-ray absorptiometry [DXA] and visceral fat [ultrasound scan and magnetic resonance] technique), insulin resistance (homeostatic model assessment) and chronic inflammation and cardiovascular risk markers (adipokines).
- To implement preventive therapeutic measures – by administration of insulin sensitizers (metformin) – addressed to avoiding and/or modulating the endocrine metabolic changes associated with catch-up postnatal growth, specifically involving: insulin resistance, excess of centrally distributed visceral fat, other changes forming the metabolic syndrome such as hypertension, and changes of the lipid profile and of chronic inflammation markers in prepuberal children with LBW without spontaneous recovery of weight and height treated with growth hormone.

Research team

Coordinator Dr. Lourdes Ibáñez

Researchers Thais Agut, Ana Alarcón, Asteria Albert, Lluís Amat, Israel Blasco, José M.^a Boguñá, Cristina Boix, Miquel Borrás, Laura Bosch, Sergi Cabré, Justo Callejo, Marta Camprubí, Cristina Carrasco, Paula Casano, Montserrat Castañón, Marta Díaz, Rubén Díaz, Silvia Ferrero, Alfredo García-Alix, M.^a Dolores Gómez, Eduardo González, Lourdes Ibáñez, Margarita Ibáñez, Isabel Iglesias, Martín Iriondo, Josep Jiménez-Chillarón, Lucas Krauel, Josep M.^a Lailla, Carles Lerin, , Isabel Miró, , Julio Moreno, Marta Olivares, Miriam Pérez. Pilar Poo, Jordi Prat, Marta Ramon, Ana Riverola, Juan Rodó, David Rodríguez, Joan Sabriá, Cristina Salvador, David Sánchez-Infantes, Núria Sanz, Giorgia Sebastiani, Xavier Tarrado, Marta Thió, Anna Torres and Antonio Vela



Postdoctoral researcher	Laura Martínez Guino and Silvia Velázquez García
Predoctoral researcher	Adriano Bonforti and Thais Pentinat
Laboratory technicians	Judith Cebrià, Deborah Martínez and Nuria Villalmazo
Assistants	Abel López-Bermejo, Maria Victoria Marcos, Edurne Mazarico and Francis de Zegher

Research lines

Childhood diabetes

Dr. Rubén Díaz and Dr. Josep Jiménez-Chillarón

The hypothesis of the foetal origin of adult disorders postulates that an adverse intrauterine environment may affect the growth of the foetus by producing permanent changes of gene expression in key cells and/or tissues. Such changes would persist after birth and could contribute to the development of chronic and complex disorders typical of adults, such as type 2 diabetes or obesity. Our laboratory's goal is to understand the molecular mechanisms that associate nutrition during intrauterine development with the risk of acquiring chronic disorders as an adult, with special emphasis on diabetes and obesity.

In order to understand the underlying molecular mechanisms, in our group we have developed an experimental model of foetal malnutrition that recapitulates the metabolic phenotype described in humans: malnourished mice in the uterus show low weight at birth and develop obesity, intolerance to glucose, and diabetes as from the 4th month of life. Our group's aims are:

1. To study the role of epigenetic mechanisms in the development of type 2 diabetes in an experimental model of intrauterine growth retardation.
2. To study the role of the glucocorticoids in the foetal programming mechanism of diabetes and obesity in the adult.
3. To study the role of intrauterine and postnatal subnutrition on memory and learning patterns in young and adult mice.

Physiologic and pathologic conditions in the newborn and consequences in subsequent evolution

Dr. Alfred García-Alix and Dr. Martín Iriondo

The genetic potential, the foetal environment and perinatal or neonatal aggressions in the neonatal period may have irreversible consequences for the individual's development and they may be the origin of permanent damage or disorders in the adult. The study of the factors and causes that have an influence during the intrauterine, perinatal and neonatal periods will allow us to increase our knowledge of the conditioning factors that may interfere with correct development. Moreover, the research on therapeutic interventions in the neonatal period, together with the follow-up of children at risk of development disorders and disability, will allow better treatments and preventive strategies to be implemented.

Work is carried out in this line of research in four main areas:

- Prematurity, development care and follow-up.
- Growth, nutrition and metabolism.
- Neonatal neurobiology.
- Critical care.
- Follow-up of newborns at risk.

Study of congenital malformations and their surgical treatment

Dr. Asteria Albert

This line of research seeks to improve our understanding, the therapeutic plan and the short- and long-term results of congenital surgical pathologies.

The clinical area includes:

- Craniofacial malformations.
- Minimally invasive treatment.



- Urological anomalies.
- Neonatal pathologies: diaphragmatic hernia and necrotising enterocolitis.

The experimental area includes:

- Diaphragmatic hernia: experimental study of the correlations between anomalous development of the lung parenchyma and the arterial tree in a rabbit foetus model. Study of pulmonary and vascular response to prenatal treatment with tracheal occlusion. Study of the development of the contralateral lung in the diaphragmatic hernia and in the diaphragmatic hernia treated with foetal tracheal occlusion.
- Response of the growing individual to the ischaemia-reperfusion of intestine, kidney and testicle; effect of treatment with platelet-rich plasma (PRP).

Foetal medicine: foetal welfare markers

Dr. Dolores Gómez-Roig

We consider it necessary to conduct further studies on the condition of the foetus so that its condition may be evaluated at any moment in the gestation period.

We do possess methods allowing us to determine the welfare situation of the foetus but when these methods show that the foetus may be in a risk situation, we do not have precise diagnostic tests to quantify the foetal condition with a view to making an accurate diagnosis and to correctly adapting the obstetric action.

Our main sub-lines of research are the following:

- Risk of loss of foetal welfare.
 - Preterm delivery. Premature newborn.
 - Foetal growth retardation.
1. Study of markers in amniotic fluid and foetal blood to determine the degree of foetal involvement in a hypoxia situation.
 2. Study of pulmonary vascularisation and texture in order to determine the degree of pulmonary maturation.
 3. Ultrasonographic study of the situation and dimensions of the cervix to prevent preterm delivery.
 4. Determination of the maternal nutritional habits and their influence on tumoral markers of type IGFBP and leptin (collaboration with the University of Navarra).
 5. Biochemical markers in maternal serum of type VEGF and PLGF in the onset of restricted foetal growth.
 6. Studies of Doppler indexes in maternal, placental, umbilical and foetal haemodynamics, in both arterial and venous territory.
 7. Diagnostic value of volume measurement in 3D ultrasound scan by the VOCAL programme.
 8. Studies of genetic mosaicisms in placentas with restricted foetal growth foetus.

Intrauterine growth retardation and changes

Dr. Lourdes Ibáñez

Foetal growth restriction may have irreversible consequences. The study of the various stages from intrauterine life to adolescence will allow us to advance in the prevention of this condition and in the treatment and prevention of the complications derived from it.

- Prenatal diagnosis.
- Postnatal growth restriction and prematurity.
- Influence of various nutritional inputs on catch-up in children with intrauterine growth retardation, on extreme prematures and on experimentation models.
- Endocrinological and developmental effects.
- Exploration of new therapeutic strategies in paediatric entities associated with insulin resistance; use of new insulin sensitizers with action on pathophysiologic mechanisms responsible for body composition changes, chronic inflammation, dyslipidaemia, hyperandrogenism and associated gonadal changes.
- Exploration of new risk markers of metabolic syndrome, hyperinsulinism and cardiovascular disease in children and adolescents with low birth weight.
- Metabolomic studies in patients with hyperinsulinism/metabolic syndrome, and exploration of animal and cell models to determine the pathophysiologic mechanisms of low birth weight, postnatal catch-up and resulting hyperinsulinism.



Projects

- Fire Squadron Grant 2012. BR2011/03. Hospital Sant Joan de Déu – Esplugues. 2012-2015. LR: Isabel Iglesias-Platas.
- Early biomarkers of safety and efficacy of nutritional support in extremely premature infants (EPI). PI13-01562. Carlos III Health Institute. 2013-2015. LR: Isabel Iglesias Platas.
- Río Hortega Contract, candidate: Nuria Sanz. CM10/00094. Carlos III Health Institute. 2011-2014. LR: Lourdes Ibáñez.
- Genetic determinants of prenatal and postnatal growth: association with early markers of cardiovascular and metabolic syndrome risk. PI11/02403. Carlos III Health Institute. 2012-2015. LR: Lourdes Ibáñez Toda.
- Metabolic and biochemical effects of betaine on insulin sensitivity and physical exercise. SAF2011-28502. Ministry of Science and Innovation. 2012-2014. LR: Carles Lerín Martínez.
- Training of research personnel, candidate: Lluís Miquel Río. BES-2012-055314. Ministry of Science and Innovation. 2013-2017. LR: Carles Lerín.
- Study to determine the suitability of preparing a practical clinical guide on hypoxic-ischaemic encephalopathy. Health Information, Evaluation and Quality Agency (AIAQS). 2011-2014. LR: Alfredo García-Alix.
- Sara Borrel Postdoctoral training contracts. Experimental study of the effect of administering fibre-rich diets versus other diets. CD10/00234. Carlos III Health Institute. 2011-2014. Candidate: David Sánchez-Infantes Sánchez. LR: Lourdes Ibáñez.
- Pilot study of the effects of growth hormone on body adiposity and visceral fat in children with low birth weight for gestational age. SMT-IIIG-19. Pfizer, SA. 2009-2014. LR: Lourdes Ibáñez.
- Prognostic factors of brain injury in foetuses with early restricted intrauterine growth. PI11/02613. Carlos III Health Institute. 2012-2014. LR: Antonio Vela.
- Fund for scientific advance and innovation in children's diabetes. Caixa d'Estalvis i Pensions de Barcelona Foundation. 2011-2015. LR: Rubén Díaz.
- Non-genomic inheritance of diabetes in a mouse model of neonatal overnutrition: potential role of epigenetic mechanisms. CP11/00312. Carlos III Health Institute 2012-2014. LR: Josep Jiménez-Chillarón.
- Miguel Servet Contracts. MS11/00312. Carlos III Health Institute. 2012-2015. LR: Josep Jiménez-Chillarón.
- Neonatal cerebral infarction: a multidisciplinary study of pathogenic factors, new diagnostic and prognostic indicators, and impact on neurodevelopment and quality of life. PI08/1366. Carlos III Health Institute. 2009-2014. LR: Alfredo García-Alix.
- Influence of postnatal nutritional support on extreme premature methylome. Spanish Paediatrics Association. 2011-2014. LR: Isabel Iglesias-Platas.
- Influence of type of food in early life stages on future cardiovascular risk and psychoneurological development in newborns with intrauterine growth restriction. PI08/0443. Carlos III Health Institute. 2009-2013. LR: Lourdes Ibáñez.
- Infojobs. Sant Joan de Déu Social Institution (OSSJD). 2012- 2013. LR: Josep Jiménez Chillarón.
- Marie Curie - IRBETAINE-CIG Molecular mechanisms underlying the development of insulin resistance: role of betaine supplementation. 293502. European Commission. 2013-2015. LR: Carles Lerín.
- Training of research personnel, candidate: Thais Pentinat. Perinatal nutrition in males programmes lipogenic gene expression in their descendants through epigenetic mechanisms. BFU2011-29739. Ministry of Science and Innovation. 2012-2014. LR: Josep Jiménez-Chillarón.
- Neuroprotection and regeneration/repair by combined therapy (hypothermia + allopurinol) in an animal model of hypoxic-ischaemic brain damage. Spanish Society for Neonatology. 2013-2014. LR: Marta Camprubí.
- Programme for intensification of research activity in the Spanish National Health System 2012. INT12/330. Carlos III Health Institute. 2013. LR: Lourdes Ibáñez.



- Grants for Ramon y Cajal contracts. RYC-2010-06789. Ministry of Science and Innovation. 2013-2015. LR: Carles Lerín.
- Maternal-Child Health and Development Network (SAMID). RD08/0072/0031. Carlos III Health Institute. 2009-2013. LR: Josep M. Lailla.
- Maternal-Child Health and Development Network (SAMID). RD12/0026/0002. Carlos III Health Institute. 2013-2016. LR: Maria Dolores Gómez-Roig.
- Group on experimental diabetes. 2009SGR407. Agency for the Management of University and Research Grants (AGAUR). 2009-2014. LR: Josep Jiménez-Chillaron.
- Effect of prenatal and perinatal changes on postnatal development. 2009SGR828. Agency for the Management of University and Research Grants (AGAUR). 2009-2014. LR: Lourdes Ibáñez.
- Unravelling novel molecular mechanisms underlying the development of insulin resistance. European Foundation for the Study of Diabetes. 2013-2014. LR: Carles Lerín.
- Diagnostic and prognostic value of the heart function study on the perinatal result and its association with markers of myocardial cell injury and heart dysfunction in cord blood in intrauterine growth restriction fetuses. PI09/0661. Carlos III Health Institute. 2010-2014. LR: Josep M. Lailla.
- Evaluation of prenatal exposure to antidepressants and anxiolytics by their determination in alternative biological matrices. PI11/02590. Carlos III Health Institute. 2012-2014. LR: María Dolores Gómez-Roig.

Clinical trials

- Endocrine metabolic effects and effects on visceral adiposity of metformin administration in low doses in prepuberal children with low birth weight for gestational age, spontaneous postnatal weight and height recovery, and risk markers. EC08/00160. Carlos III Health Institute. 2009-2014. LR: Lourdes Ibáñez.
- Effects on cardiovascular risk markers of metformin addition in treatment with growth hormone in prepuberal patients with background of low birth weight for gestational age without postnatal height recovery. TRA-131. Ministry of Health and Social Policy. 2010-2013. LR: Paula Casano.
- Use of metformin in children and adolescents with type 1 diabetes mellitus. HSJD-MET-DM1. 2010-. LR: Roque Cardona.
- Randomised placebo-controlled double-blind phase II clinical trial with parallel groups to evaluate the safety and effectiveness of diet supplementation with tryptophan in weight reduction and its neuropsychological effects in obese adolescents. EC10-148. Ministry of Health and Social Policy. 2011-2014. LR: Marta Ramon Krauel.
- Trial to investigate the effectiveness and safety of insulin degludec/insulin aspart with the rest of meals versus insulin detemir once or twice daily plus prandial insulin in children and adolescents with type 1 diabetes mellitus. NN5401-3816. 2013-. LR: Roque Cardona.
- Open randomised multinational trial with escalating dosage and controlled with active medication on the safety, tolerability, pharmacokinetics and pharmacodynamics of a single dose of long-acting growth hormone (NNC0195-0092) in comparison with the daily administration of Norditropin® SimpleXx® in children with growth hormone deficiency. LR: Lourdes Ibáñez.
- Ethinyl estradiol + levonorgestrel versus pioglitazone + spironolactone + metformin in low doses in adolescents with ovarian hyperandrogenism and hyperinsulinism: effects on ovulatory function, chronic inflammation parameters, markers of cardiovascular and type 2 diabetes development risk. FSJD-PIOSPIMET-2012. 2013-. LR: Lourdes Ibáñez.
- Low molecular weight heparin for prevention of complications derived from placental insufficiency in patients at risk without thrombophilia: randomised multi-centre study. EC10-147. Ministry of Health and Social Policy. 2011-2014. LR: María Dolores Gómez-Roig.
- Magnesium sulphate in continuous versus discontinuous administration in expectant management of severe pre-eclampsia: randomised clinical trial. EC11-375. Ministry of Health and Social Policy. 2012-2014. LR: Joan Sabrià.



- Resuscitation of newborns with extremely low weight through an integral monitoring system: study of the influence of the oxygen inspiration fraction. REOX. 2012-. LR: Marta Thió.

Publications

- Alarcon A, Martinez-Biarge M, Cabañas F, Hernanz A, Quero J, Garcia-Alix A. Clinical, biochemical, and neuroimaging findings predict long-term neurodevelopmental outcome in symptomatic congenital cytomegalovirus infection. *J Pediatr* 2013. 163: 828-. FI: 4,035(Q1)
- Bassols J, Megia A, Soriano-Rodríguez P, Díaz M, Prats-Puig A, Gifre M, Simón-Muela I, Torrent S, Borrell AC, Riera-Socasau JC, Vendrell J, de Zegher F, Ibáñez L, López-Bermejo A. A common gene variant in STK11 is associated with metabolic risk markers and diabetes during gestation. *Fertil Steril* 2013. 100: 788-792. FI: 4,174(Q1)
- Beardsall K, Vanhaesebrouck S, Ogilvy-Stuart AL, Vanhole C, VanWeissenbruch M, Midgley P, Thio M, Cornette L, Ossueta I, Palmer CR, Iglesias I, de Jong M, Gill B, de Zegher F, Dunger DB. Validation of the continuous glucose monitoring sensor in preterm infants. *Arch Dis Child Fetal Neonatal Ed* 2013. 98: -0. FI: 3,451(Q1)
- Camprubí C, Iglesias-Platas I, Martin-Trujillo A, Salvador-Alarcon C, Angeles Rodriguez M, Rodriguez Barredo D, Court F, Monk D. Stability of genomic imprinting and gestational-age dynamic methylation in complicated pregnancies conceived following assisted reproductive technologies. *Biol Reprod* 2013 Sep 5; 89(3):50. FI: 4,139(Q1)
- Callejo J, Salvador C, González-Nuñez S, Almeida L, Rodríguez L, Marqués L, Valls A, Lailla JM. Live birth in a woman without ovaries after autograft of frozen-thawed ovarian tissue combined with growth factors. *J Ovarian Res* 2013. 6: 33-0. FI: 2,429(Q2)
- Casano-Sancho P, Suárez L, Ibáñez L, García-Fruitoso G, Medina J, Febrer A. Pituitary dysfunction after traumatic brain injury in children: is there a need for ongoing endocrine assessment?. *Clin. Endocrinol.* 2013. 79: 853-858. FI: 3,396(Q2)
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Thesis

- Endocrine-metabolic profile and body composition in macrosomas. Doctoral candidate: Miriam Pérez Cruz. Registration date: 15/02/2013.
- Influence of food in the early stage of life on future cardiovascular risk in newborns with intrauterine growth restriction. Doctoral candidate: Giorgia Sebastiani. Registration application: 04/04/2013.
- Study on the glycaemic profile before discharge in preterm infants with suitable weight for gestational age and with intrauterine growth restriction. Doctoral candidate: África Pertierra Cortada.
- Study on the glycaemic profile before discharge in preterm infants with suitable weight for gestational age and with intrauterine growth restriction. Doctoral candidate: Thais Agut.

Networks

- CIBERDEM: Centre for Biomedical Network Research on Diabetes and Associated Metabolic Disorders. LR: Lourdes Ibáñez.
- Maternal-Child Health and Development Network (SAMiD). Carlos III Health Institute. 2009-2013. LR: Josep M. Lailla.



Infectious diseases and systemic inflammatory response in paediatrics

The infectious diseases research group focuses on the study of the clinical, molecular and epidemiologic aspects of the main paediatric infectious diseases, including vaccine preventable diseases (such as pneumococcal disease and human papillomavirus infection) and vertically transmitted infections (like HIV-1 and hepatitis C). The group also works on the early diagnosis and identification of infectious diseases by molecular methods. The multidisciplinary character of the research group's members allows the comprehensive study of our patients' infections.

Research team

Coordinators Dr. Carmen Muñoz-Almagro and Dr. Clàudia Fortuny

Researchers Laia Alsina, Montse Alvaro, Hector de Paz, Eva del Amo, Jordi Antón, Rosa Bou, Pedro Brotons, Olga Domínguez, Mariona Fernández, Clàudia Fortuny, Victòria Fumadó, Juan José García-García, Eva Gargallo, Amadeu Gené, Maite Giner, Susanna Hernández, Melania Iñigo, Rosa Jiménez-Feijoo, Iolanda Jordán, Teresa Juncosa, Cristian Launes, Jaime Lozano, M.^a Anunciación Martín, Carmen Muñoz-Almagro, Antoni Noguera, Ana María Plaza, Natalia Peris, Mónica Piquer, Silvia Ricart, Palmira Santin, Laura Selva, Vicenç Torrente, Mireya Urrea and Asunción Vicente

Support technicians Cristina Esteva

Assistants Joan Calzada, Anna Esteve Sole, Estibaliz Iglesias, Alain-Michel Boudet, Alain Moren and Judith Sánchez

Research lines

Molecular epidemiologic surveillance of vaccine preventable diseases

Dr. Carmen Muñoz-Almagro

The human species' first contact with many microorganisms takes place in childhood, when children have not been infected and have not developed the disease. Vaccination in early ages of life has proven to be an effective tool in the fight against infectious diseases. In order to evaluate the best vaccination strategies in a specific population, a good molecular characterisation of the microorganisms circulating in the respective community is essential since microorganisms diversify genetically to adapt themselves as well as possible to a specific environment. At present the group's most active research line is the molecular epidemiologic surveillance of pneumococcal disease. Since the end of the 1980s, studies have been underway on the evolution of the serotypes and clones of the pneumococcus producing this invasive disease in our population and since 2008 the surveillance of the child population of Sierra Leone has been added, applying innovative techniques for diagnosis and capsular typing by molecular methods.

VIH

Dr. Clàudia Fortuny

Study of the factors associated with vertically transmitted infections and especially with HIV infection: long-term follow-up of healthy patients exposed to HIV and to anti-retroviral drugs to define whether exposure to such drugs in the gestational and neonatal periods affects neurologic or weight-height development in any way when associated with carcinogenesis, or if they are a risk factor for other disorders.



Systemic inflammatory response in the paediatric age

Dr. Jordi Antón

Study of the immune mechanisms in the following groups of diseases: congenital immunodeficiencies, secondary immunodeficiencies, autoimmune diseases and allergic diseases. Specifically, studies have been started on inflammatory response in severe invasive pneumococcal disease, on analysis of phenotypes and genotypes of variable common immunodeficiency, and on analysis of the signalling pathways of Toll-like receptors in hereditary and non-hereditary inflammatory diseases.

Projects

- Predoctoral training grants in health research. Beneficiary: Eva del Amo. Carlos III Health Institute. FI11/00720. 2011-2014. LR: Carmen Muñoz-Almagro.
- Correlation between the clinical and immunologic phenotypes of paediatric patients with common variable immunodeficiency. Spanish Society for Paediatric Clinical Immunology, Allergy and Asthma. 2012-2014. LR: Mónica Piquer.
- Detection and serotyping of *S. pneumoniae* by means of dried-blood spot (DBS) in developing countries LS081288. Agency for the Management of University and Research Grants (AGAUR). 2012-2013. LR: Carmen Muñoz Almagro.
- Molecular diagnosis of food allergy to shellfish in the paediatric population. Spanish Society for Paediatric Clinical Immunology, Allergy and Asthma. 2013-2015. LR: Olga Domínguez Sánchez.
- Effectiveness of 13-valent pneumococcal conjugate vaccine in the prevention of invasive pneumococcal disease in children. A matched case-control study. PI11/02081. Carlos III Health Institute. 2012-2014. LR: Juan José García-García.
- Study of the primary and secondary defects of the IL-12/IFN-gamma/TNF-alpha pathway with susceptibility to infection by intracellular micro-organisms. PI12/01990. Carlos III Health Institute (FIS). 2013-2015. LR: Laia Alsina.
- Intensification for healthcare activity. Godia Foundation. 2012-2013. LR: Carmen Muñoz-Almagro.
- Identification of prognostic factors in muscular biopsy in the diagnosis of patients with juvenile dermatomyositis. Catalan Society for Rheumatology. 2013-2015. LR: Estibaliz Iglesias Jiménez.
- Impact of the administration of systemic glucocorticoids on the inflammatory response and clinical evolution of patients with moderate-severe bronchiolitis. EC10-176. Ministry of Health and Social Policy. 2011-2013. LR: Iolanda Jordan.
- Incidence of somatic mutations of the NLRP3 gene in patients with clinical diagnosis compatible with Cryopyrin-associated periodic syndromes. Catalan Society for Rheumatology. 2012-2014. LR: Jordi Antón.
- Influence of MBL (Mannose-binding lectin) deficiency on invasive pneumococcal disease and association with the various serotypes in the adult and child populations. PI10/02058. Carlos III Health Institute. 2011-2013. LR: Carmen Muñoz-Almagro.
- Reference laboratory for molecular epidemiologic surveillance of meningococcal disease in Catalonia. Public Health Agency of Catalonia. 2013. LR: Carmen Muñoz-Almagro.
- Reference laboratory for molecular epidemiologic surveillance of invasive pneumococcal disease in Catalonia. Public Health Agency of Catalonia. 2013. LR: Carmen Muñoz-Almagro.
- Reference laboratory for molecular epidemiologic surveillance of whooping cough in Catalonia. Public Health Agency of Catalonia. 2013. LR: Carmen Muñoz-Almagro.
- Modulation of the systemic inflammatory response in critically ill children after supplementation with glutamin. TRA-166. Ministry of Health and Social Policy. 2010-2013. LR: Iolanda Jordan García.
- RESPOC. Fast, cost-effective, user-friendly point of care (POC) instrument for detection of respiratory pathogens, including *Streptococcus pneumoniae*. 606488. European Commission. 2013-2016. LR: Carmen Muñoz-Almagro.



- Recognised research group on infectious diseases in the paediatric age. 2009SGR136. University and Research Grants Management Agency (AGAUR), Government of Catalonia. 2009-2013. LR: Carmen Muñoz-Almagro.
- Single HUB and access point for paediatric rheumatology in Europe (SHARE). European Commission. 2012-2015. LR: Jordi Antón.
- Contracting of research support technicians in the National Health System. CA11/00447. Carlos III Health Institute. 2012-2015. Beneficiary: Cristina Esteva. LR: Carmen Muñoz Almagro.
- Use of dried-blood spot (DBS) samples for detection and molecular surveillance of *Streptococcus pneumoniae* in developing countries. Hospital Sant Joan de Déu. BR201101.2012-2015. LR: Carmen Muñoz-Almagro.

Clinical trials

- Continued access to Darunavir/ritonavir (DRV/rtv) in children and adolescents aged 3 years or more infected by HIV-1. TMC114-TiDP29-C232. 2011-. LR: Clàudia Fortuny.
- Continued access to etravirine in previously treated children and adolescents infected by HIV-1. TMC125-TiDP35-C239. 2010-. LR: Clàudia Fortuny.
- Open multi-centre 48-week trial of pharmacokinetics by administration of multiple doses, and of safety and effectiveness of maraviroc in combination with an optimised base therapy for treatment of children and adolescents aged 2 to 18 years infected by HIV-1 with CCR5 tropism who have previously been treated with anti-retrovirals. A4001031. 2010-. LR: Clàudia Fortuny.
- Double-blind randomised multi-centre comparative clinical trial to evaluate the effectiveness, safety and pharmacokinetics of daptomycin in comparison to the active reference treatment in paediatric patients with acute haematogenous osteomyelitis caused by gram-positive organisms. DAP-PEDOST-11-03. 2011-. LR: Juan José García-García.
- Open multi-centre phase 3 clinical trial to evaluate the pharmacokinetics, effectiveness and safety of abatacept administered subcutaneously (sc) in children and adolescents with active polyarticular juvenile idiopathic arthritis and inadequate response to biological or non-biological disease-modifying antirheumatic drugs (DMARDs). IM101-301. 2013-. LR: Jordi Antón.
- Contact follow-up phase 3 trial comparing the diagnostic functioning of C-Tb to QuantiFERON®-TB Gold In-Tube, in combination with a randomised double-blind safety analysis in different parts of the body with C-Tb versus 2 UT of tuberculin PPD RT23SSI (PPD). TESEC-06. 2013-. LR: Antoni Noguera.
- Open extension study to evaluate the long-term safety of etanercept in children and adolescents with extended oligoarticular juvenile idiopathic arthritis, enthesitis-associated arthritis or psoriatic arthritis who took part previously in protocol 0881A1-3338-WW (B1801014). B1801023. 2013-. LR: Jordi Antón.
- Open extension study with canakinumab (ACZ885) in patients with systemic juvenile idiopathic arthritis and active systemic manifestations. CACZ885G2301E1. 2011-. LR: Jordi Antón.
- Open multi-centre phase 1b study to investigate the pharmacokinetics, pharmacodynamics and safety of tocilizumab after subcutaneous administration to patients with polyarticular juvenile idiopathic arthritis. WA28117. 2013-. LP: Jordi Antón.
- Open 2-stage phase 1/2 study on a single group of the safety, pharmacokinetics and effectiveness of telaprevir in combination with peginterferon alfa-2b and ribavirin in paediatric subjects from 3 to 17 years old infected with genotype 1 hepatitis C virus. VX11-950-118. 2013-. LR: Clàudia Fortuny.
- Placebo-controlled double-blind randomised phase 3 study to determine the effectiveness, safety and tolerability of lebrikizumab in adolescent patients with uncontrolled asthma treated with inhaled corticosteroids and a second control drug. WB28183. 2013-. LR: Ana M.^a Plaza.
- Phase III, randomised, double-blind, placebo-controlled, parallel group study to assess the effectiveness and safety over 48 weeks of orally inhaled tiotropium bromide (2.5 µg and 5 µg once daily) delivered by the Respimat® inhaler in adolescents (12 to 17 years old) with moderate persistent asthma. 205.444. 2013-. LR: Ana M.^a Plaza.



- Open single-arm prospective multi-centre international study to assess the safety, effectiveness and pharmacokinetics of atazanavir (ATV) powder strengthened with liquid ritonavir (RTV) with an optimised combination of nucleosides in children infected by HIV, untreated or previously treated with anti-retrovirals, aged between 3 months and under 8 years (Pediatric Atazanavir International Clinical Evaluation: PRINCE II study). AI424-451. 2012-. LR: Clàudia Fortuny.
- Active-control observer-blind randomised multi-centre study to assess the safety, tolerability, effectiveness and pharmacokinetics of ceftaroline versus a comparator in paediatric subjects with acute bacterial infection of the skin and cutaneous structures. P903-23. 2013-. LR: Juan José García.
- Double-blind placebo-controlled parallel group randomised multi-centre study to assess the safety, effectiveness and pharmacokinetics of belimumab, an anti-BLYS human monoclonal antibody, plus standard therapy in paediatric patients with systemic lupus erythematosus (SLE). BEL114055. 2013-. LR: Jordi Antón.
- Long-term follow-up multi-centre study on HLH patients previously treated with NI-0501, a gamma anti-interferon monoclonal antibody. NI-0501-05. 2013-. LR: Laia Alsina.
- Placebo-controlled randomised double-blind multi-centre study on parallel groups to evaluate the safety and tolerability of 10 mg bilastine administered once daily to children from 2 to 11 years old with allergic rhinoconjunctivitis or chronic hives. BILA-3312/PED. 2013-. LR: Ana M.^a Plaza.
- Open multi-centre pilot study on the effectiveness and safety of canakinumab treatment for 6 months and follow-up of up to 6 months in patients with active Hyper-IgD syndrome. HIDS study. CACZ885D2402. 2012-. LR: Jordi Antón.
- Open single-arm multi-centre pilot study to explore the safety, tolerability, pharmacokinetics and effectiveness of multiple intravenous administrations of NI-0501, a gamma anti-interferon monoclonal antibody (anti-IFN) in paediatric patients with reactivated primary haemophagocytic lymphohistiocytosis. NI-0501-04. 2013-. LR: Laia Alsina.
- Comparative evaluation of the safety and effectiveness of daptomycin versus standard treatment in paediatric patients from 2 to 17 years old with bacteraemia caused by *Staphylococcus aureus*. DAP-PEDBAC-11-02. 2013-. LR: Antoni Noguera.
- Impact of the administration of systemic glucocorticoids on the inflammatory response and clinical evolution of patients with moderate-severe bronchiolitis. LR: Yolanda Jordan.
- Short-cycle therapy (SCT) (5 days with/2 days without) in young people infected by HIV-1 (PENTA 16). PENTA 16. 2011-. LR: Clàudia Fortuny.

Publications

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- Álvaro M, Giner MT, Vázquez M, Lozano J, Domínguez O, Piquer M, Díaz M, Jiménez R, Martín MA, Alsina L, Plaza AM. Reply to correspondence letter by M. Korppi. *Eur J Pediatr* 2013. 172: 283-284. FI: 1,907(Q2)
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- Berruero R, Antón A, Rives S, Català A, Toll T, Ruiz A, Camós M, Torrebadell M, Estella J, Muñoz-Almagro C. Multiplex real-time PCR for prompt diagnosis of an outbreak of human parainfluenza 3 virus in children with acute leukemia. *Infection* 2013. 41: 1171-1175. FI: 2,440(Q3)



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- Borrás Novell C, Hernández Bou S, García García JJ. Prescripción antibiótica en los pacientes hospitalizados desde Urgencias. Estudio multicéntrico. *An Pediatr (Barc)* 2013. 79: 15-20. FI: 0,867(Q4)
- Borràs Novell C, Jordan García Y, Muñoz-Almagro C. Lactante sano con reactivación de citomegalovirus en contexto de bronquiolitis por metapneumovirus. *An Pediatr (Barc)* 2013. 79: 268-269. FI: 0,867(Q4)
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Research and innovation in surgery

This group is engaged in research on disorders in which surgical treatment is involved at some point in the care process. It is a multidisciplinary group formed by a team of people from different fields of medicine, who work in a coordinated way in the group's various research areas (specialists in general and digestive surgery, traumatology, gynaecology, urology, diagnostic imaging, and endocrinology and nutrition, among other areas). The group's field of study is quite broad and comprises aspects involving pathophysiology and epidemiology, risk factors and critical analysis of the various aspects of surgical therapeutics.

Research team

Coordinator Dr. David Parés

Researchers Rosa Cambra, Manera Carreras, Juan Castellanos, Josep M Casulleras, Isaac Cebrecos, Manuel Céspedes, Jordi Comajuncosas, Raúl de Diego, Enric Domínguez, Laia Estalella, Lluís Font, Josep-Ramón Céspedes, Laura García, Andres E. Gerding, Pere Gris, Judit Hermoso, Oscar Izquierdo, Jaime Jimeno, Carlos Jordán, José Manuel Ledesma, José Luis López-Negre, Montserrat Margarit, Eva Martínez-Franco, Gabriela Monroy, Rolando Orbeal, David Parés, Nuria Rojo, Sergi Romero, Ana Sánchez, Joan Urgellés and Helena Vallverdú

Research lines

Functional pathology of the digestive system and the abdominal wall

Dr. David Parés

Research is focused on functional disorders of bowel habits (faecal incontinence), benign anorectal disorders (haemorrhoids, anal fistula, anal fissure) and their diagnosis with 3D endoanal ultrasound scanning, and on clinical aspects and quality of life in inguinal hernia.

Study of hepatobiliary, endocrine and breast disorders

Dr. Jaime Jimeno

Most of the research in this line is focused on aspects of care quality in laparoscopic cholecystectomy and on disorders of the parathyroid gland.

Locomotor system disorders

Dr. Juan Castellanos

Research covering all aspects of orthopaedic surgery and traumatology with its main focus on control and study of infection in traumatology and on microsurgery treatment of various disorders of the locomotor system.

Urogynaecologic and pelvic floor surgery

Dr. Manuel Céspedes

Postpartum disorders of the pelvic floor (urinary incontinence) and surgical disorders of the urethra.



Projects

- Effect of electromagnetic fields on adhesion and formation of *S. epidermidis* biofilm on various metals. Mutual Mèdica Grant. Mutual Mèdica de Catalunya i Balear. 2011-2014. LR: Luis Font Vizcarra.
- Impact of the use of information and communication technologies (ICTs) on the management of the surgery waiting list: a randomised clinical trial. Sant Joan de Déu Healthcare Park (PSSJD). 2013-2014. LR: David Parés Martínez.

Publications

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- Parés D. Return to work after elective inguinal hernia repair. *Cir Esp* 2013. 91: 473-475. FI: 0,871(Q3)

Thesis

- Thesis title: Prevalence of faecal incontinence in Barcelona and analysis of its impact on quality of life and mental health. Thesis supervisors: Dr. Luis Grande (Hospital del Mar) – Dr. David Parés (PSSJD). Thesis defence date: 9 May 2013.



Healthcare technologies and results in primary care and mental health

This team carries out projects in the field of epidemiology, analysis of effectiveness of treatments and their adaptation, the determinants of mental health and its financial effects on society. This research is focused on both disorders and treatments undertaken in specific contexts, with the following aims:

1. To assess the prevalence of mental disorders and the needs of people who suffer from them, both in the general population and in specific populations (primary care, prison care).
2. To appraise the effectiveness of interventions in primary care: anti-depressive treatment, psychoeducation, pharmaceutical intervention, etc.
3. To describe the population for which the primary care doctor prescribes anti-depressive drugs and to describe the treatment pattern.
4. To assess the manner in which health determinants influence the presentation and/or evolution of mental disorders.
5. To assess financially the impact of mental disorders on society.
6. To assess interdisciplinary cooperation in primary care.

Research team

Coordinator Dr. Antoni Serrano Blanco

Researchers Jaume Autonell, Luisa Baladón, Imma Beneitez, Alexia Camuñas, Antonio Cuesta-Vargas, Rosa Dueñas, Ana Fernández, Rita Fernández, Juan Vicente Luciano, Juan Manuel Mendive, Elisa Olivari, María Teresa Peñarubia, María Rubio, Luis Savador, Antoni Serrano-Blanco and Enric Vicens

Assistants Elena Blanco, Laura Gómez, Diego Palao, Martin Knapp and Eugenia Cardeñosa

Projects

- Preventive activities and health promotion in primary care. RD12/0005/0008. Carlos III Health Institute (FIS). 2013-2016. LR: Antonio Serrano-Blanco.
- Cost-effectiveness of non-pharmacological vs. pharmacological (fluoxetine, escitalopram or venlafaxine) treatment of major depression in Spanish primary care (INFAP Study). PI11/01345. Carlos III Health Institute (FIS). 2012-2014. LR: Antonio Serrano-Blanco.
- Unmet needs in elderly persons hospitalised for the first time in an acute psychiatry unit: relation with quality of life and use of healthcare and social resources. Sant Joan de Déu Healthcare Park (PSSJD) – Mental Health Services. 2013-2014. LR: Antonio Serrano-Blanco.
- Factors involving the healthcare professional, the patient, genetics and their interaction associated with the therapeutic success of an intervention to prevent major depression in primary care. PredictD-EVAL study. PI12/02755. Carlos III Health Institute (FIS). 2013-2015. LR: Juan Bellón. AR: Ana Fernández.
- Research on healthcare services and health-related results.
- Research on healthcare services and health-related results. 2009SGR101. Agency for the Management of University and Research Grants (AGAUR). 2009-2014. LR: Antonio Serrano-Blanco.
- REDIAP – Network for Research on Preventive Activities and Promotion of Health in Primary Care. RD06/0018/0017. Carlos III Health Institute (FIS). 2006-2013. LR: Antonio Serrano-Blanco.



- Clinical subtypes in fibromyalgia and cognitive strategies for emotional regulation: a multi-centre study in primary care. PSSJD 2011 Grants. Sant Joan de Déu Healthcare Park (PSSJD) – Mental Health Services. 2012-2013. LR: Juan Vicente Luciano.

Publications

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Emerging research groups

Influence of the environment on child and adolescent welfare

Group focused on research in the following spheres:

- Study of the epidemiologic and clinical factors of childhood accidents.
- Differential diagnosis of child mistreatment.
- Early detection and secondary prevention of social-health issues in adolescence: drugs, sexuality and violence.
- Impact of external agents (radiation, pollution, etc.) on child health.
- Improvement of paediatric patient care in medical visits: presence of parents, analgesia, differentiated care by age (children/adolescents), etc.

Research team

Coordinators Dr. Carles Luaces and Dr. Jordi Pou Fernández

Researchers Gemma Claret, Ana Isabel Curcoy, Carles Luaces, Jordi Pou, Silvia Ricart, Marta Simó and Victoria Trenchs

Projects

- Impact of rapid diagnosis tests on the evaluation and handling of newborns aged 0 to 90 days with fever without focus. 285/15/2008. Agency for Information, Evaluation and Quality in Health (AIAQS). 2009-2013. LR: Carles Luaces Cubells.
- Treatment of pain and anxiety based on interaction of social robots with children to improve patient's experience. TIN2012-38416-C03-03. Ministry of Science and Innovation (MINECO). 2013-2015. LR: Carles Luaces Cubells.

Publications

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- Claret Teruel G, Bilbao Meseguer N, Valverde-Molina J, Korta Murua J, Sotoca Fernández JV, Sánchez Echániz J. Crisis asmática en los servicios de urgencias en España, ¿cuál es nuestra práctica habitual?. *An Pediatr (Barc)* 2013. 78: 216-226. FI: 0,867(Q4)
- Deya-Martinez A, Claret-Teruel G, Fernandez-Santervas Y, Trenchs-Sainz de la Maza V, Gonzalez-Alvarez V, Luaces-Cubells C. Se debe ser más intervencionista en urgencias con las convulsiones febriles atípicas? Experiencia en un hospital terciario durante tres años. *Rev Neurol* 2013. 56: 353-358. FI: 1,179(Q4)
- Panzino F, Quintillá JM, Luaces C, Pou J. Ahogamientos por inmersión no intencional. Análisis de las circunstancias y perfil epidemiológico de las víctimas atendidas en 21 servicios de urgencias españoles. *An Pediatr (Barc)* 2013. 78: 178-184. FI: 0,867(Q4)
- Trenchs Sainz de la Maza V, Curcoy Barcenilla AI, Gelabert Colome G, Macias Borrás C, Pou Fernández J. Evolución de los ingresos por maltrato infantil durante 15 años. *An Pediatr (Barc)* 2013. 78: 118-122. FI: 0,867(Q4)



Clinical and epidemiologic research on high-prevalence disorders

This research group forms a multidisciplinary team of researchers who work on high-prevalence disorders. These are disorders with a high morbidity/mortality, representing an increasingly higher percentage of activity in all hospitals. The group comprises specialists with long clinical experience who commonly work with disorders of this type.

This group has recently taken up a new research line focused on critical patients.

The common goal of the group is clinical research aimed to obtain further clinical knowledge allowing an improvement and simplification of diagnostic and/or therapeutic techniques. It also seeks to increase the epidemiologic research in our area to help to obtain a greater knowledge of the incidence, prevalence and risk factors of high-prevalence disorders.

Research team

Coordinator Dr. Luis Lores Obradors

Researchers Maria Aiguabella, Mireia Albuixech, Elisabeth Arellano, Nuria Berrocal, Ernest Bragulat, Antoni Callén, Anna Capella, Xavier Casas, Francisco Castro, Yolanda Delgado, Vicens Diaz de Brito, Gemma Donaire, Rosana Hernando, Lluís Font, Arantxa Garcia, Diego Gauna, Paola Gómez, Araceli González, Jordi Graells, Ana Escrig, Soledad Herrera, Oscar Izquierdo, Mireia Junyent, Francisco López, Luis Lores, Pablo Marchena, Xavier Martret, Patricia Miro, Gerard Navarrete, Joan Nicolás, Rosa M.^a Ojeda, Teresa Pascual, Carles Paytubi, Sandra Pérez, Berti Rivero, Bernabé Robles, Amara Rodenas, Yobanni Rodríguez, Julián Rodríguez-Larrea, César Romero, Elisabeth Rovira, Marta Serrano, Rosalia Torres, Mireia Vila and M.^a José Vives

Research lines

Clinical and epidemiologic research on chronic degenerative neurologic disorders

Dr. Antoni Callén

This line focuses on personal networks as a strategy for dealing with stress in carers of patients with dementia: it analyses the interpersonal relation networks of carers of dementia patients. The objective is to document the work overload of the carer and the stress that it generates in order to provide the tools required to cope with the job involved. Application of new technologies to patients with cognitive deterioration: Location-Based Extensible and Generic Platform for Ambient Assisted Living (LEGAAL) ICT 4 for Healthy Ageing. Application of the new technologies to promote independent healthy ageing. Monitoring of vital functions, fall risk analysis as preventive measures. Promotion of healthy habits. GPS tracking of patients with dementia to prevent the risk of getting lost.

Clinical and epidemiologic research on emerging respiratory disorder processes

Dr. Luis Lores Obradors

The research work is focused on prevalence studies of obesity hyperventilation syndrome in the urban area and prevalence of chronic obstructive pulmonary disease in the reference area; numerous clinical trials and observational studies on patients with COPD and studies of chronic bronchial disorders.



Clinical and epidemiologic research on chronic heart disorders

Dr. César Romero

Work is carried out on 4 research lines: cardiac arrhythmias, heart failure, coronary atherothrombotic disease, and cardiovascular risk factors.

Emergency care processes and disorders

Dr. Ernest Bragulat

Research is conducted along 3 lines: chest pain; prevalence of DVT in mental health patients, and triage at Sant Joan de Déu Healthcare Park.

Epidemiologic research on non-melanoma skin carcinoma

Dr. Jordi Graells

Within the general lines described for the research group, special emphasis is placed on epidemiologic research on non-melanoma skin cancer, the risk factors relating to the appearance of new skin neoplasms, and the relations and synergies between primary care and specialised care.

Clinical and epidemiologic research on severe infectious processes

Dr. Vicenç Díaz de Brito

4 research lines are followed:

- Nosocomial infection associated with social-healthcare centres.
- Infection by multi-resistant or highly complex micro-organisms.
- High-prevalence respiratory infections.
- Prosthetic osteoarticular infection.

Processes and disorders of critical patients

Dr. Fernández Trujillo

Work is carried out on three main lines of research: 1. cardiovascular research on the role of ultrasound scanning in cardiac arrest, 2. techniques for improvement of tracheotomy with ultrasound scanning, and 3. handling of chronic patients in critical care units.

Projects

- Study of personal networks as a strategy against stress in carers of Alzheimer patients. Sant Joan de Déu Healthcare Park (PSSJD) – Mental Health Services. 2013-2014. LR: Jaime Llopis.
- Utility of care coordination to suitably adapt clinical treatment and the administrative handling of atrial fibrillation. PSSJD 2011 Grants. Sant Joan de Déu Healthcare Park (PSSJD) – Mental Health Services. 2012-2013. LR: Mireia Junyent.
- Impact of strengthening basic hygiene measures on multi-resistant micro-organisms in long-term centres and private care homes. PSSJD, social-healthcare centres and private care homes in PSSJD's area of influence. 2014- 2015. Mutuam-Conviure 2013 Foundation. Beneficiary: Amara Ródenas. LR: Vicenç Díaz de Brito.

Clinical trials

- Clinical effectiveness and secondary histological changes in treatment with omalizumab in allergic asthma patients in GINA stage V. CHD-PI08. 2009-. LR: Luis Lores.
- Open prospective randomised phase IV clinical trial to evaluate the utility of nitric oxide measurement in exhaled air in the therapeutic handling of adult patients with light asthma. FSJD-ALINO. 2012-. LR: Luis Lores.



- Compared clinical trial of two strategies for therapeutic decision-making in the study of tuberculosis contacts: standard strategy based on the tuberculin test (TT) versus the combination of TT and QuantiFERON-TB Gold In Tube QFT-ECC-01. 2011-. LR: Xavier Casas.
- Active product-controlled double-simulation double blind randomised trial to assess the effectiveness, safety and tolerability of clidinium bromide/formoterol fumarate, administered twice daily, versus salmeterol/fluticasone propionate, administered twice daily, in treatment under a period of 24 weeks of symptomatic patients with chronic obstructive pulmonary disease (COPD). M-40464-39. 2013-. LR: Luis Lores.
- Double-simulation double blind randomised trial with parallel groups comparing fluticasone propionate/ formoterol fumarate (Flutiform®) 250/10 µg (2 inhalations twice daily) and Flutiform® 125/5 µg (2 inhalations twice daily) versus formoterol fumarate dihydrate (Atimos®) 12 µg (1 inhalation twice daily) in subjects with chronic obstructive pulmonary disease (COPD). FLT3509. 2013-. LR: Luis Lores.
- Multi-centre placebo-controlled double blind randomised trial of ciprofloxacin 32.5 µg in dry powder for inhalation twice daily in intermittent administration during 28 days with another 28 days of rest or during 14 days with another 14 days of rest, versus placebo, evaluating the time until the first pulmonary exacerbation and the frequency of exacerbations in subjects with bronchiectasis not due to cystic fibrosis. BAY q3939/15625. 2013-. LR: Luis Lores.
- Multi-centre randomised trial with duration of 52 weeks to evaluate the remote monitoring of patients using the EXACT questionnaire on patient-reported results in the reduction of hospitalisations due to exacerbations in chronic obstructive pulmonary disease patients versus patients controlled according to the usual clinical practice. CIDD001D2401. 2013-. LR: Luis Lores.
- Placebo-controlled double blind randomised dose search trial to evaluate dupilumab in patients with moderate to severe uncontrolled asthma. DRI12544. 2014-. LR: Luis Lores.
- Clinical results study to compare the effect of fluticasone furoate/inhaled vilanterol powder 100/25 µg with placebo on survival of subjects with moderate chronic obstructive pulmonary disease (COPD) and with background or high risk of cardiovascular disease. HZC -113782. 2011-. LR: Luis Lores.
- Randomised multi-centre trial with active control of effectiveness and safety to compare betrixaban in prolonged treatment with Enoxaparina® as usual treatment for prevention of venous thromboembolism in patients with medically acute disease. 11-019. 2012-. LR: Pablo Marchena.
- Placebo-controlled double blind randomised multi-centre trial with parallel groups and active treatment with duration of 12 weeks to assess the effectiveness, safety and tolerability of QVA149 (indacaterol maleate/ glycopyrronium bromide) in COPD patients with moderate to severe limitation of air flow. CQVA149A2336. 2013-. LR: Luis Lores.
- Evaluation of the clinical effects of inhibition of cholesterol ester transport protein with evacetrapib in patients with high risk of vascular events. ACCELERATE Study. I1V-MC-EIAN (ACCELERATE). 2013-. LR: Pablo Marchena.
- SAS115359, a trial on the safety and effectiveness of a combination of fluticasone propionate/inhaled salmeterol versus inhaled fluticasone propionate in the treatment of adolescents and adults with asthma. SAS115359. 2012-. LR: Luis Lores.
- Sequence (multi-centre) study: Intravenous to oral sequencing and early discharge opportunities in gram-positive infections requiring treatment with glycopeptide or lipopeptide. LR: Vicenç Díaz de Brito.

Publications

- Muñoz-Mahamud E, Gallart X, Soriano A. One-stage revision arthroplasty for infected hip replacements. *Open Orthop J* 2013; 14(7): 148-9.
- Muñoz-Mahamud E, Bori G, García S, Ramírez J, Riba J, Soriano A. *J Arthroplasty* 2013; 28(8): 1247-50. FI: 2,110.



Research groups under formation

Research on nursing, education and society

The Research Group on Nursing, Education and Society (GIIES) works in 4 different fields of research: social action, healthcare methodology, educational innovation, and identity traits. In each of these fields a group of professors carry out their research activity in one of the following main areas of interest: analysis of social inequalities and vulnerability, evaluation of nursing care plans, development and analysis of innovative educational methodologies, and identity traits of our profession.

Research team

Coordinators Dr. Núria Roca and Dr. Juan Roldán

Researchers Judit Boluña, Marta Callarisa, Anna Cano, Rosa Gaya, Amèlia Guilera, Marina Heredia, Barbara Hurtado, Laura Martínez, Dolores Miguel, Carlos Nebot, Núria Roca, Olga Rodrigo, Juan Roldán, M. José Morera, Àngels Pedrola, Anna Pérez, Anna Ramió, Nuria Roca, Dolores Royo, Júlia Roura, Laura Serradesanferm, Joan Uribe and Carme Vega

Research lines

Social action

Dr. Núria Roca

Social inequalities and the situation of vulnerability in which a steadily growing part of the population finds itself call for the implementation of policies aimed to improve people's lives. The research group on social action has the goal of conducting studies that will provide a better knowledge of the structural conditions of inequality and that will allow proposals for improvement to be developed.

Identity traits

Dr. Anna Ramió

The goal in this field is to foster the research on the identity traits of the healthcare professions (and especially those of nurses) and of the social-healthcare organisations. The identity of the professions and organisations in this field is structured around the collective's values and attitudes which, together with its abstract knowledge and its skills, specify and generate its social service. The research in this field seeks to increase the knowledge of these essential core aspects, around which pivots the humanised care provided to people by the social-healthcare professions and organisations.

Educational innovation

Ms. M^a José Morera

The concern for the quality of education and the start-up of initiatives for organizational change in education and in educational methodology practices place fundamental importance on the role of innovation and change in the whole process of adapting to existing social demands. The Educational Innovation Group conducts research on the educational methodologies that promote educational change, innovation and improvement.



Its main goals are:

1. Research focused on the improvement of teacher training, organisational culture and management of the centre.
2. The development of educational strategies that will strengthen the training of students within the frame of the current context and needs.

Healthcare methodology

Dr. Juan Roldán

The goal in this field is to strengthen the study of the care to be provided to people with health problems in order to promote health, welfare and quality of life in all age groups and all personal situations.

We consider that research is a necessary activity which should allow us to answer the questions arising about our nursing practice and that it is a basic instrument for this practice's development. This activity will not only assure a quality nursing intervention for people but will also provide an added value for us as professionals, for the community and for the healthcare system itself.

Projects

- Adaptation and validation of the questionnaire on self-care requirements according to the Dorothea Orem nursing model for hospitalised patients diagnosed with schizophrenia. 5170/09. Official Nursing Association of Barcelona. 2010-2013. LR: Juan Roldán-Merino.
- Application of the patient- and family-centred healthcare model to hospitalised children diagnosed with acute bronchospasm: a commitment to hospital efficiency. PR-2715/12. Official Nursing Association of Barcelona. 2013-2014. LR: Marta Fernández Corcuera.
- Carers 2.0: effectiveness of a support programme for non-professional carers of chronic patients. FIS Carlos III Institute. File no.: PI12/01224. 2013-2015. LR: Mar Lleixà Fortuño. Researcher: Juan Roldán-Merino.
- Qualitative study on the spiritual needs of people in a situation of vulnerability and social exclusion. Sant Joan de Déu Social Services (hostel). 2012-. LR: Ricardo Dasí.
- Study of the attitudes and behaviours attached to the institutional values of the Hospitaller Order of Saint John of God, Aragon-Sant Rafael Province. EUI-SJD Sant Joan de Déu Educational Campus – Private Foundation. Hospitaller Order of Saint John of God – Provincial Curia. 2012-2016. LR: Anna Ramió.
- Sons and daughters of immigrant families in Catalonia: management of interculturality for social cohesion. RecerCaixa research grants 2011. 2011-2013. LR: Carlota Solé Puig. Researcher: Núria Roca.
- Training of the collective of women of Maghrebi origin in Sant Vicenç dels Horts. Sant Joan de Déu Educational Campus. 2013-2014. LR: Laura Martínez.
- Young Latin Americans in the UK. Identities, discrimination and social inclusion. 2nd addendum to the cooperation agreement between EUI and FSJD (donation agreement for the performance of the research project). EUI SJD – Sant Joan de Déu Educational Campus – Private Foundation. 2011-. LR: Núria Roca.
- Social action of the Church entities: its role in social cohesion in Catalonia. Catalan Government. 2012-2013. Researcher: Núria Roca.
- Hospitality as a value. Meanings and its building in the students of the Sant Joan de Déu Educational Campus. (EUI agreement). EUI SJD – Sant Joan de Déu Educational Campus – Private Foundation. 2012-2016. LR: Laura Martínez.
- The mobility of students and its impact on schooling in the metropolitan region of Barcelona: types, processes and trends. Ministry of Economy and Competitiveness. LR: Silvia Carrasco. Researcher: Núria Roca.
- Tutorial action plan for nursing degree studies. San Joan de Déu Educational Campus. 2012-2014. LR: Núria Roca.



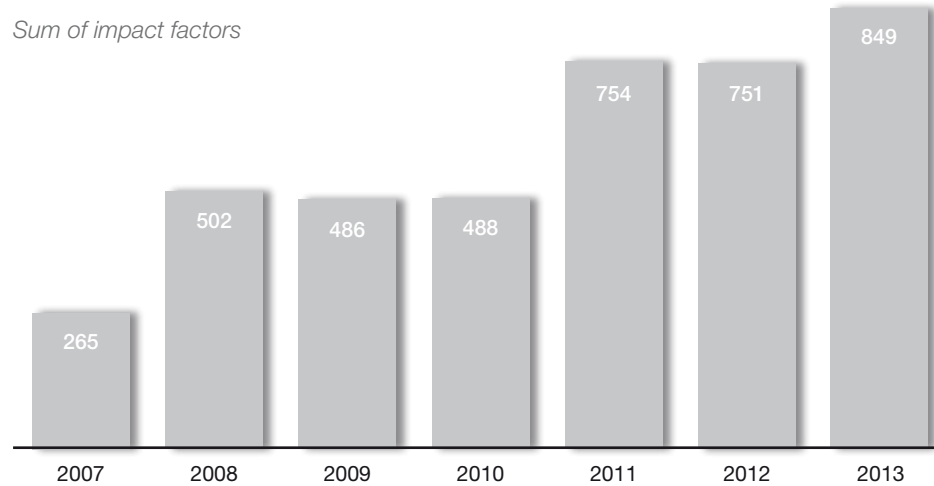
Publications

- El difícil equilibri entre el dret a la confidencialitat i el dret a la informació: la Llei catalana 18/2009, del 22 d'octubre, de salut pública. *Àgora Inf* 2013. 14: 165-167.
- Casas I, Esteve M, Guerola R, García-Olivé I, Roldán-Merino J, Martínez-Rivera C, Ruiz-Manzano J. Incidence of tuberculosis infection among healthcare workers: risk factors and 20-year evolution. *Respir Med* 2013. 107: 601-607. FI: 2,585(Q2)
- Lluch-Canut T, Puig-Llobet M, Sánchez-Ortega A, Roldán-Merino J, Ferré-Grau C. Assessing positive mental health in people with chronic physical health problems: correlations with socio-demographic variables and physical health status. *BMC Public Health* 2013. 13: 928-0. FI: 2,076(Q2)
- Roldán-Merino J, García IC, Ramos-Pichardo JD, Foix-Sanjuan A, Quilez-Jover J, Montserrat-Martinez M. Impact of personalized in-home nursing care plans on dependence in ADLs/IADLs and on family burden among adults diagnosed with Schizophrenia: a randomized controlled study. *Perspect Psychiatr Care* 2013. 49: 171-178. FI: 1,038(Q2)
- Roca i Caparà, N. (2013) "Young Latin Americans in Barcelona, London and Oxford: Building Identities in Contexts of Inequality and Discrimination". Centre on Migration, Policy and Society. Working Paper, N° 110. University of Oxford, 2013. WP-13-110.
- Roca i Caparà, N. (2013) "Joves adults d'origen extracomunitari a Barcelona. Construcció de la identitat i processos d'inclusió i exclusió social". *Papers* 2013, 98/2, pp 331-364. ISSN 2013-9004.
- Sánchez-Ortega A, Roldán-Merino J. Assessing positive mental health in people with chronic physical health problems: correlations with socio-demographic variables and physical health status. *BMC Public Health* 2013. 13: 928-0. FI: 2,076(Q2)



Impact factor

Sum of impact factors



Activities

- 9th Conference on Research in Mental Health at the Healthcare Park (20/11/2013)
- Symposium on Clinical Research of the General Hospital (Healthcare Park) (18/10/2013)
- 7th Course on Economic Evaluation and Social-Healthcare Policy (23/09/2013-26/09/2013)
- Conference: "Patronage: promoting research on mental health" (25/06/2013)
- Course on introduction to methodology and statistics addressed to healthcare professionals (17/06/2013-20/06/2013)
- Conference "Patronage: promotion of paediatric research" (11/06/2013)
- Analysis of the expression and function of the calcium-sensing receptor in developmental tumours (04/06/2013)
- Conference "Lessons learned on new treatments for fragile X syndrome" (06/05/2013)
- Hol·la Genís Festival (El Morell) (20/04/2013)
- Solidary walk for research (09/03/2013)
- Workshop on Ewing's sarcoma (08/03/2013-09/03/2013)
- Solidary theatre: Ni blanc ni negre: GREASE! (03/02/2013)
- Benefit concert "New Year's Strauss Grand Gala" (04/01/2013)



Scientific seminars

- “SP transcription factors in peripheral blood cells and hippocampus volume in first-episode psychosis” (19/12/2013)
- “Applying metabolomics to obesity and diabetes research” (10/12/2013)
- “U.S. financing opportunities” (05/12/2013)
- “Predicting animal choices from neuronal activity” (26/11/2013)
- “Scientific production and Fund@net Curriculum Vita” (12/11/2013)
- “Source memory and hallucinations in people with schizophrenia” (07/11/2013)
- “Inflammation-mediated fibrosis in Duchenne muscular dystrophy” (29/10/2013)
- “New technologies addressed to care of depressive patients” (17/10/2013)
- “Improving survival of paediatric adrenocortical tumours: from the crib to genomics” (08/10/2013)
- “Procedures for obtaining biological samples used in metabolic and molecular studies” (03/10/2013)
- “US financing opportunities” (01/10/2013)
- “Spatial recoding of pitch in the right posterior cortex” (19/09/2013)
- “Prenatal exposure to substances of abuse: exposure biomarkers in alternative matrices and damage biomarkers” (17/09/2013)
- “Bibliographic reviews and searches” (18/07/2013)
- “The role of nutrition & exercise in minimizing the pathogenic effect of autophagy in late-onset Pompe’s disease” (09/07/2013)
- “Applications of Affymetrix in genomic medicine” (04/07/2013)
- “High-risk mental states (HRMS)” (04/07/2013)
- “Placebo-controlled double blind trial of the effectiveness of reboxetine and citalopram as coadjuvant treatment of 2nd-generation antipsychotics in treatment of negative symptoms of schizophrenia” (06/06/2013)
- “Documentary analysis as a qualitative research technique” (23/05/2013)
- “Molecular changes in psychiatric disorders: transcription and beyond” (21/05/2013)
- “Utility of a nanovaccine in type 1 diabetes” (16/05/2013)
- “Evaluation of the active surveillance of invasive pneumococcal disease in Catalonia: a European project” (07/05/2013)
- “Call for projects for Marie Curie individual fellowships. PEOPLE programme. European Commission” (30/04/2013)
- “Qualitative research” (25/04/2013)
- “Calculation of size of effect” (21/03/2013)
- “Metabolomics as a unique biochemical approach to understand disease pathogenesis” (19/03/2013)



- “New role of oncostatin m, a gp130 cytokine secreted in adipose tissue, in the development of insulin resistance and obesity” (26/02/2013)
- “Structural and functional neuroimaging: applications to the study of psychiatric disorders” (21/02/2013)
- “Neuropsychological rehabilitation in children with moderate to severe TBI. Randomised study: conference addressed to parents, to children via robotics and control group” (21/02/2013)
- “SP transcription factors and hippocampus in schizophrenia” (07/02/2013)
- “Pathophysiology of neural stem cells of sympathoadrenal lineage” (29/01/2013)
- “New outlook on muscular dystrophies: the role of collagen VI” (15/01/2013)
- “European financing opportunities for R&D&I projects” (14/01/2013)