

BARCELONA CENTRE FOR
INTERNATIONAL HEALTH
RESEARCH (CRESIB)

ANNUAL REPORT 2012



Hospital Clínic - Universitat de Barcelona

Leading research at:

ISGlobal Barcelona
Institute for
Global Health

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*CRESIB,
the backbone
of ISGlobal*



Pedro L. Alonso

Director

Fruit of the long tradition of the Hospital Clínic and the University of Barcelona in International Health and Tropical Medicine, the Barcelona Centre for International Health Research (CRESIB) was founded in 2006. Shortly thereafter, it became one of the central elements in the creation of the Barcelona Institute for Global Health (ISGlobal). As a result, CRESIB became the backbone of ISGlobal, an organisation dedicated to addressing global health problems from a multi-disciplinary perspective in which, in addition to knowledge creation, strives to transmit knowledge through its Training Area, as well as knowledge analysis and its practical application that take place in the Think Tank and Technical Assistance Area.

During 2012, CRESIB solidified its position as the research arm of ISGlobal. During a time when science was navigating difficult times as a result



of budgetary restrictions related to the economic crisis, CRESIB managed not only to strengthen its principal activities, but also take the initial steps in creating a strategic alliance with the Centre for Research in Environmental Epidemiology (CREAL).

ISGlobal's multidisciplinary vision extends to the scientific research at CRESIB, taking on topics from the most basic science to knowledge translation for concrete tools and strategies. Thanks to a structural matrix that allows CRESIB to address a topic from different perspectives, the centre has been able to examine principal global health problems such as malaria, HIV/AIDS, maternal and infant mortality and antibiotic resistance through areas ranging from molecular biology, biochemistry, nanotechnology, biostatistics and epidemiology to economics and anthropology.

The CRESIB team finished 2012 proud of our accomplishments and hopeful that in the future, the expected alliance with CREAL will allow the centre to further its successes in an increasingly competitive environment.

Excellence, originality and collaboration between the different areas and institutions have been hallmarks of our work, the results of which are presented here in the 2012 Annual Report. The achievements are a collective effort of more than 165 people, and CRESIB is confident that they will strengthen the virtuous circle where new knowledge contributes to improving the living conditions of populations most in need. ◆

New milestones in scientific production and competitive funding for research



Antoni Plasència

Deputy Director

The year 2012 has been very important for CRESIB as a leading research centre in global health, as described in this Annual Report. Recent achievements show that CRESIB's scientific momentum is able to attain new milestones, both in the area of scientific production, as well as in the area of competitive funding. As an example, in 2012 CRESIB reached a new record in the yearly number of scientific publications, 174 papers, solidifying an uninterrupted, increasing trend since its creation in 2006, with 2 out every 3 publications in the top quartile of their specialty field (see Figure on page 17). This achievement allows the continued inclusion of our scientific record in key bibliometric databases and reports, such as the SCImago Institutions Ranking. The malaria research programme, together with the viral and bacterial diseases programme have made the largest contributions to the total number of papers and impact factor.

In addition, in a difficult context of strong economic recession, our overall budget has remained stable, with 92% of the 2012 activity coming from competitive funding, while less than 10% has been provided as core-funding from our governing institutions. This means that for every public Euro invested in CRESIB by our trustees, we have been able to attract 9 additional Euros, yielding a 900% return rate.

Moreover, the competitive funds executed in 2012 are almost evenly distributed between public (53%) and private (47%) sources, a differential feature of our funding scheme (see Figures on page 18), illustrating the notable effort of our centre and its researchers to



attract funds from funding sources less likely to support research, including global health. Finally, about 62% of the total amount of competitive funds come from international sources, 40% of which are from the European Union (see Figure on page 19), reflecting the international acknowledgement of our scientific progress.

These results demonstrate substantial effort at all levels of our centre to successfully respond to the current financial challenges, resulting in more than 130 active research projects in 2012, coming from 40 different funding sources. The main projects awarded include 4 new, coordinated international projects (including FP7, NIH and BMGF funding), 2 Innovative Medicines Initiative (IMI), 5 new FIS projects, as well as 1 MINECO and 2 RETICS projects. These projects are often made possible through a complementary and proactive search for human resources funding, that in 2012 included 1 new ICREA Research Professor Award, 3 Post-doctoral fellowships, 1 Pre-doctoral fellowships, 1 Post-MD Fellowship and 3 awarded positions for technicians and management.

In spite of the fact that restrictions in core funding trends are limiting the growth and strengthening of our human scientific resources, in the past year 2 new researchers have joined CRESIB as part of the ISGlobal Emerging Leaders Programme, and 5 scientific promotions have taken place (3 new Associate Research Professors and 2 new Assistant Research Professors). Moreover, CRESIB's Scientific Career Track and Evaluation Criteria have been formally approved, providing a clear guidance to all researchers interested in

pursuing a career at CRESIB. Complementarily, for the first time, a Mentoring Programme has been set up, to help researchers face some of the challenges and crossroads in their professional career.

CRESIB, as the allied research centre of ISGlobal, is actively contributing to new Initiatives linking research to health policy and advocacy agendas, to training and to technical cooperation interventions, in the areas of malaria elimination, Chagas disease, maternal and child health, and bacterial resistance, with a special emphasis on the opportunities arising from our international partnerships network, including those in Mozambique, Bolivia and Morocco.

The year 2012 concluded with two key external reviews of the progress of our centre; the first was CRESIB's Third Meeting of its Scientific and Technical Advisory Committee (STAC), and the second was the Institutíó CERCA Evaluation process, the first of its kind at our centre, under the leadership of Generalitat of Catalonia. Both Committees were impressed by the developments and research performance of CRESIB and the interrelated ISGlobal, and highly supportive with the strategic developments in place, including the alliance to be initiated between CRESIB, CREAL and ISGlobal, based on a strategic plan with a balanced focus on science, financing and management. We are grateful to all persons, institutions and Corporations who have contributed, one more year, under the leadership of Professor Pedro Alonso, to CRESIB's commitment towards better knowledge for global health equity. Thank You! ◆

CRESIB
leading research
at ISGlobal



ISGlobal **Barcelona**
Institute for
Global Health

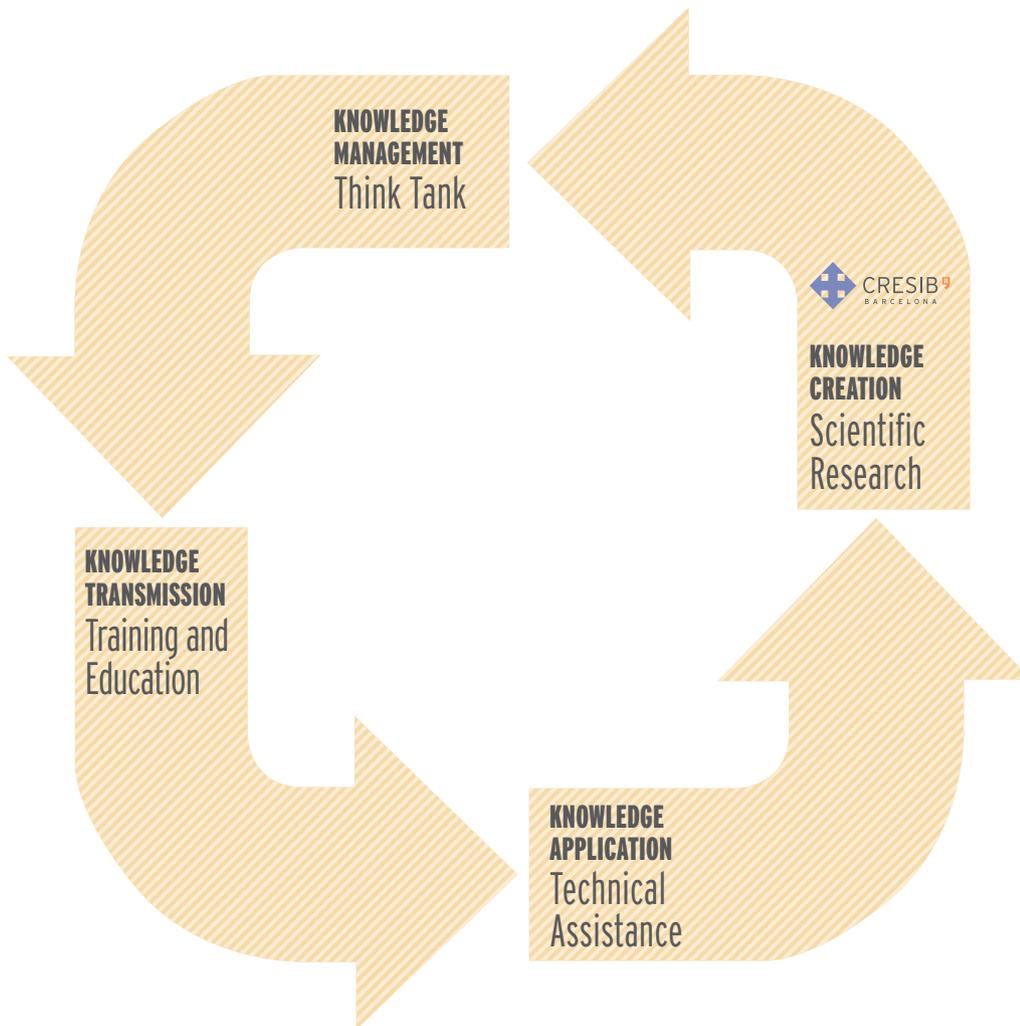
The Barcelona Centre for International Health Research (CRESIB) is a **Centre of Excellence**, whose mission is to **improve global health through research and training.**

CRESIB was founded in 2006 with the objective to expand the research and training activities being carried out by the Hospital Clínic and the University of Barcelona through the Tropical Medicine Department. Four years later, in 2010, the desire to extend the value chain from research to knowledge creation, management, transmission and application in the field, led to the creation of a new organisation, the Barcelona Institute for Global Health (ISGlobal). In turn, CRESIB became the research arm of ISGlobal, and the *expertise* provided by its scientific staff allows both centres to promote excellence in global health research and contribute to its social impact.

ISGlobal is the result of a collaboration between public and private institutions, and is supported by: the “la Caixa” Foundation, the Generalitat of Catalonia, The Ministry of Foreign Affairs/Spanish Agency for International Cooperation, Hospital Clínic and the University of Barcelona. It aims to improve global health of vulnerable populations through four action areas



Value Chain ISGlobal

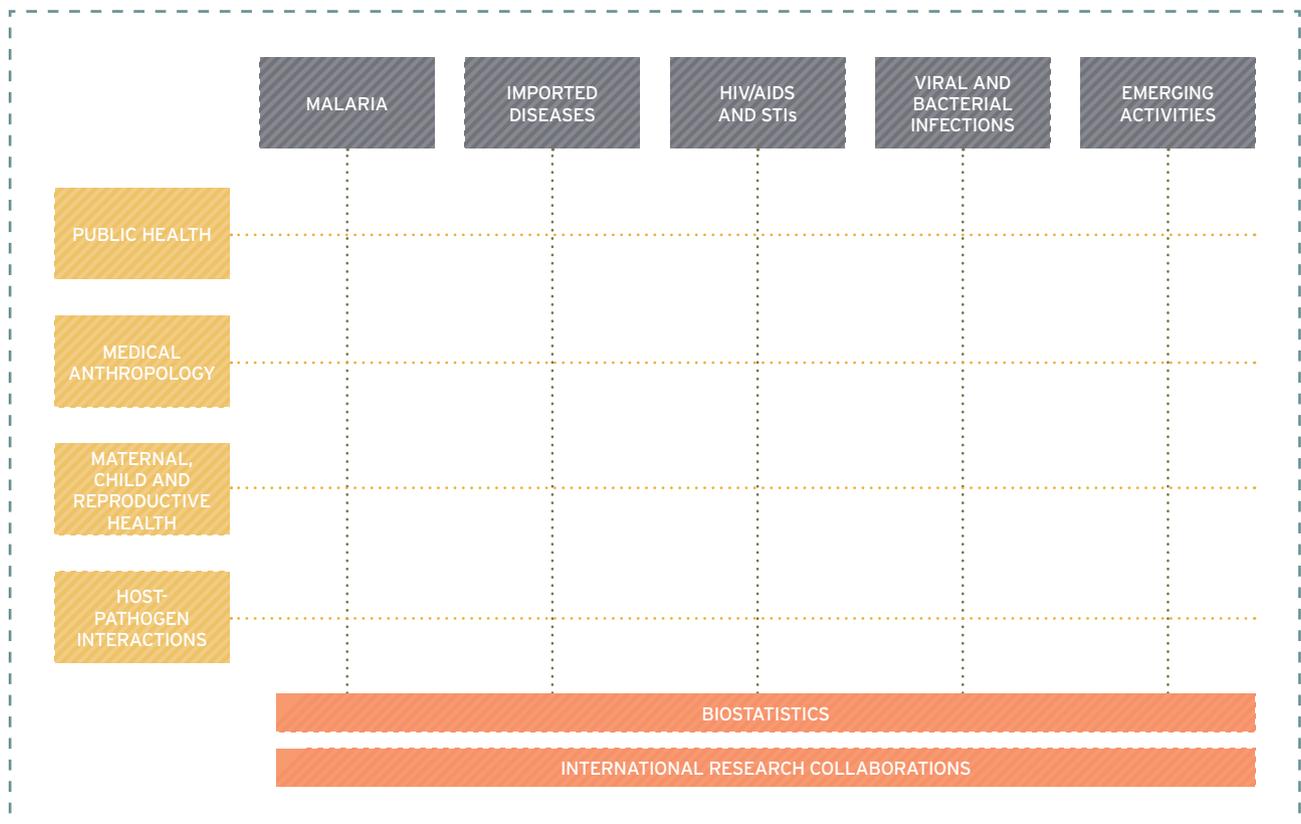


Organisational Chart

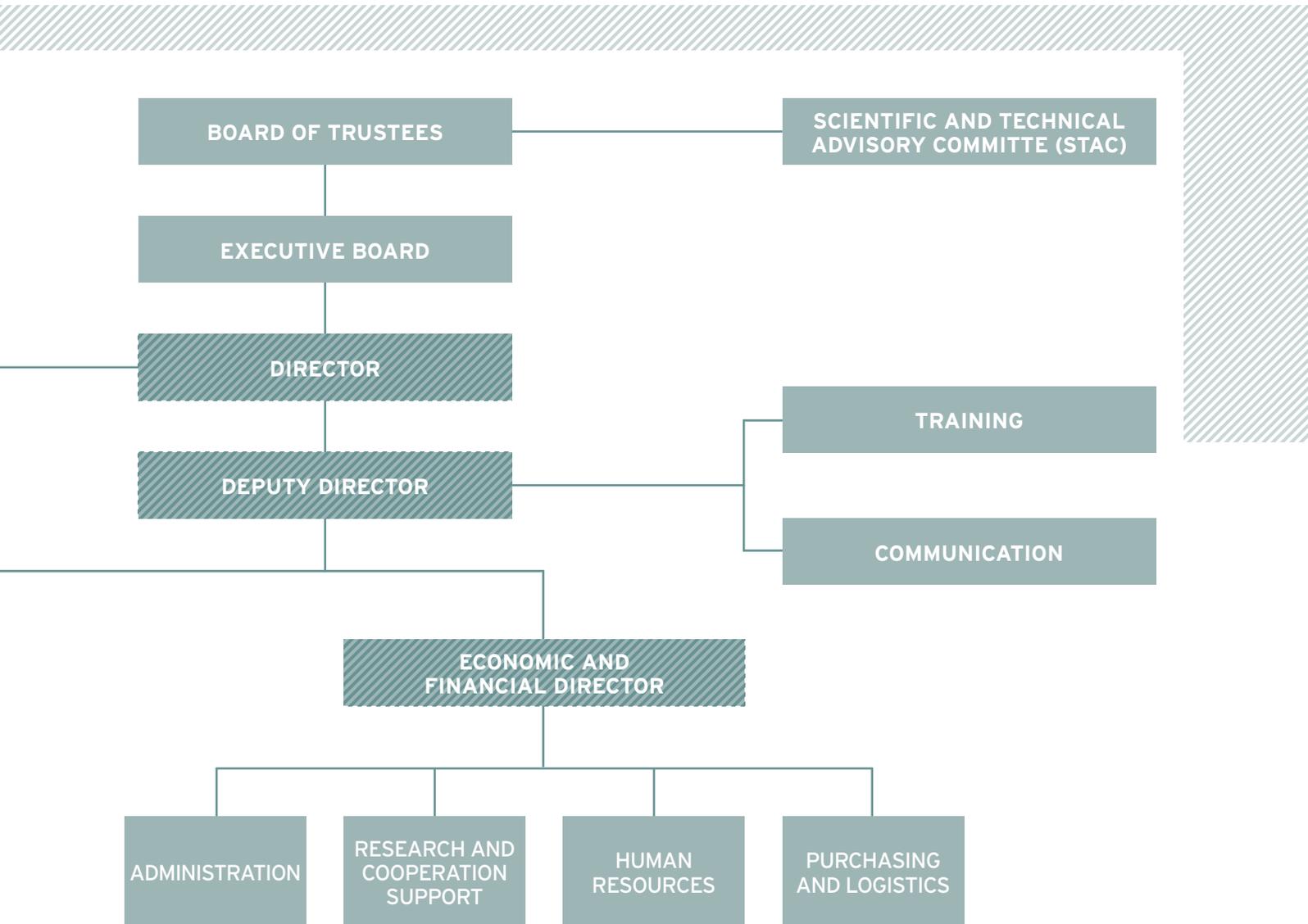
INTERNAL SCIENTIFIC COMMITTEE

SCIENTIFIC COORDINATION

C RESIB is a research institute created by some of the leading academic and biomedical research institutions in Barcelona - Hospital Clínic of Barcelona, the University of Barcelona (UB) and the August Pi i Sunyer Institute of Biomedical Research (IDIBAPS) - and the Catalan Government. Its mission is to **improve global health through research and training**. Its Director is Professor Pedro L. Alonso, a world-renowned expert on malaria.



ORGANISATIONAL CHART



- Directorate
- Research programmes
- Research areas
- Research support platforms

Governing Board, Directorate and Advisory Committees



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Department of Health
Generalitat of Catalonia*

FIRST VICE-PRESIDENT

ANDREU MAS-COLELL

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President, Governing Board for the IDIBAPS
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General Director of Research
Department of Economy and Knowledge
Generalitat of Catalonia

SCIENTIFIC AND TECHNICAL ADVISORY COMMITTEE (STAC)

Appointed by CRESIB's Board of Trustees and constituted by renowned external researchers and experts in the field of International Health, the main task of this committee is the assessment and evaluation of the scientific activities and research programmes undertaken by CRESIB. This includes the selection and evaluation of research staff and evaluation of the Strategic Plan.



DR. JOSÉ ALCAMÍ

*Head, AIDS Immunopathology Unit
National Microbiology Centre
Instituto de Salud Carlos III
Madrid (Spain)*

PROF. MYRON M. LEVINE

*Grollman Distinguished Professor and Director
Center for Vaccine Development
School of Medicine, University of Maryland
Baltimore (U.S.A.)*

DR. MARIANO ESTEBAN

*Director
National Biotechnology Centre
Consejo Superior de Investigaciones Científicas (CSIC)
Madrid (Spain)*

PROF. DAVID MABEY

*Professor of Transmittable Diseases
Clinical Research Unit
London School of Hygiene & Tropical Medicine
London (United Kingdom)*

DR. MARIA C. FREIRE

*President
Lasker Foundation
New York (U.S.A.)*

DR. REGINA RABINOVICH

*Director of Infectious Diseases
Global Health Program
Bill & Melinda Gates Foundation
Seattle (U.S.A.)*

DR. FEDERICO GÓMEZ DE LAS HERAS

*Retired. Formerly VP Director
Diseases of the Developing World Drug Discovery
GlaxoSmithKline
Tres Cantos, Madrid (Spain)*

PROF. MARCEL TANNER (CHAIR)

*Professor and Director
Swiss Tropical and Public Health Institute
Basel (Switzerland)*

DR. VICENTE LARRAGA

*Director
Biological Research Centre
Consejo Superior de Investigaciones Científicas (CSIC)
Madrid (Spain)*



DIRECTORATE

DIRECTOR:

PROF. PEDRO L. ALONSO

DEPUTY DIRECTOR

DR. ANTONI PLASÈNCIA

ECONOMIC AND FINANCIAL DIRECTOR

MS. MARGARITA SALA (until October)

MR. GONZALO VICENTE (from November)

INTERNAL SCIENTIFIC COMMITTEE (ISC)

The Internal Scientific Committee (ISC) is an internal body that advises the CRESIB directorate on scientific matters. It consists of the Director, the Deputy Director, the Research Professors, the Associate Research Professors and the Scientific Coordinator, who holds the Secretariat. The main tasks of the ISC are:

- To evaluate research proposals to ensure they are consistent with the objectives of the centre and compatible with its Scientific Programme.
- To participate in the recruitment of research staff by evaluating candidates for posts or scholarships offered by CRESIB.

This Committee also serves as a forum for updating and discussing among senior researchers important scientific aspects concerning the centre.

In 2012 the committee was made up of the following members: Prof. P.L. Alonso, Dr. A. Plasència, Dr. E.B. Hayes (chair until October), Dr. H. del Portillo, Dr. J. Gascon (chair from November), Dr. C. Menéndez, Dr. I. Mueller, Dr. J. Ordi, Dr. R. Pool, Dr. T. Pumarola, Dr. A. Trilla, Dr. J. Vila, Dr. J.J. Aponte, Dr. C. Dobaño, Dr. A. Mayor, Dr. J. Ruiz and Dr. E. Casamitjana (Secretary). ♦

Facts and Figures

CRESIB publications 2012

NUMBER OF
ARTICLES

174

TOTAL
IMPACT
FACTOR

816

WITHIN
THE 1ST
QUARTILE

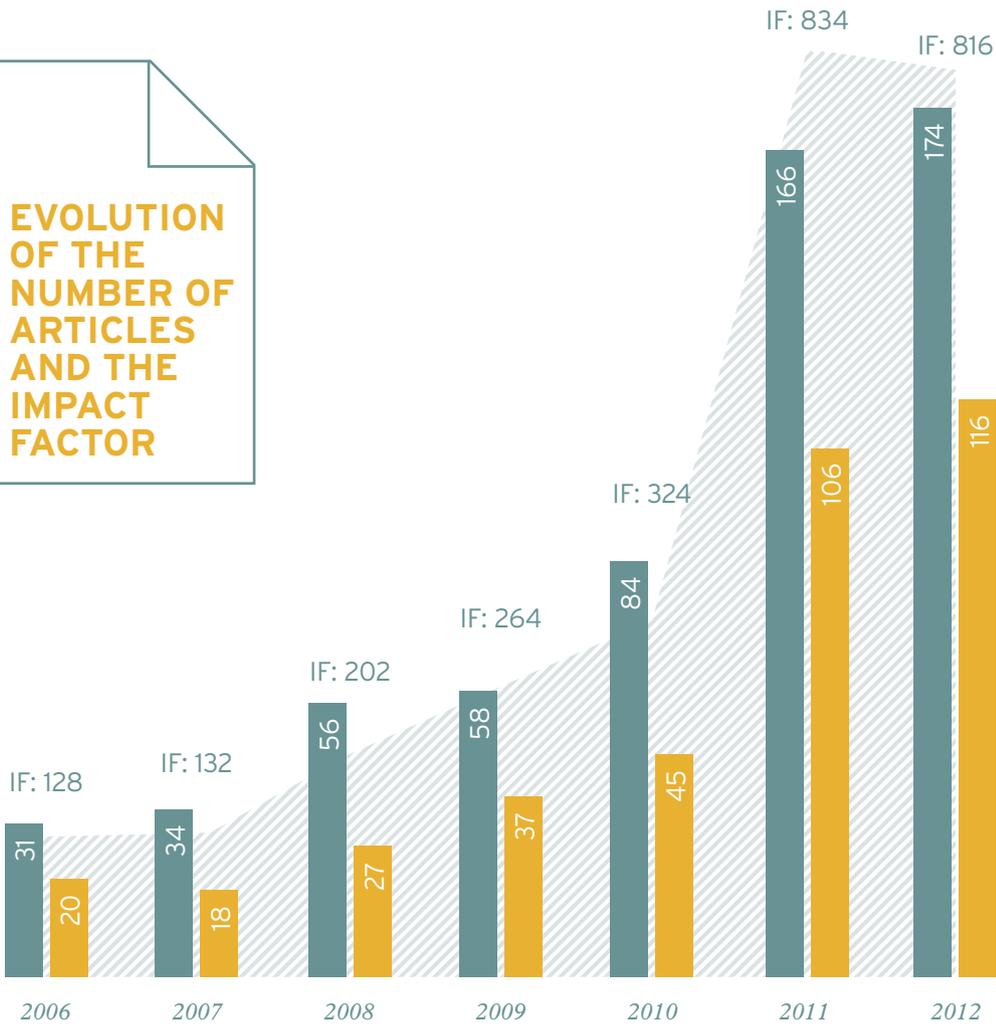
116

AVERAGE
IMPACT
FACTOR

4.7



EVOLUTION OF THE NUMBER OF ARTICLES AND THE IMPACT FACTOR



NOTE
 Number of articles, impact factor and articles in the first quartile of their speciality published by CRESIB researchers since its foundation. This includes papers from researchers who are affiliated with CRESIB since January 2010 and who belong to CRESIB's trustee institutions, regardless of the affiliation indicated by the authors of the paper.

■ Number of articles ■ Number of articles within the 1st quartile ▨ Impact factor

Annual Budget

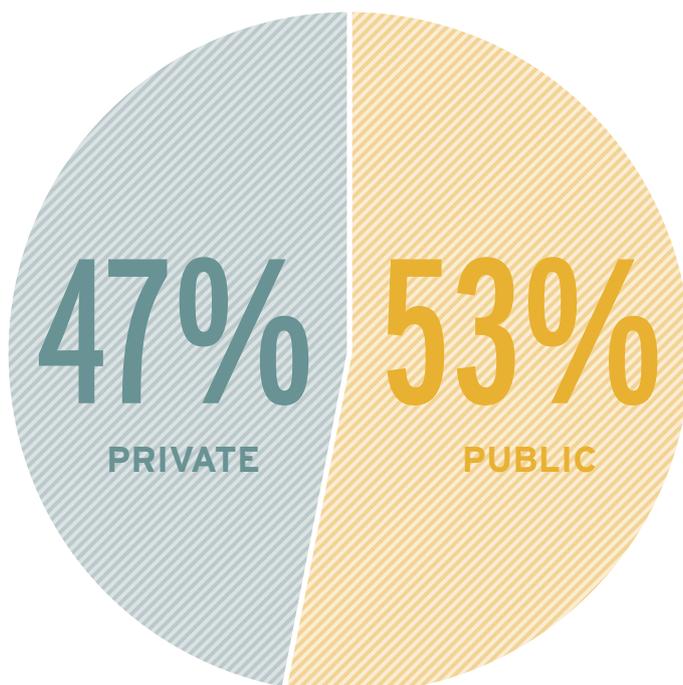


NOTE

Evolution of CRESIB's annual executed budget since its foundation. The centre is financed by international health research funds (competitive and structural funds) awarded to CRESIB, its founding institutions (Hospital Clinic, IDBAPS, University of Barcelona) and the Clinic Foundation for Biomedical Research (FCRB), acting as the organisation responsible for managing these funds.

*Data from 2012 is provisional

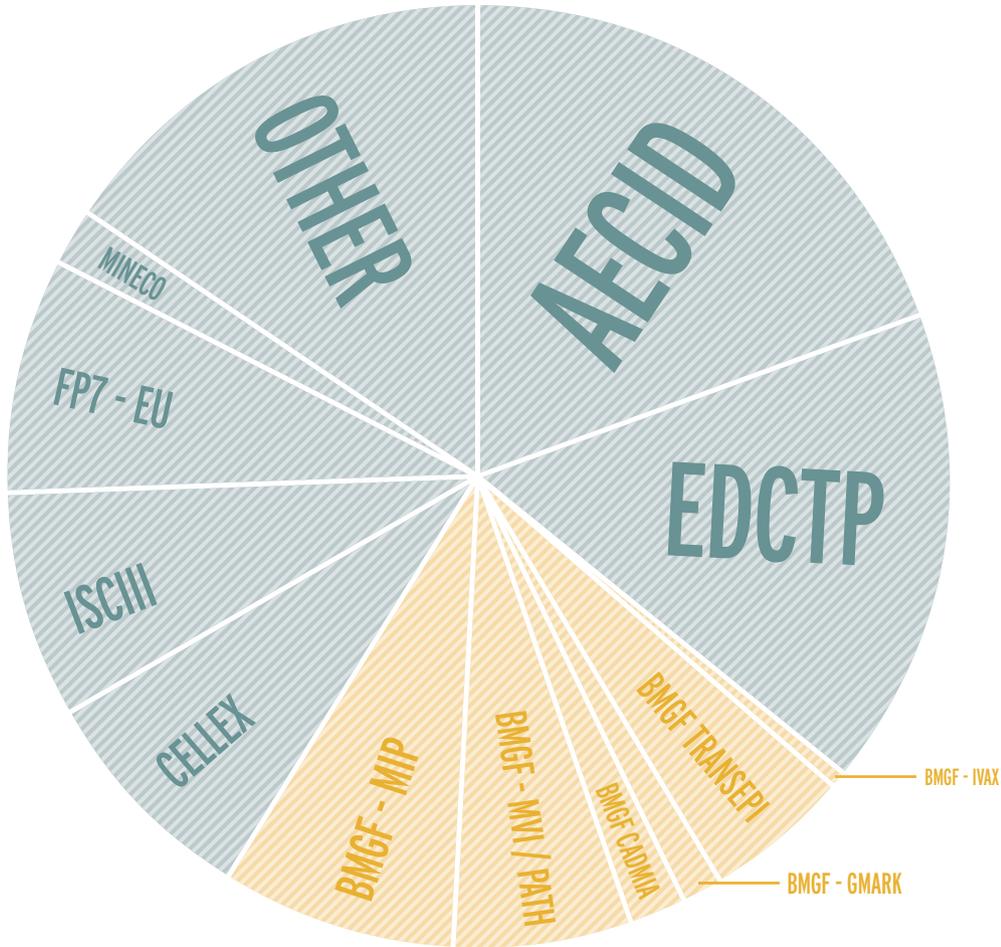
Funding Sources



NOTE

Sources of funding (public or private) for project funds and grants active in 2012

Main Funders



NOTE

CRESIB's main funders, taking into account project funds and grants active in 2012. As in the Annual Budget graph, these include international health research funds awarded to CRESIB, its founding institutions (Hospital Clinic, IDBAPS, University of Barcelona) and the Clinic Foundation for Biomedical Research (FCRB).

AECID (Spanish International Development Cooperation Agency)	19.6%
EDCTP (European and Developing Countries Clinical Trials Partnership)	16.5%
BMGF (Bill & Melinda Gates Foundation)	22.8%
BMGF - IVAX -	0.4%
BMGF - TRANSEPI -	5.1%
BMGF - GMARK -	1.4%
BMGF - CADMIA -	1.9%
BMGF - MVI/PATH -	6.2%
BMGF - MIP (Malaria in Pregnancy Consortium) -	7.8%
Fundació Privada CELLEX	8.0%
ISCIH (Carlos III Health Institute)	7.8%
FP7 - EU (Framework Programme 7 European Union)	8.0%
MINECO (Ministry of Economy and Competitiveness)	2.0%
Others	15.3%

Public Health



Area Leader

Edward B. Hayes

Researchers working in the area

Antoni Plasència, Tomàs Pumarola, Antoni Trilla, Quique Bassat, Albert Picado, Elisa Sicuri, Anna Vilella, José M Bayas, M Ángeles Marco, Alberto García Basteiro, Oriol Mitjà

MAIN LINES OF RESEARCH IN 2012

- Evaluation of effectiveness, utilisation and safety of licensed vaccines
- Studies of the impact of emerging infectious diseases and of the interventions and strategies to prevent and control such diseases
- Development of innovative and effective strategies for disease prevention and control

MAIN RESULTS OF 2012

- A multi-centre, case-control study found that the risk of influenza diagnosis increased with the number of people living in the household and for health care workers. The use of metropolitan public transport was associated with a lower frequency of influenza diagnosis but not the use of taxis or long-distance transport. The influenza A(H1N1)09 vaccine had a protective effect, unlike hand washing after touching contaminated surfaces or the use of alcohol-based hand sanitizers. However, another study found that measures of hand washing and hand washing after contact with contaminated surfaces were protective factors in a dose-responsive way. Alcohol-based hand sanitizers were associated with marginal benefits.
- A seroprevalence study of tetanus and diphtheria was carried out in a sample of 537 healthcare workers in Catalonia. The prevalence of protective antibodies against tetanus was 93.9% compared to 46.4% against diphtheria. The immune status against diphtheria was poor, with less than half of people born before 1975 correctly immunised.



PHOTO

Administering a dose of azithromycin for the treatment of yaws at Lihir Island, Papua New Guinea.

- A clinical trial in Papua New Guinea showed that a single oral dose of azithromycin is non-inferior to benzathine benzylpenicillin for treatment of yaws, and avoids the need for injection equipment and medically trained personnel. A change to the simpler azithromycin treatment regimen could enable yaws elimination through mass drug administration programmes. ♦



HIGHLIGHTED PUBLICATIONS



Mitja O, Hays R, Ipai A, Penias M, Paru R, Fagaho D, de Lazzari E, Bassat Q. 2012.

Single-dose azithromycin versus benzathine benzylpenicillin for treatment of yaws in children in Papua New Guinea: an open-label, non-inferiority, randomised trial.

Lancet 379 (9813), 342-347.

Vilella A, Serrano B, Marcos MA, Serradesanferm A, Mensa J, Hayes E, Anton A, Rios J, Pumarola T, Trilla A. 2012.

Pandemic Influenza A(H₁N₁) Outbreak Among a Group of Medical Students Who Traveled to the Dominican Republic.

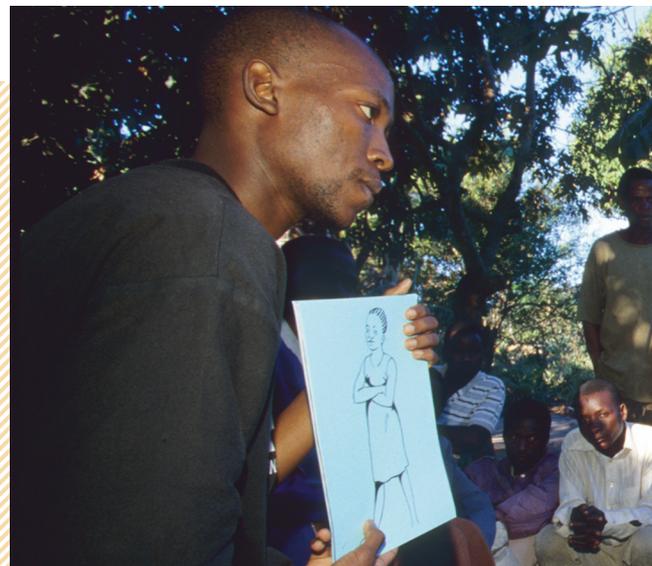
Journal of Travel Medicine 19 (1), 9-14.

Gershman MD, Staples JE, Bentsi-Enchill AD, Breugelmans JG, Brito GS, Bastoscamacho LA, Cottin P, Domingo C, Durbin A, Gascon J, Guenaneche F, Hayes EB, Jelenik Z, Khromava A, Martins RD, Wilson MM, Massy N, Nasidi A, Niedrig M, Sherwat A, Tsai T, Vilella A, Wilson ME, Kohl KS. 2012.

Viscerotropic disease: Case definition and guidelines for collection, analysis, and presentation of immunization safety data.

Vaccine 30 (33), 5038-5088.

Medical Anthropology



Area Leader
Robert Pool

Researchers working in the area

Maria Roura, Federico Bisofi, Barbara Rodriguez, Laia Ventura

MAIN LINES OF RESEARCH IN 2012

- Migration and health
- End of life care
- HIV prevention
- Malaria in Pregnancy

MAIN RESULTS OF 2012

Three main results emerged from the research programme on end-of-life care (EoL):

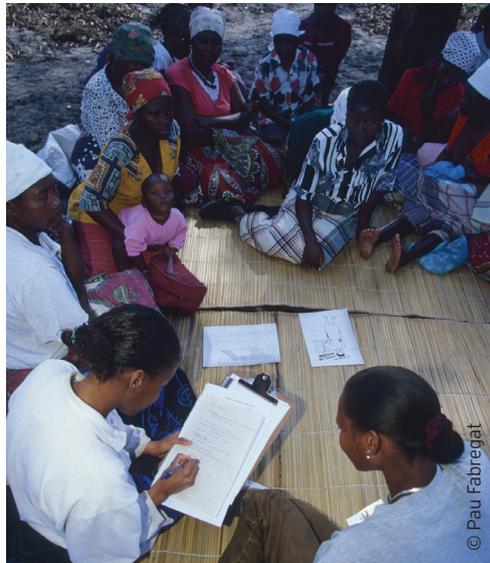
- A comparative exploration of the literature on cultural differences in the understanding of end-of-life (EoL) care in 11 European countries revealed clearly distinguishable national cultures of EoL care, with differences in meaning, priorities, and expertise in each country.
- A comparison between southern European countries revealed similarities, including higher proportions of people who wished to die at home than actually died at home, a persistent trend for partial disclosure in Italy and Spain, low use of advance directives, and low incidence of all medical EoL decisions (with the exception of terminal sedation) compared to northern European countries. The role of religion and the importance of family ties were the two main cultural factors used to explain the similarities.
- Priorities for cross-cultural research were identified: 1) clarifying the concepts of culture and cultural competence; 2) defining EoL in a context of social and cultural diversity, with a focus on concepts of EoL care and bioethics, experiences of receiving and giving EoL care, and care practices in different settings; and 3) developing appropriate methodologies and outcome measurement that address diversity.



PHOTO

Community sensitisation sessions at Manhiça, Mozambique.

In the Microbicides Development Programme, using the interdependence model of couple communal coping and behaviour change to analyse data from partners participating in an HIV prevention trial in Uganda and Zambia, found that, although most HIV prevention interventions are aimed at the individual, dyadic interventions might be more feasible, acceptable and effective. ♦



HIGHLIGHTED PUBLICATIONS



Meñaca A, Evans N, Andrew EV, Toscani F, Finetti S, Gomez-Batiste X, Higginson IJ, Harding R, Pool R, Gysels M. 2012.

End-of-life care across Southern Europe: A critical review of cultural similarities and differences between Italy, Spain and Portugal.

Critical Reviews in Oncology/Hematology 82 (3), 387-401.

Gysels M, Evans N, Meñaca A, Andrew EV, Bausewein C, Gastmans C, Gomez-Batiste X, Gunaratnam Y, Husebo S, Toscani F, Higginson IJ, Harding R, Pool R. 2012.

Culture Is a Priority for Research in End-of-Life Care in Europe: A Research Agenda.

Journal of Pain and Symptom Management 44 (2), 285-294.

Montgomery CM, Watts C, Pool R. 2012.

HIV and Dyadic Intervention: An Interdependence and Communal Coping Analysis.

PloS one 7 (7), e40661.

Maternal, Child and Reproductive Health



Area Leader

Clara Menéndez

Researchers working in the area

Jaume Ordi, John J. Aponte, Carlota Dobaño, Alfredo Mayor, Denise Naniche, Azucena Bardají, Quique Bassat, Elisa Sicuri, Ruth Aguilar, Pilar Requena, Raquel González, Cinta Moraleda, María Ruperez, Pau Cisteró

MAIN RESULTS OF 2011

- The first results of a hospital-based study on the aetiology of anaemia in Mozambican children became available in 2012. Iron deficiency, determined by bone marrow examination, was extremely frequent in children exposed to high prevalence of infections. However, even the best markers of bone marrow iron deficiency did not identify around a quarter of iron-deficient children. Though these results may not extrapolate directly to the community, these findings urge for more reliable, affordable and easy to measure iron indicators to reduce the burden of iron deficiency anaemia in resource-poor settings where it is most prevalent.
- Contribution to the characterisation of *P. vivax* infection in pregnant women. Specifically, the first *P. vivax* congenital malaria case in Latin America with genotypical, histological and clinical characterisation was described. The findings show that maternal *P. vivax* infection still occurs in areas on the path to malaria elimination, and can be associated with detrimental health effects for the neonate. It also highlights the need, even in very low transmission areas, to not only maintain, but also increase awareness and develop surveillance strategies (based on population risk) to detect the infection, especially in this vulnerable group.
- A study conducted in Papua New Guinea showed that *P. vivax* can be associated with placental in-

MAIN LINES OF RESEARCH IN 2012

- Malaria in pregnancy:
 - Evaluation of alternative drugs for intermittent preventive treatment of malaria in pregnancy
 - Description of the epidemiology and clinical impact of *Plasmodium vivax* infection in pregnant women in three endemic regions
 - Physiopathology of malaria in pregnancy
 - Socio-cultural aspects of malaria in pregnancy
 - Economic evaluation of malaria prevention in pregnancy
- Pharmacovigilance studies in pregnant women
- Description of the aetiology and risk factors of anaemia among children in Mozambique
- Descriptive, community-based study of the prevalence and incidence of HIV infection in Mozambique



© Raquel González

PHOTO

Nurse at the Antenatal Clinic of Manhica District Hospital, Mozambique, assessing foetal cardiac sounds in a pregnant woman.

fection. However, placental inflammation was not observed in *P. vivax* mono-infections, suggesting other causes of poor delivery outcomes associated with *P. vivax* infection.

- Undetected *P. falciparum* infections during pregnancy using standard diagnostic methods (microscopy, placental histology and HRP2-based) were associated with maternal anaemia, highlighting the urgent need for more accurate malaria diagnostic tools for pregnant women to avoid the negative clinical impact of hidden infections.
- Pharmacovigilance studies have shown that drug exposure during pregnancy, including drugs with recognised potential pregnancy risk, is high in some areas of southern Africa. The association of stillbirths with drug exposure might be a consequence of the disease that led to drug administration, although a direct causality of the drugs could not be excluded. These findings emphasise the need for reinforcing pharmacovigilance systems in rural Africa, especially for pregnant women.
- Results from a randomised placebo-controlled trial showed that pregnant women with low levels of IgGs specific for a broad spectrum of *P. falciparum* antigens were found to have an increased risk of cord blood malaria infection. Importantly, the work revealed that HIV infection can reduce the ability of pregnant women to control vertical transmission of malaria by decreasing levels of these potentially protective Pf-specific antibodies. ♦

HIGHLIGHTED PUBLICATIONS



Aguilar R, Moraleda C, Quintó L, Renom M, Mussacate L, Macete E, Aguilar JL, Alonso PL, Menendez C. 2012.

Challenges in the diagnosis of iron deficiency in children exposed to high prevalence of infections.

PLoS one 7 (11), e50584.

Mayor A, Bardaji A, Felger I, King CL, Cistero P, Dobaño C, Stanicic DI, Siba P, Wahlgren M, Del Portillo H, Mueller I, Menendez C, Ordi J, Rogerson S. 2012.

Placental infection with *Plasmodium vivax*: a histopathological and molecular study.

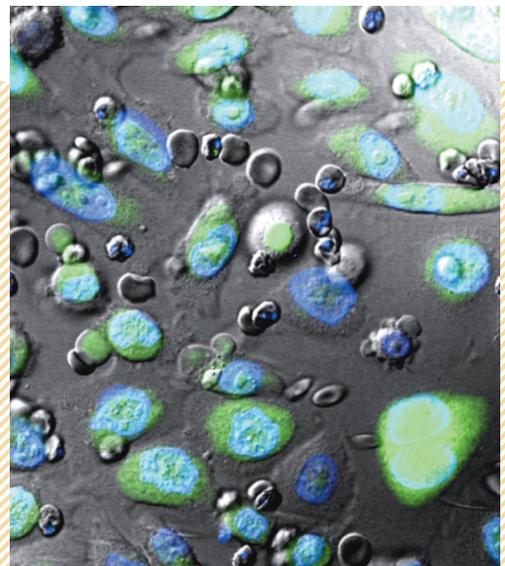
Journal of Infectious Diseases 206 (12), 1904-1910.

Mayor A, Moro L, Aguilar R, Bardaji A, Cistero P, Serra-Casas E, Sigauque B, Alonso PL, Ordi J, Menendez C. 2012.

How Hidden Can Malaria Be in Pregnant Women? Diagnosis by Microscopy, Placental Histology, Polymerase Chain Reaction and Detection of Histidine-Rich Protein 2 in Plasma.

Clinical Infectious Diseases 54 (11), 1561-1568.

Host-Pathogen Interactions



Area Leader

Hernando del Portillo

Researchers working in the area

Pedro L. Alonso, Joaquim Gascon, Clara Menéndez, Ivo Mueller, Jaume Ordi, Jordi Vila, Alfred Cortés, Carlota Dobaño, Alfredo Mayor, Denise Naniche, Joaquim Ruiz, Quique Bassat, Carmen Fernández-Becerra, Xavier Fernández-Busquets, Luis Izquierdo, Jose Muñoz, Krijn Paaijmans, Ignasi Roca, Sara Soto, Núria Antón, Anna Fàbrega, Lorena Martín, Gemma Moncunill, Pilar Requena, Clara Ballesté, María Bernabeu, Patricia de Molina, Paula Espinal, Mireia Ferrer, Elisabet Guiral, Yuly López, Ariel Magallón María Joana A Marques, Sofía Mira, Ernest Moles, Laura Moro, Noraida Mosqueda, Claudia Paradelá, María Jesús Pons, Emma Rey, Emma Saez, Sílvia Sanz, Cèlia Serna, Mar Solé, Patricia Urbán, Xavier Vila, Laura Puyol, Diana Barrios, Pau Cisteró, Alfons Jiménez, Laura Muñoz, Miriam Ramírez, Núria Rovira

MAIN RESULTS OF 2012

- Associations between Southeast Asian Ovalocytosis and protection against *Plasmodium vivax* by a mechanism that is independent of the Duffy antigen was reported. This finding opens new avenues for vaccine development against this human malarial parasite.
- Histopathological studies further support the idea that, contrary to the widely accepted belief, there is cytoadhesion of *P. vivax*-infected reticulocytes to human endothelia in different organs including the placenta and the spleen.
- Undetected *P. falciparum* infections during pregnancy using standard diagnostic methods (microscopy, placental histology and HRP2-based) were associated with maternal anaemia, highlighting the urgent need for more accurate malaria diagnostic tools for pregnant women to avoid the negative clinical impact of hidden infections.
- CRESIB participated in a multi-centre, interdisciplinary study of immunodominant CD8(+) T cell epitopes in parasite paraflagellar rod proteins. Identification of MHC class I epitopes inducing immune responses open possibilities for designing vaccines against *T. cruzi*.
- The use of MALDI-TOF MS to identify members of the *Acinetobacter baumannii* group demonstrated rapid and accurate identification of clinically

MAIN LINES OF RESEARCH IN 2012

- Naturally-acquired and vaccine-induced protection
- Antigen discovery and vaccine development
- Drug discovery and Targeted Drug Delivery
- Control of gene expression
- Molecular mechanisms of drug resistance
- Molecular and serological markers of disease
- Immune responses and markers in co-infections
- Molecular basis of pathology
- Vertical transmission of infectious diseases
- Vector biology



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PHOTO

*Left: Representative image of the time-lapse microscopy of the flow adhesion experiment of a transgenic line of *P. falciparum* expressing a *P. vivax* variant VIR protein on its surface to CHO-cells expressing the ICAM-1 endothelial receptor. The CHO-ICAM-1 cytoplasm was stained with calceinAM and the nuclei of parasites and CHO-ICAM-1 with Hoescht. Authors: Maria Bernabeu and Carmen Fernandez-Becerra.*

Right: Insecticide-treated bednets protect pregnant women from malaria.

significant strains, improving control measurements and understanding of their epidemiology. Dissemination of resistance genes among different clones of *E. coli* causing bacteraemia and the increase of antimicrobial resistance in *E. coli* causing neonatal sepsis were found.

- A prospective study in rural Mozambique demonstrated a low proportion of recent HIV-infections among HIV-positive adults presenting voluntarily to a testing centre. A sub-group of patients in early phases of HIV infection who sustained an elevated HIV-RNA setpoint greater than 5.0-log₁₀ copies/mL were identified and could be targets for antiretroviral treatment as a prevention strategy.
- Results from a randomised placebo-controlled trial showed that pregnant women with low levels of IgGs specific for a broad spectrum of *P. falciparum* antigens were found to have an increased risk of cord blood malaria infection. Importantly, the work revealed that HIV infection can reduce the ability of pregnant women to control vertical transmission of malaria by decreasing levels of these potentially protective Pf-specific antibodies.
- Implementation of custom-made Agilent microarrays to facilitate the study of global *P. falciparum* and *P. vivax* transcription. In addition, implementation of a functional assay to study cytoadherence in malaria using flow physiological conditions. ♦

HIGHLIGHTED PUBLICATIONS



Rosanas-Urgell A, Lin E, Manning L, Rarau P, Laman M, Senn N, Grimberg BT, Tavul L, Stanicic DI, Robinson LJ, Aponte JJ, Dabod E, Reeder JC, Siba P, Zimmerman PA, Davis TME, King CL, Michon P, Mueller I. 2012.

Reduced Risk of *Plasmodium vivax* Malaria in Papua New Guinean Children with Southeast Asian Ovalocytosis in Two Cohorts and a Case-Control Study.

PLoS Medicine 9 (9), e1001305.

Naniche D, Serra-Casas E, Bardaji A, Quinto L, Dobaño C, Sigauque B, Cistero P, Chauhan VS, Chitnis CE, Alonso PL, Menendez C, Mayor A. 2012.

Reduction of Antimalarial Antibodies by HIV Infection Is Associated With Increased Risk of *Plasmodium falciparum* Cord Blood Infection.

Journal of Infectious Diseases 205 (4), 568-5.

Espinal P, Seifert H, Dijkshoorn L, Vila J, Roca I. 2012.

Rapid and accurate identification of genomic species from the *Acinetobacter baumannii* (Ab) group by MALDI-TOF MS.

Clinical Microbiology and Infection 18 (11), 1097-1103.

Malaria



Researchers working in the programme

Clara Menéndez, Ivo Mueller, Jaume Ordi, John J. Aponte, Alfred Cortés, Carlota Dobaño, Alfredo Mayor, Azucena Bardají, Quique Bassat, Carmen Fernández-Becerra, Xavier Fernández-Busquets, Caterina Guinovart, Luiz Izquierdo, Krijn Paaijmans, Elisa Sicuri, Ruth Aguilar, Núria Anton, Andrea Kuhn, Lorena Martín, Gemma Moncunill, Charlotte Pierrat, Pilar Requena, Juan José Valle, Alberto García-Basteiro, Raquel González, Miguel Lanaspá, María Dolores Madrid, María Ruperez, Richard Thomson, Joseph Joe Campo, María Bernabeu, Mireia Ferrer, Ariel Magallón, Joana A Marques, Sofía Mira, Ernest Moles, Laura Moro, Silvia Sanz, Patricia Urbán, Inoni Betuela, Laura Puyol, Diana Barrios, Pau Cisteró, Alfons Jiménez, Miriam Ramirez, Núria Rovira



Programme Leaders

Pedro L. Alonso and Hernando del Portillo

MAIN LINES OF RESEARCH IN 2012

- Basic science
 - Antigen Discovery
 - Molecular basis of pathology and pathophysiology
 - Control of gene expression and adaptation
 - Drug discovery and targeted-delivery
 - Glycobiology
- Malaria Immunology
 - Developing immunological and molecular techniques for malaria research
 - Understanding the development of naturally-acquired immunity to malaria
 - Identifying immune markers of severe *falciparum* malaria in children
 - Evaluating the impact of malaria control tools on the development of naturally acquired immunity to malaria in children and pregnant women, and the contribution of HIV infection
 - Evaluating the breadth of antibody responses in children vaccinated with RTS,S
- Evaluation of prevention and therapeutic tools
 - Evaluating antimalarial drug combinations for the treatment of *Plasmodium falciparum* and *Plasmodium vivax*
 - New ways of evaluating safety, efficacy and immunogenicity of vaccines and drugs, through controlled human malarial infection by *P. falciparum* sporozoites in non-immune adults



© Paola de Grenet

PHOTO

Casa de mães de espera (pregnant woman house) in Manhica's District Hospital.

- Evaluating the safety, immunogenicity and efficacy of the RTS,S malaria candidate vaccine in infants
- Developing vaccines against *P. vivax* using a reticulocyte-derived exosome platform
- Diagnostics
 - Identifying biomarkers to distinguish malaria from other common paediatric infections
- Epidemiology and clinical presentation of *P. falciparum* and *P. vivax*
 - Clinical characterisation of severe *P. vivax* malaria in distinct epidemiological settings
 - Understanding malaria transmission
 - Epidemiology and clinical characterisation of malaria in pregnancy
 - Contribution of malaria to mortality
- Novel approaches and strategies to malaria elimination
- Vector Biology and Control
 - Evaluating the levels of insecticides in biological and environmental samples after indoor residual spraying

HIGHLIGHTED PUBLICATIONS



The RTS, S Clinical Trials Partnership. 2012.
A Phase 3 Trial of RTS,S/AS01 Malaria Vaccine in African Infants.
 New England Journal of Medicine 367 (24), 2284-2295.

Guinovart C, Dobaño C, Bassat Q, Nhabomba A, Quinto L, Manaca MN, Aguilar R, Rodriguez MH, Barbosa A, Aponte JJ, Mayor AG, Renom M, Moraleda C, Roberts DJ, Schwarzer E, Le Souef PN, Schofield L, Chitnis CE, Doolan DL, Alonso PL., 2012.

The Role of Age and Exposure to *Plasmodium falciparum* in the Rate of Acquisition of Naturally Acquired Immunity: A Randomized Controlled Trial.
 PLoS one 7 (3), e32362.

Lacerda MV, Fragoso SC, Alecrim MG, Alexandre MA, Magalhaes BM, Siqueira AM, Ferreira LC, Araujo JR, Mourao MP, Ferrer M, Castillo P, Martin-Jaular L, Fernandez-Becerra C, Del Portillo H, Ordi J, Alonso PL, Bassat Q. 2012.

Postmortem Characterization of Patients with Clinical Diagnosis of *Plasmodium vivax* Malaria: To What Extent does this Parasite Kill?.
 Clinical Infectious Diseases 55 (8), 67-74.

Rovira-Graells N, Gupta AP, Planet E, Crowley VM, Mok S, Ribas de Pouplana L, Preiser PR, Bozdech Z, Cortes A. 2012.

Transcriptional variation in the malaria parasite *Plasmodium falciparum*.
 Genome Research 22 (5), 925-938.

Bernabeu M, Lopez F, Ferrer M, Martin-Jaular L, Razaname A, Corradin G, Maier A, Del Portillo H, Fernandez-Becerra C. 2012.

Functional analysis of *Plasmodium vivax* VIR proteins reveals different subcellular localizations and cytoadherence to the ICAM-1 endothelial receptor.
 Cellular Microbiology 14 (3), 386-400.

PHOTO

Child being vaccinated at the Manhiça Health Centre, Mozambique.



MAIN RESULTS OF 2012

BASIC SCIENCE

- Using a systems approach, we robustly showed that clonally variant expression controlled at the epigenetic level is an intrinsic property of specific *P. falciparum* genes and gene families, the majority of which participate in host-parasite interactions. Epigenetic variation confers plasticity to malaria parasites and plays a role in their adaptation to changes in their environment.
- New advances have been made in understanding the glycobiology of parasitic protozoa, and this information and methodologies are being used to study fucosylation processes of *P. falciparum* as a source of novel drug targets.
- Unlike previously thought, *P. vivax*-infected reticulocytes cytoadhere to different tissues including placenta and spleen. The contribution of this to the patho-physiology of *P. vivax* is not yet known, but furthering these studies could unveil molecular basis of pathology in *P. vivax*.
- A case-controlled study comparing severe and uncomplicated malaria cases demonstrated that antibody responses to *P. falciparum* EBA-175 blood stage protein and interleukin 10 responses were associated with risk of clinical malaria in children. Additionally, low IgM antibodies against *P. falciparum*, specific IgG against a rosetting

PfEMP1 domain and imbalanced pro-inflammatory cytokines were associated with severe malaria in Mozambican children.

- Implementation of enabling technologies, including custom-made Agilent microarrays and adherent assays to facilitate the study of global transcription of *P. falciparum* and *P. vivax*. A functional assay to study cytoadherence in malaria using flow physiological conditions has also been implemented.

MALARIA IMMUNOLOGY

- A clinical trial in which infants were randomly protected against malaria during different time periods in their first year of life found no evidence that the age of first exposure to malaria affects the rate of acquisition of natural immunity against malaria.

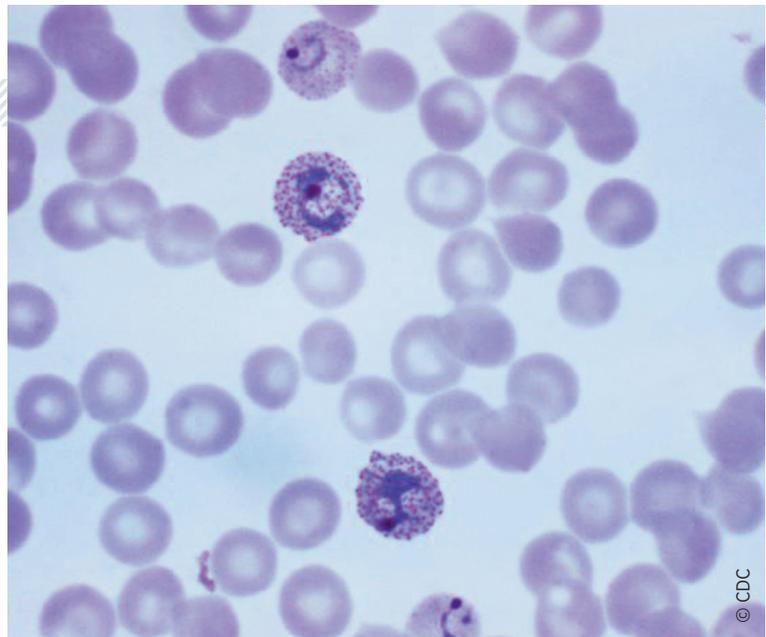
EVALUATION OF PREVENTION AND THERAPEUTIC TOOLS

- Demonstration that intermittent preventive treatment with sulfadoxine-pyrimethamine did not modify acquisition of cellular immune responses to *P. falciparum* in infancy.
- Surveillance of the efficacy and safety of artemether-lumefantrine (AL) and amodiaquine-artesunate (AQ-AS) in 5 different sentinel posts throughout Mozambique confirm that both drugs remain highly efficacious to treat *P. falciparum* malaria.

- Current primaquine regimens (14 days, 0.5mg/kg of body weight) tested in glucose-6-phosphate dehydrogenase (G6PD)-normal Papua New Guinean children have demonstrated good tolerability, do not lead to reductions in haemoglobin levels, and can thus safely be used in children 1 to 10 years of age.
- The non-ACT antimalarial drug combination Fosmidomycin-clindamycin showed an unacceptably poor efficacy when assessed for the treatment of uncomplicated *P. falciparum* malaria in Mozambican children <3 years of age.
- The preliminary results of a Phase III clinical trial of the RTS,S vaccine candidate in infants aged 6 to 12 weeks showed that three doses of RTS,S were moderately effective, reducing the risk of clinical malaria by 31%.

EPIDEMIOLOGY AND CLINICAL PRESENTATION OF *P. FALCIPARUM* AND *P. VIVAX*

- Undetected infections during pregnancy using standard diagnostic methods (microscopy, placental histology and HRP2-based) were associated with maternal anaemia, highlighting the urgent need for more accurate malaria diagnostic tools for pregnant women to avoid the negative clinical impact of hidden infections.
- Hypnozoites are an important source of *P. vivax* infection and contribute substantially to the high burden of *P. vivax* disease observed in young Papua New Guinean children. Even in highly endemic areas with a high risk of reinfection, anti-hypnozoite treatment should be given to all cases with parasitologically confirmed *P. vivax* infections.
- *P. vivax* may be an important contributing factor to deaths in malaria patients with pre-existing illnesses, but also independently accounts for mortality, as evidenced in the first case series of *P. vivax*-related complete diagnostic autopsies published.



- *P. vivax* infections have been confirmed using nested-PCR from different sentinel sites in Northern Mali. The diagnostics of this human malaria parasite should be taken into account in the context of malaria control and elimination efforts, not only in Mali, but also in sub-Saharan Africa.

PHOTO

Immature and mature trophozoites of the Plasmodium vivax parasite

VECTOR BIOLOGY AND CONTROL

- Moderate concentrations of insecticides were detected in biological and environmental samples in Manhiça at the early stages of indoor residual spraying for malaria control. ♦

Imported Diseases



Programme Leader

Joaquim Gascón

Researchers working in the programme

José Muñoz, María Roura, Montserrat Gàllego, Montserrat Portús, Soledad Castillejo, Edelweiss Aldasoro, Inés Oliveira, María Jesús Pinazo, Ana Requena, Magdalena Alcover, Cristina Ballart, Elizabeth Posada, Laia Ventura, Silvia Tebar



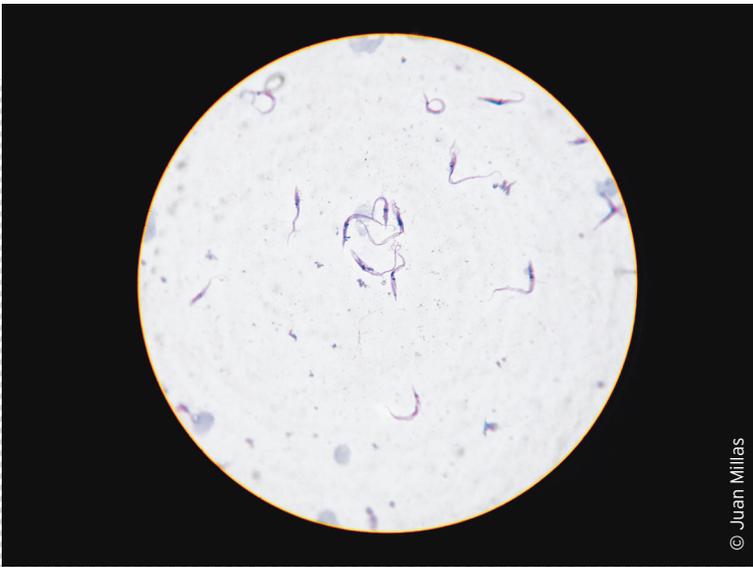
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MAIN LINES OF RESEARCH IN 2012

- Epidemiology of Chagas disease in non-endemic areas
- Biomarkers for therapeutic efficacy of treated patients and early diagnosis of cardiac damage in patients with Chagas disease
- Clinical trials for the new drugs for Chagas parasitological treatment
- Studies on the pharmacokinetics of benznidazole
- Epidemiological surveillance on imported dengue fever
- Diagnosis and treatment of strongyloidiasis
- Epidemiology and vectoral control of *leishmaniasis*
- Clinical research on imported malaria
- Studies addressing migrant health

MAIN RESULTS OF 2012

- The finalisation of an international consensus process that resulted in guidelines for the monitoring and treatment of adverse reactions to the yellow fever vaccine.
- Development of new screening strategies to avoid undiagnosed cases of strongyloidiasis and thus cases of fatal hyperinfection in immunosuppressed patients.
- Identification of a new focus of *leishmaniasis* in the Lleida Pyrenees, and a new species of phlebotomus in Lleida Province and Andorra at altitudes of over 2000 metres.



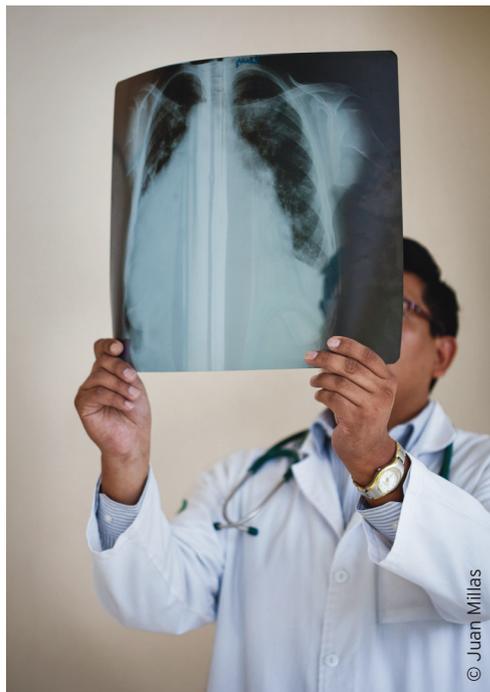
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PHOTO

Above: Trypanosoma cruzi

Down: Reviewing a chest X-Ray for evidence of cardiomegaly that patients with chronic Chagas disease present

- A collaborative study with the Instituto Lopez-Neyra, Granada, showed that a higher IFI-secretion level was observed in asymptomatic chronic Chagas patients versus symptomatic patients. The cytotoxic activity of the PFRs epitope-specific CD8+ T cells seems to be correlated with the degree of severity of Chagas disease. Thus, the PFR2 and PFR3-derived epitopes may constitute attractive molecules for monitoring disease pathology, and may help to design specific immunotherapies and/or vaccines against *T. cruzi* infection. ♦



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HIGHLIGHTED PUBLICATIONS



Egui A, Thomas MC, Morell M, Maranon C, Carrilero B, Segovia M, Puerta CJ, Pinazo MJ, Rosas F, Gascon J, Lopez MC. 2012.

***Trypanosoma cruzi* paraflagellar rod proteins 2 and 3 contain immunodominant CD8(+) T-cell epitopes that are recognized by cytotoxic T cells from Chagas disease patients.**

Molecular Immunology 52 (3-4), 289-298.

Ballart C, Alcover MM, Portus M, Gallego M. 2012.

Is leishmaniasis widespread in Spain? First data on canine leishmaniasis in the province of Lleida, Catalonia, northeast Spain.

Transactions of the Royal Society of Tropical Medicine and Hygiene 106, 134-136.

Gershman MD, Staples JE, Bentsi-Enchill AD, Breugelmans JG, Brito GS, Bastoscamacho LA, Cottin P, Domingo C, Durbin A, Gascon J, Guenaneche F, Hayes EB, Jelenik Z, Khromava A, Martins RD, Wilson MM, Massy N, Nasidi A, Niedrig M, Sherwat A, Tsai T, Vilella A, Wilson ME, Kohl KS. 2012.

Viscerotropic disease: Case definition and guidelines for collection, analysis, and presentation of immunization safety data.

Vaccine 30 (33), 5038-5088.

HIV/AIDS and Sexually Transmitted Infections (STI's)



Programme Leader

Denise Naniche

Researchers working in the programme

Clara Menéndez, Jaume Ordi, Alfredo Mayor, Raquel González, Emili Letang, Cinta Moraleda, Cèlia Serna, Mercè Bosch

MAIN LINES OF RESEARCH IN 2012

- HIV and maternal and infant health
- Pathogenesis of acute and early HIV infection
- Community epidemiology studies to inform future HIV prevention interventions
- Human papilloma virus and cervical cancer

MAIN RESULTS OF 2012

- In order to tailor prevention programmes to distinct populations, local epidemiological data are necessary. We determined age and sex-specific community HIV prevalence in adults aged 18-47 years old in Manhiça town using a randomised, community-based sample. The findings indicated that the overall HIV prevalence was 39.9%. Young adults (18-27 years) had the lowest HIV prevalence rates (23.2%). The HIV prevalence in older adults (28-47 years) was found to be significantly higher. Figure 1 shows the age- and sex-specific HIV prevalence. These trends reflect the critical situation of the HIV epidemic in southern Africa and the need for innovative HIV prevention strategies.
- A prospective study in rural Mozambique demonstrated a low proportion of recent HIV-infections among HIV-positive adults presenting voluntarily to a testing centre. A sub-group of patients in early phases of HIV infection who sustained an elevated HIV-RNA setpoint greater than 5.0-log₁₀ copies/mL were identified and could be targets for antiretroviral treatment as a prevention strategy.
- Recent evidence has confirmed two independent pathways in the development of vaginal squamous cell carcinoma (VaSCC): one related to and the other independent of human papillomavirus (HPV). Our study showed that individuals with



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PHOTO

Above: Health worker collects data for the Demographic Surveillance System used in Manhiça District, Mozambique.

Down: Population based sex- and age-specific HIV prevalence in Manhiça town, Southern Mozambique. Brackets show 95% CI. From Gonzalez et al, 2012, HIV Medicine.

HPV-positive tumours had significantly better disease-free survival and overall survival than did HPV-negative tumours. HPV-positive early VaSCCs had a better prognosis than did early HPV-negative tumours. HPV detection and/or p16(INK4a) immunostaining can be easily implemented in routine pathology and should be considered as valuable prognostic biomarkers in the study of patients with VaSCC. ♦

HIGHLIGHTED PUBLICATIONS



Gonzalez R, Munguambe K, Aponte J, Bavo C, Nhalungo D, Macete E, Alonso P, Menendez C, Naniche D. 2012.

High HIV prevalence in a southern semi-rural area of Mozambique: a community-based survey.

HIV Medicine 13 (10), 581-588.

Serna-Bolea C, de Deus N, Acacio S, Muñoz J, Nhalungo D, Letang E, Alonso P, Naniche D. 2012.

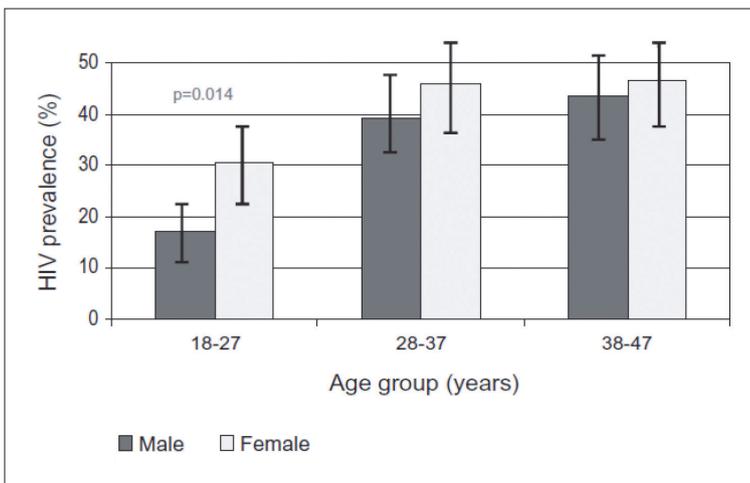
Recent HIV-1 infection: identification of individuals with high viral load setpoint in a voluntary counselling and testing centre in rural Mozambique.

PLoS one 7 (2), e31859.

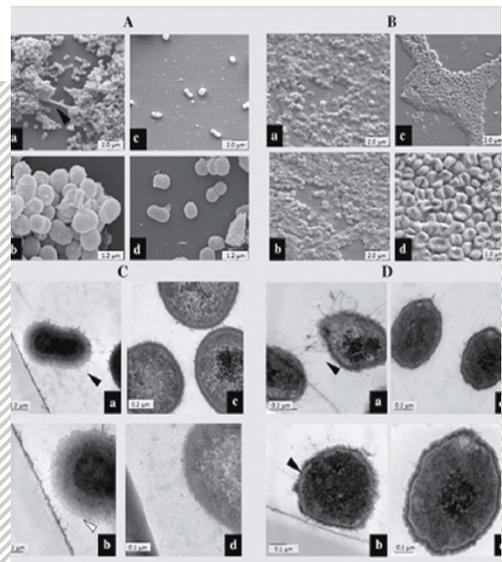
Alonso I, Felix A, Torne A, Fuste V, del Pino M, Castillo P, Balasch J, Pahisa J, Rios J, Ordi J. 2012.

Human papillomavirus as a favorable prognostic biomarker in squamous cell carcinomas of the vagina.

Gynecologic Oncology 125 (1), 194-199.



Viral and Bacterial Infections



Programme Leader
Jordi Vila

Researchers working in the programme

Pedro L. Alonso, Tomas Pumarola, Joaquim Ruiz, Miriam Álvarez, Quique Bassat, Ignasi Roca, Sara Soto, Griselda Tudó, Julià González, Francesc Marco, M. Ángeles Marco, Anna Fàbrega, Mikel Martínez, Cristina Pitart, Elisa López-Varela, Oriol Mitjà, Andrés Antón, Clara Ballesté, Patricia de Molina, Paula Espinal, Elisabet Guiral, Yuly López, Noraida Mosqueda, Claudia Paradela, Maria Jesús Pons, Emma Rey, Emma Saez, Mar Solé, Xavier Vila, Rachid Ben Messaoud, Imane Jroundi, Tacilta Nhamposa, Laura Muñoz

MAIN LINES OF RESEARCH IN 2012

- Design of new rapid tools to diagnose infectious diseases
- Investigation of the molecular bases of antimicrobial resistance
- Relationship between virulence and antimicrobial resistance
- Discovery and evaluation of new antibacterial drugs
- Surveillance, phylogeny and clinical impact of influenza virus and emergent viruses
- Search for biomarkers for diagnosis and prognosis of bacterial and viral infections
- Pathogenesis and antimicrobial resistance of microorganisms causing neonatal sepsis
- Treatment of yaws in Papua New Guinea

MAIN RESULTS OF 2012

- Demonstration that for yaws treatment, a single oral dose of azithromycin is non-inferior to benzathine benzylpenicillin. A change to the simpler azithromycin treatment regimen could enable yaws elimination through mass drug administration programmes.
- Among hospitalised children with CSP and absence of concurrent malaria, PCT pre-screening could help reduce the number of blood cultures and diagnosis costs by specifically targeting patients more likely to yield positive results.
- A study showed high prevalence of quinolone-resistant *Escherichia coli* (32%) was found in stools of Peruvian children, which suggested an exogenous acquisition.
- Demonstration that different variants of the *espB*, *espD* and *tir* genes in enteropathogenic *E. coli* and some variants of the *espD* gene are associated with the major or minor duration of the diarrhetic process.
- *Bartonella bacilliformis* can survive in blood samples storage at 4°C more than 1 year, increasing the potential risk of transmission through blood transfusion.
- *Acinetobacter baumannii* strains producing biofilm survive longer (32 days) than the non-pro-



PHOTO

Left: Electromicroscopy of *Acinetobacter baumannii* strains producing (A and C) and non-producing (B and D) biofilm.

ducing biofilm counterparts (14 days), increasing the potential spread of the bacteria in the nosocomial setting, and the cause of outbreaks.

- Colistin-resistant *Acinetobacter baumannii* are less virulent than the colistin-susceptible strains, explaining why there are not many colistin-resistant strains detected in hospital settings.
- Salicylate increases the expression of *marA* and reduces *in vitro* biofilm formation in uropathogenic *E. coli* by decreasing type 1 fimbriae expression.
- Demonstration that MALDI-ToF MS is an easy and rapid tool to identify species of the genus *Acinetobacter* and *Corynebacterium* and to identify bacteria growth in blood culture, helping clinicians to prescribe a more specific antibiotic treatment.
- A descriptive study made the first identification of OXA-72 carbapenemase from *Acinetobacter pittii* in Colombia. Surveillance of this new carbapenemase should be implemented in Colombia to prevent further dissemination. ♦

HIGHLIGHTED PUBLICATIONS



Mitja O, Hays R, Ipai A, Penias M, Paru R, Fagaho D, de Lazzari E, Bassat Q. 2012.

Single-dose azithromycin versus benzathine benzylpenicillin for treatment of yaws in children in Papua New Guinea: an open-label, non-inferiority, randomised trial.

Lancet 379 (9813), 342-347.

Ruiz J, Silva W, Pons MJ, Del Valle LJ, Tinco CR, Casabona VD, Gomes C, Bazan J, Zavaleta V, Cornejo H, Champin D, Del Valle J. 2012.

Long time survival of *Bartonella bacilliformis* in blood stored at 4 masculineC. A risk for blood transfusions.

Blood Transfusion 10 (4), 563-564. Letter to editor.

Espinal P, Seifert H, Dijkshoorn L, Vila J, Roca I. 2012.

Rapid and accurate identification of genomic species from the *Acinetobacter baumannii* (Ab) group by MALDI-TOF MS.

Clinical Microbiology and Infection 18 (11), 1097-1103.

Biostatistics Unit



Platform Leader
Sergi Sanz

Personnel working at the platform

Elisa de Lazzari, Susana Méndez, Llorenç Quinto, Elena Rodríguez (Until April 2012)

MAIN ACTIVITIES AND RESULTS OF 2012

- Publication of an article on Stata programming and the programming language HTML for the presentation of the statistical results in this format.
- Participation in 17 drafts of scientific articles.
- Remained part of the organising committee of the National Stata Congress.
- Award of a Human Resource Grant from the Ministry of Health to contract research technical support for a data management project. This project received high scores, ranking 3rd nationally. ♦

DESCRIPTION OF THE PLATFORM ACTIVITIES AND OBJECTIVES

The Biostatistics Unit is a platform for scientific research that has existed for over 10 years. It supports CRESIB in all aspects of statistical research studies. This unit assists the drafting of the statistics part of protocols and requests for scientific studies. We also participate in the drafting of plans for analysis and in data cleaning, data management, statistical analysis and writing of articles.

The Biostatistics Unit's main objective is to participate in the statistical resolution of all studies that occur at the CRESIB. This participation may be given directly by statistical work or by collaboration, advising researchers in solving their statistical doubts. Apart of this objective, the Unit aims to provide the latest statistical techniques, keeping abreast of new tools being developed worldwide.

The Biostatistics Unit has focused on the statistical software STATA, and aims to become a reference point worldwide for its usage, although it applies other statistical analysis software as appropriate.

International Research Collaborations



Platform Leader

Marga Sala
(until October),
Gonzalo Vicente
(from November)

Personnel working at the platform

Elena Esteban, Carles Alemany, Carole Amroune, Pascal Andignac, Pau Balcells, Pau Carreras, Marina Espriu, Anne Sophie Gresle, Meritxell Graupera, Eva López, Samantha Mardell, Anna Massaneda, Esther Muro, Sira Rodrigo, Anna Rosés, Noelia Sánchez, Mònica Solanes, Alicia Llamas, Solenne Garnier, Carla Garrido, Raquel German, Esther Roset, Jordi Vilalta, Francesc Guil, Maria José Merino, Jordi Pitarch, Fernando Andres, Esperanza Marín, María Mengibar

DESCRIPTION OF THE PLATFORM ACTIVITIES AND OBJECTIVES

The International Cooperation Office (OCI) provides support for the administrative and financial management of International Health grants, projects and international collaborations among the organisations associated with the Hospital Clinic and the University of Barcelona (FCRB, IDIBAPS, CRESIB, and ISGlobal). The OCI comprises two main departments: Administration & Finance and Projects. Administration & Finance covers accounting, human resources and procurement activities. The Projects department includes fundraising and pre-award activities (calls for proposals, contracts, budgeting) as well as grants and project management (follow-up, reporting, auditing, etc.). The OCI's main objective is to guarantee transparency, responsibility, compliance and efficiency in the management of resources for all International Health grants and projects.

Other objectives include:

- Support for the management, administrative and financial performance of

the Research Platforms in Mozambique (Manhiça Health Research Centre, CISM), Morocco and Bolivia

- Capacity building on project management for international partners in developing countries
- Contributing to International Health human resources management (headquarters and expatriates), particularly during the processes of job profile definition, recruitment, selection and administrative follow-up. ♦

MAIN ACTIVITIES AND RESULTS OF 2012

The International Cooperation Office manages 231 active grants, amounting to a multi-year budget of 44,5 million euros, with activities in over 40 countries. Examples of achievements in 2012 include:

- During 2012, 45 new grants, totalling 11.737.495 euros, have been awarded, including four large, multi-centre collaborative projects funded by IMI, NIH and FP7; CRESIB coordinates two of them.
- 40 new staff members have been hired, totalling 167 national and international staff working in our projects. Including the staff working in international research platforms, we total over 500 people.
- Management of over 1.500 square meters of lab and office space within the Campus Clinic.
- An intranet was developed during 2012, with the double objective of reinforcing internal communication within the group and providing a platform for standardised operating procedures for purchases, travel and staff holidays and leaves. ♦

Strategic Partnerships



The Spanish Agency for International Cooperation and Development (AECID) continued to support and fund the core activities and functioning of our strategic partnerships in Mozambique, Bolivia and Morocco during 2012

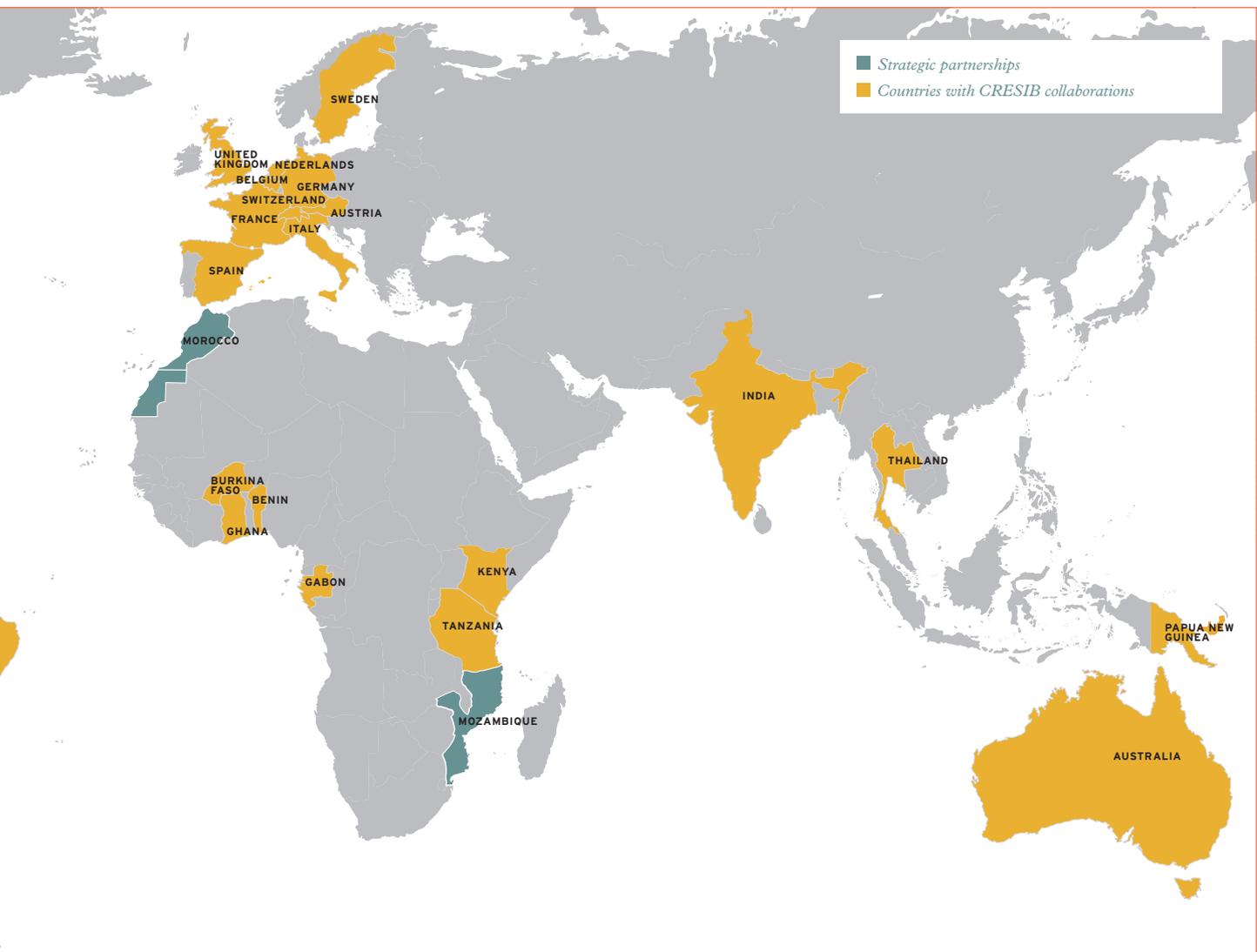
MOZAMBIQUE - MANHIÇA HEALTH RESEARCH CENTRE (CISM)

The main research activities carried out during 2012 in collaboration with CRESIB included:

- Presentation of the results of the Phase III clinical trial of the RTS,S malaria vaccine candidate.
- Involvement in the Phase IIb multi-site trial (Kenya, South Africa, Mozambique) to test the safety and efficacy in newborns of a new tuberculosis vaccine candidate (AERAS 402), in collaboration with the TBVACSIN consortium and the AERAS Initiative.

- Involvement in two major grants awarded to CRESIB (National Institutes of Health and 7th Framework Programme) to study the immunologic response of the RTS,S malaria vaccine candidate in children age < 5 years.
- National launching of the Global Antibiotic Resistance Partnership (GARP), in coordination with Ministry of Health, WHO and other international agencies, to reinforce surveillance and data collection tools to study antibiotic resistance.
- Initial phase of the evaluation of the pneumococcal vaccine impact in children < 5 years old, in collaboration with the Ministry of Health.

In training, the Manhiça Senior Research Fellowships programme was launched in 2012 to attract and retain national experienced researchers and to support PhD and Master



students internationally. In addition, CISM continued to host medical students and graduate students from the Eduardo Mondlane University, Spanish universities and other international academic institutions.

CISM organised the 3rd International Conference in the Framework of the European Foundations Initiative for Neglected Tropical Diseases (NTDs) and the 4th edition of the Annual Lecture on Global Health, with the presence of Dr. Seth Berkley, CEO of the GAVI Alliance.

The President of the Republic of Mozambique, Armando Guebuza, visited the CISM and recognised the role and contribution of the centre towards developing health research at national and international levels. The WHO Regional Director for Africa, Dr. Luis Gomes Sambo, also visited CISM.

In 2012, the CISM completed the upgrade of its morbidity and demographic data collection systems with the introduction of new electronic devices and tools, and also finished the refurbishment of some infrastructures (electric power system, warehouse) that began in 2011.

BOLIVIA

In 2012, the Chagas disease “platform” in Bolivia, aimed to improve medical care to adult patients, has consolidated its services in six health structures in Cochabamba (1 in urban and 3 in rural areas), Tarija (1) and Sucre (1). During the first two years of activity, 9.075 people benefited from specialised medical care. This partnership between Bolivian professionals and institutions and CRESIB staff also reinforces the capacities of the Spanish health system to better diagnose

PHOTO

*Above: Chagas disease “platform” team in Cochabamba, Bolivia.
Down: Medical staff at the Spanish Hospital of Tetuan, Morocco.*



and treat the estimated 50.000 - 70.000 Chagas patients in Spain.

During 2012, research activities carried out in Bolivia included:

- E1224 Phase II Clinical trial of a new drug against Chagas disease
- New diagnostic serum biomarkers
- Digestive Chagas disease form characterisation
- Entomological control and surveillance with the Bolivian Chagas National Control Programme (Ministry of Health)
- Definition of the international R+D agenda on Chagas disease

Education activities have also been carried out, including:

- An on-going programme of health professional training for the platform staff
- Professional exchanges between Barcelona and Bolivia to improve knowledge of Chagas disease
- Training fellows programme of Bolivian health care professionals

Community activities have been sustained during 2012; these activities have been reinforced by a collaborative agreement with Chagas patient associations in Bolivia and Barcelona.

CRESIB played a crucial role in the creation and launch of an international coalition, together with the Drugs for Neglected Diseases Initiative (DNDi), Carlos Slim Health Institute, Mundo Sano Foundation and Sabin Vaccine Institute, to increase access to prevention, diagnosis and treatment for Chagas patients, as well as to promote research and innovation to fight Chagas disease.

MOROCCO

Two studies investigating the epidemiology and aetiology of pneumonia and diarrheal diseases among children <5 years old, carried out in partnership with the Ibn Sina University Hospital of Rabat and the Ministry of Health, completed the recruitment of patients and the analysis of preliminary results.





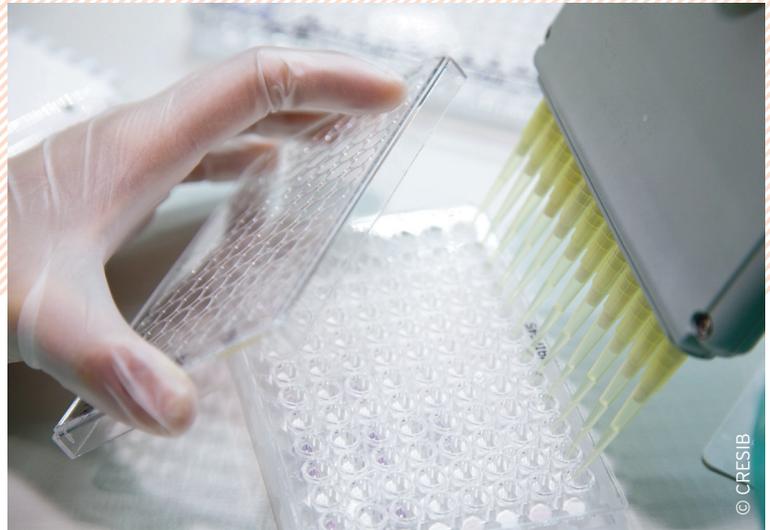
The research agenda for the introduction of the HPV vaccine in Morocco was also defined in coordination with the Ministry of Health and the Lalla Salma Association.

In training, two editions of the Early Detection of Cervical Cancer e-learning course were implemented, and two new diplomas in Emergency Obstetric and Neonatal Care and Neonatal Resuscitation were designed and launched in collaboration with the Mohamed V - Soussi University of Rabat. ♦

Innovation



In 2012, the joint Unit between CRESIB and the Institute for Bioengineering of Catalonia (IBEC) led by Dr. Xavier Fernández-Busquets, together with the Università degli Studi di Milano (Italy), filed a patent related to the use of polyamidoamines as antimalarial agents or carriers of antimalarial drugs. ♦



Patent Official Code	Inventors	Assignees	Title	Year
EPI2192633.1	Fernández-Busquets, X., Urbán, P., Ranucci, E., Ferruti, P., Fenili, F., Manfredi, A., Mauro, N.	IBEC, CRESIB, Università degli Studi di Milano	Amphoteric polyamidoamines in the treatment of malaria	2012

Education and Training



Part of CRESIB's mission and one of its key priorities is to be a reference point and facilitator in education and training in International Health. To this end, CRESIB is continuously developing a programme aimed at training researchers as well as professionals working in the health sciences and other related disciplines.

CRESIB is a partner and executive board member of the European Academic Global Health Alliance (EAGHA, www.eagha.org), of the TropEd network of education and training in International Health (www.troped.org), and of the Eurolife International Health Alliance (EIHA, www.eurolifeuniversities.org).

Described below are the highlights of CRESIB's main Education and Training activities in 2012:

AGREEMENT WITH UNIVERSITY OF BARCELONA

CRESIB/ISGlobal formalised its collaboration with the University of Barcelona (UB) in training through a framework agreement

FIRST EDITION OF THE MASTER DEGREE AND DIPLOMA IN GLOBAL HEALTH

Classes began in September with 10 Master Degree students and one Diploma student.

COURSES AND WORKSHOPS OFFERED

- VIII Workshop on imported Chagas disease (March 5th, 150 participants)
- Prevention, detection and management of arboviral diseases (organised with the CDC, April 23rd -27th, 18 participants)
- The Science of eradication: malaria (organised with Harvard University and the Swiss Tropical and Public Health Institute, (June 3rd -8th, 50 participants)
- International policies and global health (Summer International School, University of Barcelona, July 9th-13th, 18 participants)
- European Course on Tropical Epidemiology (August 27th - September 14th, 28 participants)
- Imported Diseases: From travel medicine to pathology in immigrants (November 29th -30th, 20 participants)

PARTICIPATION IN MASTER PROGRAMMES

CRESIB participated in the final edition of the Master in International Health (2011 - 2012) offered jointly by the University of Barcelona and the Autonomous University of Barcelona (UAB). This Master will be discontinued in 2012-2013.



Starting in the academic year 2012 - 2013, CRESIB/ISGlobal is coordinating the International Health specialisation in the new Master in Clinical Investigation, offered by the UB, which began in September 2012.

CRESIB/ISGlobal has coordinated and participated in courses on Global and International Health in the following master degree programmes: Translational Medicine (UB), Internationalisation (UB) and Public Health (Pompeu Fabra University- UAB).

TRAINING PROGRAMMES IN MOZAMBIQUE AND MOROCCO

CRESIB/ISGlobal finalised two programmes aimed at strengthening teaching and research capacities in Mozambique and in epidemiological training in Morocco. These programmes were funded by the "la Caixa" Foundation.

In coordination with the Moroccan Ministry of Health and the Mohamed V University, a training programme in maternal and neonatal health has begun. This programme is funded by the "la Caixa" Foundation.

In addition, the programme with the Foundation for Community Development for the Higher Education of Women in Mozambique, also funded by the "la Caixa" Foundation continues its activities.

TRANS GLOBAL HEALTH : ERASMUS MUNDUS JOINT DOCTORATE PROGRAMME

In 2012, CRESIB/ISGlobal and the University of Barcelona applied for a joint Doctoral Programme in Global Health titled "**Trans Global Health**". The application was made to Erasmus Mundus together by a consortium including: the VU University of Amsterdam, the University of Amsterdam, the Amsterdam Medical Centre (AMC), and the Amsterdam Institute for Global Health and Development (AIGHD); University of Bordeaux Segalen; the Antwerp Institute of Tropical Medicine and the University of Barcelona. The programme was approved, and in November of 2012 launched the first call for programme candidates.

DOCTORAL THESES READ IN 2012

Role of the spleen in *Plasmodium vivax*: a reticulocyte-prone non-lethal malariae

Mireia Ferrer Almirall

Faculty of Medicine, University of Barcelona
24th January 2012

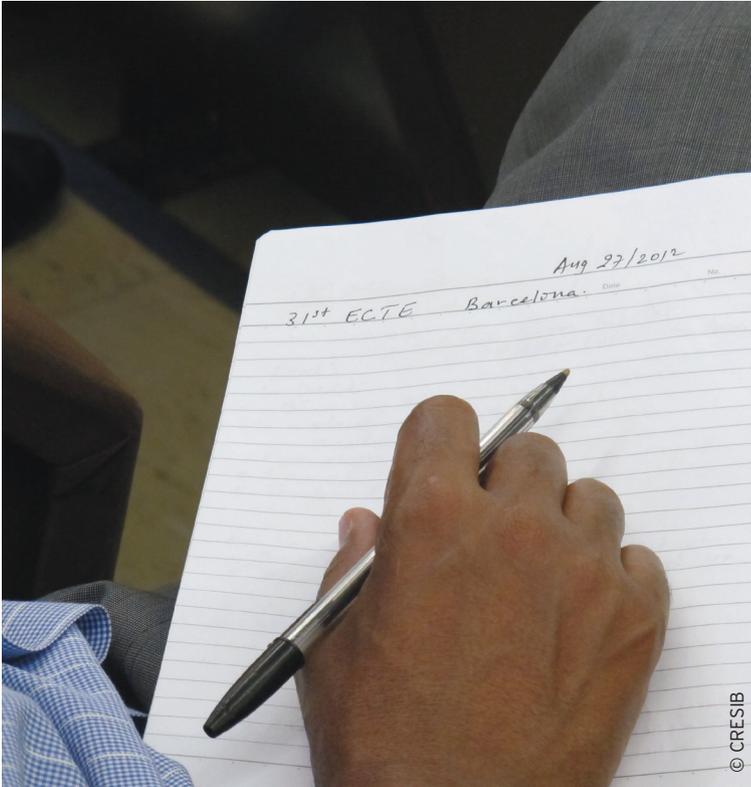
Director: Dr. Hernando A. del Portillo

Expressió proteica diferencial en l'endometri humà durant la finestra d'implantació

Helena Suárez Cisneros

Faculty of Medicine, University of Barcelona
5th March 2012

Directors: Dr. Jaume Ordi and Dr. Jaume Balasch



TRAINING FELLOWS PROGRAMME

“Training Fellows” programme, in collaboration with the Manhica Health Research Centre (CISM Mozambique), this programme is aimed at Mozambican graduates and is intended to train researchers to enable them to follow master and doctorate courses, mainly at universities in Catalonia. Over 30 people have completed the programme and all of them have re-joined African health centres.

“Training Fellows” programme in Morocco, at present, two Moroccan graduates have completed their Masters (at the UB and the UPF) and are finishing the PhD programme at the UB.

“Training Fellows” programme in Papua New Guinea; at present, one graduate student from this country is doing his PhD at the UB.

CRESIB SEMINARS

11/01/2012

Josep M^a Miró. Hospital Clínic, IDIBAPS, Barcelona (Spain).

Actualització de la infecció aguda pel VIH: tractar o no tractar

08/02/2011

Miquel Sitjar. Johns Hopkins Center for Clinical Global Health Education, Baltimore (USA).

Using the eMOCHA platform for Medical Data Collection on Smartphones

15/02/2012

Miriam Álvarez. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Diagnòstic molecular de *Trypanosoma cruzi*

Epidemiología de las fases tempranas de la infección por el VIH en pacientes ambulatorios de una zona semi-rural del sur de Mozambique

Celia Serna Bolea

Faculty of Medicine, University of Barcelona

8th May 2012

Director: Dr. Denise Naniche

Estratègies pel control del Pian i altres malalties oblidades a les illes del Pacífic Sud.

Oriol Mitjà Villar

Faculty of Medicine, University of Barcelona

1st June 2012

Director: Dr. Quíque Bassat

Virus del Papil·loma Humà com a factor pronòstic en les Neoplàsies Malignes de la Vulva i de la Vagina

Maria Victòria Fusté Chimisana

Faculty of Medicine, University of Barcelona

29th June 2012

Director: Dr. Jaume Ordi

23/02/2012

Adele Benzaken. Fundação Alfredo da Matta de Manaus (FUAM) i Fundação Oswaldo Cruz (FIOCRUZ), Manaus (Brazil).

Mejora del acceso al cribaje de VIH y sífilis en comunidades indígenas del Amazonas

07/03/2012

Santiago G. Moreno. HTA Analyst, Barcelona (Spain).

Use of network meta-analysis in HTA (Health Technology Assessment)

22/03/2012

Jean Herve. Fundación CRASH (Centre de Réflexion sur l'Action et les Savoirs Humanitaires-CRASH), Paris (France).

Innovaciones médicas en la Acción Humanitaria

28/03/2012

Alfredo Mayor. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Antibodies against VAR2CSA at delivery are markers of *Plasmodium falciparum* exposure during pregnancy and are not associated with protection against malaria in pregnancy

11/04/2012

Clara Menéndez. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Iniciativa Salut Materna y Neonatal

12/04/2012

Krijn Paaijmans. Center for Infectious Disease Dynamics, Penn State University, White Oak (USA).

Effects of temperature on host-parasite interactions

13/04/2012

Mats Wahlgren. Karolinska institutet, Stockholm, (Sweden).

Understanding Severe Malaria to Avoid Deaths

24/04/2012

Thomas P. Monath. Kleiner Perkins Caufield & Byers / Harvard School of Public Health, Boston (USA).

Developing New Vaccines Against Arboviral Diseases

30/05/2012

Iveth J. González. Foundation for Innovative New Diagnostics (FIND), Geneva (Switzerland).

Loop-mediated isothermal amplification of DNA (LAMP) for the diagnosis of malaria and other infectious diseases

06/06/2012

Kate Whitfield. Malaria Eradication Scientific Alliance (MESA), ISGlobal, Barcelona (Spain).

MESA Malaria Eradication Scientific Alliance

13/06/2012

Ariadna Sanz. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

WAMI - West Africa Malaria Initiative



20/06/2012

Pilar Goñi. Departamento de Microbiología, Medicina Preventiva y Salud Pública. Facultad de Medicina, Universidad de Zaragoza, Zaragoza (Spain).

Aplicaciones de la PCR en el diagnóstico y epidemiología de las parasitosis intestinales

4/07/2012

Jesús Tamariz. Universidad Peruana Cayetano Heredia, Lima (Perú).

Fagoterapia en infecciones producidas por *Staphylococcus aureus* Meticilino Resistente (MRSA)

12/07/2012

David Dickson. Scidev.net editor, London (United Kingdom).

Science Communication

05/09/2012

Manuel Llinás. Princeton University and Visiting Professor at CRESIB, Barcelona (Spain).

Exploring Transcription and Metabolism in *Plasmodium falciparum*

10/09/2012

Deepak Gaur. International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi (India).

Development of novel combination blood stage malaria vaccines against *Plasmodium falciparum*

12/09/2012

Ignasi Labastida. Universitat de Barcelona, Barcelona (Spain).

Com afecta la propietat intel·lectual a la recerca i la docència?

19/09/2012

Alfredo Mayor. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

***Plasmodium vivax* in pregnancy: histopathology, PCR and adhesion studies**

5/10/2012

Ana Langer. Women and Health Initiative (W&HI), Harvard School of Public Health, Boston (USA).

Maternal mortality: a global priority

10/10/2012

Alessandro Tarozzi. Universitat Pompeu Fabra, Barcelona (Spain).

Micro-loans, Insecticide-Treated Bednets and Malaria: Evidence from a Randomized Controlled Trial in Orissa (India)

25/10/2012

Paula Castillo. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Massive *P. falciparum* visceral sequestration: a cause of maternal death in Africa

9/11/2012

Matthias Egger. Institute of Social & Preventive Medicine (ISPM) at University of Bern, Bern (Switzerland).

Scaling up ART in resource-limited settings: Epidemiology in action





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9/11/2012

John J Aponte. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

A phase 3 RTS,S/AS01 Malaria Vaccine trial in African Infants

21/11/2012

Papa Dramé. Institut de Recherche pour le Développement (IRD), UMR-MIVEGEC, Montpellier (France).

Development of a new serological biomarker of *Anopheles* mosquito bites and pertinent applications

22/11/2012

Jeroen Ensink. London School of Hygiene and Tropical Medicine (LSHTM), London (United Kingdom).

Untreated wastewater use in agriculture in Pakistan, how to balance risks and benefits

28/11/2012

Pedro Alonso. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Reto Experimental de Malaria

03/12/2012

Chetan Chitnis. International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi (India).

Key signaling events and molecular interactions during red cell invasion by malaria parasites

12/12/12

Gemma Moncunill. Centre de Recerca en Salut Internacional de Barcelona (CRESIB, Hospital Clínic - Universitat de Barcelona), Barcelona (Spain).

Acquisition and maintenance of immunity to malaria in travelers and immigrants with a malaria episode

19/12/2012

Julià Blanco. IGTP/IRSICAIXA Hospital Germans Trias i Pujol, Badalona (Spain).

Chronic immune activation, causes and pathogenic mechanisms in HIV infection

PHOTO

VIII Workshop on imported Chagas disease at Casa del Mar in Barcelona.

CRESIB in the News



CRESIB SCIENTISTS MAKE KEY BREAKTHROUGH THAT COULD LEAD TO THE ERADICATION OF A NEGLECTED DISEASE: YAWS

The *Lancet* magazine published in January the results of a clinical trial conducted by researchers from the Barcelona Centre for International Health Research (CRESIB) that demonstrated the efficacy of an oral antibiotic for the treatment of yaws. This is the first study to show that yaws—treated to date with penicillin injections—can be efficaciously treated with a single dose of azithromycin. The use of an oral treatment could pave for the way for the eradication of the disease, making yaws the second infectious disease to be wiped off the planet.

The clinical trial was conducted at the Lihir Medical Centre under the direction of Oriol Mitjà, a specialist in infectious diseases and first author of the study, and Quique Bassat, a paediatrician specialised in tropical medicine and international health, and senior author. Upon learning the study results, the WHO convened a technical meeting at which it officially recommended azithromycin for the treatment of yaws.



RTS,S MALARIA VACCINE CANDIDATE SHOWS MODERATE EFFICACY IN INFANTS

In 2011, the results of a Phase III clinical trial of the **RTS,S vaccine candidate** in children aged 5 to 17 months showed that three doses of RTS,S reduced the risk of clinical malaria by 56% and of severe malaria by 47%. New results following the vaccination of infants aged 6 to 12 weeks show the vaccine to be moderately effective, producing a **31% reduction in the risk of malaria** in this population. These findings were published online in the *New England Journal of Medicine (NEJM)* and announced at the International African Vaccinology Conference (VACFA) in South Africa.

The Phase III clinical trial of RTS,S began in May 2009 and is **scheduled to end in 2014** with the publication of final data on the overall result. Those findings will provide additional information on the duration of the vaccine's efficacy at the different trial sites, and on the factors that may influence the difference in efficacy between older and younger infants.

EL PAÍS
Revés para la vacuna contra la malaria
La inmunización solo protege al 31% de los bebés de menos de 12 semanas, según un estudio hecho en África • Los patrocinadores no tiran la toalla y siguen con el ensayo

Claves de la vacuna contra la malaria

- El nuevo ensayo de eficacia se hace en África, donde se encuentra el 90% de los casos de malaria.
- El estudio se hace en un país donde la malaria es endémica.
- El estudio se hace en un país donde la malaria es endémica.
- El estudio se hace en un país donde la malaria es endémica.

El sistema inmunitario de la madre puede alterar la eficacia

El remedio es clave para evitar las resistencias a los tratamientos

Fundamental en la investigación de una vacuna contra la malaria que se puede utilizar como herramienta de control, dice El Gub. "Es un tipo de vacuna que se puede utilizar como herramienta de control, dice El Gub. "Es un tipo de vacuna que se puede utilizar como herramienta de control, dice El Gub. "Es un tipo de vacuna que se puede utilizar como herramienta de control, dice El Gub."

ABC

Malaria, una epidemia global

La malaria es una enfermedad infecciosa que afecta a más de 200 millones de personas al año. Se transmite por la picadura de un mosquito infectado.

El ciclo de la enfermedad

- El mosquito infectado pica a una persona sana.
- El mosquito se infecta con los parásitos de la malaria.
- Los parásitos se multiplican en el mosquito.
- El mosquito infectado pica a una persona sana.

El cambio hacia la vacuna más prometedora

2001: Primer ensayo de eficacia de la vacuna RTS,S en niños de 5 a 17 meses en Kenia, Gambia, Guinea-Bisáu y Tanzania.

2009: Primer ensayo de eficacia de la vacuna RTS,S en niños de 6 a 12 semanas en Kenia, Gambia, Guinea-Bisáu y Tanzania.

2011: Primer ensayo de eficacia de la vacuna RTS,S en niños de 6 a 12 semanas en Kenia, Gambia, Guinea-Bisáu y Tanzania.

2013: Primer ensayo de eficacia de la vacuna RTS,S en niños de 6 a 12 semanas en Kenia, Gambia, Guinea-Bisáu y Tanzania.

2014: Primer ensayo de eficacia de la vacuna RTS,S en niños de 6 a 12 semanas en Kenia, Gambia, Guinea-Bisáu y Tanzania.

Malas noticias para la vacuna más prometedora contra la malaria

EL MUNDO

Una madre sostiene a su hijo mientras la vacuna en el Centro de Investigación en Salud de Mombasa (Kenia).

SAUD PARA EL DESARROLLO

Un estudio muestra que la eficacia de la vacuna ensayada por el español Pedro Alonso es sólo del 31% cuando se pone en los primeros cuatro meses de vida.

Golpe a la lucha antimalaria

ANÁLISIS DE LA EFICACIA DE LA VACUNA CONTRA LA MALARIA EN NIÑOS DE MENOS DE 12 SEMANAS EN KENIA, GAMBIA, GUINEA-BISÁU Y TANZANIA.

A YEAR FULL OF AWARDS FOR CRESIB RESEARCHERS

2012 has been a year full of awards and recognitions for CRESIB researchers. In September, the Catalan Generalitat awarded a **Josep Trueta Medal for Healthcare** to **Professor Pedro Alonso** in recognition of his outstanding contribution to medical advances and the improvement of global health. The Government highlighted his role in the establishment of three institutions currently working to combat poverty and neglected diseases: ISGlobal, its research centre, CRESIB, and the Manhica Health Research Centre (CISM) in Mozambique.

That same month, Dr. Núria Casamitjana Badia, Training & Education Director at ISGlobal and CRESIB and professor at the Department of Pharmacology and Medicinal Chemistry at the University of Barcelona Faculty of Pharmacy, was elected as a fellow of the Royal Academy of Pharmacy of Catalonia.

During the last trimester of 2012, several CRESIB researchers were recognised with different awards. Dr. Quique Bassat, a paediatrician specialised in tropical medicine and epidemiology, was named **one of the ten outstanding young persons of the world in 2012 by Junior Chamber International (JCI)** in the category of medical innovation for his “extraordinary work in paediatrics and medical research in developing countries.”



In addition, the **Social Council of the University of Barcelona** named **Dr. John Jairo Aponte** winner of **2012 Ramón Margalef Award** for an article on intermittent preventive treatment in infants (IPTi) published in *The Lancet*. The article, entitled “Efficacy and safety of intermittent preventive treatment with sulfadoxine-pyrimethamine for malaria in African infants: a pooled analysis of six randomised, placebo-controlled trials”, is based on the research conducted by Dr. Aponte during his doctoral studies.

Last but not least, the Spanish Epidemiology Society awarded the **“Enrique Najera” award** for a young epidemiologist to CRESIB researcher **Dr. Alberto García-Basteiro** for his protocol “Infant mortality and morbidity associated with prematurity and intrauterine growth retardation in Mozambique: a retrospective cohort study”.



WOMEN SCIENTISTS WORKING TO PREVENT WOMEN'S DEATHS IN AFRICA

YO DONA magazine, distributed by two main Spanish newspapers: *El Mundo* and *El Periódico de Cataluña*, travelled to Manhica, Mozambique, to see firsthand the work that professor Clara Menéndez and her team are conducting in maternal, infant and reproductive health in Africa.

The article published highlighted the important role that women scientists play in saving the lives of pregnant women in Africa. The article focused on the MIPPAD project (Malaria in Pregnancy Prevention Alternative Drugs) that started in 2007 and aims to develop new anti-malarial drugs in pregnancy prevention, promote European and African research collaboration and strengthen the research capacity of African institutions.

Publications



This list of publications includes papers from researchers who are affiliated with CRESIB since January 2010 and who belong to CRESIB's trustee institutions, regardless of the affiliation indicated by the authors of the paper.

Aguilar R, Machevo S, Menendez C, Bardají A, Nhabomba A, Alonso PL, Mayor A. 2012.

Comparison of placental blood microscopy and the ICT HRP2 rapid diagnostic test to detect placental malaria.

Transactions of the Royal Society of Tropical Medicine and Hygiene 106 (9), 573-575.

Aguilar R, Moraleda C, Quintó L, Renom M, Mussacate L, Macete E, Aguilar JL, Alonso PL, Menendez C. 2012.

Challenges in the diagnosis of iron deficiency in children exposed to high prevalence of infections. PLoS one 7 (11), e50584.

Alcover MM, Gramiccia M, Di Muccio T, Ballart C, Castillejo S, Picado A, Portus M, Gallego M. 2012.

Application of molecular techniques in the study of natural infection of *Leishmania infantum* vectors and utility of sandfly blood meal digestion for epidemiological surveys of *leishmaniasis*. Parasitology Research 111 (2), 515-523.

Alemaný L, Perez C, Tous S, Llombart-Bosch A, Lloveras B, Lerma E, Guarch R, Andujar M, Pelayo A, Alejo M, Ordi J, Klaustermeier J, Velasco J, Guimera N, Clavero O, Castellsague X, Quint W, Muñoz N, Bosch FX, de Sanjose S. 2012.

Human papillomavirus genotype distribution in cervical cancer cases in Spain. Implications for prevention. Gynecologic Oncology 124 (3), 512-7.

Alonso I, Felix A, Torne A, Fuste V, del Pino M, Castillo P, Balasch J, Pahisa J, Rios J, Ordi J. 2012.

Human papillomavirus as a favorable prognostic biomarker in squamous cell carcinomas of the vagina. Gynecologic Oncology 125 (1), 194-199.

Anton A, Pozo F, Niubo J, Casas I, Pumarola T. 2012.

Influenza A(H1N1)pdm09 virus: viral characteristics and genetic evolution. Enfermedades Infecciosas y Microbiología Clínica 30 Suppl 4, 10-17.

Ballart C, Alcover MM, Portus M, Gallego M. 2012.

Is *leishmaniasis* widespread in Spain? First data on canine *leishmaniasis* in the province of Lleida, Catalonia, northeast Spain. Transactions of the Royal Society of Tropical Medicine and Hygiene 106, 134-136.

Ballart C, Baron S, Alcover MM, Portus M, Gallego M. 2012.

Distribution of phlebotomine sand flies (Diptera: *Psychodidae*) in Andorra: First finding of *P. perniciosus* and wide distribution of *P. ariasi*. Acta Tropica 122 (1), 155-159.

Bardají A, Bassat Q, Alonso PL, Menendez C. 2012.

Intermittent preventive treatment of malaria in pregnant women and infants: making best use of the available evidence. Expert Opinion on Pharmacotherapy 13 (12), 1719-1736.

Batty KT, Salman S, Moore BR, Benjamin J, Lee ST, Page-Sharp M, Pitus N, Ilett KF, Mueller I, Hombhanje FW, Siba P, Davis TME. 2012.

Artemisinin-naphthoquine combination therapy for uncomplicated pediatric malaria: a pharmacokinetic study. Antimicrobial Agents and Chemotherapy 56 (5), 2472-2484.

Benjamin J, Moore B, Lee ST, Senn M, Griffin S, Lautu D, Salman S, Siba P, Mueller I, Davis TME. 2012.

Artemisinin-naphthoquine combination therapy for uncomplicated pediatric malaria: a tolerability, safety, and preliminary efficacy study. Antimicrobial Agents and Chemotherapy 56 (5), 2465-2471.

Bernabeu M, Gomez-Perez GP, Sissoko S, Niambele MB, Haibala AA, Sanz A, Thera MA, Fernandez-Becerra C, Traore K, Alonso PL, Bassat Q, Portillo HA, Doumbo O. 2012. **Plasmodium vivax malaria in Mali: a study from three different regions.** *Malaria Journal* 11 (405).

Bernabeu M, Lopez F, Ferrer M, Martin-Jaurar L, Razaname A, Corradin G, Maier A, Del Portillo H, Fernandez-Becerra C. 2012. **Functional analysis of Plasmodium vivax VIR proteins reveals different subcellular localizations and cytoadherence to the ICAM-1 endothelial receptor.** *Cellular Microbiology* 14 (3), 386-400.

Betuela I, Bassat Q, Kiniboro B, Robinson LJ, Rosanas-Urgell A, Stanisic D, Siba PM, Alonso PL, Mueller I. 2012. **Tolerability and safety of primaquine in Papua New Guinean children 1 to 10 years of age.** *Antimicrobial Agents and Chemotherapy* 56 (4), 2146-2149.

Betuela I, Maraga S, Hetzel MW, Tandrapah T, Sie A, Yala S, Kundi J, Siba P, Reeder JC, Mueller I. 2012. **Epidemiology of malaria in the Papua New Guinean highlands.** *Tropical Medicine & International Health* 17 (10), 1181-1191.

Betuela I, Rosanas-Urgell A, Kiniboro B, Stanisic DI, Samol L, de Lazzari E, Del Portillo HA, Siba P, Alonso PL, Bassat Q, Mueller I. 2012.

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