Annual Report ISGlobal 2014

ISGlobal
Barcelona
Institute for
Global Health

Research

- Enabling technologies for malaria research
- Parasite biology
- Physiopathology
- Malaria immunology
- Diagnostics
- Evaluation of preventive and therapeutic tools
- Epidemiology and clinical presentation of Plasmodium falciparum and Plasmodium vivax
- Vector biology and control
- Novel approaches and strategies for malaria elimination

- Epidemiology of Chagas disease in non-endemic areas
- Biomarkers for therapeutic efficacy in treated patients and for early diagnosis of cardiac damage in patients with Chagas disease
- Clinical trials for new drugs to treat Chagas disease
- Studies on the pharmacokinetics of benznidazole

- Malaria in pregnancy
- Operational research on the implementation of a HPV vaccination programme
- Pharmacovigilance studies of antiretroviral and antimalarial drugs in pregnant women
- Aetiology and risk factors of anaemia in children
- Determination of causes of death in low-income countries
- Effects of the HIV/AIDS epidemic on maternal and child health
- Epidemiology of maternal bacterial carriage and pathogen-related risk factors for vertical transmission of bacterial infections

- 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 assessment of new antibacterial drugs
- Search for biomarkers for diagnosis and prognosis of bacterial and viral infections
- Pathogenesis and antimicrobial resistance of microorganisms that cause neonatal sepsis

Training and Education

- 3rd Edition of the Course "Science of Eradication: Malaria"
- Update Course on the Elimination of Malaria in Mesoamerica and the Island of Hispaniola (El Salvador)

- 10th Workshop on Chagas Disease

- Training Programme to Fight Cervical Cancer in Mozambique
- Higher Education for Mozambican Women

Policy and Global Development

- New agenda for malaria elimination
- The Malaria Eradication Scientific Alliance (MESA) Secretariat is hosted by ISGlobal

- Coordination of The Global Chagas Disease Coalition

- Advocacy Work and Participation in Decision-Making Forums

- Roadmap on Antibiotic Resistance in Africa

Malaria Elimination Initiative

Chagas Initiative

Maternal, Child and Reproductive Health Initiative

Antibiotic Resistance Initiative

Letter from the Director

In recent years, the world has been affected by a terrible financial crisis that has had a particular impact on scientific research and development cooperation. These have not been easy years, but ISGlobal has continued to make steady progress in its institutional development despite the difficult conjuncture. Three key elements help our institute to continue building on the solid foundation of past work: the scientific advances made by our centre, the creation of long-term international alliances, and the consolidation of a working model aimed at leveraging the positive impact of scientific research as a tool for change.

In 2014, the institute experienced a series of important leadership changes that have served to reinforce the international reputation of our organisation. The appointment of Dr Pedro Alonso as director of the World Health Organisation's Global Malaria Programme recognised not only Dr Alonso's professional career but also his role as one of the founders of ISGlobal and his leadership as director of the institute. After Dr Alonso's departure in October, the Board of Trustees appointed me to the position of Director of ISGlobal, a challenge I have taken up with great confidence in the work that has been done and great hopes for the road that lies ahead. Towards the end of the year, Dr. Regina Rabinovich joined us as director of the Malaria Elimination Initiative, thus consolidating a key area of work in our Institute, and we also welcomed Dr. Joan Bigorra as Head of Strategy and Innovation.

Among the principal challenges we face in this new phase of our work, I would like to highlight the following:

- The consolidation of our governance structure with the incorporation of new trustees as a result of the strategic merger between CREAL and ISGlobal, creating an innovative model with extensive and diverse public and private participation.
- The rollout of new projects and initiatives that will combine scientific research, training and knowledge transfer—the three pillars of our model of excellence—with a significant component of cooperation based on long-term international partnerships.
- The development of new areas of excellence, strengthening the synergies between the research agenda for transmissible diseases and the agenda focussed on chronic diseases in relation to environmental risk factors.
- Attracting, renovating and consolidating our talent as well as our financial and structural resources to support our knowledge model;
  Strengthening our leadership and management capacities in a cohesive, efficient and visible institution.
- And, finally, fostering collaboration between the world of business and civil society in the field of global health.

On this basis, with thanks to all the institutions, entities and people who daily demonstrate their confidence in us and support our endeavours, ISGlobal aspires to become a benchmark institution in the field of global health and to contribute to both breaking the vicious circle of poverty and disease and reducing health inequities.

Antoni Plasència
General Director of ISGlobal

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The Barcelona Institute for Global Health is the fruit of a collaboration between institutions from the public and private sector. During 2014, the ISGlobal Board of Trustees membership was as follows:

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The International Global Health Partnership Board is made up of individuals and institutions of recognised international prestige in the field of health and international cooperation. One of the functions of the Committee is to advise the Board of Trustees and offer a global vision of the executive strategy of the organisation.

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Nelson Mandela Children's Fund

*Dr de Quadros, one of the pioneers in the eradication of smallpox worldwide and in the elimination of polio and measles from the Americas, died on 28 May, 2014.

How We Work

ISGlobal's mission is to promote health equity through excellence in research and the translation and application of knowledge. Our vision is a world in which all people can enjoy good health.

Work models

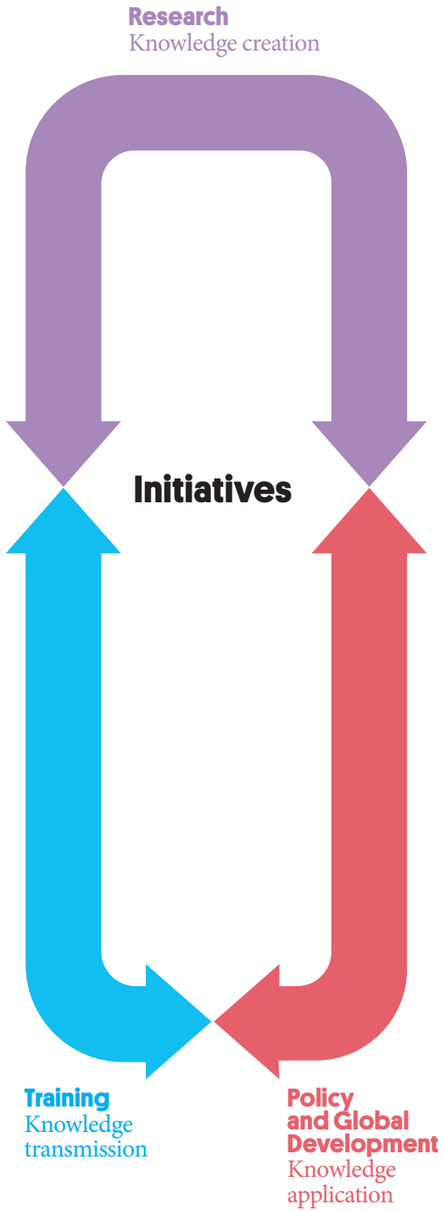
The aim of our work model is to potentiate the positive impact of science as an instrument of change and to encourage a value chain that creates a virtuous circle of knowledge, action and impact on health.

CRESIB and CREAL research centres are dedicated to generating new scientific knowledge about chronic diseases—infectious and non-communicable—and their social and environmental determinants, while the Training and Policy & Global Development departments focus on the translation of this knowledge to society.

ISGlobal Initiatives

Since knowledge transfer is particularly important in the field of global health, in ISGlobal we have launched four initiatives to increase the impact of research-generated knowledge beyond the realm of science. Our initiatives focus on areas in which ISGlobal is at the forefront of international research efforts. They explore the ways scientific knowledge can be applied to have an effective impact on global health.

- **Malaria Elimination Initiative**
- **Chagas Initiative**
- **Maternal, Child and Reproductive Health Initiative**
- **Antibiotic Resistance Initiative**



Facts & Figures

WHO Collaborating Centre for Malaria Control, Elimination and Eradication

Articles & Reviews

172

% in First Quartile

66%

% in First Decile

38%

Ranked 6th among Spanish Health Research Centres in Normalised Impact Factor *(Scimago Institutions Rankings, 2014)*

6th

Research Staff **Total 170**

- Research Professor (1 ICREA) 7
- Associate Research Professor (1 ICREA) 6
- Assistant Research Professor (4 Ramón y Cajal, 1 Miguel Servet) 17
- Associated Researchers 9
- Staff Scientist 1
- Postdoctoral Fellow 17
- Medical Research Fellow 16
- Predoctoral Fellow 37
- Research Assistant 2
- Master/Graduate Students 22
- International Research Scholars 4
- Research Support 32

Despite the difficult economic climate of the past few years, in 2014 we expanded our research and knowledge translation capabilities. More articles by our researchers were published in the top decile scientific journals, and according to the Scimago Institutions Ranking 2014 ISGlobal is the 6th Spanish health research centre in terms of normalized impact. In late 2014, an ISGlobal project looking for new antibiotics became the first project coordinated by our institution to receive funding from the European Union's Horizon 2020 programme. We also obtained funding for the first Innovative Training Network (ITN) in the field of leishmaniasis. As part of our ongoing efforts to translate knowledge from bench to bedside, we launched our first spin-off, Innovex Therapeutics, and applied for a patent for a treatment for gram-negative bacterial infections.

ISGlobal's PhD programme was overhauled to improve the training we provide to young researchers. Our recent recruitment of a Strategy and Innovation Director reinforced our goal of positioning ISGlobal at the forefront of global health research and knowledge translation. Finally, ISGlobal played a key role in creating the Catalan Scientific Advisory Committee on Ebola Virus Disease at the height of the Ebola crisis.

Until 2014, ISGlobal's research programme was carried out by CRESIB, an independent international health research centre that was founded some years before ISGlobal. In 2015, CRESIB will be definitively integrated into ISGlobal. The aim of the merger is to create a single institution with a greater critical mass that will be more competitive internationally.

CRESIB 5
BARCELONA
Hospital Clínic - Universitat de Barcelona

Leading research at:
ISGlobal

Institució CERCA
Centres de Recerca de Catalunya

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Innovation

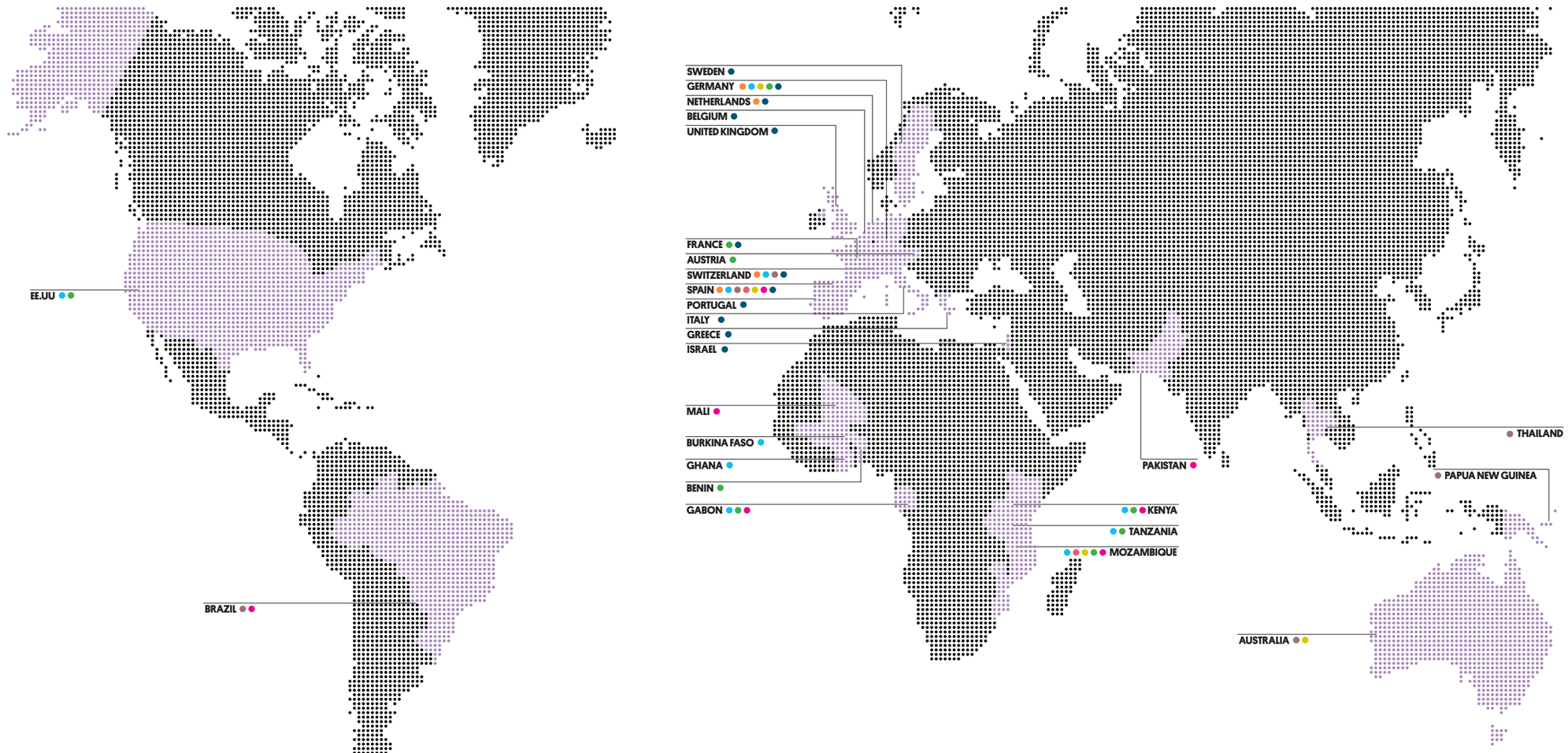
INNOVEX THERAPEUTICS S.L.

Innovex Therapeutics S.L. was the first spin-off to emerge from CRESIB, ISGlobal's research centre. It was officially constituted on 19 March of 2014. The new company, the first of its kind in Spain, will engage in research and development related to extracellular vesicles and their application in malaria vaccines and/or diagnostic tests. Innovex Therapeutics S.L. will be based at the Germans Trias i Pujol Health Sciences Research Institute (IGTP) in Badalona, Spain, which is allowing the company to use its facilities for three years. The founding partners are Dr Hernando A. del Portillo, an ICREA researcher professor attached to CRESIB who holds 80% of the capital; Dr Francesc E. Borràs, an IGTP researcher and professor at the Autonomous University of Barcelona, with 10% of the capital; ICREA and CRESIB, with 4% each; and the IGTP, with 2%.

Patent

Peptides against outer membrane protein A (OmpA) to treat infections caused by gram-negative pathogens
Inventors: J. Vila, X. Vila, Y. Smani, J. Pachón, E. Giralt, M. Teixidó, M. Bayó
Institutions: ISGlobal, Hospital Clínic, Universitat de Barcelona, IDIBAPS, Hospital Universitario Virgen del Rocío, IRB.
Ref. number: P 201431400

8 Multisite Research Projects Coordinated by ISGlobal



MALARIA

SYSMALVAC

Identifying Correlates of Protection to Accelerate Vaccine Trials.
Goal: to apply an analytical method of mapping the human immune response to malaria vaccines that allows a predictive artificial intelligence model to identify the main physiological processes leading to protection upon inmunisation with the candidate vaccine RTS,S or with sporozoites (CPS). Generalisable immune correlates of protection will be validated in an experimental CPS animal model. Combinatorial biomarkers correlating with protection against malaria will be bundled into a final vaccine product.

—
PI and coordinator:
Carlota Dobaño
Funding institution: Seventh Framework Programme (FP7), European Union
Funding: €2.8 million
Calendar: 2013–2015

RTS,S IMMUNOLOGY

Malaria Vaccine-Induced Protection Through Integrated Analysis of Antibody, B Cell and T Cell Immune Responses.
Goal: to identify antibody and cellular immunological signatures associated with protection elicited by RTS,S with innovative technical and analytical approaches that would allow a deeper and more powerful assessment of vaccine induced immunity.
—
PI and coordinator:
Carlota Dobaño
Funding institution: NIH
Funding: $3 million
Calendar: 2012–2017

TRANSEPI

The Comparative Epidemiology of P falciparum and P vivax Transmission in Brazil, Thailand and Papua New Guinea.
Goal: to contribute towards improved control and eventual elimination of malaria in the Asia-Pacific and Americas through gaining an in-depth understanding of transmission patterns of *P. falciparum* and *P. vivax*.
—
PI and coordinator: Ivo Mueller
Funding institution: Bill & Melinda Gates Foundation
Funding: $3.5 million
Calendar: 2012–2015

MALTEM

Mozambican Alliance Towards the Elimination of Malaria.
Goal: to support the Mozambican National Malaria Control Program (NMCP) with the overall goal to eliminate malaria in the southernmost areas of Mozambique by 2020 and to make significant progress towards elimination in Gaza and Inhambane provinces. In the long-term, the adopted strategy seeks to expand malaria elimination efforts to the rest of the country, through the development of a national elimination strategy.
—
PI: Antoni Plasència
Funding institutions: Bill & Melinda Gates Foundation, "la Caixa" Foundation
Funding: €16 million
Calendar: 2015–2020

HIV/AIDS

GAMA

Development of Novel Gastrointestinal Biomarkers for Use in HIV Incidence Determination in a Sub-Saharan African Setting.
Goal: to develop a set of biomarkers which can discriminate individuals recently infected with HIV (6-12 months prior) from chronically infected individuals.
—
PI and coordinator:
Denise Naniche
Funding institution: Bill & Melinda Gates Foundation
Funding: $1 million
Calendar: 2012–2016

MATERNAL, CHILD AND REPRODUCTIVE HEALTH

MiPPAD

Evaluation of alternative antimalarial drugs to sulphadoxine-pyremethamine for intermittent preventive treatment in pregnancy (IPTp) in the context of insecticide treated nets.
Objective: To contribute to the development of new clinical interventions to fight malaria by the evaluation of different antimalarial drug alternatives as intermittent preventive treatment in pregnancy (IPTp) in the context of insecticide treated nets (ITNs).

—
PI & coordinator:
Clara Menéndez
Funding Institutions: European & Developing Countries Clinical Trial Partnership (EDCTP), Malaria in Pregnancy Consortium (MiPc) and Fondo de Investigaciones Sanitarias (FIS)
Funding: 6.6 M€
Calendar: 2008-2013

CaDMIA

Validation of the Minimally Invasive Autopsy (MIA) Tool for Cause of Death Investigation in Developing Countries.
Goal: to design and assess Minimally Invasive Autopsies (MIA) tools for investigation of infectious causes of death, and to evaluate the acceptability and feasibility of using such tools in different cultural, religious and geographical backgrounds.
—
PI and coordinators: Quique Bassat, Clara Menéndez and Jaume Ordi
Funding institution: Bill & Melinda Gates Foundation
Funding: $1.4 million
Calendar: 2013–2015

VIRAL AND BACTERIAL INFECTIONS

COMBACTE

Combatting Bacterial Resistance in Europe.
Goal: to give antibiotic drug development a much-needed boost by pioneering new ways of designing and implementing efficient clinical trials for novel antibiotics.
—
PI: Jordi Vila
Funding institutions: Innovative Medicines Initiative (IMI), European Union
Funding: €2.5 million
Calendar: 2013–2020

Malaria

Malaria affects almost half of the world's population and in 2013 caused an estimated 584,000 deaths. It remains a serious health burden, particularly in sub-Saharan Africa and among two of the most vulnerable population groups: children and pregnant women. Remarkable progress in preventing and controlling the disease has been made over the past decade. Since 2000, malaria cases and deaths have decreased by 30% and 47%, respectively. However, the recent spread of artemisinin-resistant parasites in Southeast Asia may reverse the substantial gains that have been made in malaria control. Moreover, the recent Ebola outbreak in West Africa showed that the malaria death toll rises quickly if treatment and prevention interventions are interrupted. We therefore firmly believe that the only long-term, sustainable solution is the complete elimination of the parasite in a given region. At ISGlobal, the Malaria Elimination Initiative is the cornerstone of our efforts to eliminate this parasitic disease.

Main Lines of Research

· Enabling technologies for malaria research
· Parasite biology
· Physiopathology
· Malaria immunology
· Diagnostics
· Evaluation of preventive and therapeutic tools
· Epidemiology and clinical presentation of *Plasmodium falciparum* and *Plasmodium vivax*
· Vector biology and control
· Novel approaches and strategies for malaria elimination

Main Results 2014*

● **World's First Functional Human Splenon-on-a-Chip.**[1] Scientists from ISGlobal and the Institute of Bioengineering of Catalonia (IBEC) designed the first-ever functional 3D splenon capable of reproducing the function of the spleen, which is to filter red blood cells. To do this, they created a microscale platform that reproduces the physical and hydrodynamic properties of the functional unit of the splenic red pulp: the splenon. The device could be used to investigate potential drugs for malaria and other blood disorders.

● **Scientists Discover Protein That Plays a Key Role in Malaria Transmission.**[2] A study published in *Nature showed* that the AP2-G protein is an essential regulator of sexual reproduction in malaria parasites and that it acts as a developmental switch by activating the transcription of early genes of gametocytes, the sexual form of the parasite. The study revealed new targets for the interruption of malaria transmission that could be used to prevent the formation and maturation of the parasite's sexual stages, which are essential for the transmission of malaria from humans to mosquitoes. The study was carried out by researchers working at ISGlobal and Princeton University, who coordinated the study and worked with the London School of Hygiene and Tropical Medicine.

*Results of studies on malaria in pregnancy are summarised in the section on the Maternal, Child and Reproductive Health Programme.

[1]Rigat-Brugarolas, L.G., Elizalde-Torrent, A., Bernabeu, M., De Niz, M., Martin-Jaular, L., Fernández-Becerra, C., Homs-Corbera, A., Samitier, J., del Portillo, H.A., 2014. A functional microengineered model of the human splenon-on-a-chip. Lab on a Chip 14 (10), 1715–1724.

[2]Kafsack, B.F.C., Rovira-Graells, N., Clark, T.G., Bancells, C., Crowley, V.M., Campino, S.G., Williams, A.E., Drought, L.G., Kwiatkowski, D.P., Baker, D.A., Cortés, A., Llinás, M., 2014. A transcriptional switch underlies commitment to sexual development in malaria parasites. Nature 507 (7491), 248–252.

● **Immature Gametocytes of Malaria Parasite Hide in Bone Marrow.**[3] Gametocytes, which are immature sexual stages of the malaria parasite that play a crucial role in malaria transmission, hide in bone marrow. This is the conclusion of a study published in *Blood*, that was the first *ex vivo* study to use polymerase chain reaction (PCR), a much more sensitive technique than microscopy, to quantify *Plasmodium falciparum* sexual stages in children exposed to malaria.

The study found that virtually all anaemic children with *P falciparum* infection are gametocyte carriers that can potentially contribute to malaria transmission. The fact that microscopy fails to detect a high proportion of gametocytes and that anaemic children may be an important reservoir of the malaria parasite should be taken into account in the design of control measures to interrupt malaria transmission.

● **Nanoparticles as Drug Carriers: A New Strategy That Could Limit the Development of Resistance in Malaria Parasites.**[4,5] New drug delivery strategies are needed in the treatment of malaria in order to improve the efficacy of the poorly soluble antimalarials currently used, and to allow the use of lower doses of new drugs that limit toxicity for the patient and avoid the development of resistant parasite strains. Researchers from ISGlobal and the Institute of Bioengineering of Catalonia (IBEC) demonstrated that an antimalarial drug encapsulated in nanoparticles—chloroquine salts in polyamidoamine polymers (AGMA1 and ISA23)—is significantly more effective *in vivo* than free drug and can therefore help to limit the development of drug resistance. The study indicates that the nanoparticles are capable of recognising different *Plasmodium* species, making their potential scope as adjuvants for malarial drugs broader than that of other carriers.

In a separate study, researchers tested four self-aggregating polymers (called dendrimers) for their capacity to encapsulate the antimalarial drugs chloroquine and primaquine in order to specifically target *Plasmodium-infected* red blood cells and to exert antimalarial activity *in vitro* and *in vivo.* Two dendritic derivatives were identified that specifically target infected red blood cells and improve the efficacy of both drugs.

● **Age of First Exposure to Malaria Parasite Does Not Influence Acquisition of Antibody Responses.**[6] A study on the acquisition of malaria antibody responses in infants under 2 years of age in Mozambique showed that the age at which infants were first exposed to Plasmodium falciparum infection did not influence the acquisition of antibody responses to the antigens examined. Drug intervention during the first year of life did not have an important impact on the acquisition of immunity to malaria in the second year of life in the face of high levels of maternal antibodies still circulating in the plasma of these infants.

Future studies will need to investigate whether drug intervention has an impact on the quality of antibody responses (e.g. affinity and functionality) and on cellular immune responses, which might contribute to naturally acquired immunity.

[3]Aguilar, R., Magallon-Tejada, A., Achtman, A.H., Moraleda, C., Joice, R., Cisteró, P., Li Wai Suen, C.S.N., Nhabomba, A., Macete, E., Mueller, I., Marti, M., Alonso, P.L., Menéndez, C., Schofield, L., Mayor, A., 2014. Molecular evidence for the localization of Plasmodium falciparum immature gametocytes in the bone marrow. Blood 123 (7), 959–966.

[4]Urbán, P., Valle-Delgado, J.J., Mauro, N., Marques, J., Manfredi, A., Rottmann, M., Ranucci, E., Ferruti, P., Fernández-Busquets, X., 2014. Use of poly (amidoamine) drug conjugates for the delivery of antimalarials to Plasmodium. Journal of Controlled Release 177c, 84–95.

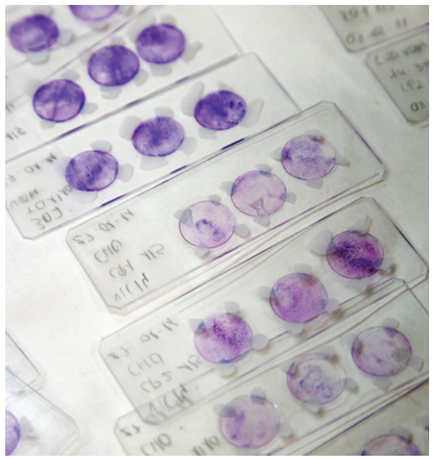
[5]Movellan, J., Urbán, P., Moles, E., de la Fuente, J.M., Sierra, T., Serrano, J.L., Fernández-Busquets, X., 2014. Amphiphilic dendritic derivatives as nanocarriers for the targeted delivery of antimalarial drugs. Biomaterials 35 (27), 7940–795

[6]Nhabomba, A.J., Guinovart, C., Jiménez, A., Manaca, M.N., Quintó, L., Cisteró, P., Aguilar, R., Barbosa, A., Rodríguez, M.H., Bassat, Q., Aponte, J.J., Mayor, A., Chitnis, C.E., Alonso, P.L., Dobaño, C., 2014. Impact of age of first exposure to Plasmodium falciparum on antibody responses to malaria in children: a randomized, controlled trial in Mozambique. Malaria Journal 13 (1), 121.

● **Malaria Vaccine Candidate Shows Continued Protection Up to 18 Months After Vaccination .**[7] Results from a large-scale Phase III trial, published in PLoS Medicine, showed that the most clinically advanced malaria vaccine candidate, RTS,S, continues to protect young children and infants from clinical malaria up to 18 months after vaccination.

The study included 8,923 children aged 5 to 17 months and 6,537 infants aged 6 to 12 weeks and showed continued protection during 18 months of follow-up. The published results were from an independent evaluation of the efficacy of RTS,S by the 11 centres participating in the trial and confirm those published in the New England Journal of Medicine several months earlier, showing that the vaccine was efficacious in close to 50% of African children aged 5 to 17 months and in 30% of infants vaccinated between 6 and 12 weeks.

The new data led the pharmaceutical company GlaxoSmithKline to submit a regulatory application to the European Medicines Agency for the malaria vaccine candidate RTS,S. If authorisation is granted, the World Health Organisation will then be faced with the challenge of deciding how to include a vaccine with moderate efficacy in its global strategies to control and eventually eliminate malaria.



[7]The RTS,S Clinical Trials Partnership, 2014. Efficacy and safety of the RTS,S/AS01 malaria vaccine during 18 months after vaccination: a phase 3 randomized, controlled trial in children and young infants at 11 African sites. PLoS Medicine 11 (7), e1001685.

Chagas Disease

An estimated 6-8 million people are infected with Chagas disease worldwide, mostly in Latin America. People with the disease may live for years without showing symptoms, but Chagas is potentially life-threatening if left untreated. Although vector-mediated transmission remains confined to the Americas, migratory flows in recent decades have led to an increasing number of cases in non-endemic countries such as Spain. At ISGlobal, we are focusing our efforts mainly on three fronts: i) we have been working since 2008 to improve prevention, diagnosis and treatment in Bolivia, the endemic country most affected by the disease; ii) we collaborate on projects to develop new drugs and biomarkers of therapeutic response; and iii) we provide research-based evidence to bolster European legislation on screening measures in organ and blood donation programmes as well as the early detection of infection in newborns with mothers from high-incidence countries, as has already been established in Catalonia.

Main Lines of Research

- Epidemiology of Chagas disease in non-endemic areas
- Biomarkers for therapeutic efficacy in treated patients and for early diagnosis of cardiac damage in patients with Chagas disease
- Clinical trials for new drugs to treat Chagas disease
- Studies on the pharmacokinetics of benznidazole

Main Results 2014

● **Chagas Disease: Europe's Unfinished Business.**[8] Despite the fact that more than 4% of the Latin Americans living in Europe have Chagas disease, the European Union still has no clear policy for preventing the transmission of this parasitic infection. While some European countries have implemented measures to screen for Chagas disease in organ donation programmes, there are no EU directives or national legislation regulating such screening. Only six European countries—Spain, Italy, France, Switzerland, the United Kingdom and Sweden—have included some level of screening for Chagas disease in their regulation of blood donations. And, despite the fact that most of the people with Chagas disease in Europe are women of childbearing age, no national laws or EU directives require that the at-risk population be screened to prevent mother-to-child transmission. In Spain, for example, screening and diagnostic protocols for pregnant women from high-incidence countries—a fundamental measure in the prevention of mother-to-child transmission—have been introduced by only four autonomous communities: Catalonia, Valencia, Galicia and, most recently, Andalusia.

● **New Findings Concerning the Treatment of Chagas Disease.** The results of a Phase II clinical trial of the experimental drug candidate E1224 developed as a treatment for Chagas disease were presented in Washington at the annual meeting of the American Society of Tropical Medicine and Hygiene. The study was carried out in Bolivia by ISGlobal together with the Platform for the Integral Care of Patients With Chagas Disease and the Drugs for Neglected Diseases initiative (DNDi). The new drug showed good safety and was effective in clearing the parasite that causes Chagas disease, but its sustained efficacy over time was low compared to the current treatment benznidazole. In light of the findings of this and other studies, the next step will be to investigate combination therapies as one of the possible strategies for the treatment of this parasitic disease.

[8]Requena-Mendez A., Albajar-Vinas P., Angheben A., Chiodini P., Gascon J., Munoz J., 2014. Health policies to control Chagas disease transmission in European countries. PLoS Neglected Tropical Diseases 8 (10), e3245.

Less than 1% of people living with Chagas disease receive treatment

● **Diagnosis of Digestive Damage in Patients with Chagas Disease in Barcelona.**[9] Digestive damage due to chronic *Trypanosoma cruzi* infection occurs as a result of peristaltic dysfunction, and the final stage, megaviscera, is a consequence of neuronal destruction of the enteric nervous system. The objectives of this study were to determine the prevalence of digestive damage in patients with Chagas disease at an international health centre in a non-endemic area and to study the utility of esophageal manometry in the early stages of disease. The prevalence of digestive chronic Chagas disease was 21.1% in the studied cohort. The authors concluded that Latin American patients with constipation or dysphagia should be tested for Chagas disease and, if diagnosis is confirmed, megacolon and esophageal involvement should be investigated.

● **Biomarkers of Therapeutic Response in Patients with Chronic Chagas Disease: A Systematic Review by the NHEPACHA Network.**[10] There is a consensus on the lack of therapeutic response markers to evaluate the efficacy of newly proposed drugs early after treatment of Chagas disease. This systematic review summarised the current evidence on molecules that are potential biomarkers for therapeutic response. The review provided an overview of the specific needs for development of biomarkers that together fulfil ideal or acceptable criteria for evaluating early responses to treatment of chronic Chagas disease. Data from ongoing studies are essential to improving assessment of existing markers and to identifying markers for early follow-up of treated patients.

[9]Pinazo MJ., Lacima G., Elizalde JI., Posada EJ., Gimeno F., Aldasoro E., Valls ME., Gascon J. 2014. Characterization of Digestive Involvement in Patients with Chronic T. cruzi Infection in Barcelona, Spain. PLoS Neglected Tropical Diseases 8 (8), e3105.

[10]Pinazo MJ, Thomas MC, Bua J, Perrone A, Schijman AG, Viotti RJ., Ramsey JM., Ribeiro I, Sosa-Estani, S, Lopez MC, Gascon J. 2014. Biological markers for evaluating therapeutic efficacy in Chagas disease, a systematic review. Expert Review of Anti-Infective Therapy 12 (4), 479–496.

Maternal, Child and Reproductive Health

Every year, around 280,000 women die as a result of pregnancy, childbirth or postpartum complications and more than 8 million children die under the age of five from preventable diseases. Most of these deaths occur in developing countries and represent the biggest global health inequity today. Improving the health outcomes of the most vulnerable populations, such as women and children in the developing world, is a priority for ISGlobal. At ISGlobal, building on the work of the past 20 years, we conduct clinical research in order to i) identify the main causes of maternal and child mortality in low-income countries, as the lack of reliable data hampers progress in maternal and neonatal health; ii) improve and scale up interventions for the prevention and control of malaria during pregnancy, since pregnant women are twice as likely to die from malaria, a condition still responsible for an estimated 10,000 maternal and 200,000 infant deaths every year, and iii) implement human papilloma virus (HPV) vaccination programmes among pre-adolescent girls in Mozambique with the aim of preventing cervical cancer, the second most common cancer in women, which causes an estimated 275,000 deaths each year, with 90% occurring in developing countries.

Main Lines of Research

- Malaria in pregnancy
- Operational research on the acceptability and feasibility of the implementation of a human papillomavirus (HPV) vaccination programme for preadolescent girls in Africa
- Pharmacovigilance studies of antiretroviral and antimalarial drugs in pregnant women
- Aetiology and risk factors of anaemia in children
- Determination of causes of death in low-income countries
- Effects of the HIV/AIDS epidemic on maternal and child health
- Epidemiology of maternal bacterial carriage and pathogen-related risk factors for vertical transmission of bacterial infections
- Role of microbiota in breast milk and mother-to-child transmission of HIV

Main Results 2014

● **Perception of Malaria in Pregnancy and Acceptability of Preventive Interventions Among African Pregnant Women.**[11] In a study conducted in Mozambican pregnant women, low awareness of the risk and adverse consequences of malaria in pregnancy did not seem to affect acceptability or uptake to the different malaria preventive interventions in the same manner. Perceived convenience, delivery approach and type of provider were the key factors. Pregnant women, through antenatal care services, can help to maximise overall coverage of insecticide-treated nets by acting as vehicles of distribution in their communities. There is a need to improve knowledge about neonatal health and malaria to improve uptake of interventions delivered through channels other than the health facility.

99% of maternal deaths occur in developing countries

[11]Boene H, Gonzalez R, Vala A, Ruperez M, Velasco C, Machevo S, Sacoor C, Sevene E, Macete E, Menendez C, Munguambe K: Perceptions of Malaria in Pregnancy and Acceptability of Preventive Interventions among Mozambican Pregnant Women: Implications for Effectiveness of Malaria Control in Pregnancy. PloS one 2014, 9:e86038.

● **Evaluation of Alternative Drugs for Malaria Prevention During Pregnancy.**[12,13] Two large ISGlobal-coordinated randomised controlled trials on the use of mefloquine (MQ) for malaria prevention in African pregnant women were published in 2014. The first trial compared sulphadoxine-pyremethamine (SP)—currently the recommended intermittent preventive treatment during pregnancy (IPTp)—with two different regimens of MQ in 4,749 HIV-negative pregnant women. The second trial compared three doses of MQ with a placebo in 1,071 HIV-positive pregnant women who also received cotrimoxazole prophylaxis (CTXp). The trials showed that:

- Two IPTp administrations with MQ at a dosage of 15 mg/kg in a context where long-lasting insecticide-treated nets (LLITN) were used had better antimalarial prophylactic efficacy than SP and a comparable safety profile with regard to pregnancy outcomes. However, the tolerability of MQ was worse than that of SP even when the dose was split over two days, which limits the potential for IPTp with MQ to be used in HIV-negative women, at least at the dose used in this study.

- An effective antimalarial drug given as IPTp can be beneficial when added to CTXp and LLITN in HIV-infected women, improving malaria prevention and overall maternal health through a reduction in hospital admissions. However, MQ was not well tolerated, which limits its potential use for IPTp and indicates a need for better-tolerated alternatives. The unexpected finding of increased mother-to-child transmission of HIV in the MQ group also highlights the need for further research.

These results do not support a change in the current IPTp policy with SP. However, they do signal the need for a better understanding of the pharmacological interactions between antimalarials and antiretroviral drugs.

● **Effects of Pregnancy and Malaria Exposure on Immune Response.**[14] Pregnancy triggers immunological changes to ensure that the mother's immune system does not reject the developing foetus, but the impact of this on B cells—one of the main cell types involved in the immune response—is still poorly understood. In addition, exposure to the *Plasmodium* parasite is associated with altered distribution of peripheral memory B cell (MBC) subsets.

This study, published in the *Journal of Immunology,* was undertaken to study the individual and combined effects of pregnancy and exposure to the malaria parasites *Plasmodium vivax* and *Plasmodium falciparum* on the distribution and characteristics of B cells. It compared the B cell populations of four study groups: pregnant and nonpregnant women in Spain who had never travelled to a malaria-endemic country, and pregnant and nonpregnant women in Papua New Guinea, a country where malaria is endemic.

The changes in B cells associated with exposure to malaria were observed in nonpregnant adult women. These changes, which include an expansion of atypical MBCs and a decrease in marginal-zone-like MBCs, also take place during pregnancy, a period characterised by considerable immunological change. Irrespective of exposure to malaria, pregnancy involves an expansion of MBCs in peripheral blood and a decrease of naive or virgin B cells, although these changes are not so evident in Papua New Guinea, a country where malaria is endemic. These changes in the distribution of certain B cell subtypes may have important implications for the response to vaccines and infections which, like malaria, are more prevalent or involve worse symptoms during pregnancy.

Furthermore, the levels of a certain cytokine (the chemokine eotaxin), which are lower during pregnancy and in women exposed to malaria, correlates well with those of atypical MBCs. Surface expression of the CCR3 marker for eotaxin in these cells suggests that the chemokine could play an important role in the B cell changes observed during pregnancy and on exposure to malaria.

[12]Gonzalez, R., Mombo-Ngoma, G., Ouedraogo, S., Kakolwa, M.A., Abdulla, S., Accrombessi, M., Aponte, J.J., Akerey-Diop, D., Basra, A., Briand, V., Capan, M., Cot, M., Kabanywanyi, A.M., Kleine, C., Kremsner, P.G., Macete, E., Mackanga, Intermittent Preventive Treatment of Malaria in Pregnancy with Mefloquine in HIV-Negative Women: A Multicentre Randomized Controlled Trial. PLoS Medicine 11(9): e1001733.

[13]Gonzalez, R., Desai, M., Macete, E., Ouma, P., Kakolwa, M.A., Abdulla, S., Aponte, J.J., Bulo, H., Kabanywanyi, A.M., Katana, A., Maculuve, S., Mayor, A., Nhacolo, A., Otieno, K., Pahlavan, G., Ruperez, M., Sevene, E., Slutsker, L., Vala, A., Williamsom, J., Menendez, C., 2014. Intermittent Preventive Treatment of Malaria in Pregnancy with Mefloquine in HIV-Infected Women Receiving Cotrimoxazole Prophylaxis: A Multicenter Randomized Placebo-Controlled Trial. PLoS Medicine 11 (9), e1001735.

[14]Requena, P., Campo, J.J., Umbers, A.J., Ome, M., Wangnapi, R., Barrios, D., Robinson, L.J., Samol, P., Rosanas-Urgell, A., Ubillos, I., Mayor, A., Lopez, M., de Lazzari, E., Arevalo-Herrera, M., Fernandez-Becerra, C., Del Portillo, H., Chitnis, C.E., Siba, P.M., Bardaji, A., Mueller, I., Rogerson, S., Menendez, C., Dobaño, C., 2014. Pregnancy and Malaria Exposure Are Associated with Changes in the B Cell Pool and in Plasma Eotaxin Levels. Journal of Immunology 193 (6), 2971–2983.

Viral and Bacterial Infections

Viral and bacterial infections account for a substantial proportion of the global burden of disease, particularly in children under five years of age. In addition, hundreds of millions of patients worldwide are affected by healthcare-associated infections, especially in developed countries. A high percentage of these hospital-acquired infections are caused by highly resistant bacteria such as methicillin-resistant Staphylococcus aureus (MRSA) or multidrug-resistant gram-negative bacteria. Resistance to antimicrobial drugs is now considered one of the biggest threats to global health. Antimicrobial-resistant bacteria are present in all parts of the world and new resistance mechanisms spread easily and globally. According to a recent report, drug-resistant infections kill hundreds of thousands of people worldwide each year, and by 2050 that figure could exceed 10 million. The economic cost would also be significant: the world economy could see losses of up to $100 trillion by 2050 if no action is taken. At ISGlobal, we have deployed our expertise in this area in an effort to i) understand and fight the various causes of antimicrobial resistance, and ii) identify new molecules with potential antimicrobial activity. We also study the epidemiology and clinical presentation of viral and bacterial infections and test new treatments to fight them.

Main Lines of Research

· 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 assessment of new antibacterial drugs
· Surveillance, phylogeny and clinical impact of the influenza virus and emergent viruses
· Search for biomarkers for diagnosis and prognosis of bacterial and viral infections
· Pathogenesis and antimicrobial resistance of microorganisms that cause neonatal sepsis
· Epidemiology and clinical presentation of viral and bacterial infections
· Treatment of yaws in Papua New Guinea

Main Results 2014

● **New Results Confirm That Eradication of Yaws May Be Possible.** Data from pilot studies in four countries on the treatment of yaws with oral azithromycin was presented at an expert consultation organised by the World Health Organisation (WHO) on 24 and 25 March. The experts examined preliminary data from pilot mass treatment campaigns with azithromycin that had been underway for the past two years in four countries (Republic of the Congo, Ghana, Papua New Guinea and Vanuatu). To date, some 90,000 people have been treated in these four countries and over 90% of the population was treated in the areas selected for study. The results show the drug to be safe, easy to use, and highly acceptable to the community, and particularly to children.
Six months after the first treatment, the prevalence of yaws had fallen by more than 90% in the study led by ISGlobal researchers in Papua New Guinea. If the other pilot projects produce similar results, there will be little doubt about the feasibility of the new eradication strategy.

Only 3 new antibiotics have received approval in the last 30 years

● **Relationship Between Drug Resistance, Fitness and Biofilm Production in *Salmonella*.**[15] Decreased susceptibility to fluoroquinolones and extended-spectrum cephalosporins is steadily increasing among *Salmonella* species. Furthermore, the ability to form a biofilm helps to confer drug resistance and can help *S enterica* survive in hostile environments. This study looked at the potential relationship between quinolone resistance and biofilm production in a collection of *S enterica* clinical isolates and showed that an increasing quinolone resistance phenotype, due to overexpression of efflux pumps, resulted in impaired fitness and a reduction in the formation of biofilms. Further work is needed in order to determine the efflux pump(s) involved in the resistance phenotype, as well as the relationship between quinolone resistance and biofilm formation.

● **Improving the Assessment of Traveller's Diarrhoea.**[16] Traveller's diarrhoea is the most common illness reported in international travellers and is caused by a wide range of pathogens, including bacteria, viruses and parasites. This study showed that the primary pathogens causing traveller's diarrhoea were *Shigella* (24.2%) followed by enterotoxigenic *Escherichia* coli (ETEC) (23.2%), enteroaggregative *E coli* (14.7%) and *Giardia* (13.7%) and concluded that the use of a commercially available multiplex polymerase chain reaction for the detection of gastrointestinal pathogens improved the detection of enteropathogens and allowed better assessment of the aetiology of traveller's diarrhoea.

● **New Findings on the Causes, Epidemiology and Prognostic Factors of Severe Pneumonia in Children in Morocco .**[17,18] The studies looked at 700 children under five years of age who were admitted to Rabat's children's hospital with clinically severe pneumonia. In one study, a quarter of the nearly 700 children analysed developed complications and required prolonged hospitalisation and intensive care; in some cases these resulted in death. The risk factors independently associated with a poor prognosis included a history of prematurity, fever prior to hospitalisation, living with smokers, cyanosis, pallor, impaired consciousness at the time of hospitalisation, rhonchi on auscultation, and human metapneumovirus infection. The researchers concluded that identifying the factors associated with a poor prognosis at an early stage could improve treatment strategies and increase the likelihood of survival in Moroccan children with severe pneumonia.

In the other study, the aetiology and epidemiology of respiratory distress in children under five years of age was described. The most frequent clinical diagnoses were wheezing-related conditions (bronchitis, asthma and bronchiolitis), whereas typical bacterial pneumonia was less frequent. While invasive bacterial disease detected by classical microbiology or molecular methods was also uncommon, respiratory viruses in the nasopharynx were detected in almost all cases. The three most frequently detected viruses were rhinovirus (53%), respiratory syncytial virus (18%) and adenovirus (17%). The authors concluded that the epidemiological profile of acute respiratory infections in children in Morocco is similar to that of high-income countries. However, the high mortality rate associated with pneumonia indicates that preventive and clinical management strategies need to be improved.

[15]Fabrega A., Soto SM., Balleste-Delpierre C., Fernandez-Orth D., Jimenez de Anta MT., Vila J. 2014. Impact of quinolone-resistance acquisition on biofilm production and fitness in Salmonella enterica. Journal of Antimicrobial Chemotherapy 64 (7), 1815–1824.

[16]Zboromyrska Y., Hurtado JC., Salvador P., Alvarez-Martinez MJ., Eugenia Valls M., Mas J., Angeles Marcos M., Gascon J., Vila J. 2014. Aetiology of traveller's diarrhoea: Evaluation of a multiplex PCR tool to detect different enteropathogens. Clinical Microbiology and Infection 20 (10), O753-O759.

[17]Jroundi I., Mahraoui C., Benmessaoud R., Moraleda C., Tligui H., Seffar M., Kettani SE.-CE., Benjelloun BS., Chaacho S., Muñoz-Almagro C., Ruiz J., Alonso PL., Bassat Q. 2014. Risk factors for a poor outcome among children admitted with clinically severe pneumonia to a university hospital in Rabat, Morocco. International Journal of Infectious Diseases 28, 164–170.

[18]Jroundi I., Mahraoui C., Benmessaoud R., Moraleda C., Tligui H., Seffar M., Kettani SC., Benjelloun BS., Chaacho S., Maaroufi A., Hayes EB., Alvarez-Martinez MJ., Muñoz-Almagro C., Ruiz J., Alonso PL., Bassat Q. 2014. The epidemiology and aetiology of infections in children admitted with clinical severe pneumonia to a university hospital in Rabat, Morocco. Journal of Tropical Pediatrics 60 (4), 270–278.

● **Resistance Mechanisms in *Acinetobacter*, a Major Source of Hospital Infections.**[19] Carbapenem-resistant *Acinetobacter baumannii* (CRAb) is a major source of nosocomial infections in Spain. This resistance is mainly due to the acquisition of carbapenem-hydrolysing enzymes (class D β-lactamases), of which three types have been found in Spain (OXA-24/40, OXA-58 and OXA-23-like). This study looked at the distribution and relatedness of CRAb strains from two Spanish multicentre studies. The results showed that the action of the OXA-24/40-like enzyme remains the main mechanism of carbapenem resistance in Spain and that the gene is located in plasmids that confer a high selective advantage thanks to a toxin/antitoxin system. Further studies on this system in *Acinetobacter spp.* can allow the identification of possible targets for the development of inhibitors as new antimicrobial agents.

A different study reported the earliest occurrence of New Delhi metallo-beta-lactamase-1 (NDM-1), an enzyme that makes bacteria resistant to a broad range of beta-lactam antibiotics—including those of the carbapenem family—in *Acinetobacter pittii*. The isolate was recovered from a female patient in her late teens from a small city in eastern Turkey who underwent surgery for metastatic carcinoma in early 2006 and had no history of travel outside of her home town. This was the first NDM-producing *Acinetobacter* isolate described in Turkey and also one of the earliest NDM producers overall. Genetic analysis suggested that NDM enzymes may have been circulating among *non-baumannii Acinetobacter* spp. in other parts of the world prior to their major spread to more clinically relevant bacterial species.

● **Antibiotic-Resistant *E coli* Among Patients with Traveller's Diarrhoea.**[20] Extended-spectrum beta-lactamases (ESBLs) are enzymes produced by some bacteria that provide resistance to beta-lactam antibiotics including cephalosporins. Plasmids responsible for ESBL production often carry genes encoding resistance to other drug classes, and antibiotic options in the treatment of infections by ESBL-producing organisms are therefore extremely limited. This study investigated the prevalence of ESBL-producing *Escherichia coli* in stool samples from patients with traveller's diarrhoea who had travelled to tropical and subtropical countries. Almost 100 ESBL-producing strains were isolated from 18% of patients, with travellers to India showing the highest prevalence of positive samples (37.4%).

[19]Mosqueda N., Gato E., Roca I., Lopez M., de Alegria CR., Fernandez Cuenca F., Martinez-Martinez L., Pachon J., Cisneros JM, Rodriguez-Bano J., Pascual A., Vila J., Bou G., Tomas M., 2014. Characterization of plasmids carrying the blaOXA-24/40 carbapenemase gene and the genes encoding the AbkA/AbkB proteins of a toxin/antitoxin system. Journal of Antimicrobial Chemotherapy 69 (10), 2629–2633.

[19]Roca I., Mosqueda N., Altun B., Espinal P., Akova M., Vila J. 2014. Molecular characterization of NDM-1-producing Acinetobacter pittii isolated from Turkey in 2006. Journal of Antimicrobial Chemotherapy 69 (12), 3437–3438.

[20]Sole M., Pitart C., Oliveira I., Fabrega A., Muñoz L., Campo I., Salvador P., Alvarez-Martinez M., Gascon J., Marco F., Vila J. 2014. Extended spectrum beta-lactamase (ESBL)-producing Escherichia coli faecal carriage in Spanish travellers returning from tropical and subtropical countries. Clinical Microbiology and Infection 20 (10), O636-O639.

HIV/AIDS

Remarkable inroads have been made against the global HIV epidemic, thanks in great part to the development of and access to anti-retroviral therapies (ART) and the fact that current research efforts are aimed at curing HIV instead of simply controlling it. Nevertheless, this disease claimed around 1.5 million lives in 2013 and continues to be a major global health issue. The most affected region is sub-Saharan Africa, which had 25 million people living with HIV in 2013 and accounted for 70% of new HIV infections worldwide.

There are still major disparities in ART coverage, and paediatric coverage continues to lag behind. In low-income countries, just 1 in 4 children with HIV have access to ART. At ISGlobal, our research on HIV/AIDS focuses on issues that are particularly relevant to the epidemic in sub-Saharan Africa.

Main Lines of Research

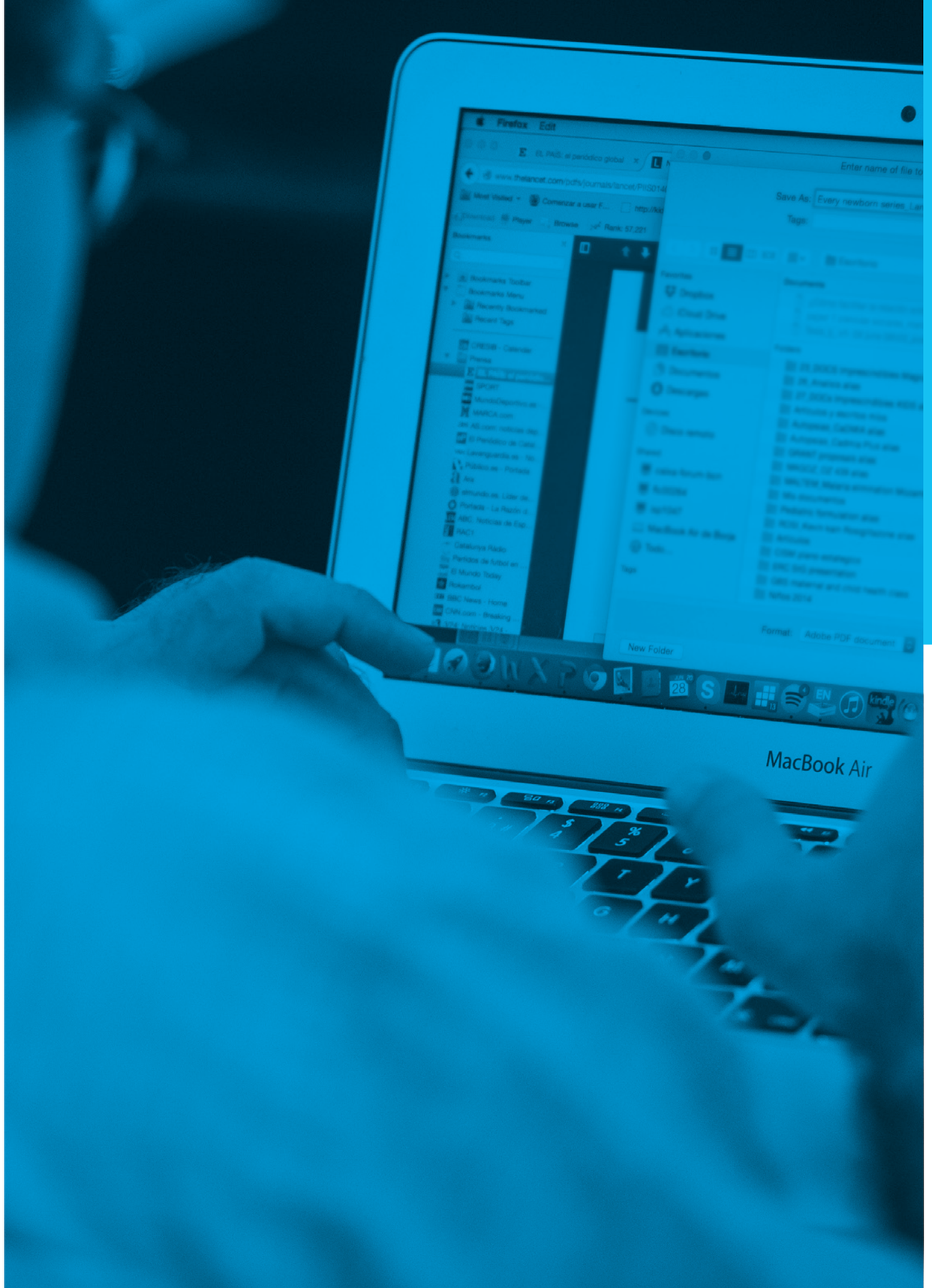
- HIV and maternal and child health
- Pathogenesis of acute and early HIV infection
- Community epidemiology studies to inform future HIV-prevention interventions
- HIV therapeutics and care in the sub-Saharan African setting

Main Results 2014*

● **Health Status of Uninfected Children Exposed to HIV in Africa.**[21] In Southern Africa, up to 40% of women live with HIV and the number of infants exposed to HIV during pregnancy, delivery and breast-feeding is steadily increasing. It is not clear if and how the health of HIV-exposed uninfected (HEU) infants is affected by their mother's HIV status. This study compared clinical, immunologic and hematologic profiles of these children as compared to HIV-unexposed (UE) infants. Results showed that HEU infants had an increased frequency of anaemia, poorer nutritional status and alterations in some immunologic profiles. In addition, the risk of severe pneumonia was increased in these children compared with UE infants. This information is important for the design of public health policies for the management of this group of vulnerable infants in sub-Saharan Africa.

*Results of studies on intermittent preventive treatment of malaria in pregnancy with mefloquine in HIV-infected women receiving cotrimoxazole prophylaxis are summarised in the section on the Maternal, Child and Reproductive Health Programme.

[21]Moraleda C., de Deus N., Serna-Bolea C., Renom M., Quinto L., Macete E., Menendez C., Naniche D., 2014. Impact of HIV Exposure on Health Outcomes in HIV-Negative Infants Born to HIV-Positive Mothers in Sub-Saharan Africa. Journal of Acquired Immune Deficiency Syndromes 65 (2), 182–189.



Facts & Figures

Training Programmes

19

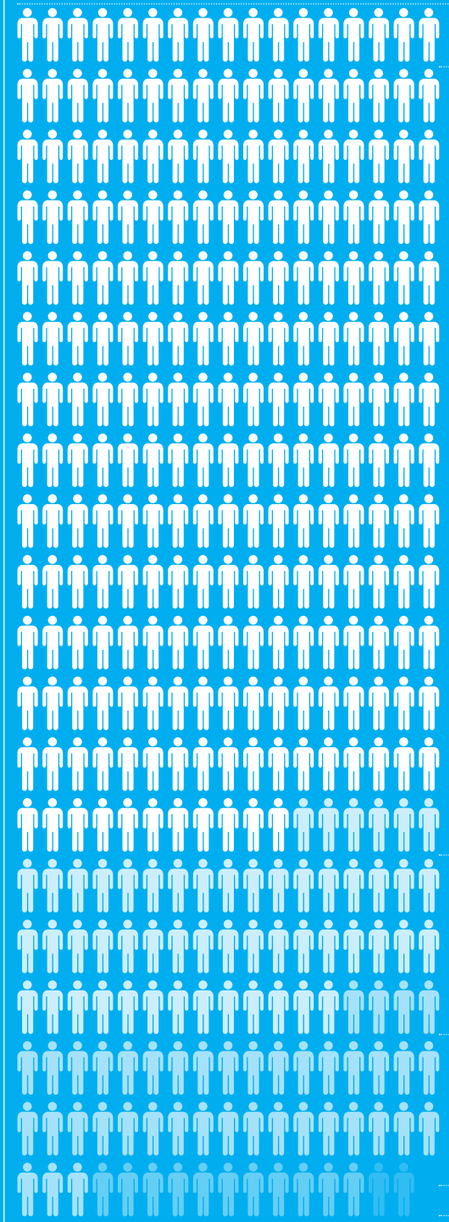
Scientific Seminars

45

Doctoral Theses Defended

8

Number of Students by Category **339**



Courses students	232
Doctoral students	53
Students	41
Rotations	11
Diploma students	2

In 2014, the graduate programmes coordinated by ISGlobal and the University of Barcelona (UB) attracted more international students than ever before. In our master's degree programmes, for example, over 60% of the students were international. The trend was similar in short courses: more than 60 students from all over the world participated in the first Barcelona Global Health Summer School, which was organised by ISGlobal and the Health Science Students' Association of Catalonia and the Balearic Islands. These figures show that our portfolio of high-quality training opportunities is gaining a strong reputation throughout the world.

Elsewhere, our training projects in Mozambique, Bolivia and Morocco reflect our belief that development is impossible without education. We have been working for many years to build educational capacities and strengthen institutions in low- and medium-income countries with the aim of improving the health of the world's most vulnerable populations and contributing to development on the ground.

Núria Casamitjana
Training and Education Director

Graduate Programmes

- Doctorate in Medicine (International Health track), UB
- Trans Global Health: joint doctorate in the framework of the Erasmus Mundus programme in collaboration with academic institutions in Belgium, France and the Netherlands
- Master of Global Health, ISGlobal-UB
- Master of Clinical Research (International Health track), ISGlobal-UB.
- Master in Internationalisation. Global Health course, Faculty of Economics, UB
- Diploma of Global Health Fundamentals, ISGlobal-UB

Courses, Workshops and Rotations

- Update Course on Malaria Elimination in Mesoamerica and Hispaniola (San Salvador, 16–21 February)
- 10th Workshop on Imported Chagas Disease (Barcelona, 4 March)
- The Science of Eradication: Malaria. Organised jointly with Harvard University and the Swiss Tropical and Public Health Institute (Basel, 1–9 June)
- Maternal and Reproductive Health (Barcelona, 10–27 February)
- Humanitarian Crises and Global Health (Barcelona, 3–20 March)
- Nutrition and Food Security (Barcelona, 1 April–6 May)
- Global Environmental Health (Barcelona, 7–15 May)
- Development and Application of Vaccines in Global Health (Barcelona, 19–28 May)
- Fundamentals of Epidemiology and Biostatistics for Global Health (Barcelona, 21 October–24 November)
- Imported Diseases: An Intensive Course for Physicians in Clinical Practice (27–28 November)
- Systems, Policies and Economics (Barcelona, 25 November–18 December)
- Rotations of resident physicians and graduate doctors at the Manhiça Health Research Centre (Mozambique)
- Student internships at the Manhiça Health Research Centre (Mozambique)

Doctoral Theses Defended

Study of Plasmodium falciparum asexual blood stage antibodies associated with sustained protection in Mozambican children vaccinated with RTS,S/AS02A, **Joe Campo**
9 January 2014, UB
Supervisors: Dra. Carlota Dobaño, Dr. Pedro L. Alonso

Resistencia antimicrobiana en patógenos bacterianos causantes de diarrea: investigación de alternativas, **Mª Jesús Pons**
7 March 2014, UB
Supervisor: Dr. Joaquim Ruiz

Epidemiología y tratamiento del Plasmodium Vivax, **Inoni Betuela**
26 March 2014, UB
Supervisors: Dr. Quique Bassat, Dr. Ivo Mueller

Mortalidad relacionada con malaria por P. falciparum y P. vivax: estudio autópsico, **Paola Castillo**
25 September 2014, UB
Supervisor: Dr. Jaume Ordi

Evaluación de los errores de medicación notificados antes y después de la implantación de un sistema informatizado de prescripción/validación/preparación /administración en onco-hematología. Impacto sobre la calidad del proceso asistencial y seguridad de los pacientes, **Natalia Creus**
21 October 2014, UB
Supervisors: Dr. Carles Codina, Dr. Antoni Trilla

Malaria and HIV in pregnancy in Southern Mozambique: new insights into immunopathological mechanisms with diagnostic potential, **Laura Moro**
24 October 2014, UB
Supervisor: Dr. Alfredo Mayor

Características microbiológicas de Ozenoxacino: una nueva desfluoroquinolona para el tratamiento de infecciones de piel, **Yuly López**
29 October 2014, UB
Supervisor: Dr. Jordi Vila

Immunity to malaria in infants: Effect of age of first exposure to Plasmodium falciparum on the development of naturally acquired immunity to malaria, **Augusto José Nhabomba**
18 December 2014, UB
Supervisor: Dra. Carlota Dobaño

To work in global health it is essential to have a broad and trans-disciplinary perspective

60% of our master's programmes students are internation

ISGlobal Creates Alumni Network

In May we launched a website that serves as a meeting place and networking tool for alumni of courses organised by ISGlobal. The platform offers an alumni directory, a calendar of events, information about training programmes, and a job notice board for posting employment opportunities at ISGlobal and elsewhere in the global health sector. The website also allows alumni to post information of interest to other members of the community.

Barcelona Global Health Summer School

In collaboration with the Health Science Students' Association of Catalonia and the Balearic Islands and the International Federation of Medical Students' Associations, in July we held the first Barcelona Global Health Summer School, which focused on the challenges that health systems must tackle if the UN goal of universal health coverage is to be achieved. With a lineup of speakers that included numerous international experts, the programme attracted 70 students from Europe, Northern Africa, China and other parts of the world. Given the success of this first edition of the Barcelona Global Health Summer School, the organisers decided to make it an annual event, with a different theme each year.

ISGlobal-CREAL Doctoral Symposium

In November, we held our first joint doctoral symposium with the Centre for Research in Environmental Epidemiology (CREAL), an ISGlobal allied research centre. The aims of the event were to increase the visibility of doctoral-level research within ISGlobal and CREAL, to create opportunities for collaboration, and to encourage synergistic interaction between researchers through scientific collaborations. The researchers presented studies on malaria, cancer, infectious respiratory diseases and other subjects. At the end of the symposium, awards were presented for the best oral presentation and the two best posters.

Training of experts is a key component of knowledge transfer in the field of global health

Malaria Elimination Initiative

Science of Eradication: Malaria

The third edition of "Science of Eradication: Malaria" was organised by three institutions with a wealth of knowledge and expertise in malaria: ISGlobal, Harvard University and the Swiss Tropical and Public Health Institute. Experts in malaria research, representatives of international organisations, and officials from malaria programmes and health ministries from all over the world gathered in Basel, Switzerland, from 1 to 9 June to discuss issues related to malaria elimination and eradication. The 55 participants who attended the course were selected from over 140 candidates.

Training Course on Malaria Elimination in Mesoamerica and Hispaniola

As part of a Global Fund initiative to eliminate malaria in Mesoamerica and the island of Hispaniola by 2020, we organised a course in collaboration with the Regional Coordinating Mechanism and Mexico's National Institute of Public Health. More than 45 people attended the "Update Course on the Elimination of Malaria in Mesoamerica and the Island of Hispaniola" between 16 and 21 February in San Salvador. Participants included representatives of programmes working to combat malaria in the nine countries involved in the Global Fund initiative—the seven countries of Central America plus the Dominican Republic and Haiti—as well as Mexico and Colombia.

Chagas Initiative

10th Workshop on Imported Chagas Disease

In March, we organised the "10th Workshop on Imported Chagas Disease" in collaboration with the Mundo Sano Foundation. More than 130 experts met to review the latest advances in the treatment of Chagas disease and discuss existing health policies. Participants highlighted the lack of clear, harmonised, Europe-wide laws regulating the means by which the disease spreads in non-endemic countries. These workshops have become a key annual event for professionals working to combat Chagas disease.

Strengthening the capacity of health care professionals is essential for development

Maternal, Child and Reproductive Health Initiative

Training Programme to Fight Cervical Cancer in Mozambique

In collaboration with the Manhiça Health Research Centre (CISM) and the Mozambican Ministry of Health, we launched a training programme to develop the necessary skills and knowledge among the country's health workers in preparation for the introduction of the human papillomavirus (HPV) vaccine, which is designed to prevent cervical cancer. Financed by the "la Caixa" Foundation, the programme targeted health staff attached to the Ministry of Health at central and district levels in the Mozambican capital of Maputo, the southern city of Manhiça, and the northern city of Mocimboa da Praia.

Higher Education for Mozambican Women

In collaboration with the Mozambique-based Foundation for Community Development (FDC) and with support from the "la Caixa" Foundation, we created a scholarship programme that helps Mozambican women pursue an undergraduate or graduate-level education. The programme enables women to focus on their studies so that they can participate in solving Mozambique's social and health problems and play a leadership role in the country's development process. Thirteen women have received scholarships since the programme was introduced in 2009.

Facts & Figures

Publications

6

Preparing the Post-2015 Agenda

8 MILLENNIUM DEVELOPMENT GOALS

17 SUSTAINABLE DEVELOPMENT GOALS

Tag Cloud

In pursuit of our mission to ensure that knowledge and innovation should transcend the boundaries of the scientific world, in 2014 we broadened the scope of the ISGlobal Think Tank by incorporating the Global Development programme into the work of policy analysis and political advocacy.

This change is a result of our commitment to new models of action and to creating international coalitions and partnerships capable of stimulating and supporting projects on the ground that incorporate the latest research, translating the results to real world applications and actions that will benefit people. The aim was to strengthen the knowledge translation process, starting with the definition of new proposals for action and then supporting the entire process to ensure that these eventually result in concrete projects and inform public policies. In short, we sought a structure that could more effectively achieve our goals and unlock ISGlobal's full potential throughout its whole sphere of action, from scientific evidence to real world action.

Rafael Vilasanjuan
Policy and Global Development Director

New Policy and Global Development Department

In September, we implemented a process of internal restructuring to reinforce the transfer of knowledge generated by research to society. The creation of the Global Policy and Development Department brought together two existing areas of work: the ISGlobal Think Tank, which is responsible for the analysis and translation of knowledge with a focus on global health priorities, and the Technical Cooperation department, which seeks to achieve real impact and benefits by implementing practical health programmes and interventions on the ground. The design of this new department will allow us to achieve greater impact by shaping transformative policies and promoting new models of action.

Publications Portfolio

- *A Health System Under Siege: Ensuring Equity Across the Continuum of Care in the Occupied Palestinian Territories.* Latifeh Dahmash, June 2014.
- *Beyond Health Aid: Would An International Equalization Scheme for Universal Health Coverage Serve the International Collective Interest?*. Gorik Ooms, July 2014.
- *The Gap.* Rafael Vilasanjuan y Gonzalo Fanjul, July 2014.
- *Building a Global Health Social Contract for the 21st Century. Collection of Papers from the Seminar held in Barcelona in 2013.* Various authors, July 2014.
- *Innovative Community-Based Approaches to Addressing Access to Sexual Violence Services.* Abby Radford, September 2014.
- *The Three Crises of Ebola.* ISGlobal Policy Team, December 2014.

New Development Policy

In 2014, we started to design a new strategy for ISGlobal as a global health actor in the arena of international development. This involved the definition of a strategy for identifying donors who would support new projects and for obtaining the national and international funding needed to form new alliances capable of developing and carrying through translational projects based on our scientific capacities and assets. Towards that end, we invested our efforts in developing new international partnerships in Africa and Latin America that could put into practice new models that will advance the aims of our initiatives. At the same time, we participated in new partnerships and the definition of policies in the European Union and the United States. The creation of a department responsible for global development has also allowed us to take concrete action on priority issues on the health agenda, areas in which we can have an impact and generate added value, such as the Ebola epidemic.

The Ebola Epidemic

The Ebola outbreak in West Africa in 2014, an epidemic involving more than 25,000 cases and some 11,000 deaths, was the first event that led us to assess the need for an ad hoc campaign. Quickly forging new partnerships, supporting projects and building a bridge between civil society organisations, researchers and government, ISGlobal contributed actively to various components of the national and international response to the epidemic, including the following:

- Contributing to the creation of and serving on the Catalan Scientific Advisory Committee on Ebola Virus Disease (CCAMVE).
- Providing expert advice to the Health and Foreign Affairs ministries of the Spanish government.
- Participation in the Strategic Advisory Group of Experts (SAGE) working group on Ebola vaccines and vaccination and in the WHO response group dealing with maternal and child health issues related to the Ebola epidemic.
- Biosecurity protocol training for health personnel in the Hospital Clínic de Barcelona and Hospital Sant Joan de Déu Hospital, in collaboration with MSF.

Three New Lines of Research

● **The Post-2015 Agenda.** The future framework for the field of global health will be shaped by the approval in 2015 of the Sustainable Development Goals and the completion of the 15-year period set for achieving the Millennium Development Goals at the end of the same year. To promote an effective and sustainable response to health inequities, we have launched a new line of work aimed at placing this issue squarely at the centre of the new development agenda.

● **The Future of Cooperation.** It is clear that a review of the existing development cooperation model is necessary to bring it into line with recent changes in the international arena (the reduction of inequalities between countries and the increase of inequities within countries). We have started a line of work aimed at promoting new proposals for replacing the traditional assistance-based approach with a more effective model of cooperation that will have beneficial repercussions for both recipients and donors.

● **Innovation.** Millions of people are not receiving the medicines they need to safeguard their health because the current model of medical innovation is driven by market incentives and fails to address public health priorities. The lack of research directed towards developing new antibiotics, the high price of essential drugs like the new treatment for hepatitis C virus, and the lack of resources to finance the treatment of diseases that primarily affect poor people are fundamental challenges for global health today. Capitalising on our position as a bridge between public and private institutions, we seek to stimulate the scientific debate by introducing new elements into the discussion.

Malaria Elimination Initiative

New Agenda for the Elimination of Malaria

Malaria eradication is a long-term objective that has been included in the Global Malaria Action Plan since 2008. There is a consensus that the definitive elimination of the parasite is the only sustainable solution in the long term and that it is an indispensable prerequisite to development in countries where the disease is endemic. To contribute to this goal, in September 2014 we launched the "la Caixa" Against Malaria programme, an initiative funded by the "la Caixa" Foundation and the Bill & Melinda Gates Foundation that will be implemented by the Government of Mozambique in collaboration with ISGlobal and the Manhiça Health Research Centre (CISM). The programme will provide valuable information for the WHO's Global Technical Strategy for Malaria and will represent a significant step towards the goal of eliminating the disease worldwide.

Secretariat of the Malaria Eradication Scientific Alliance

The objective of the Malaria Eradication Scientific Alliance (MESA) is to advance the science of malaria eradication through research and development. ISGlobal has hosted the secretariat of the Alliance since it was first established and we have contributed to MESA's work of knowledge management and catalysing research in this field. In February, we participated in the conference The Science of Malaria Eradication organised by Keystone Symposia and MESA in Mexico, and in November we collaborated with the launch of MESA Track, a database of ongoing projects pertinent to the elimination and eradication of malaria.

Chagas Initiative

The Global Chagas Disease Coalition

In 2014, we took on the task of coordinating the Global Chagas Disease Coalition, an open, collaborative alliance that aims to promote access to diagnosis and treatment for patients with Chagas disease and to stimulate innovation in this field and accelerate efforts to develop new tools to fight the disease. In March, representatives of the Coalition came together in Barcelona with over 60 researchers and other specialists from different parts of the world at a symposium entitled "Access to Health Care Services and Treatment for People with Chagas Disease". The experts who attended highlighted the need to implement programmes offering the diagnosis and treatment of Chagas disease that are accessible to at-risk populations.

Antibiotic Resistance Initiative

Roadmap on Antibiotic Resistance in Africa

In November 2013, we organised a discussion forum in Barcelona to stimulate debate among the main actors involved in the prevention and treatment of infections caused by multidrug-resistant bacteria. As a result of this meeting, in 2014 we designed a roadmap that includes an initial mapping of resistance in Africa, one of the continents where there is the least information on the phenomenon.

Maternal, Child and Reproductive Health Initiative

Advocacy Work and Participation in Decision-Making Forums

During the year we were active in various forums on maternal, child and reproductive health. In June we attended the third Partner's Forum organised by the Partnership for Maternal, Newborn and Child Health (PMNCH), which was held in Johannesburg, South Africa. The following month, we took part in the 16th Annual Meeting of the Roll Back Malaria Partnership Working Group on Malaria in Pregnancy in Ghana, where participants reviewed the available scientific evidence, studied the progress being made in different countries on the adoption and implementation of policies on intermittent preventive treatment in pregnancy, and discussed the question of how to improve the administration of antimalarial treatment during pregnancy.

Communications and Outreach

At ISGlobal, we are committed to science communication, encouraging young people to pursue careers in science, and informing society about the greatest global health challenges currently facing the world. One of our aims is to raise awareness about the value of science as an instrument of change capable of improving people's health. Our work in 2014 included a number of communications and outreach activities designed to achieve this objective.

Launch of the InfoChagas.org Website

To provide information to the public about Chagas disease, we created a new online tool. The InfoChagas.org website is designed to answer the questions most often asked about this neglected disease, which official WHO statistics estimate affects some 6 to 7 million people, primarily in Latin America. The website was officially launched at the DNDi Chagas Platform meeting held on in August in Mexico City during the International Congress of Parasitology (ICOPA).

#ObjectHealth Communication Campaign

The aim of the #ObjectHealth campaign was to draw attention to the many gaps in health equity worldwide. The campaign consisted of 15 short videos broadcast on Spanish national television and 15 articles published in the "Planeta Futuro" section of the El País newspaper over the course of three weeks last November. In these pieces, international global health experts discussed major global health problems and ways they could be addressed through science and innovation.

Promoting Careers in Science

Two recipients of the Extraordinary Baccalaureate Award—a merit-based honour granted by the Catalan Ministry of Education—spent a week at ISGlobal in September. The students had the chance to see first-hand how a centre for global health research and knowledge translation operates. We also participated in Barcelona's 2014 Science Festival. An ISGlobal researcher gave a talk about how biomarkers can be used to identify the cause of infection (malaria, bacteria or virus) in children with clinical pneumonia.

The dialogue between science and the rest of society has never been more important

Facts & Figures

Joint Research Projects in Mozambique

17

Mozambican Researchers in the Training Fellowship Programme

4

New Patients Treated by the Chagas Platform in Bolivia

5,222

Health Professionals Trained in Bolivia

544

Health Professionals Trained in Morocco from 2012 to 2014

369

Our work in science and knowledge translation is strongly rooted in the realities of low- and medium-income countries. Throughout our history, we have developed long-term strategic alliances and partnerships in sub-Saharan Africa, Latin America and the Maghreb. In 2014, we provided support for our partners in Mozambique, Bolivia and Morocco, combining important research with efforts to promote and consolidate local human capacities as well as technical resources and infrastructure.

Bolivia

Building on our work with Chagas disease in Spain, in 2009 we created the Platform for the Integral Care of Patients With Chagas Disease in Bolivia, the country most affected by this disease. The Platform has implemented a new health care model that combines research, training for health professionals, and direct patient interventions aimed at improving the prevention, diagnosis and treatment of Chagas disease.

Consolidated Health Care Model

Our initial four-year period of funding from the Spanish Agency for International Development Cooperation (AECID) ended in 2014. Seventy-three percent of the 19,279 patients seen by the Chagas Platform over the past four years have been diagnosed with Chagas disease and nearly half of those diagnosed have received treatment. At the global level, however, the picture is very different: just 1% of the world's Chagas-infected people receive treatment. In contrast, 50% of the patients seen by the Chagas Platform are treated and, of these, more than 80% complete the treatment successfully.

Training and Research Activities

In 2014, the Chagas Platform provided training to 554 health professionals working in this field. Among those trained were 55 employees of the national health system who received theoretical and practical training that prepared them to overhaul the protocols used at their respective health care facilities. In addition, in 2014 two high-impact research projects were launched at Chagas Platform centres: 1) a clinical trial of fexinidazole, a new drug for the treatment of Chagas disease, carried out in collaboration with the Drugs for Neglected Diseases initiative (DNDi), and 2) the genotyping of the *Trypanosoma* cruzi strains found in patients with chronic digestive problems (chagasic megacolon).

Chagas Platform Enters New Stage

The pilot stage of the Chagas Platform (2009-2013) laid the groundwork for the new four-year agreement with AECID that was approved in 2014. Over the next four years, the Platform's model of comprehensive health care for patients with Chagas disease will be introduced at medical centres in Bolivia's national health system.

The Chagas Platform in Bolivia is based on an innovative model combining clinical care and R&D

Morocco

ISGlobal has been working to improve the health of women and children in Morocco for more than a decade. In collaboration with the Moroccan Ministry of Health and various academic institutions and health care centres, we analyse, design and implement effective health policies and work to strengthen Morocco's capacity to address the problems of maternal and child mortality and morbidity.

African and European Research Centres Collaborate on the MNSIRSES Project

The kick-off meeting of the MNSIRSES project took place in Rabat, Morocco, in March 2014. This ISGlobal-coordinated project brings together eight research institutions from Morocco, South Africa and Europe with the aim of establishing stable relationships and promoting clinical research. As part of MNSIRSES, a substantial number of PhD candidates and young researchers will receive training, and new scientific collaboration proposals and research articles will be developed. MNSIRSES receives funding from the European Union's Seventh Framework Programme (FP7) as part of the International Research Staff Exchange Scheme (IRSES).

Spanish and Moroccan Researchers Study Respiratory Diseases and Diarrhoea in Morocco

In 2014, two studies contributed new data on the aetiology, epidemiology and risk factors associated with a poor prognosis in Moroccan children with severe pneumonia. The findings will help the Moroccan Ministry of Health to improve the prevention and management of infections that still cause many deaths. Another study found that diarrhoeagenic strains of *Escherichia coli* and rotavirus are a major cause of severe diarrhoea in Morocco. The findings suggest that better surveillance and prevention programmes are needed for early recognition and better clinical management of acute diarrhoeal episodes.

Moroccan Health Care Personnel Trained in Women's and Children's Health

Improving health care during childbirth and the postpartum period is a priority in Morocco. A training programme designed to build institutional capacities and improve the training of health care personnel ran from 2012 to 2014. Funded by the "la Caixa" Foundation and run by ISGlobal, the programme trained 369 health professionals (over 70% of whom were women) on specific topics related to their work, including obstetric and neonatal emergency care, control of cervical cancer, and neonatal resuscitation. In the technical evaluation of the project, the integration of these programmes into policies implemented by the Moroccan Ministry of Health was singled out as one of the most notable achievements.

Closing the gap between science and effective interventions is one of the keys to improving health in Morocco

Mozambique

The Manhiça Health Research Centre (CISM) is one of Africa's leading health research centres. ISGlobal's long-term strategic alliance with CISM guarantees knowledge transfer and capacity building and supports a research portfolio focused on some of the main threats to health in Mozambique. This relationship was further strengthened in November 2014, when ISGlobal joined the Board of Trustees of the Manhiça Foundation (the entity responsible for the scientific and administrative management of CISM), replacing the Clinic Foundation for Biomedical Research.

Strategic Partnership Between CISM and ISGlobal

The stable partnership between CISM and ISGlobal is the result of a 20-year process dedicated to implementing a shared model of research and development based on the principles of scientific excellence, innovation, knowledge transfer, capacity building, collaboration, and impact on health. This model has brought about significant advances and achievements in various areas of investigation, consolidating CISM's position as one of Africa's leading health research centres. It has also facilitated the promotion and development of exemplary lines of research at ISGlobal based on studies carried out in Mozambique. In 2014, ISGlobal and CISM carried out 17 joint research projects.

New Tool for Investigating Causes of Death

The aim of the CaDMIA project is to validate a minimally invasive—and therefore more acceptable—methodology for determining infectious causes of death. Researchers from CISM and ISGlobal carried out minimally invasive autopsies (MIAs) at the Central Hospital of Maputo throughout 2014. The MIA results will be analysed alongside the results of the full autopsies that were also performed. In parallel, a sociological and anthropological study carried out in five countries (Gabon, Kenya, Mali, Mozambique and Pakistan) evaluated the acceptability and viability of MIAs in different cultural, religious and geographical contexts. The information generated by this project will play a key role in determining whether MIAs can replace full autopsies in areas where post-mortem studies traditionally cannot be performed.

Mozambican Alliance Towards the Elimination of Malaria

In 2014, the Mozambican government and various national and international partners, including CISM and ISGlobal, formed the Mozambican Alliance Towards the Elimination of Malaria (MALTEM). The main objective of MALTEM is to support Mozambique's National Malaria Control Programme with the overall goal of eliminating the disease from Mozambique. The programme will collect the scientific evidence needed to ascertain whether the current strategy, based on vector control and the use of available drugs, is appropriate for use in a country with a high level of endemicity.

CISM Recognised for Work in Mozambique

CISM received several honours in 2014. In February, the centre received the Bagamoyo Medal from the President of the Republic of Mozambique in recognition of its essential work in education and development in Mozambique. Several months later, the Foundation for Community Development, chaired by Graça Machel, paid tribute to CISM and highlighted the role played by Dr Eusébio Macete, director of CISM, and Dr Pedro Alonso, director of ISGlobal, in supporting the Foundation's work. Finally, the King of Spain awarded the Order of Isabella the Catholic to Pascoal Mocumbi, President of the Manhiça Foundation, in recognition of his active contribution to strengthening Spanish-Mozambican relations.

Seven million new cases of malaria are recorded in Mozambique every year

ISGlobal Alliance

In May, the staff of ISGlobal, CRESIB and CREAL came together for our first joint team-building event.

With the support of the Generalitat de Catalunya, the process of merging CRESIB and CREAL with ISGlobal was started in 2013. The ultimate goal of this process is to consolidate an internationally renowned centre for research and knowledge translation and to reach the critical mass needed to become a world leader in the fight to overcome the problems of global health, including infectious diseases and chronic noncommunicable diseases as well as their environmental determinants.

3 Ways to Stay Up to Date

1. Follow us on the social networks

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Health ISGlobal
Sign up to receive notifications of new posts by email

3. Subscribe to our monthly newsletter

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AstraZeneca

Barcelona City Council

BECKMAN

Biokit

British Society for Antimicrobial Chemotherapy

Catalan Agency for Development Cooperation

Centers for Disease Control and Prevention

Centro para el Desarrollo Tecnológico Industrial

CEPHEID

CIBER - Epidemiología y Salud Pública

Drugs for Neglected Disease initiative

EACEA - Education, Audiovisual and Culture Executive Agency

EMBO

European Commission (FP7, H2020)

European & Developing Countries Clinical Trial Partnership

European Society of Clinical Microbiology and Infectious Diseases

Fundación para la Investigación Biomédica – Hospital Ramón y Cajal

Genesis Laboratories

GlaxoSmithKline Biologicals

IMS Health

Innovative Medicines Initiative

Instituto de Salud Carlos III

International Society of Travel Medicine

IrsiCaixa Foundation - Hospital Germans Trias i Pujol

Izasa

Johns Hopkins University

Laboratorios LETI

London School of Higiene & Tropical Medicine

Medicines for Malaria Venture

Merck Sharp & Dohme de España

Mologic

Mundo Sano Foundation

Nanomedpharma

National Institute of Health

Novartis

Operon

Pfizer

PATH Malaria Vaccine Initiative

SEIMC - Sociedad Española de Enfermedades Infecciosas y Microbiología Clínica

Ramon Areces Foundation

SEMTSI - Sociedad Española de Medicina Tropical y Salud Internacional

Servicio Andaluz de Salud

SIGMA-TAU

Spanish Ministry of Economy and Competitiveness

Spanih Ministry of Education, Culture and Sport

Spanish Ministry of Health, Social Services and Equality

SPOO - Stichting Pathologie, Onderzoek en Ontwikkeling Swiss Federal Institute of Technology

Swiss Tropical & Public Health Institute

The Institute of Tropical Medicine

Thrasher Research Fund

USAID

World Health Organization

Total Number of Employees

216

Average Age

38

Nationality

80% Spanish

20% from other countries

Sex

69%

31%

Staff by Departments

- **79%** Research
- **14%** Technical and Administrative Staff
- **5%** Policy and Global Development
- **2%** Training and Education

Sources of Funding

51%
Private

49%
Public

Total Budget 2014

€14.725.625

*This information has been taken from the audited annual accounts of the global health group comprising ISGlobal and its allied research centre CRESIB. The financial data relating to the international health projects undertaken by the Fundació Clínic per a la Recerca Biomédica have not yet been audited and are subject to modification.

Projects Managed in 2014

149

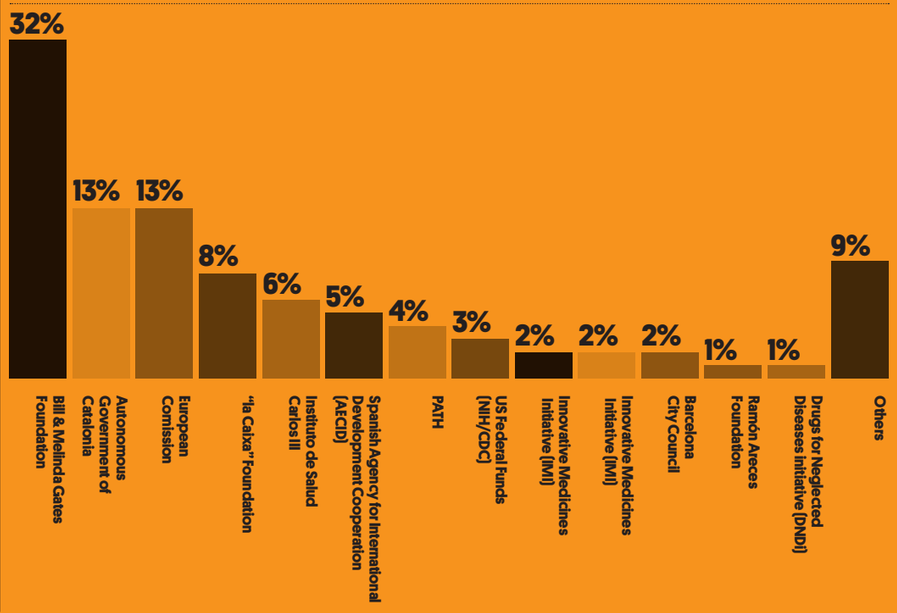
New Projects in 2014

64

Budget Breakdown by Areas

- **50%** Research
- **23%** Initiatives
- **16%** Administration and Infrastructures
- **8%** Policy and Global Development
- **3%** Training and Education

Main Funders



Highlights 2014

January

February

- Scientists Discover Protein That Plays a Key Role in Malaria Transmission

March

- Training Course on Malaria Elimination in Mesoamerica
- International Experts Meet in the 10th Workshop on Chagas Disease
- Presenting ISGlobal's First Spin-Off

Abril

- New Results Confirm That Eradication of Yaws May Be Possible

May

- Improving Health Care for Women and Children in Morocco

June

- Third Edition of the Course "Science of Eradication: Malaria"
- Successful End-of-Course for Second Graduating Class of ISGlobal-UB Master of Global Health

July

- Malaria Vaccine Candidate Shows Continued Protection up to 18 Months after Vaccination
- Pedro Alonso, New Director of the WHO's Global Malaria Programme

August

- CRESIB and CREAL Rank on Top of Scientific Performance Indicators in Catalonia and Spain

September

- Mefloquine Fails to Replace Sulphadoxine-Pyrimethamine for Malaria Prevention During Pregnancy
- "la Caixa" Foundation, the Bill & Melinda Gates Foundation and ISGlobal Join Forces to Eliminate Malaria

October

- Antoni Plasència Appointed Director of ISGlobal The Tropical Medicine and
- International Health Department at Barcelona's Hospital Clínic Celebrates 30 Years of Service
- ISGlobal Draws Up Plan to Support Key Institutions Responsible for Addressing the Problem of the Ebola Outbreak
- ISGlobal Becomes a Strategic Partner of the Business Alliance for Child Vaccination

November

- First Joint Doctoral Symposium Organised by ISGlobal and CREAL
- ISGlobal Launches #ObjecgtHealth, a Campaign to Denounce the Health Gap in the World

December

- Regina Rabinovich to Lead ISGlobal Malaria Elimination Initiative

A partnership of:

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