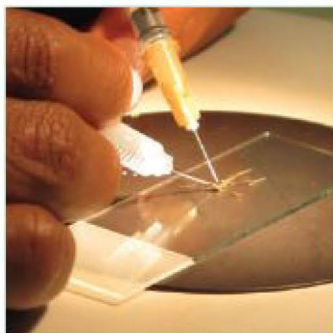
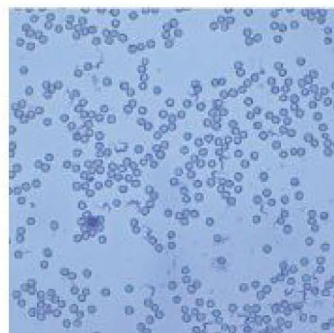


Instituto de Higiene e Medicina Tropical
Universidade NOVA de Lisboa

ANNUAL REPORT 2013



INSTITUTO DE HIGIENE E
MEDICINA TROPICAL
EXISTE DESDE 1902



UNIVERSIDADE
NOVA
DE LISBOA

MESSAGE FROM THE DIRECTOR

Paulo Ferrinho



During 2013 IHMT's management team consolidated its strategy for its four-year mandate ending in early 2014. This strategy implied the implementation of **several interrelated agendas**: departmental reorganisation, administrative modernisation, rehabilitation and upgrading of physical infrastructures, advancing staff careers, merit recognition, differentiation and relocation of training programmes, focusing on key research themes, fostering (inter)national cooperation and partnerships, investing in knowledge management, maximising the profitability of services, promoting health surveillance and investing in the protection and dissemination of our cultural and museological heritage.

This strategy was wholeheartedly supported by the Chairman of the **Institute's Board**, Ambassador António Russo Dias. The **Advisory Board**, chaired by Dr. Maria de Belém Roseira, maintained a strong representation of the Portuguese business sector and health sectors of Angola, Cape Verde, Guinea-Bissau and Mozambique, ensuring that our decisions were guided by a close proximity to the countries with which we collaborate.

Teaching is the major priority of our mission. In 2013, the students enrolled in our degree courses totalled 235 from 17 countries. It is worth highlighting the accreditation of the Ph.D. programme in Human Genetics and Infectious Diseases (in partnership with the Faculty of Medical Sciences) and the approval, by the Portuguese Science Foundation, of a Global Public Health doctoral programme in partnership with the National School of Public Health, the Faculty of Health Sciences and the Institute of Public Health.

Non-degree study programmes have focused on needs identified by our partners in other Portuguese speaking countries and, whenever possible, have been physically relocated to the CPLP (Community of Portuguese-Speaking Countries) member states, many times with the support of distance teaching technology. For the duration of our mandate, 876 students completed non-degree study programmes (226 in 2013).

Our collaborations in Education are also reflected by my presence in the Scientific Committee of CEDUMED (Centre for Medical Education) of Agostinho Neto University, Luanda, Angola as well as the presence of Maria do Rosário Oliveira Martins in the Scientific Committee of the Master's in Tropical Medicine and International Health of UniLúrio, Nampula, Mozambique, and by the tribute IHMT received from the Board of the Faculty of Medicine of Eduardo Mondlane University, Maputo, Mozambique, during the celebrations of its fiftieth anniversary. We remained active in the Network for Education in International Health (TropEd).

Our educational programmes are supported by a very rich research agenda. That is why, every year, on the 12th of December, our Scientific Council, organizes one-day Scientific Seminars, where our doctoral students present their research. Once again, in the 2013 4th edition, the best posters and presentations were awarded a merit diploma. The Scientific Council also awarded "best students" medals to five outstanding students in the different academic programmes.

Our **Research** addresses several areas of relevance to global health: from issues related to the health workforce, climate changes, the most prevalent tropical diseases and their entomological vectors, to opportunistic and neglected diseases, as well as the health concerns of migrants and travellers. As emerging areas of our work, we are strengthening the study of problems related to nutrition and food safety (IHMT coordinates CPLP's Food Safety Commission), health and nutrition, medicinal plants and infection genetics and resistances. The work on multi-drug resistant tuberculosis remains a major theme. The growing internal coherence of our research activities led us to consolidate our research agendas into three research groups (Vector-Borne Diseases; Tuberculosis, HIV and Opportunistic Infections; Population Health, Policies and Services) and into

two lines that cut across the three groups (Travellers and Migrants' Health; Emerging Diseases and Environmental Changes). These Groups and Lines were the basis for the development of a new institutional research Centre – denominated **Global Health and Tropical Medicine** - that brought together CMDT, UPMM and other unaffiliated IHMT researchers.

We reedited the National Congress of Tropical Medicine after an absence of 60 years. The first one took place in Lisbon in 1952, as part of the commemorations of the fiftieth anniversary of the then-called "Instituto de Medicina Tropical" (Institute of Tropical Medicine). The second, held in April 2013, closed the celebrations of IHMT's 110th anniversary. We welcomed speakers from at least 20 nations. By adopting Portuguese as a working language, this Congress reaffirmed it as a valid tool for scientific communication. We are already planning the third Congress for 2015, dedicated to Vector-Borne Diseases. Other scientific events organised during 2013 are presented in a timeline in the following pages of this report.

IHMT's **International Cooperation** cuts across all our activities. Acknowledges the Millennium Development Goals and is guided by the health and cooperation priorities defined at institutional, national, bilateral and multilateral levels. As advisers to CPLP's Executive Secretariat, we continue to support the implementation of its Strategic Plan for Cooperation in Health (PECS), with a particular attention to: the creation of National Institutes of Public Health (INSP) in Cape Verde, São Tomé and Príncipe and East Timor; the establishment of a network of medical schools in CPLP's African countries; the development of health inspectorates and regulatory authorities in CPLP's member states; encouraging national health and human resources observatories; and the expansion of services for the maintenance of medical equipment. In Africa, with the Regional Office of WHO, we have strengthened our collaboration with the health observatory and ran training courses in biostatistics for WHO's staff. We also participated in the 66th Session of the World Health Assembly in Geneva, and in the 63rd Session of the WHO Regional Committee for Africa, in Brazzaville, Republic of Congo. Our bilateral cooperation with Fiocruz, in Brazil goes from strength to strength.

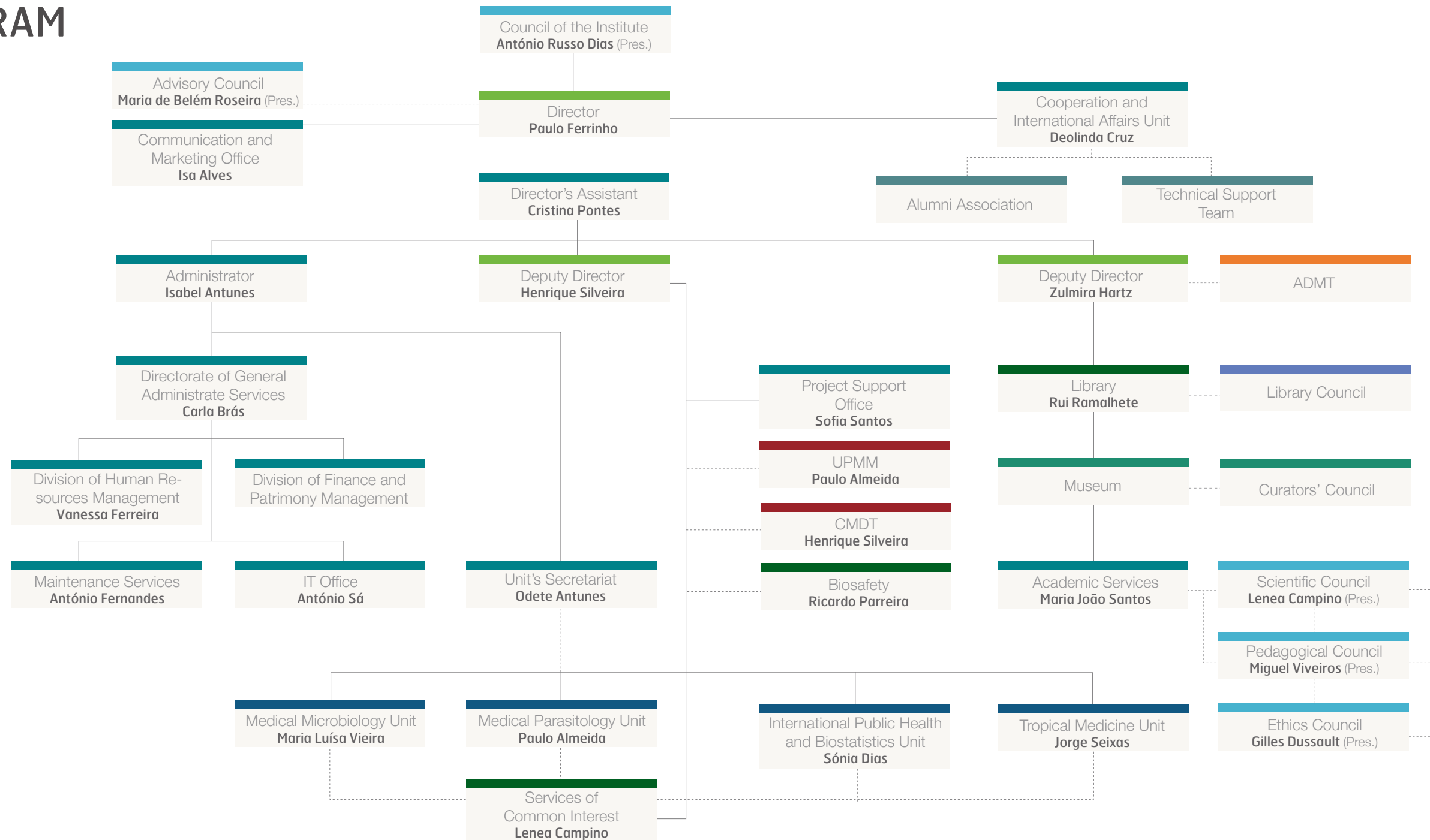
Our Travellers and Tropical Medicine Clinical services (in partnership with the Association for the Development of Tropical Medicine) is the oldest in the Country. The 11,148 travellers' health appointments during 2013 were a significant increase in relation to the 7,909 appointments of 2009. Our laboratory diagnostic services cover a very specialised niche, and we take great pride in our WHO accredited Reference Laboratory for Leptospirosis. We have also maintained advisory services for health ministries, international organisations and companies.

Our whole activity is closely linked to **health surveillance**, which has allowed us to identify the Dengue fever outbreak when it emerged in Angola and led us to integrate the Medical Entomology and Public Health Experts Platform, coordinated by the Portuguese Directorate General of Health, in order to prepare a contingency plan for the advent of tropical disease-carrying mosquitoes in mainland Portugal, a decision motivated by the Dengue fever outbreak in Madeira, where IHMT was also at the forefront of the control efforts.

With the creation of its **Communication and Marketing Office**, IHMT strengthened its ability to raise public awareness about the risks associated with tropical diseases and their relevance in today's world, including in Portugal. We have revamped our website, published a monthly newsletter with a circulation list of around 1800 recipients, regularly reprinted our scientific journal, the Anais do IHMT, held a successful third Open Day and multiplied our presence in the media, not only in Portugal, but also in Angola and Mozambique. IHMT participated in the community outreach Ciência Viva Programme, of the National Agency for Scientific and Technological Culture for youths during the summer holidays.

So far, our **Cultural Agenda** includes the survey of all sculptures, watercolours, oil paintings, tile panels and tapestries existing at IHMT and the strengthening of our museological activities. The Institute also assumed the coordination of CPLP's Commission for Culture.

ORGANOGRAM



■ january

16/01: Researcher Ana Abecasis is awarded the L'Oréal Portugal Medal of Honour for Women in Science



■ february

► IHMT creates the Communication and Marketing Office

18/02: Start of the Advanced Management Course for Hospital Medical Managers in Mindelo, Cape Verde (26 doctors trained)



25/02: Start of the Advanced Management Course for Hospital Head Nurses in Mindelo, Cape Verde (29 nurses trained)

■ march

► Professors Inês Fronteira and James Buchan take on the position of associate editors for the journal *Human Resources for Health*

18/03: Start of the Training Course on Secretarial Techniques in Mindelo, Cape Verde

27/03: Carlos Novo is awarded the Santander Totta/Nova University Scientific Merit Prize for his research on “Antibody engineering for the treatment of breast cancer”



■ april

15/04: Epidemiological surveillance: IHMT identifies and reports to national and international authorities on an outbreak of Dengue fever in Angola, diagnosed during a tropical medicine appointment

18/04: CPLP's Technical Group for the Strategic Plan for Cooperation in Health (PECS) holds a meeting at the CPLP Executive Secretariat Headquarters to assess the implementation of the 1st phase of the PECS



19/04: Conference “Health professional regulation: experience in the European Union”, promoted by IHMT's WHO Collaborating Centre for Health Workforce Policy and Planning

■ may

19/04: The meeting of the CPLP's National Network of Public Health Institutes is held at IHMT

20/04: Opening of the Exhibit “Portugal in the World: The First Tropical Medicine Congress, 1952”

► Workshop to establish a network of medical schools under CPLP's PECS

22/04: 2nd National Tropical Medicine Congress (300 participants)



■ june

► Publication of a study identifying a new *Leishmania*-transmitting species in Europe

10-11/05: Open Day with more than 200 visitors



20-28/05: Participation in the 66th World Health Assembly in Geneva, Switzerland

27/05: Ana Afonso is granted a Talented Youth Scholarship from the Brazilian programme “Science Without Borders”

■ june

17-18/06: The Director represents WHO European Region at the Joint Coordinating Board of the World Health Organisation's TDR Programme



26/06: Participation in the 6th Meeting of the Advisory Observers of CPLP's Executive Secretariat, in Lisbon

■ july

23/07: A collaboration protocol is signed with the National Museum of Natural History and the Science Museums of the University of Lisbon



■ august

► Marcelo Silva is granted a Talented Youth Scholarship from the Brazilian programme “Science Without Borders”

► All the procedures performed by the IHMT Animal House are validated by the Portuguese National Authority for Animal Health



1/08: Angolan Minister of Health visits IHMT

26/08: IHMT and the Brazilian National Council of Health Secretaries (CONASS) organise a workshop in Lisbon, on the remuneration of Family Health Units' professionals

■ september

2-6/09: Participation in the 63rd session of the WHO African Regional Committee



■ october

4/10: UNICEF's International Conference on Breastfeeding takes place at our facilities

7/10: Seminar on “Leishmaniasis: from the clinic to the laboratory”

18/10: Solemn Opening of the Academic Year 2013-14 (224 students of 17 nationalities enrolled)



Awards for best students:
Professor Doutor Cruz Ferreira Award – Tropical Medicine: Fernanda Monteiro and Dinamene Oliveira
Professor Doutor Francisco Cambournac Award – International Health: Mariana Pinto
Professor Doutor João Fraga de Azevedo Award – Medical Parasitology: Vasco Gordicho
Professor Doutor Manuel Pinto Award – Medical Microbiology: Patrícia Vieira



24/10: Support to the initiative “Health+Nearby”, of the Portuguese League against AIDS

24-26/10: 1st Conference of Ibero-American and Portuguese-Speaking Countries on *Pneumocystis* and Pneumocystosis



29/10: Technical mission to São Tomé and Príncipe as member of CPLP's Network of National Public Health Institutes

31/10: Participation in Calouste Gulbenkian Foundation's meeting on Neglected Tropical Diseases in Portuguese-Speaking Countries

■ november

7-8/11: Participation in meeting of CPLP's Network of Technical Health Schools and in the seminar “Political, Strategic and Operational Aspects of the Management of National Public Health Institutes”, in Brazil



12-13/11: IHMT and the Sérgio Arouca National Public Health School, of the Oswaldo Cruz Foundation, held the seminar “Knowledge Evaluation, Translation and Management in Health Research”, in Rio de Janeiro

22/11: As part of the Science and Technology Week, organization of “An Evening with Tropical Medicine”

25/11: Opening of the Model and Mock-up Exhibit of the IHMT museum collection at the Church of S. João Batista, in Castelo de Vide

29-30/11: Organisation, jointly with CMDT, of the workshop “Dengue: present and future”



■ december

9/12: Publication of the book “Nutrition and Food Safety in CPLP: Challenges and Outlooks”



► The Elsevier Foundation awards a grant to IHMT's coordinated “Network of Portuguese-Speaking Women in Tropical Health”

11/12: Training collaboration agreement with the Health Services of the Angolan Armed Forces

12/12: Inauguration of a restored panel painted by Neves e Sousa (with the support of the Millennium bcp Foundation)



12-13/12: Participation in High-Level Conference in Athens, on the reform of the Health Sector in Greece

13/12: 4th Edition of IHMT's Science Seminars



► Publication of the book “Positive Futuring – Satisfaction at Work”, by André Biscaia (based on 2010 doctoral thesis)

► Collaboration agreement with Portuguese National Institute of Public Health



16/12: 3rd Meeting of Portuguese Public Health Ph.D. students

17/12: IHMT's Director is elected for the vice-presidency of the Federation of the European Societies for Tropical Medicine and International Health

MUSEUM

april - july

EXHIBIT “PORTUGAL IN THE WORLD: THE FIRST TROPICAL MEDICINE CONGRESS, 1952”



november

EXHIBIT OF IHMT’S MODELS AND MOCK-UPS AT THE CHURCH OF SÃO JOÃO BATISTA, IN CASTELO DE VIDE



december

PARTICIPATION AT THE EXHIBIT “AFRICA - VISIONS OF THE OFFICE OF COLONIAL URBANISATION”, AT BELÉM CULTURAL CENTRE



december

INAUGURATION OF THE RESTORED PANEL PAINTED BY ALBANO NEVES E SOUSA



PROJECTS PLANNED FOR 2014

- ✓ Participation, with samples of four furniture, at the exhibit “Respect and Discipline by All - Furniture for Public Buildings in Portugal, 1934-1974”, at the Museum of Design and Fashion
- ✓ Exhibit “Picturing Tropical Diseases: Lessons from History”, in collaboration with the Centre for Global Health Histories of the University of York, to celebrate the 40th anniversary of WHO’s Special Programme for Research and Training in Tropical Diseases
- ✓ Design and production of the catalogue of the exhibit “ Picturing Tropical Diseases: Lessons from History” – IHMT collection
- ✓ Design and production of the brochure “Health Building Models” - IHMT Collection

ACKNOWLEDGMENTS / COLLABORATIONS

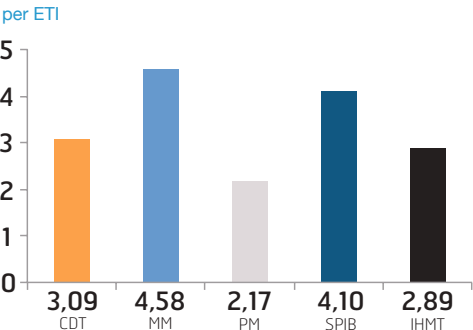
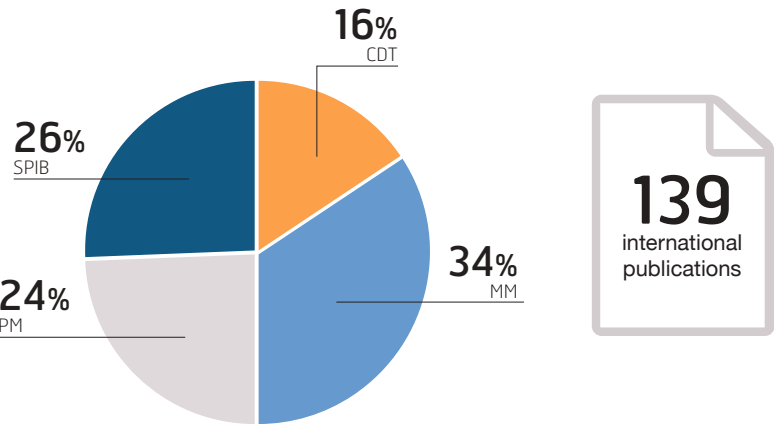
- ✓ Architect João Couto Duarte (Universidade Lusíada)
- ✓ Architect João Paulo Martins (Centro de Investigação em Arquitetura, Urbanismo e Design da Faculdade de Arquitetura da UTL)

TEAM

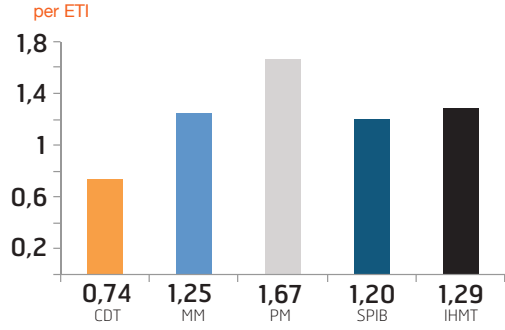
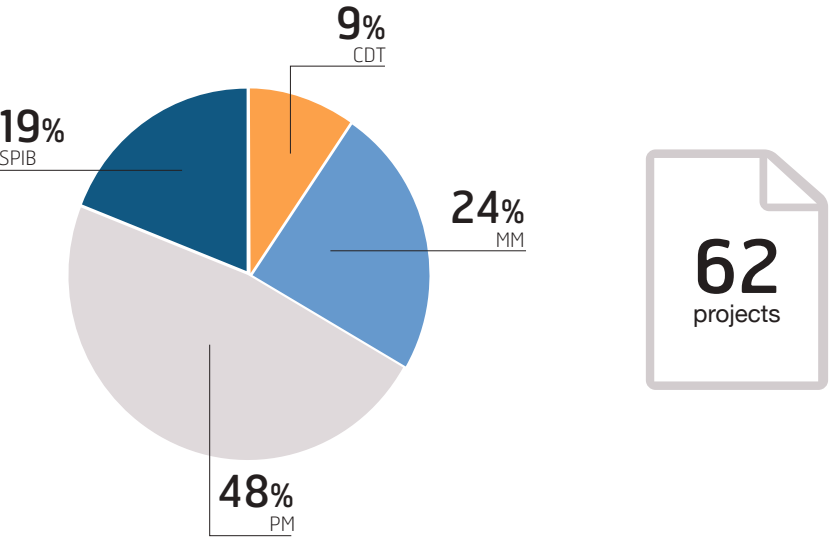
Coordination: Zulmira Hartz | **Board of Curators:** Luís Ferraz de Oliveira, José L. Doria
Interinstitutional Curatorship: Isabel Amaral (FCT/UNL), Helena Andrade (INSA/MS), Marta Lourenço (MNHNC/UL), Cátia Carvalho (FCSH/UNL), Jaime Benchimol (COC/Fiocruz), Magali Romero Sá (COC/Fiocruz) | **Restoration, Drawings and Technical Support:** Luís Marto

2013 IN NUMBERS

PEER REVIEWED INTERNATIONAL PUBLICATIONS



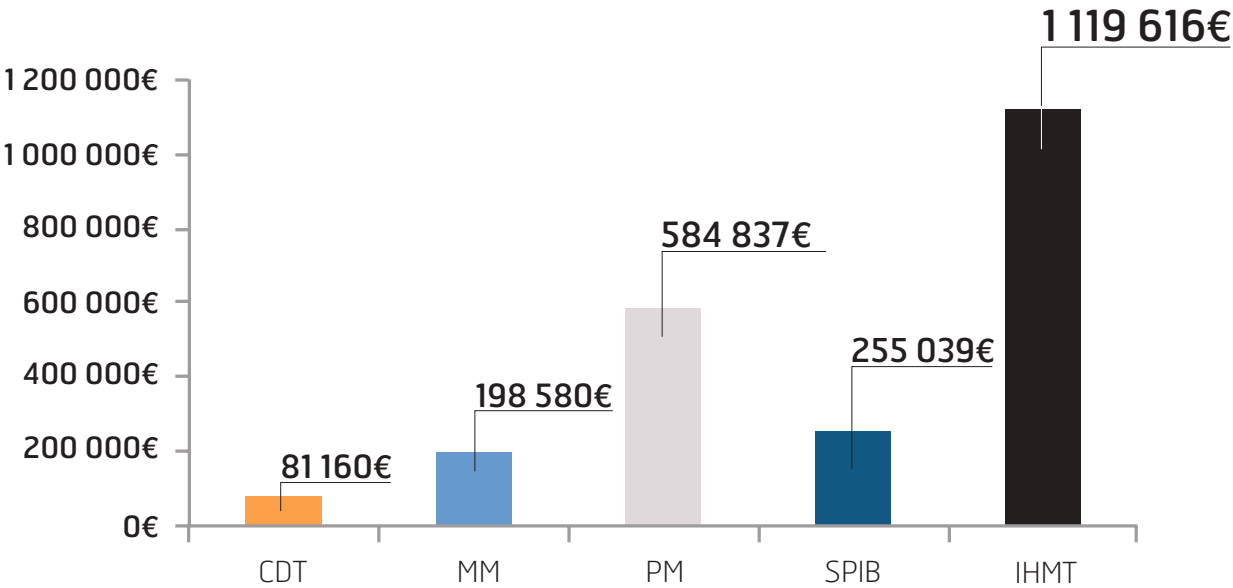
RESEARCH PROJECTS



CAPTION
IHMT = Instituto de Higiene e Medicina Tropical | CDT = Tropical Medicine Unit | MM = Medical Microbiology Unit
PM = Medical Parasitology Unit | SPIB = International Public Health and Biostatistics Unit | ETI = Full Time Equivalent

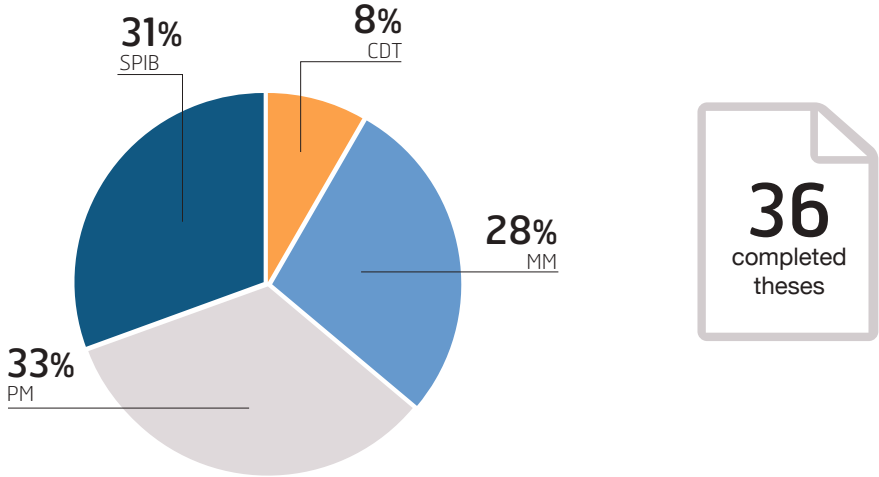
RESOURCES

COMPETITIVE FUNDING



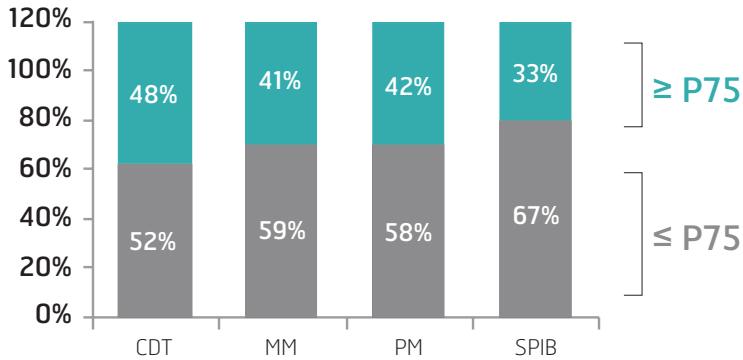
 **1.119 616€**
TOTAL € COMPETITIVE FUNDING 2013

MASTERS AND PH.D. STUDY PROGRAMMES CONCLUDED



PERCENTILE 75 WEB OF KNOWLEDGE

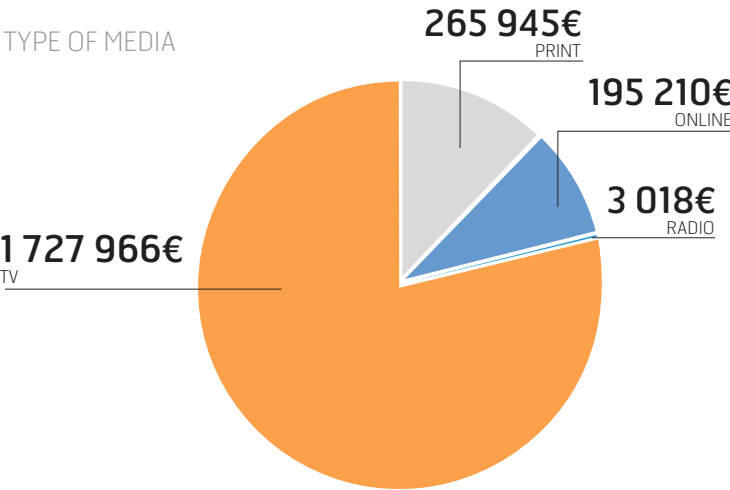
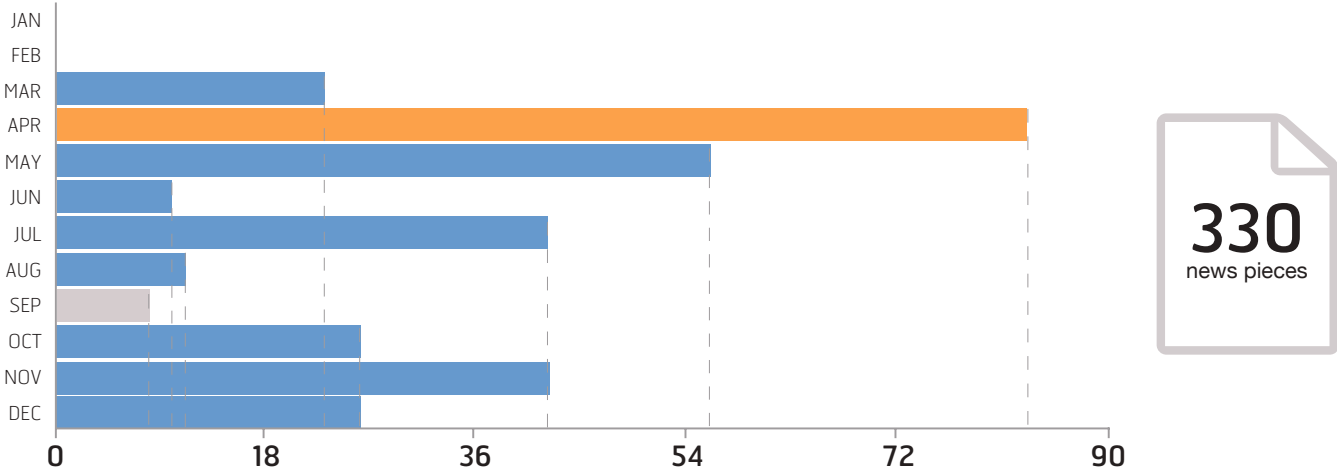
IMPACT FACTOR / SCIENTIFIC AREA



CAPTION
CDT = Tropical Medicine Unit | MM = Medical Microbiology Unit
PM = Medical Parasitology Unit | SPIB = International Public Health and Biostatistics Unit

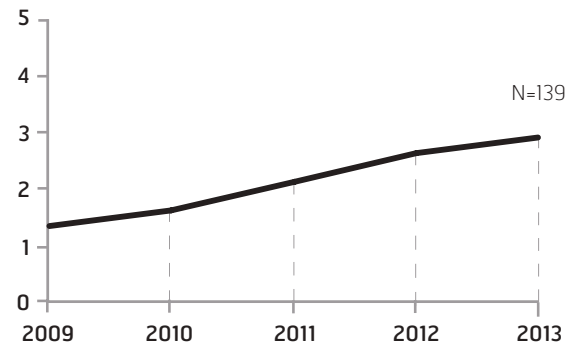
COMMUNICATION AND MEDIA

NUMBER OF MONTHLY NEWS PIECES



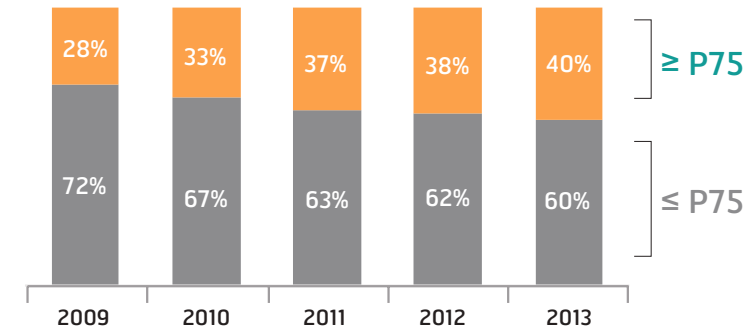
EVOLUTION 2009-2013

PUBLICATIONS / ETI



PERCENTILE 75 WEB OF KNOWLEDGE

IMPACT FACTOR / SCIENTIFIC AREA



PROJECTS

COMPETITIVE FUNDING

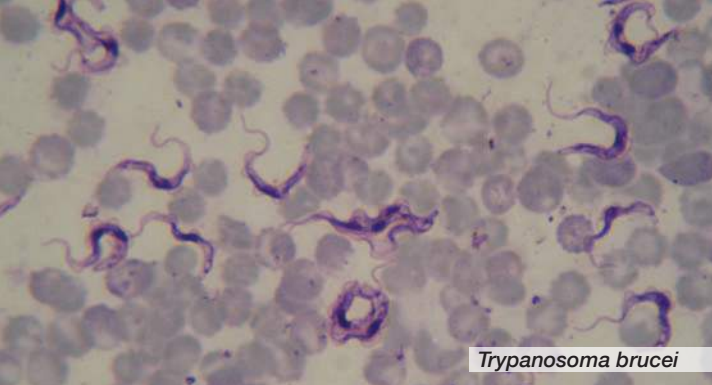
	2009	2010	2011	2012	2013
Research Projects	53	81	92	88	62
Research Projects / ETI	0,98	1,49	1,80	1,88	1,29
Competitive Funding	1 362 349,00€	1 670 849,00€	1 976 504,00 €	1 925 740,00€	1 119 616,00€
Competitive Funding / ETI	25 089,30€	30 770,70€	38 679,14 €	41 095,60€	3 276,84€

CAPTION
IHMT = Instituto de Higiene e Medicina Tropical | CDT = Tropical Medicine Unit | MM = Medical Microbiology Unit
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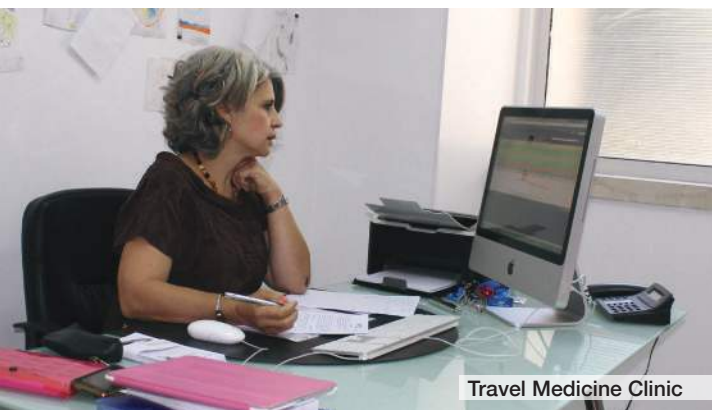


TEACHING AND RESEARCH UNITS

- ✓ Tropical Medicine
- ✓ Medical Microbiology
- ✓ Medical Parasitology
- ✓ International Public Health and Biostatistics



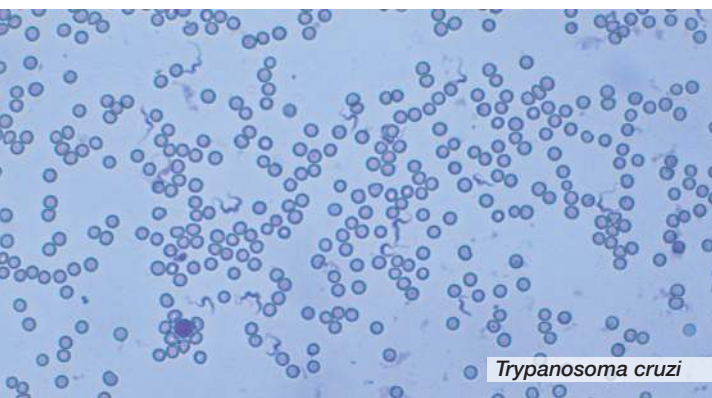
Trypanosoma brucei



Travel Medicine Clinic



Clinical Analysis Laboratory



Trypanosoma cruzi

TROPICAL MEDICINE

PRESENTATION

The Tropical Medicine Teaching and Research Unit develops teaching, research and cooperation activities in three main areas: Travellers and Migrants' Health, Infections and Nutrition and Neglected Tropical Diseases.

The Unit coordinated a doctoral programme in Tropical Medicine and a masters' degree in Tropical Health as well as shorter specialisation courses in Tropical Medicine and Travel Medicine. In 2014 the Unit will be coordinating a Tropical Medicine specialisation course for Angolan military doctors in Luanda and running a doctoral programme in Brazil.

The Unit also provided medical assistance and expert advice through the Tropical and Travel Medicine Clinic and the Clinical Analysis Laboratory (LabClin). This laboratory, which currently uses new, faster tests to optimise diagnostic flowcharts, has played an important role in identifying the 2013 Dengue outbreak in Angola, and made it possible to, in coordination with the Medical Microbiology Unit, develop the molecular typing of the causative virus.

TEAM

Director: Jorge Seixas

Professors: Cláudia Conceição, Filomena Pereira, Filomeno Fortes, Jaime Manuel Nina, João Costa, Jorge Luís Atouguia, Kamal Mansinho, Luís Manuel Varandas, Rosa Maria Teodósio | **Researchers:** João Alexandre Rodrigues, Marcelo Sousa Silva, Nuno Miguel Rolão, Sónia Centeno Lima | **Post-Doc:** Jorge Varanda | **Ph.D. students:** Filipa Santana Ferreira, Marisol Garzon, Carolina Antero da Silva | **Project grant holder:** Rúben Rodrigues

MAIN RESEARCH LINES

Molecular epidemiology

✓ Serologic reactivity of samples taken from travellers exposed to infection by *Plasmodium falciparum* have shown Western blot profiles consistent with patterns of antigen immunoreactivity at molecular masses between 30 and 60 kDa. The proteins identified in this study constitute the starting point for further investigations on serological markers and immunity mechanisms in travellers exposed to malaria.

✓ Work developed in a hospital setting, in Mozambique, with children under-5 years of age demonstrated the neglected nature of infection by the protozoan *G. duodenalis*, which is rarely considered or diagnosed by healthcare staff, despite its significant incidence and high potential impact on the health of the affected children. The researchers detected a clear predominance of genotype B of *G. duodenalis*.

Therapeutics of Neglected Tropical Diseases

✓ In the context of the BERENICE consortium for Chagas' disease, the murine model of T. cruzi infection was established at our laboratory following preclinical toxicity and efficacy studies with nanoformulations containing Benznidazole. This partnership aims at developing a new, less toxic and a more effective formulation of benznidazole for the treatment of Chagas' disease.

Malnutrition

✓ In São Tomé, the analysis of the anthropometric indicators of malnutrition in children under-5 years (n = 417) at the community level showed a high prevalence (15-23%) of mild malnutrition, pointing to the need to adopt better prevention strategies.

HIGHLIGHTED PUBLICATIONS

Costa RM, Nogueira F, de Sousa KP, Vitorino R, Silva MS, 2013. Immunoproteomic analysis of Plasmodium falciparum antigens using sera from patients with clinical history of imported malaria. Malaria Journal 12:100.

Ferreira FS, Machado Sá da Bandeira RA, Constantino CA, Fonseca AM, Gomes JD, Rodrigues RM, Atouguia JL, Centeno-Lima SC, 2013. Molecular and clinical characterization of Giardia duodenalis infection in preschool children from Lisbon, Portugal. Journal of Parasitology Research. 2013: 252971

Guimarães Nebenzahl H, Lopes Â, Castro R, Pereira F, 2013. Prevalence of human immunodeficiency virus, hepatitis C virus, hepatitis B virus and syphilis among individuals attending anonymous testing for HIV in Luanda, Angola. South African Medical Journal. 103:186-188.

Vercauteren J, Theys K, Carvalho AP, Valadas E, Duque LM, Teófilo E, Faria T, Faria D, Vera J, Águas MJ, Peres S, Mansinho K, Vandamme AM, Camacho RJ, 2013. The demise of multidrug-resistant HIV-1: The national time trend in Portugal. Journal of Antimicrobial Chemotherapy 68:911-914.

Seixas J, Louis FJ, Atouguia J, 2013. Clinical manifestations of human African trypanosomiasis. In: Cattand, P, Louis, F, Simarro, P (eds), Sleeping Sickness Lectures. Association Contre la Trypanosomiase en Afrique, (pp. 159-181). ISBN-978-2-9544171-0-3.

1778

Laboratory tests conducted
an 83% increase over 2012

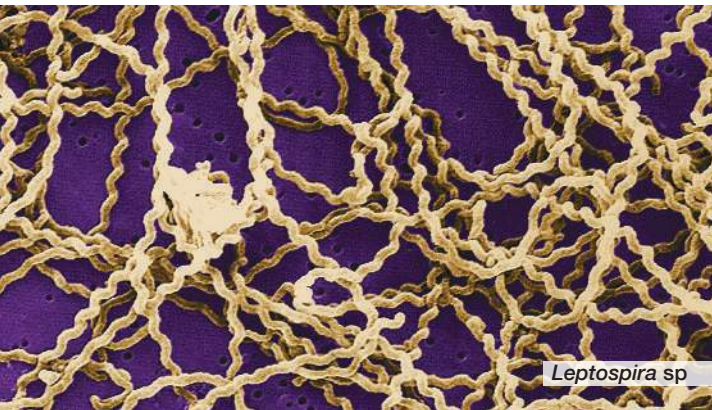




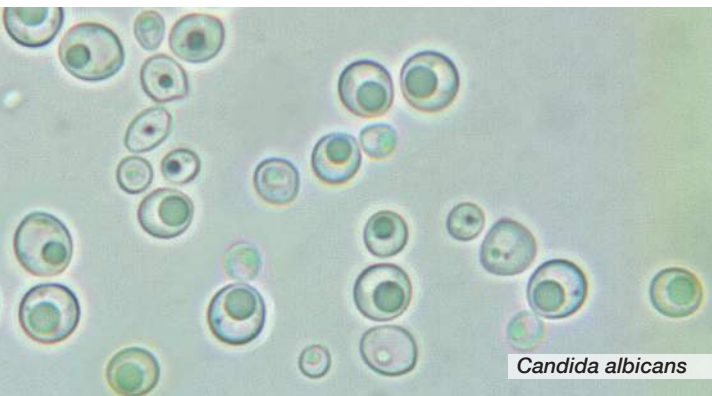
Mycobacterium tuberculosis



Practical Class



Leptospira sp



Candida albicans

MEDICAL MICROBIOLOGY

PRESENTATION

The Medical Microbiology Teaching and Research Unit develops teaching, research and cooperation activities focusing on infectious diseases with major impacts on global health, such as tuberculosis, the human immunodeficiency virus, other sexually transmitted bacterial and viral diseases, viral hepatitis, bacterial and viral diarrhoeal agents, fungal infections and vector-borne diseases, such as Dengue and Chikungunya fevers, and Lyme disease and new approaches for the therapy, prophylaxis and control of these diseases.

The Unit coordinated masters' degrees in Biomedical Sciences and Medical Microbiology as well as shorter continuing education courses, such as: Training Course in Laboratory Diagnosis of Tuberculosis and HIV (funded by the Calouste Gulbenkian Foundation and the CPLP) in partnership with the Dr. Ricardo Jorge National Public Health Institute; training of technicians on the epidemiology of Rotavirus infection in Huambo, Angola. It co-coordinated the accreditation of a new doctoral programme in Human Genetics and Infectious Diseases during 2013.

The unit still provides differentiated laboratory diagnostic and scientific consulting services to the health care providers and for researchers on *Leptospiras* and *Borrelias*, Mycobacteria, fungi, and bacteria or viruses that cause exotic diseases.

TEAM

Director: Maria Luísa Vieira; João Piedade (until february 2013)

Professors: Aida Esteves, Anne-Mieke Vandamme, Celso Cunha, Filomena Martins Pereira (until september 2013), Isabel Couto, João Borges da Costa, João Piedade, Miguel Viveiros, Ricardo Parreira, Rita Castro | **Researchers:** Ana Maria Armada, Claudia Istrate, Fernando Teles, Maria Luísa Vieira, Maria da Luz Martins | **Lab Technicians:** Ana Paula Maduro, Ângela Maria Mendes, Jorge Ramos, José Maria Marcelino, Teresa Margarida Carreira | **Post-Doc:** João Paulo Fernandes, Paulo Rabna | **Project grant holder:** Ana Paula Fernandes, Carlos Serra, Carolina Alves, Cristina Raposo, Cristina Mendes, Elisabete Junqueira, Joana Wilton Pereira, Mónica Eusébio, Sofia Costa

MAIN RESEARCH LINES

Molecular epidemiology

✓ Molecular epidemiology and mutational dynamics of drug resistance of HIV and *Mycobacterium tuberculosis* as a way to increase effectiveness of control and treatment.

✓ Multiple hybridisation assays to identify the most common genetic forms of HIV1.

✓ Evolution of HIV2's viral envelope as a way to understand pathogenesis and identify new molecular targets for diagnosis and treatment.

✓ First identification of pathogenic *Leptospira* species in small rodents in Guinea-Bissau.

✓ First identification and genetic characterization of *Leptospira interrogans* serovars circulating in human populations of Huila (Lubango), Angola.

Development of diagnostic tests

✓ Screening of sexually transmitted infections (STI) in populations of men who have sex with men and sex workers using mobile screening units.

✓ New technologies for molecular diagnostics of STIs using new support media, such as functionalised gold nanoprobe or paper assays.

✓ Genotypic diversity of environmental *Cryptococcus neoformans* was characterised from the perspective of its potential as an opportunistic agent of HIV patients.

Resistance mechanisms

✓ Hybridisation assays were developed for the identification of mechanisms that increased drug resistance, such as the over-expression of efflux pumps in bacteria.

Emerging infections

✓ Identification and characterisation of several flaviviruses and other viruses that cause rare or exotic viral infections, which are becoming more frequent in Portugal as a result of climate changes.

Causal links of infections with chronic diseases

✓ Correlation of Lyme disease with chronic inflammatory processes of unknown aetiology, such as multiple sclerosis and of hepatitis Delta virus with hepatocellular carcinomas.

HIGHLIGHTED PUBLICATIONS

Cavaco-Silva J, Aleixo MJ, Van Laethem K, Faria D, Valadas E, Gonçalves MF, Gomes P, Vandamme AM, Cunha C, Camacho RJ, 2013. Mutations selected in HIV-2-infected patients failing a regimen including atazanavir. *Journal of Antimicrobial Chemotherapy* 68: 190-192.

Freitas FB, Esteves A, Piedade J, Parreira R, 2013. Novel multiregion hybridization assay for the identification of the most prevalent genetic forms of the human immunodeficiency virus type 1 circulating in Portugal. *AIDS Research and Human Retroviruses* 29:318-328.

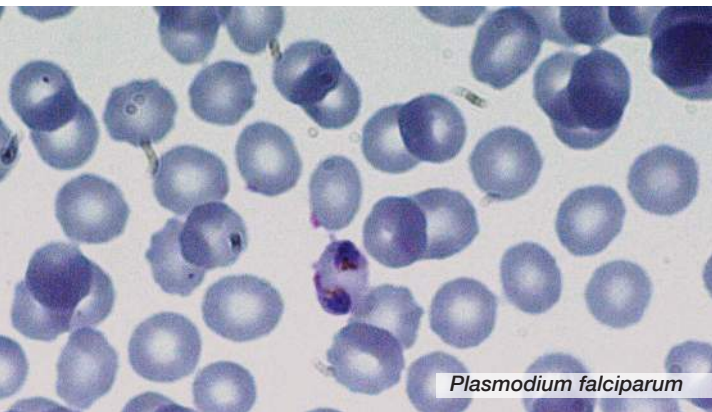
Machado D, Perdigão J, Ramos J, Couto I, Portugal I, Ritter C, Boettger EC, Viveiros M, 2013. High-level resistance to isoniazid and ethionamide in multidrug-resistant *Mycobacterium tuberculosis* of the Lisboa family is associated with *inhA* double mutations. *Journal of Antimicrobial Chemotherapy* 68: 1728-1732.

Mendes M, Pérez Hernandez D, Vazquez J, Coelho AV, Cunha C, 2013. Proteomic changes in HEK-293 cells induced by hepatitis delta virus replication. *Journal of Proteomics* 89:24-38.

Rocha C, Calado R, Borrego P, Marcelino JM, Bártolo I, Rosado L, Cavaco-Silva J, Gomes P, Família C, Quintas A, Skar H, Leitner T, Barroso H, Taveira N, 2013. Evolution of the human immunodeficiency virus type 2 envelope in the first years of infection is associated with the dynamics of the neutralizing antibody response. *Retrovirology* 10:110



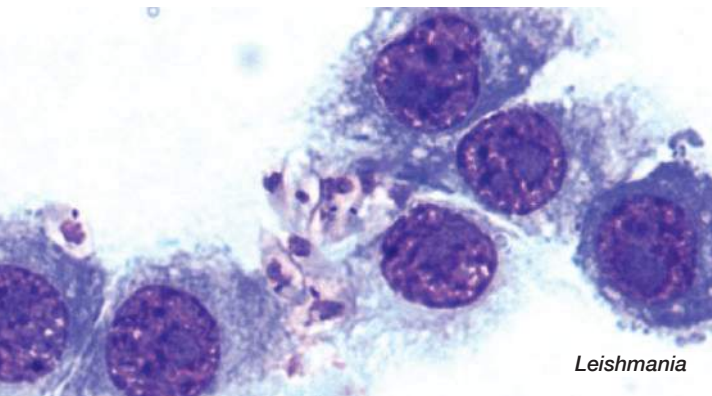
Mosquito dissection



Plasmodium falciparum



Practical Class



Leishmania

MEDICAL PARASITOLOGY

PRESENTATION

The Medical Parasitology Teaching and Research Unit develops teaching, research and cooperation activities with special focus on diseases transmitted by vectors and intermediate molluscan hosts, neglected diseases, (re)emerging infections, opportunistic infections, drug resistance and new approaches for therapy and prophylaxis and control of vectors or intermediate hosts.

The Unit coordinated the doctoral program in Biomedical Sciences, as well as shorter continuing education courses. It co-coordinated the accreditation of a new doctoral programme in Human Genetics and Infectious Diseases during 2013.

It also performs laboratory tests requested by the network of private and public hospitals, through parasitological, immunological and molecular techniques on various biological products, covering several parasitic diseases and vector monitoring studies.

TEAM

Director: António Paulo Almeida; **Silvana Belo** (until 1 february 2013)

Professors: António Paulo Almeida, Carla A. Sousa, Gabriela Santos-Gomes, Henrique Silveira, Isabel Maurício, João Pinto, Lenea Campino, Maria Manuela Calado, Maria Odete Afonso, Maria Teresa Novo, Olga Matos | **Researchers:** Ana Isabel Domingos, Ana Júlia Afonso, Ana Paula Arez, Carlos Novo, Dinora Lopes, Fernando Cardoso, Maria de Fátima Nogueira | **Technical Support:** Carla Maia, Pedro Ferreira | **Post-Doc:** Ana Custódio, Francisco Esteves, Patrícia Salgueiro, Sofia Cortes, Maria Luisa Lobo, Carla Maia | **Project grant holder:** Andreia Albuquerque, Cátia Ferreira, César Dinis Capinha, David Mateus, Diara Kady Rocha, Eliane Carvalho, Fábila Araújo Gomes, Gonçalo Seixas, Isa Pires, José Luís Cravo Vicente, Lara Borges, Leonor Pinho, Marta Machado, Mónica Guerra, Nuno Cardoso Domingues, Patrícia Machado, Sara Santos, Vasco Ferreira Gordicho

MAIN RESEARCH LINES

New compounds with anti-parasitic properties

✓ Identification of new compounds with *in vitro* anti-*Leishmania* activity and Hybrid strains of *Leishmania* sp. showed greater resilience than parent strains.

✓ Promising candidates with antibacterial and antiparasitic properties were obtained from testing Guinea-Bissau plant extracts from the following selection of species: *Margaritaria discoidea*, *Psychotrya peduncularis*, *Combretum micratum*, *Ocimum gratissimum* and *O. basilicum*.

Molecular epidemiology, entomological surveillance and genetic diversity

✓ The isoenzyme analyses of *Phlebotomus ariasi* and *Phlebotomus perniciosus* from Portugal, Spain and France revealed a very short genetic distance and an absence of intraspecific variations.

✓ Entomological surveillance of *Aedes aegypti*, in the Madeira island. Insecticide resistance and its causal mechanisms were studied and alternative control mechanisms were assessed.

✓ The rate of infection by *Dirofilaria* sp canina was determined in 4 Portuguese districts and the symbiont bacteria *D. immitis*, *Wolbachia* sp. were detected.

✓ Identification of a group of SNPs of *P. jirovecii* with clinical/epidemiological importance by a new MPCR/SBE protocol.

Vaccination

✓ The recombinant protein cyclophilin 1 of *L. infantum* provides high level of protection against homologous infection and promotes the differentiation of T helper cells and memory cytotoxic cells, being a potential candidate for a future vaccine against zoonotic visceral leishmaniasis.

✓ Preliminary data suggests that akirin protects *Anopheles gambiae* against infection by *P. berghei*, having potential as anti-malaria vaccine.

✓ New tick antigens were identified as highly efficient anti-tick and antiparasitic cattle vaccine candidates.

Causal links of infections with chronic diseases

✓ The presence/absence of early markers of follicular bladder cancer in patients infected with *S. haematobium* was investigated.

Resistance mechanisms

✓ The role of efflux pumps was tested on the phenotype of a selected strain of *S. mansoni* that was resistant up to 4 times the therapeutic dosage

✓ An association was identified between *in vitro* resistance to *P. vivax* and a point mutation on the pvdhps gene (S382C), in the Brazilian Amazon.

HIGHLIGHTED PUBLICATIONS

Beato S, Parreira R, Roque C, Gonçalves M, Silva L, Maurelli MP, Cringoli G, Grácio MA, 2013. Echinococcus granulosus in Portugal: The first report of the G7 genotype in cattle. Vet Parasitol, 198 (1-2), 235-239. (IF=2.381)

Madureira J, Ramos CIV, Marques M, Maia C, de Sousa B, Campino L, Santana-Marques MG, Farrell N, 2013. Nonclassic metallointercalators with dipyrrophenazine: DNA interaction studies and leishmanicidal activity. Inorganic Chemistry 52, 8881-8894. (IF= 4.593)

Monteiro WM, Margioto Teston, AP, Gruendling AP, dos Reis D, Gomes ML, Marques de Araújo S, Bahia MT, Costa Magalhães LK, de Oliveira Guerra JA, Silveira H, de Ornelas Toledo MJ, Vale Barbosa MdG, 2013. Trypanosoma cruzi I and IV Stocks from Brazilian Amazon Are Divergent in Terms of Biological and Medical Properties in Mice. PLoS Neglected Tropical Diseases 7(2):e2069.

Pinto J, Egyir-Yawson A, Vicente JL, Gomes B, Santolamazza F, Moreno M, Charwood JD, Simard F, Elissa N, Weetman D, Donnelly MJ, Caccone A, della Torre A, 2013. Geographic population structure of the African malaria vector Anopheles gambiae suggests a role for the forest-savannah biome transition as a barrier to gene flow. Evolutionary Applications 6, 910-924.(IF= 4.153)

Salgueiro P, Moreno M, Simard F, O'Brochta D, Pinto J, 2013. New Insights into the Population Structure of Anopheles gambiae s.s. in the Gulf of Guinea Islands Revealed by Herves Transposable Elements. PLoS ONE 8:e62964. (IF= 3.730)



NGO Partnerships



Teaching Programmes



Technical Assistance to Health Systems

INTERNATIONAL PUBLIC HEALTH AND BIOSTATISTICS

PRESENTATION

The International Public Health and Biostatistics Teaching and Research Unit develops teaching, research and cooperation activities in the fields of health policies and strategies, health systems and services/programmes, human resources for health, population mobility and migration and HIV/AIDS infection. It is a WHO Collaborating Centre for Health Workforce Policy and Planning.

The Unit coordinated the masters' degree in Health and Development and the doctoral program in International Health, as well as shorter continuing education courses for managers of health services in the CPLP member states. It participated in the submission of an English language doctoral programme in Global Public Health that was accredited during 2013.

TEAM

Director: Sónia Ferreira Dias

Professors: António Jorge Cabral, Gilles Dussault, Inês Fronteira, James Buchan, Jorge Simões, Luís Velez Lapão, Luzia Gonçalves, Maria do Rosário Oliveira Martins, Mohsin Sidat, Paulo, Pedro Serrano, Sónia Dias, Zulmira Hartz | **Researchers:** Ana Abecasis, Isabel Craveiro, Giuliano Russo | **Higher Technician and Research Assistants:** Ana Luísa Trindade, Cláudia Leone, Ana Filipa Gama, Fátima Ferrinho, André Beja | **Post-Doc:** Ana Abecasis, Isabel Craveiro | **Collaborators:** Ana Paula Eusébio, Antónia Fernandes, António Pedro Delgado, Carlos Andrade, Celeste Pereira, Eduardo Sá Ferreira, Fernando Cupertino, João Filipe Raposo, José Pedro C. M. Serrano | **Project grant holder:** Daniela Amaral Alves, João Pedro Bernardo Gregório, Rui Pedro Raminhos Simões, Sílvia Lourenço Ferreira Machaqueiro, Tiago Henrique Lopes Ferreira

MAIN RESEARCH LINES

Human resources in healthcare

✓ Several studies regarding dual employment and physicians working in the private sector in low-income countries, training of health workers, health workers mobility, strategic planning of the health workforce, the implications of the workforce status quo to the universal health coverage agenda and recruitment and retention of health professionals in the EU.

First contact health services

✓ A number of research projects on community pharmacy services and on the management models of Health Centre Clusters in the context of primary health care in Portugal.

Phylogenetic studies

✓ Evolution of HIV/AIDS pandemic and the transmission of resistance to antiretroviral drugs.

Development aid

✓ Studies on global health initiatives, the African contribution of the Brazilian health cooperation, Cuban health diplomacy and the potential of GAVI funding programs for immunisation coverage in developing countries.

Migrants and other risk groups

✓ HIV/AIDS infection and associated determinants in higher risk groups, the migrant populations' health status and their use of health services.

HIGHLIGHTED PUBLICATIONS

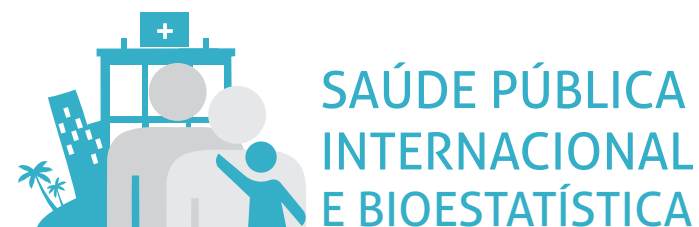
Abecasis, A.B., Wensing, A.M.J., Paraskevis, D et al. (2013). HIV-1 subtype distribution and its demographic determinants in newly diagnosed patients in Europe suggest highly compartmentalized epidemics. *Retrovirology* 10. (IF= 5.657)

Campbell, J., Buchan, J., Cometto, G., David, B., Dussault, G., Fogstad, H., Fronteira, I., et al., (2013). Human resources for health and universal health coverage: Fostering equity and effective coverage. *Bull of WHO*, 91, 853-863. (IF= 5.250)

Cabral, J., Dussault, G., Buchan, J., Ferrinho, P., (2013). Scaling-up the medical workforce in Timor-Leste: Challenges of a great leap forward. *Social Science and Medicine* 96, 285-289. (IF= 2.733)

Russo G, Shankland A. (2013). Brazil's engagement in health cooperation; is there a contribution to the global debate on health? *Health Policy and Planning*. March, doi:10.1093/heapol/czt014. (IF=3.056)

Almeida, M. L., Caldas, J., Ayres-de-Campos, D., Salcedo-Barrientos, D., Dias, S. (2013). Maternal healthcare in migrants: a systematic review. *Maternal and Child Health Journal*, doi 10.1007/s10995-012-1149-x [Epub ahead of print]. (IF= 1.875)



WHO Collaborating Center on Health
Workforce Policy and Planning

MASTERS AND PH.D. STUDY PROGRAMMES CONCLUDED

PH.D. IN BIOMEDICAL SCIENCES

Bruno Gomes da Silva
Genetic studies on the vector mosquito *Culex pipiens*
Supervisor: J Pinto / Co-supervisor: AP Almeida

Carolina Alves
Characterisation of the hepatitis delta virus’ RNA synthesis mechanisms
Supervisor: C Cunha

Cristina Isabel C. de Almeida Costa
Production and characterisation of monoclonal antibodies against cell cycle regulators of *Trypanosoma brucei*
Supervisor: Carlos Novo / Co-supervisor: Tansy Hammarton

Patrícia Isabel Pires Machado
Pyruvate kinase and glucose-6-phosphate dehydrogenase deficiencies and their association with malaria -population genetics and proteomic studies
Supervisor: AP Arez / Co-supervisor: V do Rosário

Pedro Manuel M. Carlos Ferreira
***Lymnaea truncatula* in Portugal: bioecology and genetic variation**
Supervisor: MA Grácio

Raquel de Sá da Silva Lares
***Trypanosoma brucei*peptidase inhibitors. Immunolocalisation, secretion and its potential use as a therapeutic target**
Supervisor: C Novo / Co-supervisor: Jeremy Mottram

Sofia Maria M. M. dos Santos Costa
Relevance of efflux activity in antibiotic resistance in *Staphylococcus aureus*
Supervisor: I Couto

Vera Códiçes
Recombinant antibodies (ScFv) and peptides for immunotherapy and vaccination against cryptosporidiosis
Supervisor: O Matos / Co-supervisor: C Novo

MASTER’S DEGREE IN BIOMEDICAL SCIENCES

Aline Teixeira Marinho
New insights on nevirapine use: A mechanistic perspective of its toxic events
Supervisor: V Marques; IHMT Co-supervisor: C Cunha

Andreia Filipa Ramos Ribeiro de Lemos Albuquerque
***In vitro* biological behaviour of “new species” of *Leishmania* from the Old World**
Supervisor: S Cortes / Co-supervisor: L Campino

Camila Borges Fernandes
Characterisation of multiple polymorphisms of *Pneumocystis jirovecii* by Multiplex-PCR/ Single Base Extension
Supervisor: O Matos / Co-supervisor: F Esteves

Catarina Isabel Gonçalves Farinha
Characterisation of strains of *Streptococcus agalactiae* colonising the genitourinary and gastrointestinal tracts of pregnant women
Orientação: I Sanches / Coorientação: R Castro

Daniela Duque Ferreira
Sequencing and analysis of the genome of a presumed isolated flavivirus of *Aedes (Ochlerotatus) caspius*
Supervisor: R Parreira

Esmeralda Clarisse Beth S. João
Etiology of Vaginal Fungal Infections and Antifungal Drug Resistance in Lubango, Huila Region
Supervisor: M Luz Martins

Joana Dias Apolónio
Acquisition of tolerance to essential oil components by pathogenic bacteria
Supervisor: ML Faleiro / Co-supervisor: MG Miguel; IHMT Co-supervisor: C Cunha

Karina Pires de Sousa
Biochemical Characterisation of Metalloproteinases from Trypanosomatide Parasites
Supervisor: M Silva

Marco André Moras Videira
Study of Na+/H NhaC and NhaE antiports of *Neisseria meningitidis*
Supervisor: A Melo; Co-supervisor: C Cunha

Raquel Alexandra Carita Machado Mota Martins
Detection of *Neisseria gonorrhoea* in urine samples taken at a venereology consultation
Supervisor: R Castro / Co-supervisor: J Costa

Vanessa Sophia Saavedra Azevedo
Leptospirosis and Fasciolosis: immunological interactions in the polymorphism of the clinical context of São Miguel’s patients (Azores)
Supervisor: ML Vieira / Co-supervisor: A Afonso

Vânia Filipa Ferreira Silva
Contribution of efflux systems for resistance to clarithromycin in the *Mycobacterium avium* complex
Supervisor: M Viveiros / Co-supervisor: I Couto

MASTER’S DEGREE IN MEDICAL PARASITOLOGY

Ana Filipa Gonçalves Teixeira
Cloning and gene expression of potential antigen candidates of the parasite *Trypanosoma brucei brucei*
Supervisor: M Silva / Co-supervisor: J Atouguia

Idalécia Laurinda C. Cossa Moiane
RAPD genetic analysis of *Schistosoma mansoni* strains with different susceptibilities to infection in the definitive host
Supervisor: A Afonso / Co-supervisor: M Calado

Miguel Correia Landum
Detection of *Dirofilaria* spp. in dogs from the Centre of Portugal
Orientação: S Belo

MASTERS DEGREE IN HEALTH AND DEVELOPMENT

Almeida Chitungo
Prevalence of malaria in febrile children under the age of five in the municipality of Longonjo (Angola)
Supervisor: P Ferrinho / Co-supervisor: F Fortes

Ana Catarina Faustino
Organisational culture in the area of Diagnostic Imaging - Perception of the Coordinators. Case Study: Central Lisbon Hospital Center
Supervisor: L Lapão / Co-supervisor: G Dussault

Ana Marina Carreira Leal
Migration of Portuguese nurses in Europe
Supervisor: I Fronteira / Co-supervisor: I Craveiro

António Moreira
Late diagnosis of HIV infection in the Island of Santiago
Supervisor: I Fronteira / Co-supervisor: MR Oliveira Martins

Cátia Alves
Logical and Context Analysis of the European Project “Epidemiological Research and prevention of HIV/STDs among Men Who Have Sex with Men - SIALON II
Supervisor: S Dias / Co-supervisor: Z Hartz

Elsa Almeida
Survival of patients infected with the Human Immunodeficiency Virus and with Acquired Immunodeficiency Syndrome in the Sotavento Islands, Cape Verde
Supervisor: P Ferrinho / Co-supervisor: MR Oliveira Martins

Filipa de Almeida Pacheco
Assessment of training process of military nurses who integrate international missions of Portuguese Air Force
Supervisor: S Dias / Co-supervisor: MR Oliveira Martins

Liliana Maria Granja Ventura Pinto
Sociodemographic and behavioural determinants of fruit and vegetable consumption among adolescents
Supervisor: C Lopes (FMUP) / Co-supervisor: S Dias

Maria da Luz Lima Mendonça
Diabetic patient control in Cidade da Praia, Cape Verde. Case study
Supervisor: P Ferrinho / Co-supervisor: MR Oliveira Martins

Mário Gomes Blasse António Tamy
Breastfeeding of Children Under One Year of age in the Oio Health Region, Guinea-Bissau
Supervisor: P Ferrinho / Co-supervisor: P Serrano

Miriam Delgado
Epidemiologic Transition / Mortality profile of S. Vicente’ Island population (Cape Verde) in the year 2009
Supervisor: I Fronteira

MASTER’S DEGREE IN TROPICAL HEALTH

Gema Ponce Revilla
Clinical and Sociodemographic Characterisation of Resistant Pulmonary Tuberculosis at the Raoul Follerau Hospital (Guinea-Bissau)
Supervisor: J Atouguia / Co-supervisor: M Viveiros

Joana da Graça Matias Gomes
Influence of the intestinal flora of Anopheles sp. mosquito on the onset of infection by *Pasmodium berghei*
Supervisor: H Silveira

CENTRE FOR MALARIA AND OTHER TROPICAL DISEASES (CMDT)

Coordinator: Henrique Silveira

Support Staff: Celeste Figueiredo

Strategic Project – LA 18 - 2013-2014

CMDT comprises 6 research groups: a) Tropical and Travel Medicine (Group Leader: Jorge Atouguia); b) Medical Parasitology (Group Leader: J Pinto); c) Health Systems and Services (Group Leader: G Dussault); d) Population Health (Group Leader: M Matos); e) Biostatistics and Bioinformatics (Group Leader: A Vandamme); and Public Health and Policies (Group Leader: C Nunes). CMDT's administration is done by IHMT and it includes researchers from IHMT (www.ihmt.unl.pt), National School of Public Health (www.ensp.unl.pt) and Faculty of Human Motility (www.fmh.utl.pt). The Centre's activities cover from basic to translational research, studying molecular and cellular aspects of diseases, pathogens, vectors and their interactions and the control of infectious agents, as well as the health of populations and health systems. CMDT's is committed to scientific excellence within the framework of an international competitive environment.

Throughout 2013, CMDT members published 203 articles in international peer-reviewed journals, at an average of 3.22 articles per researcher (63 members). CMDT members also published 29 books/book chapters. In some areas of knowledge, and in light of its goals, CMDT must publish in Portuguese and so, 33 articles were published in national journals. Seven new projects were implemented. CMDT's members contributed with 73% of IHMT's total number of publications.

CMDT supported the 3rd National Congress in Tropical Medicine and six other international meetings: European Workshop on HIV and Hepatitis; International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology; Workshop on HIV Resistance; Advanced study programme on clinical interpretation of drug resistance testing; Dengue: present and future; Conference on the regulation of health professionals in the European Union: Experiences in the United Kingdom, Germany, Spain and Portugal.

Highlights of the 2013 scientific activities include:

Vectors and vector-borne diseases

✓ Development of a new method for capillary blood feeding of ticks and its assessment to validate vaccine candidate antigens; demonstration of the leishmanicidal activity of two peroxide compounds; parasite proteomics studies revealed that the plasmodia that develop in erythrocytes of subjects with G6PD or PK deficiencies show changes that are related to differences observed in the development of malaria in subjects with such deficiencies; the importance of quantifying the number of copies of the *mdr* gene of *Leishmania* in the assessment of multi-drug-resistance.

HIV and opportunistic infections

✓ Studies that revealed that B-glucan may be used as a serological biomarker for diagnosing and screening pneumonia caused by *Pneumocystis jirovecii*; international collaboration within the CHAIN network led to significant advances in the interpretation of HIV's genetic diversity, transmission and resistance to antiretroviral drugs, as well as the expansion of the HIV database, now with 9,700 patients and over 12,500 HIV-1 sequences; development of compounds with increased activity against multi-resistant bacteria through exposure of phenothiazines to laser rays.

Health systems research

✓ The health system and services group conducted research on migrants, health services and employment conditions in 3 Portuguese-speaking African countries, the implications of the workforce status quo to the universal health coverage agenda and recruitment and retention of health professionals in the EU.

For more information, please visit cmdt.ihmt.unl.pt.

MEDICAL MICROBIOLOGY AND PARASITOLOGY UNIT (UPMM)

Coordinator: Paulo Almeida

Strategic Plan - UI 74 - 2011-2013

UPMM integrates four research groups: Medical Helminthology (Group Leader: S. Belo), Mycobacteria (Group Leader: A. Martins), Vectors (Group Leader: P. Almeida) and Virology (Group Leader: A. Simões). UPMM's administration is by IHMT and it includes researchers from IHMT (www.ihmt.unl.pt), and the National Institute of Agrarian and Veterinary Research (www.inia.v.pt). During 2013, the 19 members of UPMM published 29 articles in international peer-reviewed journals, 10 articles in national publications and one book. Five masters and one doctoral thesis were completed.

UPMM addresses from basic to translational research questions, studying several aspects of parasitic diseases, viruses and their vectors, as well as mycobacteria (with results and methodologies that have been extended to cancer cells, in the meantime).

UPMM supported the 3rd National Congress in Tropical Medicine and several seminars were held, including workshops on genomics.

Some examples of the research conducted are presented in the next paragraphs.

Neglected tropical diseases

A population of the *Schistosoma mansoni* trematode which was 4 times more resistant to praziquantel than the parent strain was selected and is being assessed as to the influence of efflux pumps in the resistant phenotype. The activity and composition of plant extracts were studied in *S. mansoni* and its intermediate hosts and in mosquito immatures.

Regarding the study of the *Dirofilaria* spp. nematode and its *Wolbachia* symbionts, prevalence was determined in dogs and vectors were characterised. The molecular diversity of *Fasciola hepatica* was characterised.

Vectors and vector-borne diseases

The characterisation of the susceptibility levels of the adult population of *Aedes aegypti* (Dengue vector) to all classes of insecticides in Madeira was completed and the resistance mechanisms were identified. A study began on the susceptibility profile of the immature population of *Aedes aegypti* to biocidal compounds with insecticidal activity.

Studies continued on the distribution of sand flies, vectors of *Leishmania*, within the EDEN and EDENnext projects, as well as on its isoenzymatic characterisation (in collaboration with foreign universities - one French and two Spanish).

Studies were conducted on insect viruses that could potentially affect the competence of arbovirus vectors, and the identification and characterisation of 10 viral isolates was started.

In studies to develop a vaccine against the Chikungunya virus (CHIKV), which has caused major outbreaks and high morbidity, there was an attempt to increase the efficiency of VLP formation, and a sequence of 350 nucleotides was identified to be preferably associated to the CHIKV capsid protein and encapsidated in VLPs.

PROJECTS

No.	Title	Reference	PI	Timeframe	Funding Agency
1	Malaria in a world without science	PEC 106	A Custódio	2013-2014	ANCCT
2	Buddies, BFFs and the like... a potential biological threat	PEC 109	C Cunha	2013-2014	ANCCT
3	Ecology and transmission dynamics of visceral leishmaniasis in Etiopia	BG 2	C Maia	2010-2015	Bill & Melinda Gates Foundation
4	BEST HOPE: Bio-Molecular and Epidemiological Surveillance of HIV Transmission Patterns, transmited Drug Resistance, Hepatitis Co-infections, and Ongoing Aging Processes in Europe	HIVERA_001_2011	A Abecasis	2013-2015	DGS / FCT
5	Epidemiology of rotavirus infection in Huambo, Angola: prevalence of the infection and of circulating genotypes	DNSPA	C Istrate	2012-2013	Direção Nacional Saúde Pública Angola
6	Epidemiology of rotavirus infection in the Democratic Republic of São Tomé and Príncipe: prevalence of the infection and of circulating genotypes	ROTA-RDST	C Istrate	2011-2013	FCG
7	Early molecular detection of M/XDRTB in the Greater Lisbon Healthcare Region	SHD49	I Couto	2009-2013	FCG
8	Challenges and solutions for the control of parasitic diseases - teaching and research	121916	I Mauricio	2012-2013	FCG
9	Training in Laboratory Diagnosis of Tuberculosis - ForDILAB TB	ForDILAB TB	M Viveiros	2012-2013	FCG
10	Implementation of a new method for the rapid identification of <i>Mycobacterium tuberculosis</i> complex	MTBC-MZ	M Viveiros	2012-2013	FCG
11	Food safety, health and nutrition in Quinara	P-126487	MR Oliveira Martins	2013-2015	FCG
12	Causative agents of diarrhoea in children under five years treated at the Bengo General Hospital (Angola)	ACD-FCG	S Lima / C Istrate	2012-2013	FCG
13	Census of African Hospitals	HA-FCG	P Ferrinho	2012-	FCG / OMS
14	Functional study of genes involved in <i>Rhipicephalus bursa</i> – <i>Babesia ovis</i> interactions	PTDC/CVT-EPI/4339/2012	A Domingos	2013-2015	FCT

No.	Title	Reference	PI	Timeframe	Funding Agency
15	Differential expression and functional characterization of tick (<i>Rhipicephalus annulatus</i>) genes in response to pathogen infection (<i>Babesia begemina</i>)	PTDC/CVT/112050/2009	A Domingos	2011-2014	FCT
16	Let's make it fall off: Genomic, proteomic and immuno-histological study of the tick cement's involution	PTDC/CVT-EPI/3460/2012	A Domingos	2013-2015	FCT
17	A challenge for the treatment of parasitic diseases: rational design of Trifluralin derivatives and appropriate nanoformulations	PTDC/CVT/098290/2008	A Domingos / G Santos Gomes	2010-2013	FCT
18	Disorders on the Glycolytic and Pentose Phosphate – Pathways of the Red Blood Cells – How do the affect Plasmodium infection?	PTDC/SAU-MET/110323/2009	AP Arez	2011-2014	FCT
19	Factors affecting dynamics of <i>Plasmodium</i> concomitant infections in a malaria endemic area: analysis through a new modeling approach	PTDC/SAU-EPI/113326/2009	AP Arez	2011-2014	FCT
20	ControlTB - Pulmonary Tuberculosis Control in Portugal from a spatio-temporal perspective: determinants, incidence trends and forecasts in geographical units. A contribution for an optimised programme	PTDC/SAU-SAP/116950/2010	B de Sousa	2012-2014	FCT
21	Statistical Methods in Clinical Research: Spatial, Longitudinal and Survival Studies	PTDC/MAT/104879/2008	B de Sousa	2010-2013	FCT
22	A yeast two-hybrid and yeast three-hybrid approach to study hepatitis delta virus replication	PTDC/SAU-MII/098314/2008	C Cunha	2010-2013	FCT
23	Epidemiology of norovirus infection among the Portuguese elderly population: viral strains and genetic factors of the host	PTDC/DTP-EPI/1222/2012	C Istrate	2013-2015	FCT
24	Cell cycle and cytokinesis regulators in <i>Trypanosoma brucei</i>	PTDC/CVT/098183/2008	C Novo	2010-2013	FCT
25	Synthesis of solar-activated materials for the controlled release of volatile compounds	PTDC/CTM-NAN/119979/2010	CA Sousa	2012-2015	FCT
26	Dengue in Madeira archipelago. Risk assesment for the emergence of <i>Aedes aegypti</i> mediated arboviroses and tools for vector control	PTDC/SAU-EPI/115853/2009	CA Sousa	2011-2014	FCT
27	Search for candidate protein biomarkers of Coffee Arabic resistance to <i>Hemileia vastatrix</i> (leaf rust)	PTDC/AGR-GPL/109990/2009	F Cardoso	2011-2014	FCT

No.	Title	Reference	PI	Timeframe	Funding Agency
28	Targeting hemozoin crystal structure: a rational approach to the design of novel antimalarials	PTDC/SAU-FAR/114864/2009	F Nogueira	2011-2014	FCT
29	Consequences of neutrophil – <i>Leishmania infantum</i> interactions in the establishment of canine leishmaniosis	PTDC/CVT/113121/2009	G Santos Gomes	2011-2014	FCT
30	Immune response regulation in dogs at various clinical stages of leishmaniasis and undergoing different therapeutic protocols	PTDC/CVT/118566/2010	G Santos Gomes	2012-2015	FCT
31	Functional characterisation of orphan GPCR family 2 receptors in the malaria model	PTDC/BIA-BCM/114395/2009	H Silveira	2011-2014	FCT
32	Immune stimulation of the mosquito <i>Anopheles gambiae</i> response against the malaria parasite <i>Plasmodium berghei</i>	PTDC/SAU-MII/102596/2008	H Silveira	2010-2013	FCT
33	Iberian Malaria Platform	Proc. 441,00	H Silveira	2008-	FCT
34	NADH – Type II menaquinone dehydrogenase (NDH-2) and the respiratory chain of <i>M. tuberculosis</i> : new therapeutic targets to combat <i>tuberculosis</i>	PTDC/BIA-MIC/121859/2010	I Couto	2012-2015	FCT
35	zoonTB – New molecular approaches for the detection and discrimination of members of the <i>Mycobacterium tuberculosis</i> complex	PTDC/CVT/111634/2009	I Couto	2011-2014	FCT
36	Speciation with gene flow and isolation genes in the mosquito <i>Anopheles gambiae</i> (Diptera: Culicidae)	PTDC/BIA-EVF/120407/2010	J Pinto	2012-2015	FCT
37	Acquisition of iron in <i>Leishmania infantum</i> - which are the players and what is their relevance for pathogenesis?	PTDC/CVT/100090/2008	J Rodrigues	2010-2013	FCT
38	Development and pre-clinical evaluation of a new HIV-1 vaccine concept	PTDC/SAU-FAR/115290/2009	JM Marcelino	2010-2014	FCT
39	Population genetics and insecticide resistance of the dengue vector (<i>Aedes aegypti</i>) in Brazil	CAPES	J Pinto	2011-2013	FCT
40	New <i>Leishmania</i> species and hybrids-risk of introduction and implications to the pathogeny of infection	PTDC/CVT/112371/2009	L Campino	2011-2014	FCT

No.	Title	Reference	PI	Timeframe	Funding Agency
41	Urban Planning and Health Inequalities - from macro - to micro-statistics	PTDC/ATP-EUR/5074/2012	L Gonçalves	2013-2015	FCT
42	e-PharmaCare: Exploring community pharmacy eservices in primary-care setting: Improving information management within community pharmacy services, including the use of e-health and social media	PTDC/CCI-CIN/122609/2010	L Lapão	2012-2014	FCT
43	OSYRISH - Organisational and Informational System to Improve the Communication Management of Healthcare Associated Infections in Hospitals	PTDC/IVC-COM/5016/2012	L Lapão	2013-2015	FCT
44	Biochemical characterization and pharmacological involvement of metalloproteinases isolated from the parasite <i>Trypanosoma brucei</i>	CAPES	M Silva	2011-2013	FCT
45	Immunotherapy of African trypanosomosis in the mouse model through DNA vaccines	PTDC/CVT/102486/2008	M Silva	2010-2013	FCT
46	Enhancing the killing of intracellular multi-drug resistant tuberculosis (MDRTB) by human macrophages: a new chemotherapeutic strategy to fight MDRTB	PTDC/SAU-FCF/102807/2008	M Viveiros	2010-2013	FCT
47	Action mechanisms of adjuvants in the antibiotic treatment of multidrug-resistant bacteria	PTDC/BIA-MIC/105509/2008	M Viveiros	2010-2013	FCT
48	Identification of potential molecular markers for staging African Human Trypanosomiasis	PTDC/SAU-ESA/102435/2008	N Rolão	2010-2013	FCT
49	The importance of β-glucan in <i>Pneumocystis Jirovecii</i> pneumonia: A new diagnosis tool	PTDC/SAU-MII/104231/2008	O Matos	2010-2013	FCT
50	Clinical relevance of multiple genetic markers in <i>Pneumocystis jivovecii</i> pneumonia: New high-throughput methodologies for molecular epidemiology and diagnosis	PTDC/SAU-MIC/116716/2010	O Matos	2012-2014	FCT
51	Ecoepidemiology of <i>Dirofilaria</i> spp.: Molecular characterisation of potential vectors and transmission dynamics	PTDC/SAU-SAP/113523/2009	S Belo	2011-2014	FCT

No.	Title	Reference	PI	Timeframe	Funding Agency
52	AVALACES - Evaluation of the Management Models of ACES (Health Centre Clusters) and their integration with Secondary Care (Health Unit vs Hospital)	2011EXT527	L Lapão	2012-2013	INSRJ
53	Contributions for the study of Multiple Sclerosis and Lyme Borreliosis association: laboratory, clinical and eco-epidemiological aspects	Serviço Lepto.	ML Vieira	2010-2013	Receitas Próprias
54	Developing and testing of new methodologies to monitor and evaluate health related EU- funded interventions in cooperation partner countries	261504	G Russo	2011-2014	UE
55	European research Infrastructure on Highly Pathogenic agents	262042	H Silveira	2010-2013	UE
56	Improvement of current and development of new vaccines for theileriosis and babesios of small ruminants	GA no. 245145	A Domingos	2010-2014	UE
57	Research capacity for the implementation of genetic control of mosquitoes	228421	J Pinto	2009-2014	UE
58	Strengthening transdisciplinary research on infectious and Emerging Diseases in French Guiana: Linking fieldwork, benchside and bedside	GA no. 285837	J Pinto	2011-2015	UE
59	Biology and control of vector-borne infections in Europe	GA no. 261504	L Campino	2011-2014	UE
60	BERENICE - Benznidazol and Triazol Research group for Nanomedicine and Innovation on Chagas disease	GA no. 305937	M Silva	2012-2016	UE
61	Capacity building in combining targeted prevention with meaningful HIV surveillance among MSM	SIALON II	S Dias	2011-2014	UE
62	Developing a training and resource package for improving the sexual and reproductive health of people living with HIV/AIDS	2008/1204	S Dias	2009-2013	UE

NETWORKS

Nº	Title	Reference	PI	Timeframe	Funding Agency
1	Antibiotic Transport and Efflux: new strategies to combat bacterial resistance	COST BM0701	L Amaral / M Viveiros		ESF
2	CHAIN - Collaborative HIV and Anti-HIV Drug Resistance Network	GA nº 223131	A Vandamme / R Camacho	2009-2014	UE
3	COST Action - Farm Animal Proteomics	FA1002	A Domingos	2010-2015	
4	COST Action - Integrated Management of Phytoplasma Epidemics in Different Crop Systems	FA0807	F Cardoso	2009-2013	
5	Criação de uma rede para identificação de marcadores de doença, infeção, suscetibilidade e resistência, e de moléculas ou processos importantes para o controle da leishmaniose visceral canina	RIMLEV	L Campino	2011-2013	Cyted
6	Environmental survey and genotyping European and Mediterranean area		M Viveiros (coord. no IHMT)		
7	European Network for Antropod Vector-Surveillance for Human Public Health	Vbornet	P Almeida		ECDC
8	ISHAM – <i>Cryptococcus</i> working group Environmental survey and genotyping European and Mediterranean area		ML Martins		
9	Leishmaniasis management Consortium	Leshman	L Campino	2012	UE
10	LEISHnet – “grupo ONLeish”		L Capmino	2010	MSD
11	LeptoNet / ILS/WHO – International Network for Surveillance of Leptospirosis		M Luísa Vieira		
12	Observatório Nacional das Leishmanioses	ONLEISH	L Campino	2008	MSD
13	Orphanet of Rare Diseases Task Force	Orphanet	O Matos	2008	UE
14	ProCura – Associação Portuguesa de Proteómica		C Cunha (Membro da Direção)		
15	Proteomica y quimiogenómica de inhibidores de proteasas de origen natural com potencial terapeutico en Malaria	PROMAL	A Domingos / D Lopes / VE do Rosário	2010-2014	Cyted
16	Rede Iberoamericana sobre Pneumocystosis	212RT0450	O Matos	2011-2014	Cyted
17	RedTrV - Red Iberoamericana para el estudio del control biológico com TRV de Triatominos transmissores de Chagas		M Silva	2009-2013	Cyted
18	SENTRY/Antifungal Surveillance Program (Objective F)		M Luz Martins		
19	TropEd: Network for Education in International Health		C Conceição		
20	TropNet: European Network for Tropical Medicine and Travel Health		J Seixas / J Atouguia		

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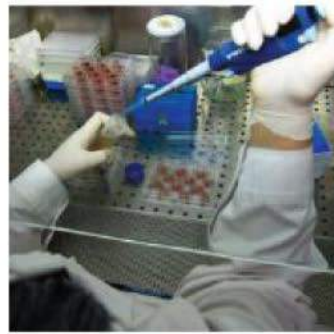
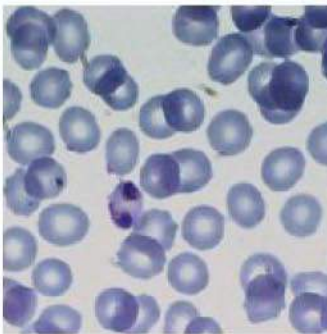
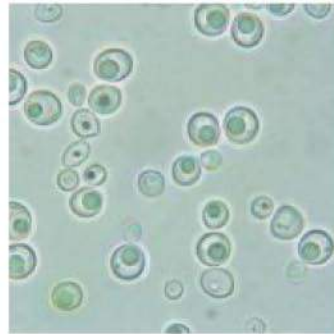
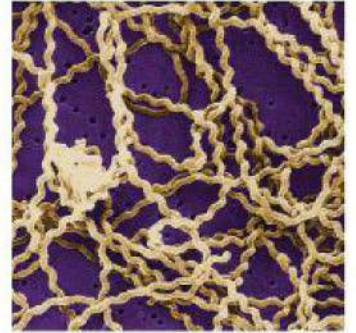
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