FAPESP
SÃO PAULO RESEARCH FOUNDATION

SÃO PAULO-UK
COOPERATION IN SCIENCE & INNOVATION

AGENCIES

ACADEMIES

COMPANIES

UNIVERSITIES

1

SAO PAULO RESEARCH COLLABORATION WITH THE UNITED KINGDOM

The Sao Paulo Research Foundation (FAPESP) is a public foundation, funded by the taxpayer in the State of São Paulo, with the mission to support research projects in higher education and research institutions, in all fields of knowledge.

FAPESP offers several funding streams so foster research collaboration with the UK, either by unilateral initiative of FAPESP or through research collaboration agreements. Collaboration agreements with organisations from the United Kingdom include UK Research and Innovation, British Council, UK Academies, companies such as Shell, GlaxoSmithKline, and AstraZeneca, and over 20 universities. The research projects funded in the context of these agreements are summarised in the next page, and detailed in the following pages of this folder.

In addition to the agreements, submissions can be received at any time of the year through the following unilateral funding instruments:

Visiting Researcher Grants: provide stipends and travel expenses for foreign scientists to visit colleagues in higher education and research institutions in São Paulo State for periods ranging between two weeks to one year.

São Paulo School of Advanced Science (SPSAS): supports the organization of short courses lasting one to three weeks. They address recent scientific advances and take place in higher education and research institutions in São Paulo State. Each SPSAS is typically attended by 50-150 PhD students and young postdocs, half of whom are international, and between seven and 20 eminent lecturers from Brazil and abroad.

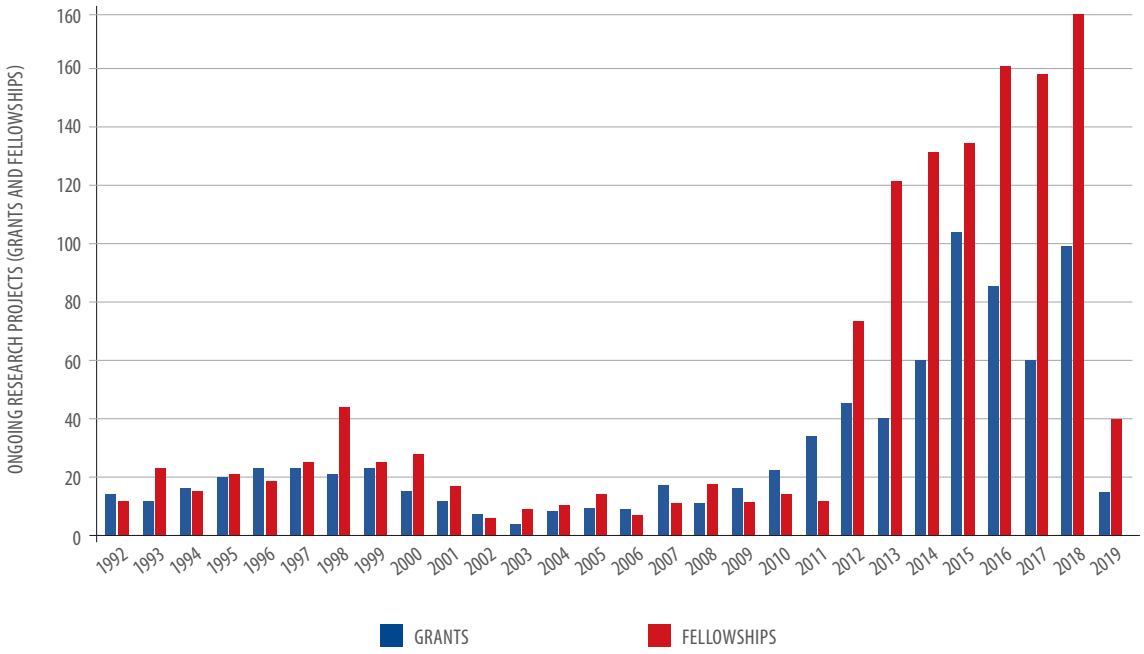
Research Fellowships Abroad (BPE): covers living and travel expenses up to 1 year for researchers with a position in an institution in the State of São Paulo working in a research project abroad.

Research Internships Abroad (BEPE): Research Internship: covers living and travel expenses for FAPESP fellowship holders (post-doc, PhD, MSc or undergraduate students), working abroad on a theme associated with the research project in which they are participating in São Paulo.

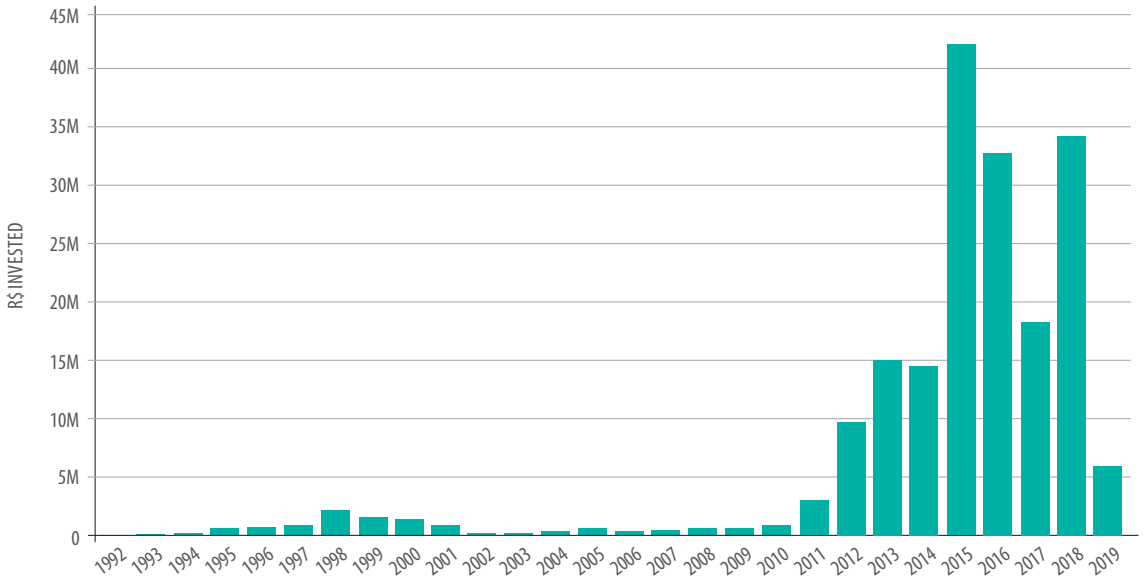
São Paulo Excellence Chair (SPEC): The São Paulo Excellence Chairs (SPEC) have the objective of fostering the association of top-level foreign researchers to qualified higher education and research institutions in the State of São Paulo, Brazil. Proposals for this program will be led by the foreign researcher who must be associated to a higher education or research institution in the State of São Paulo, Brazil, with a commitment to spend at least 12 weeks per year for at least 3 years at the host institution (the 12 weeks do not need to be consecutive).

Young Investigator Award: enables the creation of job opportunities for highly qualified young researchers (or group of highly qualified young researchers), especially in emerging research institutions in the State of São Paulo, Brazil. Proposals of new research areas in traditional institutions are also eligible. This Program favours the creation of new research groups that will work on state-of-the-art areas that are internationally relevant and new to the state of São Paulo. Funds research costs, fellowships and salary for young researchers spending 2 to 4 years in São Paulo.

ALL GRANTS AND FELLOWSHIPS WITH UK RESEARCH PARTNERS (UNILATERAL AND RESEARCH COLLABORATION AGREEMENTS)



TOTAL FUNDING CONTRACTED YEARLY BY FAPESP FOR PROJECTS WITH UK RESEARCH PARTNERS (UNILATERAL AND COLLABORATION AGREEMENTS)



PARTNERSHIPS FAPESP-UK
IN SCIENCE AND INNOVATION

Established in 1962, the São Paulo Research Foundation (FAPESP) supports high quality research in all fields of knowledge, selected through rigorous peer-review evaluation. The support is focused on the backing of basic research, to contribute to the advancement of knowledge, and research for technological innovation, through grants and fellowships, many of them connected to strategic themes, such as biodiversity, bioenergy, climate change, and eScience, implemented in collaboration with research institutions, universities and companies.

From this viewpoint, FAPESP has established partnerships with several international funding agencies, academies, companies, and higher education and research institutions. Such collaboration include the exchange of researchers and the development of joint research projects.

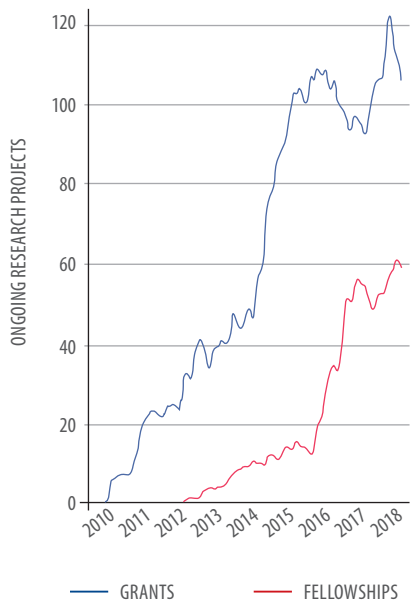
Since 2009, with the first joint peer review agreement with UK Research & Innovation, FAPESP has gradually increased and strengthened the partnerships with British institutions, including academies, companies and an expressive number of universities. The collaboration with the Newton Fund established in 2014 was also significant to the increase of research partnerships. Researchers from the State of Sao Paulo and from the UK now have a broad range of funding schemes available to collaborate.

400 research projects have been supported, and 80 fellowships granted in the context of these agreements. 350 grants and 724 fellowships awarded in the past 10 years were submited spontaneously by São Paulo researchers with a partner from the UK. As a result, co-authorship between researchers from the State of São Paulo and the UK has risen 173% from 2010 to 2016 (Incites Thomson Reuters 2016).

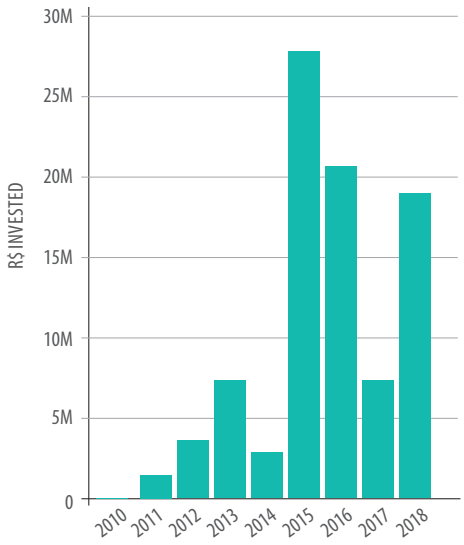
There is a clear complementarity between Brazilian and British Science, with expertise in biodiversity, climate change, neglected diseases, and biofuels – to name a few. FAPESP and the UK partners continue to welcome joint proposals from researchers from São Paulo and the UK, and look forward to seeing this collaboration flourish even more in the coming years.

RESEARCH PROJECTS ASSOCIATED TO UK COOPERATION AGREEMENTS

FUNDED RESEARCH PROJECTS (GRANTS AND FELLOWSHIPS)



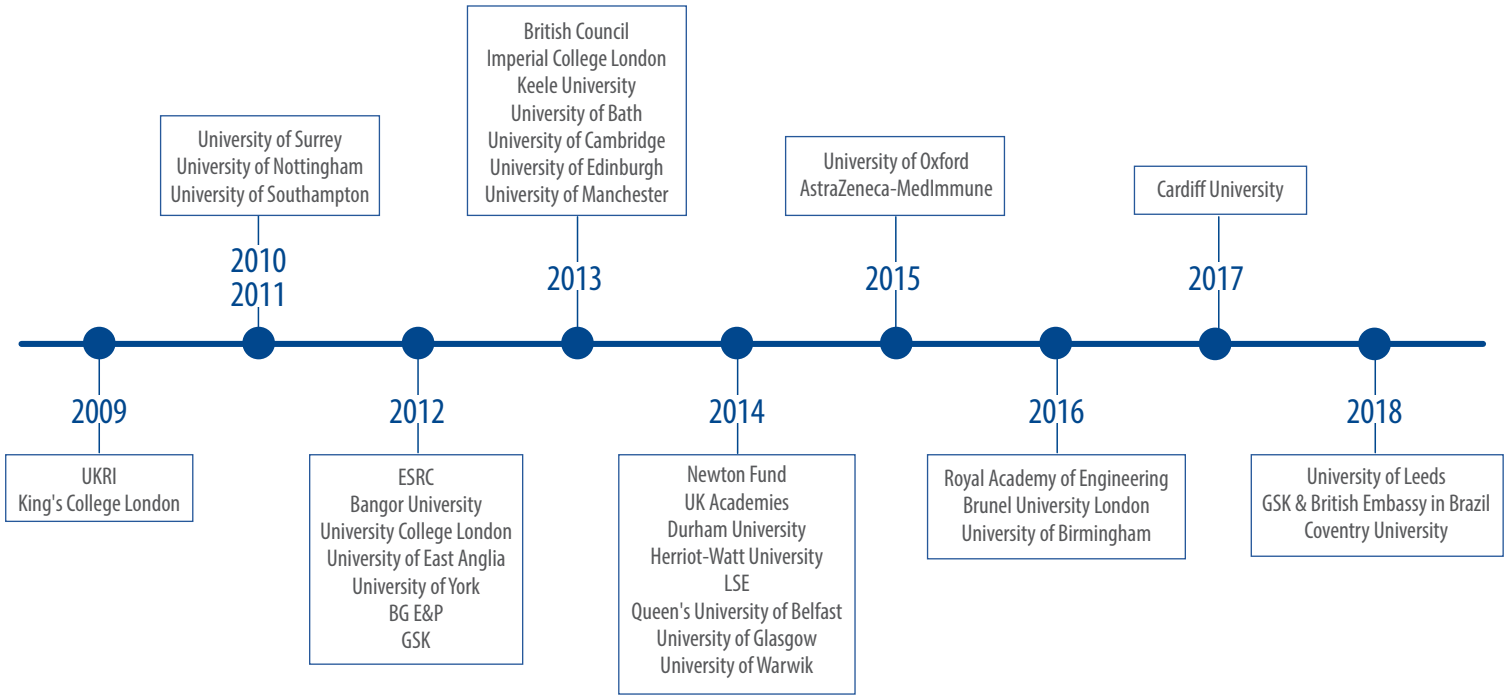
DISBURSEMENT



Details on some of the projects funded are in the following pages, and can also be found at
BV.FAPESP.BR/EN/COLABORACAO_INTERNACIONAL/19/REINOUNIDO

FAPESP
SÃO PAULO RESEARCH FOUNDATION

AGREEMENTS FAPESP–UNITED KINGDOM SINCE 2009



Since 2009, FAPESP has signed several collaboration agreements with universities, research funding agencies, academies, companies, government representatives, and other institutions related to the UK science, innovation and technology system. The agreements support cooperation between Sao Paulo and UK researchers, and has been growing at a steady pace since 2009.

AGENCIES Research Councils and British Council

Agencies responsible for research and innovation funding, as well as capacity building for researchers.

UK Academies

Scientific institutions or societies dedicated to the promotion of science.

Companies

Private R&D-intensive companies.

Universities

Higher Education and research institutions, universities and research centres.

RESEARCH FUNDING AGENCIES AND ORGANISATIONS

UK research Funding organisations are among the lead partners of the São Paulo Research Foundation. FAPESP has joined forces with the national research funding agencies – UK Research & Innovation (UKRI) – and the international organisation for cultural relations and educational opportunities – British Council – to encourage collaboration between British and Sao Paulo-based research institutions.

FAPESP and UKRI have signed a memorandum of understanding in 2009 and renewed it in 2012 and 2015. The agreement with the UK Research Councils establishes a joint peer review system, avoiding double jeopardy in the analysis of proposals.

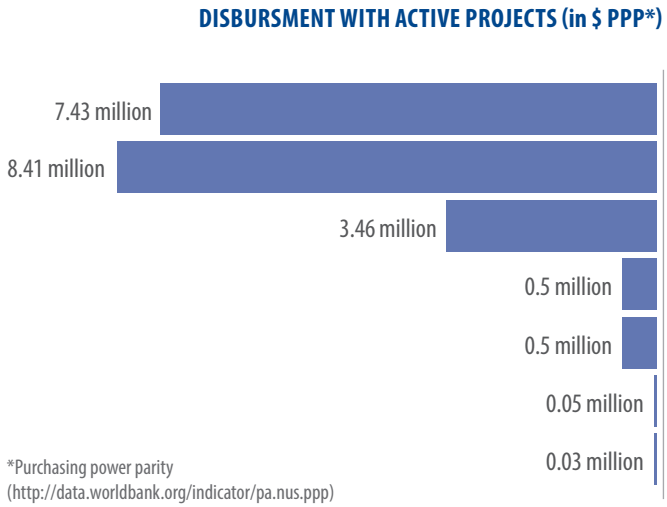
The joint-proposal is assessed in the respective Research Council's regular procedure, with experts nominated by FAPESP involved in the decision-making. Once approved, each funding body covers funding for their element of the research proposal. This was the first international peer review agreement signed by all RCs.

The partnership with the British Council begun in 1996, and was renewed in 2013 and 2015. FAPESP and BC have funded together scientific workshops, travel grants, Scientific English training and three FameLab editions – a science communication competition. In total, FAPESP has funded over 70 joint-research proposals with all Research Councils, and 60 workshops or mobility grants with the British Council.

The agreements encourage cooperation in three phases. The first phase consists of funding of workshops, travel grants, and joint activities fostering initial researchers and institutional links. Small seed research grants are awarded as a second phase for collaboration. Finally, the third phase encourages robust, more ambitious and larger research proposals.

Projects are accepted on responsive mode through open deadline applications, and on directive mode, with 40 calls for proposals launched in specific themes or areas of cooperation.

More recently, the partnerships with the British Council and UKRI have included calls with funding bodies from other Brazilian States and with Latin American countries such as Uruguay, Chile, Peru and Argentina, encouraging trilateral or multilateral collaboration. This is especially relevant in studies that address shared challenges and resources, including biodiversity, Earth Systems Science, and anthropology/human rights.



Details on some of the projects funded are in the following pages, and can also be found at BV.FAPESP.BR/EN/COLABORACAO_INTERNACIONAL/19/REINOUNIDO

PUBLIC SPACES AND THE ROLE OF THE ARCHITECT: A COMPARATIVE STUDY OF INFLUENTIAL MODERNIST AND CONTEMPORARY EXAMPLES IN LONDON AND SAO PAULO

This project will: 1) examine the role of the architect in the production of contemporary public space in Sao Paulo and London from the perspective of the architects very different role during the period of High Modernism (1960s-70s) in both cities; 2) investigate the relationship between traditional top-down design in both countries, and the growing interest in the UK and Brazil in bottom-up initiatives, within the context of the production of public spaces in both cities; 3) assess whether there are positive aspects to architectural Modernism in Sao Paulo and London that can be recovered to address the social segregation of public space that currently challenges both cities; 4) develop and disseminate a widerand deeper understanding of the relation between the authorship and ownership of public space, post-war and now in both cities. Context of The Research: The cultural and architectural innovations of Brazilian Modernism followed a post-war progresist State seeking to embody itself in a modern architecture. The critical power of this 'golden period' derives from the social agenda of architectural Modernism and the social pact between the architect and society. This period, and this pact, are long over in Brazil, and it could be argued that England, apart from a brief interlude in the early 1950s centered around the Festival of Britain, never enjoyed a Modernist 'golden period', and that the British resisted, not the emancipatory agenda of architectural Modernism, but its often alien expression in built form. The differences both in the production and reception of Modernist architecture in Sao Paulo and London bear detailed examination, to understand the role of the architect.

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2013/50098-7
Term: Mar 2014 to Feb 2017
Regular Research Grant
UKRI – AHRC

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TOWARDS AN INTERMEDIAL HISTORY OF BRAZILIAN CINEMA

This project will bring together academic expertise on Brazilian cinema, intermediality and the history and theory of film, based at the University of Reading and at the Federal University of São Carlos, in order to produce the first, groundbreaking, intermedial history of Brazilian cinema. It will also explore the uses of intermediality as a historiographic method applicable to cinema as a whole. Intermediality has never been applied to cinema as a historiographic method, which is being proposed in this project as an entirely original and promising avenue…

PRINCIPAL INVESTIGATORS

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FAPESP Process 2014/50821-3
Term: Jun 2015 to Dec 2018
Regular Research Grant
UKRI – AHRC

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JE LANDSCAPES OF SOUTHERN BRAZIL

PRINCIPAL INVESTIGATORS

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FAPESP Process 2012/51328-3
Term: Feb 2014 to Dec 2018
Thematic Project
UKRI – AHRC

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The project *Je Landscapes in Southern Brazil* (JLSB) has been developed as a partnership among the Museum of Archeology and Ethnology of the São Paulo University (MAE-USP) and the University of Exeter (UK), under the joint coordination of Jose Iriarte (Exeter) and Paulo DeBlasis (USP). Sponsorship has also integrated the British agency Arts and Heritage Research Council (AHRC) and Fundação de Auxílio à Pesquisa do Estado de São Paulo (FAPESP). Besides these main institutions, several others have taken a role into this project, such as the University of Reading (UK), UNISUL and UNESC in Santa Catarina, UFPel and UFPR, among other partners. In addition, a number of students from different universities have participated intensively, and several academic grades (masters, PhDs) have been produced, some still on the making.

This project examines historical territories of the Southern Je speaking peoples, aiming to unfold the cultural processes involved in creating and transforming the social landscape of the southern Brazilian highlands. The construction of ceremonial features into outstanding physical landmarks or geographical epicenters reflects the emergency of complex social relations and power structures towards large territories and transitional ecological scenarios.

The project has focused along a transect crossing four main environmental domains in Santa Catarina, southern Brazil, from the Atlantic coast towards the La Plata (Paraná river) basin, a large territory traditionally occupied by Je speaking societies. Into this area archaeological evidence for the presence of Je speaking peoples goes way back to around 2000 years ago, across this wide and ecologically diversified territory. Je speaking societies (Xokleng and Kaingang) are still living into this area, opening space for meaningful cultural connections between archaeological scenarios and present day societies, a deep perspective of indigenous history which this project aims to contribute.

Past Je landscapes are highly structured in social terms, with local communities organized around ceremonial and funerary architectural complexes built in strategic locations, usually centralized as regards communities distribution, and taking advantage of scenic natural features. Settlements include large and well-planned pithouse villages, open-air locations and rock shelters with distinctive engravings and paintings on the wall. Another research focus is the much discussed relationship between the distribution of prehistorical Je sites and the *Araucaria* forest, supposedly expanded by means of anthropic management.

Field research has focused in three different and regionally diversified areas of the Santa Catarina state (figure 1). The plateau, a flat and elevated planate extension trimmed by deep valleys where open grasslands (*campos*) and *Araucaria* forest patches predominate; the *Encosta* (piedmont) area with wide valleys among elongated mountain ranges, occupied by dense Atlantic tropical forest; and the coast, where sandy and boggy environments predominate, and the forest mingles with coastal vegetation.

Sites studied into these areas represent a culminant moment of the expansion of Je speaking peoples across the southern Brazilian plateau and adjacent areas, thus propitiating an excellent setting for investigating Je social and cultural diversity as regards the ecological variability along them. Integrating archaeology, ethnography and paleoecology, the main questions for this approach are:

- how did the Je peoples organize themselves in regional scale, taking into consideration the ecological patchiness along these areas?

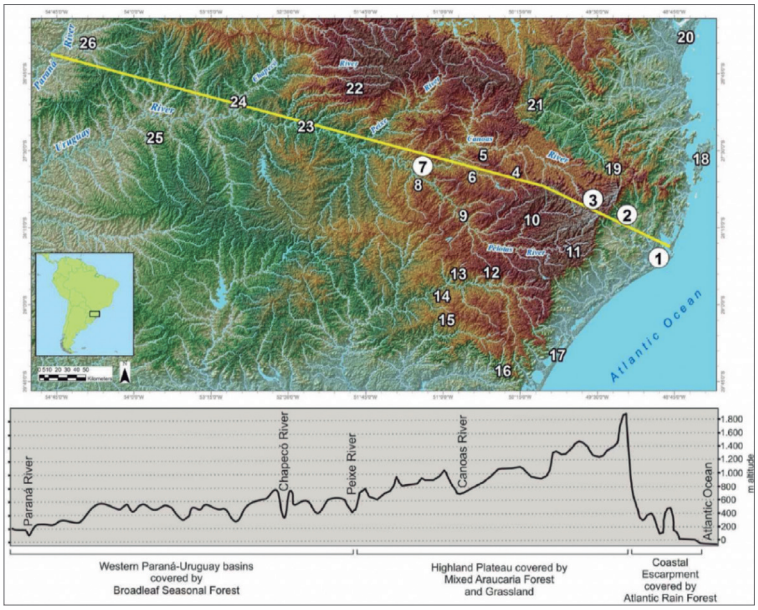

Figure 1. Transect across the areas of interest of the Je Landscapes of Southern Brazil project, highlighting the areas where fieldwork has actually taken place: 1 coast, 2 encosta, 3 Urubici e 7 Campo Belo do Sul, among other areas of the Je territory.

- what is the role played by environmental managing in such a population expansion, considering the intensification of plant domestication and food production but, also, the coeval Araucaria forest expansion that has taken place around a thousand years ago?

- are there social and spatial patterns (or principles) for these groups that can be perceived across the diversity of environmental domains and their extensive chronology, including the historical and ethnographic record available for them?

- finally, how did they interact with former populations on these territories, and also among themselves?

MAIN PUBLICATIONS

Robinson, Mark José Iriarte, Jonas Gregorio De Souza, Rafael Corteletti, Priscilla Ulguim, Michael Fradley, Macarena Cárdenas, Paulo DeBlasis, Francis Mayle and Deisi Scunderlick. 2017. Moieties and mortuary mounds: dualism at a mound and enclosure complex in the southern Brazilian highlands. *Latin American Antiquity*. **28(2)**:232-251. doi:10.1017/laq.2017.11.

Robinson, Mark, Jonas Gregorio de Souza, S. Yoshi Maezumi, Macarena Cárdenas, Luiz Pessenda, Keith Prufer, Rafael Corteletti, Deisi Scunderlick, Frank Mayle, Paulo DeBlasis, and José Iriarte. 2018. Uncoupling human and climate drivers of late Holocene vegetation change in southern Brazil. *Nature Paper* #SREP-18-01368A.

Souza, Jonas Gregorio de, Mark Robinson, Rafael Corteletti, Macarena Lucia Cardenas, Sidnei Wolf, Jose Iriarte, Francis Mayle, Paulo DeBlasis. 2016. Understanding the chronology and occupation dynamics of oversized pit houses in the southern Brazilian highlands. *PlosOne*. **11**, e0158127 (D-15-47625R2).

SUMMARY OF RESULTS

This project has produced a consistent chronology for Je occupation during the late prehistorical times (1200 years ago approximately) to present times, establishing a reliable connection between prehistorical evidences and ethnographically known Je speaking societies, even to the remaining Je peoples to this day, allowing for deep indigenous history approaches. In addition, spatial correlates for sophisticated social structures have been documented in the past, allowing for modelling the existence of enduring social organization and cultural patterns.

The enduring occupation of specific and important sites has been enhanced, both residential and ceremonial. Large villages have documented a sedentary way of life, reinforced by the documented presence of domesticated plants. Excavation has exposed residential configurations including pithouses, organized kitchens with plenty of ceramic ware, and spatially integrated open activity areas. In some sites, both residential and ceremonial, spatial disposition vividly suggest the dual social organization patterns described ethnographically, making a strong connection between past and present day Je societies.

To conclude, Araucaria forest dispersion seems indeed to have been deeply connected with Je dispersion, a product of human management along the last two thousand years.

BIOPHYSICAL STUDIES OF THE STRUCTURE/ FUNCTION OF ANTIMICROBIAL PEPTIDES AND ENZYMES ISOLATED FROM EXTREMOPHILE ORGANISMS

This project would use novel developments for spectroscopic characterization of these AMP in liposomes, lipid films and lipid monolayers to establish the mechanism of action and optimize the design of novel related peptides as bacteriocins. The project will also focus on the identification and characterisation of new hyper-stable enzymes isolated from petrochemical sources. Extremophiles isolated from hot oilfield waters produce a range pf enzymes that exhibit both thermostability and stability in non- aqueous solvents, that give them potential for use in industrial applications where their unique properties are compatible with bioprocessing and biomodification requirements. This project will examine the thermal stability and environmental stability factors associated with enzymes from extremophile isolates using a range of novel spectroscopic methods, including SRCD and fluorescence. The functional enzymatic properties would be correlated with structural features, in particular in organic, lipophilic and other non-aqueous milleux.

PRINCIPAL INVESTIGATORS

ANA PAULA ULIAN DE ARAUJO
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ABOUT THE PROJECT

FAPESP Process 2015/50347-2
Term: Oct 2015 to Mar 2018
Regular Research Grant
UKRI – BBSRC

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ANTIMICROBIAL RESISTANCE IN BRAZILIAN PIG AND POULTRY PRODUCTION AND ITS CONTRIBUTION TO THE SUCCESS OF *SALMONELLA SEROTYPES*

This study aims to evaluate the evolution of antimicrobial resistance (AMR) phenotypes and genotypes in *Salmonella enterica* from swine and poultry production in Brazil, over the last ten years, and determine the impact of AMR profiles on the dynamics of serotypes spread on both animal species. Strains from the FMVZ/USP collection will be submitted to multiplex PCR serotyping, AMR profiling and further whole genome sequencing. Expected results include improving the knowledge of AMR epidemiology and resistance genes transmission dynamics in *S. enterica* from swine and poultry, as well as training of the involved research groups.

PRINCIPAL INVESTIGATORS

ANDREA MICKE MORENO
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ABOUT THE PROJECT

FAPESP Process 2017/50453-2
Term: Jun 2018 to May 2019
Regular Research Grant
UKRI – BBSRC (Newton Fund)

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RESOLVING MECHANISTIC DETAILS OF PEPTIDE TRANSPORT ACROSS MEMBRANES USING CRYSTALLOGRAPHIC AND NON-CRYSTALLOGRAPHIC STRUCTURAL BIOLOGY APPROACHES

Extending our recent new crystallographic structural models, ESR DEER and MD (Fowler et al., (2015) Structure, 23(2):290- 301 - front cover feature), we now aim to define the reaction coordinates for two peptide transporters from the bacteria Shewanella oniedensis (PepTSo) and from Streptococcus thermophilus (PepTSt). Both the conformational changes associated with discernible Intermediates in the transporter pathway(s), as well as the lipid dependence of the various stages are currently not described, and so will be addressed here using underpinning molecular biology approaches in Oxford and Sao Paulo. The response of the transporter to the proton motive force (pmf) in sealed systems, and the nature of the ligand binding environment, will also be examined, giving new Information about direct coupung of peptide transport to the energetics that drives function, with a view to defining electromechanical coupling within this important drug facilitator. To do this we will: - direct the design of spectroscopic studies of membrane-embedded peptide transporters using currently available, as well as new crystal structural and MD generated models; – use the spectroscopic and functional Information to determine conformational and dynamic details of membrane – embedded transporters, and generate novel detailed molecular models of reaction intermediates; With a final goal of describing the mechanism of action, lipid dependence and conformations of reaction intermediate states of peptide (and other homologues) transporters in molecular and kinetic detail.

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2015/50366-7
Term: Nov 2015 to Oct 2019
Regular Research Grant
UKRI – BBSRC

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NUCLEUS: A VIRTUAL JOINT CENTRE TO DELIVER ENHANCED NITROGEN USE EFFICIENCY VIA AN INTEGRATED SOIL-PLANT SYSTEMS APPROACH FOR THE UK & BRASIL

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2015/50305-8
Term: May 2016 to Apr 2019
Thematic Project
UKRI – BBSRC (Newton Fund)

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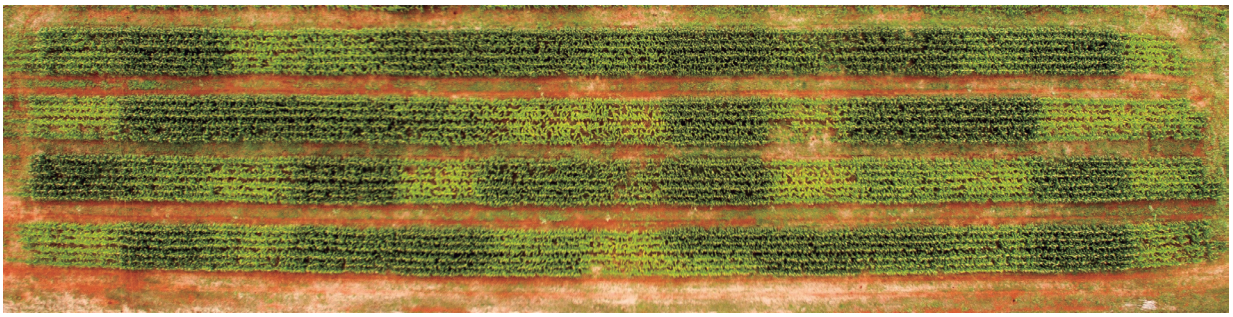
The Joint Virtual Centre will focus on enhancing our understanding of key agronomic aspects of nitrogen use efficiency (NUE) and improve the synchronicity between plants need for N and soil N availability that diminishes N losses. We aim to achieve this via investigating the main nitrogen pathways in the soil-plant-atmosphere continuum and identifying how N pools least prone to losses can be managed aiming at a more efficient use of N by crop plants. Our specific aims are:

- To address research gaps in our understanding to improve NUE and priorities including: Sensor Technologies to Improve NUE; Linking the Impacts of Soil Physical Condition and N Cycling on Plant Growth; Manipulating Plant Root Systems for Improved NUE; Enhancing NUE through Soil Amendments; Increasing Agronomic NUE in flooded and rain-fed rice production.
- A strong focus on capacity building, engagement and support of Early Career Scientists through exchange, joint-supervision, training activities and collaborative research.
- A series of workshops, training activities and other dissemination events over the duration of the project, ensuring the maximum possible impact for the research.



Maize response to nitrogen when grown after forage grasses in Brazil

SUMMARY OF RESULTS

- The number of wheat nodal axes increases with nitrate availability, and when water is withheld, the growth limiting stress is most likely to be root impedance.
- Total soil porosity is higher in zero Tillage (ZT-19.7%) compared to conventional tillage (CT-14.3%), but the number of pores is almost twice in CT. Long-term adoption of ZT leads to higher porosity and connectivity of pores which is likely to have positive implications for nutrient cycling, root growth, soil gas fluxes and water dynamics.
- The use of palisade grass in rotation with maize can mitigate ¬¬NH3 losses to the atmosphere, but there are no differences between forage grasses as related to GHG emissions, N2O emission factor, and yield-scaled emissions.
- The activity of ammonifying microorganisms is not affected by ruzigrass, which increases the soil N nitrification potential when compared with palisade grass and Guinea grass. Biological nitrogen fixation might be an important input of N in cropping systems with maize and forage grasses.
- In soil poor in N, maize grown after ruzigrass, palisade grass and Guinea grass is efficient in acquiring soil N, resulting in negative balance even with the application of up to 210 kg h-1 of N.

MAIN PUBLICATIONS

Rosolem CA, Ritz K, Cantarella H, Galdos MV, Hawkesford MJ, Whalley WR, Mooney SJ. 2017. Enhanced plant rooting and crop system management for improved N use efficiency. *Advances in Agronomy*, doi:10.1016/bs.agron.2017.07.002, p. 205-239.

Galdos MV, Pires LF, Cooper HV, Calonego JC, Rosolem CA, Mooney S.J. Assessing long-term effects of zero-till on the porosity of Brazilian soils using X-ray Computed Tomography. *Geoderma* (in print).

Ge Y, Hawkesford M, Rosolem CA, Mooney S, Whalley R. The effects of root impedance, water availability and nitrogen availability on the early growth of wheat: a comparison of two growth systems. *Physilogia Plantarum* (in print).

DISSECTING ESSENTIAL ROLES OF CHIKEN INTERFERON STIMULATED GENES IN THE PATHOBIOLOGY OF POULTRY VIRUSES

PRINCIPAL INVESTIGATORS

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FAPESP Process 2014/50696-4
Term: Mar 2015 to Aug 2018
Regular Research Grant
UKRI – BBSRC

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To initiate successful virus replication cycle, viruses have to breach a cascade of host cellular responses. Among these barriers, innate immune responses are most potent and independent to nature of pathogens. The objectives of this work are to define the interactions of chicken interferon stimulated genes (chISGs) with diverse poultry viruses that are of economic importance both in Brazil and UK. Our preliminary transcriptomic and expression analysis indicate that chISGs are the most potent responses of the chicken infected with Marek's disease virus (MOV) indicating that chISGs essentially mediate pathobiology of viruses. In this proposal, we will dissect the significance and breadths of chISGs against poultry viruses using large-scale, genome-wide and high through put screen platforms. Specifically, we will simultaneously measure the temporal expression of ISGs that synergistically or antagonistically regulate specific virus replication using a pre-established lentivirus-based ISG library. We will combine this data with results gain through shRNA mediated silencing screening to catalogue chISGs with broad-spectrum or virus specific chISGs. These data will be integrated within mechanistic studies to provide an incredible rich data on how viruses interact with host immune responses, essentially contributed by ISGs. and the ways viruses have adapted to circumvent these responses. These experimentations will be performed with avian influenza virus, avian paramyxoviruses and Marek's disease virus in The Pirbright Institute, UK and with avian metapneumoviruses and infectious bursal disease virus in State University of Campinas, Brazil using homogeneous system in two laboratory settings. Finally, the gained information will be utilized to establish a cell line having profound favorable effects on the growth kinetics.

LIGNIN VALORIZATION IN CELLULOSIC ETHANOL PLANTS: BIOCATALYTIC CONVERSION VIA FERULIC ACID TO HIGH VALUE CHEMICALS

Lignin can be obtained as a by-product of cellulosic ethanol production, and is a potential source of renewable chemicals, if methods for lignin valorization can be developed. Efficient valorisation of lignin is a major unsolved problem in the development of sustainable biorefineries. The proposal builds upon an existing BBSRC partnership award, and brings together expertise in biocatalyst discovery and lignocelullose ethanol production (CTBE) with expertise in biocatalytic lignin valorization (Warwick) and biocatalysis for high value chemicals production (Manchester, UCL) The overall aim is to generate new methods for lignin valorization via intermediate ferulic acid, which has been generated from lignin in previous PI's works. The project will involve the following work packages: 1) optimization of lignin generation from cellulosic bioethanol; 2) conversion of lignin to ferulic acid from lignin using synthetic biology; 3) enzymatic conversion of ferulic acid into pharmaceutical L-Dopa; 4) biocatalytic generation of high value fragrance chemicals (coniferyl acetate, isoeugenol) from ferulic acid; 5) bioprocess and scale-up of chemicals production from renewable feedstocks; 6) technical and sustainability impact assessment. Technology developed in the project could be applied to major plant feedstocks used in Brazil (sugar cane) or the UK (wheat).

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Thematic Project
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INTEGRATED ENZYME DISCOVERY AND PATHWAY OPTIMIZATION FOR BAGASE VALORIZATION

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The ultimate aims of this project are i) to utilize a microbial metagenomics platform to enable novel enzyme building block discovery and identification, ii) to assess the capabilities and of the bacteriallignin peroxidase treatment against sugarcane bagasse lignin, iii) to integrate these building blocks into suitably engineered host chassis using synthetic biology principies and to engineer convergent biosynthetic pathways to valorized lignin using multiple feedstocks, iv) to assess these integrated recombinant systems under high-density cell fermentation, using bioprocess analysis to optimize pathway flux and process design space. The pump-priming project will contain a number of activities focused on collaboration building and partner integration, and a number of praclical activities focused on gathering preliminary proof of concept experimental data.

THE ECOSYSTEM RESPONSE TO URBAN TRANSFORMATION: THE IMPACT OF RAPID URBANIZATION ON THE SOCIAL DEMOGRAPHICS OF ECOLOGICALLY SIGNIFICANT INSECT SPECIES

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The International Cooperative Biodiversity Group (ICBG) Program addresses the interdependent issues of drug discovery, biodiversity conservation, and sustainable economic growth (http://www.icbg.org/). Our ICBG brings together an interdisciplinary leadership team of physicians, pharmacologists, evolutionary biologists, and chemists that will discover and develop therapeutic agents produced by Brazilian bacteria. The team will target three therapeutic areas: 1) infectious fungal diseases, 2) cancers of the blood, and 3) Chagas disease, ali of which urgently require new therapeutic agents to meet unmet needs. Invasive fungal diseases are a challenge to human health and now kill more people than malaria or TB. In spite of major improvements in cancer chemotherapy, cancer will kill 8-million people around the world this year (13% of ali deaths, WHO) and an estimated 13-million in 2030. Chagas disease imposes a special burden on Brazil, which has roughly half the world s patient population (4-million Brazilians), and the disease kills as many Brazilians as does TB. The ICBG has focused and separate screening platforms for ali three diseases that can perform ali required steps from primary screens through in vivo mouse model studies. The ICBG will focus on the bacterial symbionts of social insects like the fungus-growing ants as these insect communities have specialized bacterial symbionts that provide chemical defenses against pathogenic fungi that threaten their communities. The ecological role of the bacterially produced chemical defenses killing pathogenic fungi but sparing the fungal gardens and the insect host matches the therapeutic requirements for antifungal, anticancer, and antiprotozoal agents. The population levei diversity of the bacterial producers will also provi de multiple variations of a structural family, which will be very useful in supporting a discovery and development pipeline. The discovery efforts will make extensive use of cutting edge technology and genomic approaches. Bacteria will be micro-cultured for high-throughput primary phenotypic screens, and priority actives will be re-cultured for secondary screens and then dereplication. Ali bacterial strains will be genotyped (16S), and strains advancing along pipelines will have their genomes sequenced and subjected to bioinformatic analysis. In addition, the ICBG will undertake major efforts to catalog Brazil's microbial diversity, train Brazilian scientists, and support the development of drug discovery in the country.

COMBATTING PEST RESISTANCE IN MAJOR BRAZILIAN CROPPING SYSTEMS THROUGH NOVEL BIOTCHNOLOGICAL APPROCHES

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This proposal seeks to address major concerns relating to economically important insect pests in Brazilian agricultural, through the development and use of novel, efficacious and safe biopesticides. One of the target insect pests selected for study is the native, polyphagous armyworm *Spodoptera fugiperda*, which has evolved resistance to a number of chemistries and the transgenic tools currently available for applied pest control (Bt plants). The recent spread of this species 10 Africa and its polyphony and resistance to several pesticides makes this species a real threat to the agriculture of the whole tropical and subtropical areas of the Old World and Asia. The other species selected is the invasive Old World bollworrn *Hetícoverpa armigera* (for Phase 1). This species has devastated large areas of agricultural crops in Brazil is causing severe damage to cotton and soybean plantations. Most of the severe damage caused is due the insensitivity of the invasive population to the pesticides used in Brazil. Therefore, this project is aimed at generating information and new technologies to fight these pests and overcome the existing resistance mechanisms. In order to achieve these goals our main objectives are 1) Design novel biopesticides using species-specific dsRNAs against target pests by in silico approaches; 2) Produce dsRNAs for preliminary toxicity testing using injection and artificial diet bioassays with selected insect pests; 3) Generate metatranscriptomic data of gut associated microbials of *S. frugiperda* and *H. armigera* to design novel biopesticides using species-specific dsRNAs targeted to obligate insect symbionts; 4) Exploit insect gut symbionts as insect-target dsRNAs delivery systems; 5) Identify suitable molecular targets in selected insect pests (*Spodoptera frugiperda* and *Heliocoverpa arrniqera*) resistant to conventional pesticides using in silico approaches.

UNDERSTANDING NOVEL FUNCTIONAL MECHANISMS OF CONCEPTUS MATERNAL INTERACTIONS TO HELP IMPROVE PREGNANCY OUTCOME IN CATTLE

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Livestock farming supports the economic livelihood and food security of almost 1.3 billion people worldwide. One factor affecting the economic efficiency and sustainability of beef and dairy farming is poor reproductive outcome associated with embryo mortality. The majority of pregnancy loss occurs in the first three weeks and some of this loss can be attributed to dysfunction in communication between the embryo and the maternal environment. The endocrinological communication between the mother and the embryo (maternally-derived progesterone and the conceptus-derived pregnancy recognition signal Interferon Tau) have been well described. Novel non-endocrinological cross-talk between the conceptus and the mother, in the form of extracellular vesicles (EVs), has been less well described. This novel mode of conceptus-maternal communication may be the key to the step change we are seeking in improving agricultural efficiency. This proposal will address how EVs contribute to conceptus-maternal cross talk by investigating the composition of EVs derived from embryos with different developmental potential (high quality, in vivo embryos: intermediate quality, in vitro embryos; low quality, cloned embryos). The components of EVs which are incorporated into the endometrium will be determined by exploiting the sub-species sequence differences in transcript between Bos taurus (embryos) and Bos indicus (maternal environment). Analysis of how components of these EVs affect endometrial function will be determined in vitro. Differential fluorescent labelling of a membrane protein that encodes EVs in cloned embryos derived from a male and female lines will determine what conceptus-derived EV components get into maternal circulation and how these differ between conceptuses of different sexes. Collectively this will enhance our fundamental understanding of what contributes to early pregnancy success and will generate novel targets for manipulation to overcome early embryonic loss.

THE GENETIC ARCHITECTURE AND EVOLUTION OF PLEIOTROPY ASSOCIATED WITH EVOLUTIONARY CHANGES IN DEVELOPMENTAL TRAJETORIES

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Individuals are composed of suites of traits that arise from a common genome through shared developmental processes that together determine their fitness. Consequently, fundamental to our understanding of the genetic basis and evolution of complex traits is the concept of pleiotropy, where a single gene affects the expression of multiple traits. Although patterns of pleiotropy have important genetic and evolutionary implications, we have a limited understanding of their genomic basis and evolution. We propose to advance our understanding of pleiotropy using an experimental system in which multivariate selection has been used to reshape patterns of growth and development in mice. By focusing on developmental traits we will also further our understanding of the relationship between the traits produced by the developmental system. To achieve our goals we will apply cutting edge computational tools in an experimental population created by intercrossing mouse strains with highly divergent ontogenies. Using these tools we will map molecular variation to multidimensional phenotypic variation to achieve the following objectives. 1) Characterize the patterns of pleiotropic effects that contributed to multivariate evolution 2) Examine whether pleiotropic effects constrained the patterns of genetic variation 3) Determine the role that context-dependent pleiotropic effects played in shaping patterns of multivariate evolution 4) Determine the contribution of maternal effects to patterns of pleiotropy 5) Understand how ontogenetic changes impact patterns of pleiotropy among adult traits, 6) Determine the contribution of genomic imprinting to patterns of pleiotropy.

DEVELOPMENT OF A UK-BRAZIL PARTNERSHIP TO TACKLE FUNGAL FOOD SPOILAGE AND IMPROVE FOOD SECURITY

The aim of this proposal is to develop a new UK-Brazil collaboration to tackle this devastating impact of fungal food spoilage on food security. The Investigators' complementary expertise provides an outstanding opportunity to combine strengths aligned around respective BBSRC and FAPESP funded projects in this area. This project will provide the travel and exchange needed for these Investigators to come together, share expertise and ideas, and initiate a collaborative research programme that will attract long-term funding. Underpinning this aim will be a focus on delivering exchange opportunities for younger scientists, so that the next generation will be equipped with the range of skills we offer to become future leaders in the food security field. Our partnerships with industry will facilitate stakeholder engagement and socio-economic impact.

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NEW APPROACHES TOWARDS IMPROVED FUNCTIONALITY OF SACCHAROLYTIC ENZYMES FROM FUNGI

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This is a bilateral UK-Brazil proposal that brings together scientists from three leading laboratories that have current research into the use of filamentous fungi to produce enzymes for the saccharification of wheat straw (UK) and sugar cane bagasse (Brazil). Their existing data underpin the proposal that will use Aspergillus niger, Trichoderma reesei and Penicillium chrysogenum to provide new knowledge on aspects of the saccharification process. Those species respond to the lignocellulosic materials in different ways, especially with the induction of glycosyl hydrolases (GHs) and accessory proteins that optimise the functionality of the GHs. The market is already reasonably well-served with cellulases from fungi (mainly Trichoderma reesei) but less so with hemi-cellulases and accessory enzymes or non-enzymic proteins that assist in the process. Our preliminary data provide new leads relating to accessory proteins and also with the signals that regulate gene expression at the appropriate time when Aspergillus and Trichoderma are exposed to wheat straw. This project will build on those data to include sugar cane bagasse as another lignocellulosic material and the project will test the following hypotheses: i) that the combined polysaccharide-degrading activity of multiple fungi from distinct genera is more effective than that of each species alone, as this more accurately reflects plant cell wall degradation in nature; ii) that the functionality of fungai enzymes used in the saccharification of lignocellulose can be enhanced by previously undiscovered proteins that do not themselves catalyse the saccharification of lignocellulose.

UNDERSTANDING THE ROLE OF HOST PATHOGEN INTERACTIONS AND THE IMPACT OF MANAGEMENT SYSTEM ON THE DEVELOPMENT OF ANTIMICROBIAL RESISTANCE IN BRAZILIAN LIVESTOCK SYSTEMS

The hypothesis of this trial is to verify if there are differences associated with system and agro ecological zone in terms of the prevalence of AMR. Dietary and management interventions (such as tannins) might alter the microbiome of the host animal to alter its level of AMR. To test this, we would sample faeces from beef animals of different ages from a range of different systems and agro ecological zones. The faecal samples will be analyzed for functional metagenomics of AMR (at CENA), microbiome composition by 168 RNA (at UoR) and fecal culturing to determine phenotypic AMR (at CENA). Forage samples would be taken for analysis of chemical composition and secondary plant metabolites/bioactive compounds by NMR (at UoR). From those data, we will determine which agro ecological zones/ systems would be associated with high or low prevalence of AMR. In the second phase, in more controlled studies, we would then aim to alter the microbiome of the high AMR animals to mirror those of the low AMR animals. At this point, we would also investigate the range of AMR associated with soil microbiome in different regions.

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XANTHOMONAS CITRI SUBS. CITRI, CAUSAL AGENT OF CITRUS CANKER: MOLECULAR EPIDEMIOLOGY AND ASSESSMENT OF LYTIC BACTERIOPHAGE AS BIOCONTROL AGENTS

Asiatic Citrus Canker (ACC) is a serious, untreatable infection of citrus trees that threatens sweet orange production in the state of Sao Paulo – a key industry economically. ACC is caused by the bacterium Xanthomonas citri subsp. citri. Infection with this organism necessitates removal and destruction of infected trees and prevention measures typically rely on the use of spraying with environmentally harmful copper bactericides. I this project we will examine the current genetic diversity of X. citri from infected plants in Sao Paulo using whole genome sequencing. This will allow us to study how the pathogen is spreading in an endemic situation - after the changes in legislation allowing the presence of the bacterium in the orchards. This information will give us important knowledge regarding its population biology. In this project, we will also isolate and characterize *X. citri* specific viruses (known as bacteriophage). Bacteriophages are proposed as an alternative to antibiotics in human health and they are currently used in the food industry eg for controlling Listeria contamination in cheese production. They are also used in the control of bacterial infections in tomato and pepper crops in the United States. We will isolate and characterize a large collection of bacteriophage from infected plant material to assess their suitability for use in biocontrol of ACC. This initial pump-priming proposal will be developed in years two and three to include in vitro infection studies in greenhouse using bacteriophages as treatments or protective agents. We will also investigate bacteriophage host-binding structures as possible species-specific ligands for delivery of antimicrobial.

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FAPESP Process 2017/50454-9
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TARGET ANALYSIS OF MICROBIAL LIGNOCELLULYTIC SECRETOMES: A NEW APPROACH TO ENZYME DISCOVERY

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From both a fundamental and industrial biotech viewpoint understanding the deconstruction of lignocellulose in soil and compost is of central importance. In the natural environments microbial communities can efficiently degrade or modify lignin to enable the effective enzymatic hydrolysis of the polysaccharides present in plant cell walls. The aim of this proposal is to use metatranscriptomics and proteomics to determine gene - and protein - centred details to determine new mechanisms and improved methods of lignocellulose deconstruction in mixed microbial communities from composting wheat straw and sugar cane bagasse. Secreted proteins will be tagged, affinity purified and analyzed by LC-ESI-MS. In order to have a picture of the overall community dynamics in terms of species composition during the composting process DNA will be extracted for SSU rRNA profiling: Saccharification of the lignocellulose will be monitored and the lignin content of the straw or bagasse analyzed using FTIR spectroscopy and solid state NMR. Metatranscriptome analysis will be performed by preparing cDNA from samples taken at various time points from the lignocellulose enriched cultures, the cDNA will be sequenced using the Roche 454 GS FLX Titanium platform. The peptide sequences from the proteomics analysis will allow the identification of full and partial coding sequences in the library. These coding sequences will be cloned and expressed in established recombinant expression systems and the recombinant proteins screened for activity.

DEFINING THE GENETIC AND SEMIOCHEMICAL BASIS OF TICK RESISTANCE IN CATTLE

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Ticks have major impacts on animals and humans by transmitting disease and causing weight loss and anaemia. Acaricides are used for tick control, but this is problematic due to resistance and chemical residues. Bovines differ substantially in tick load, and this is genetically controlled. We hypothesize that the primary means by which host cattle differ in tick resistance is via their semiochemicals profiles, i.e., attractant/repellent volatile chemicals on the skin surface, with 6-methyl-5-hepten-2-one being our primary candidate. We will perform a GWAS for tick resistance, characterize the semiochemicals which differ between cattle resistant or susceptible ticks, identify genes differentially expressed between resistant and susceptible animals, integrate the results to obtain insights into the genetic and biochemical basis of tick resistance, and devise control options. The GWAS will be performed on >1000 Girolando cattle in Brazil, which will have been intensively phenotyped for tick burden, with detailed epidemiological data collected (to identify risk factors). GWAS will be performed using data from the high density bovine SNP chip, giving >750,000 genotypes per animal, and analysed with state-of-the-art techniques. From skin rubbings from animals with extreme tick counts, semiochemical profiles will be characterised using high resolution chromatography (GC, HPLC) and spectroscopic analysis. Gene expression will be performed using RNAseq on skin biopsies from extreme animals, before and after infestation, and pathways co-expressed with resistance determined. These data will inform on the true extent of genetic control, the underlying mechanisms and indicate actual loci contribution to variation. Validated SNPs for resistance will be identified, as will potential semiochemicals to be used as repellents.

DISSECTING THE CONTRIBUTIONS OF EFFECTOR PROTEINS SAP11 AND SMP11 TO PHYTOPLASMA SYMPTOM DEVELOPMENT IN ARABIDOPSIS AND MAIZE

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Phytoplasmas are vector-borne bacteria associated with various plant diseases. They have virulence proteins that interfere with plant development and aid disease spread in nature by affecting plant defenses against vectors. This project builds on functional data for the Aster yellows phytoplasma strain Witches' Broom (AY-WB), which secretes a virulence protein SAP11 that alters plant development in Arabidopsis and vector-plant interactions, by degrading TCP plant transcription factors. The goal is to investigate the contribution of SAP11 homologue (SMP11) to the virulence of Maize bushy stunt phytoplasma (MBSP), an important pathogen of Zea mays L. To pursue this goal, we will (1) investigate if SAP11 and SMP11 interact with various classes of Arabidopsis and maize TCPs, (2) study variations in genome and SMP11 sequences and symptom induction of MBSP isolates, and (3) identify TCP protein sequences that are involved in interactions with SAP11/SMP11. We expect to determine which sequences ín SAP11 and SMP11 are involved in TCP binding and use this information to predict the specificity of SAP11 homologsin other phytoplasmas, as well as to determine tf SMP11 induce bushy symptoms in MBSP-infecfed maize, and influence the reproduction of the leafhopper vector, Dalbuius maidis. From objective 2, we hope to identify variation in SMP11 genes among MBSP strains and how they may interact with the plant host TB1/C1N-TCP transcription factors resulting in symptoms and increased maize susceptibility to D. maidis. Finally, in objective 3 we will have identified the TCP domains/residues that are involved in SAP11/SMP11 binding and SAP11/SMP11-mediated destabilization, and also have collected information for generating transgenic maize lines that are more resistant to MBSP.

BEHAVIOURAL AND NEUROENDOCRINE MECHANISMS REGULATING HYDROMINERAL METABOLISM – A LIFELONG PERPECTIVES

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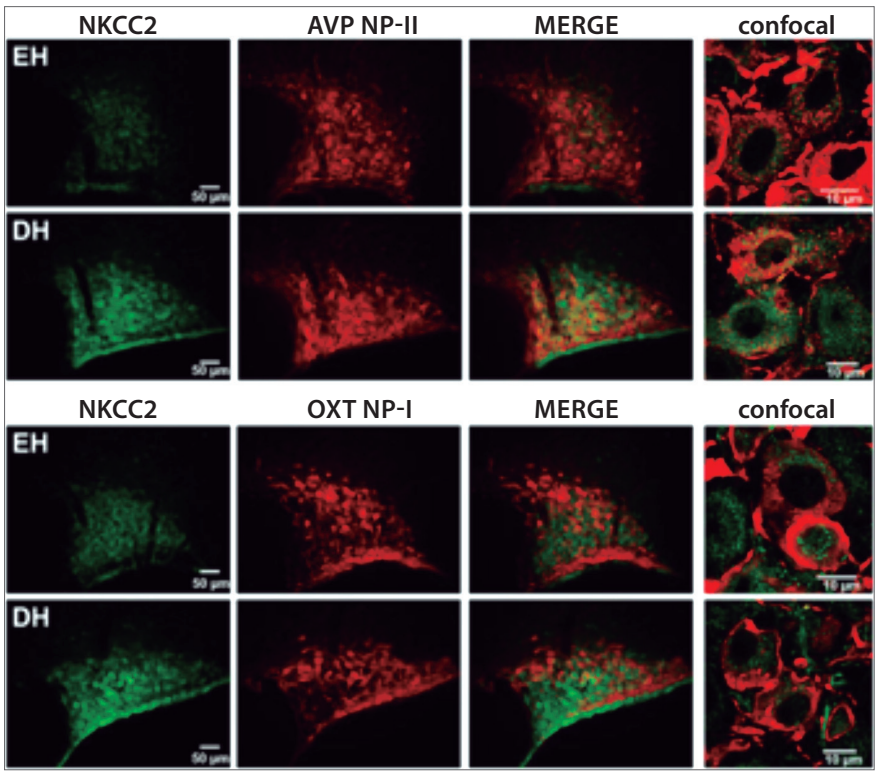
In mammals, challenges such as dehydration or hemorrhage trigger important adjustments in water/salt ingestion/excretion through the activation of neuroendocrine and behavioral mechanisms. The paraventricular nucleus of the hypothalamus (PVN) is well known for producing hormones that regulate these functions. Prof. David Murphy's research group cataloged the PVN transcriptome and described that, in response to fluid withdrawal for 36 hours, there is a significant increase in gonadotrophin-induced transcription factor 1 (Giot1) expression, as well as Rasd1, a GTPase. By inhibiting or overexpressing these genes in PVN using lentiviral vectors, these researchers demonstrated the importance of these proteins in regulating salt and water appetite. In addition, the functioning of these systems apparently deteriorates with age and may also be altered by exposure to a high salt content in neonatal life. Thus, the general objective of the study was to decipher the molecular mechanisms by which PVN controls the appetitive behavior and the neuroendocrine mechanisms involved in the control of hydro saline homeostasis.



The Na-K-2Cl cotransporter 2 (NKCC2) is expressed in vasopressinergic and oxytocinergic neurons following dehydration. Immunocytochemistry reveals that transcripts from the gene that encodes NKCC2 (Slc12a1) expressed in the supraoptic nucleus (SON) are translated into NKCC2-like material that colocalizes with both vasopressin and oxytocin. This is particularly evident in the higher magnification confocal images. Comparing the low level of NKCC2-like material in euhydrated (EH) rats with 3 d dehydrated (DH) animals reveals an increase in immunoreactivity following osmotic stimulation (Konopacka et al, 2015).

SUMMARY OF RESULTS

Under basal conditions, the knockdown of the neuronal NOS enzyme in the hypothalamus increased water intake and urinary volume, and these responses were abolished in animals exposed to saline overload for 4 days and submitted to gene silencing. The CB1 receptor knockdown in the central amygdala increased spontaneous sodium intake and urinary volume, but induced a reduction in urinary osmolality. Through the challenge of water deprivation, these animals ingest sodium earlier, indicating an increased appetite for this ion. In response to the hyposodic diet, on the other hand, transcriptome analysis showed that approximately 70% of the evaluated genes had their expression reduced in the hypothalamus, among them those encoding AVP and OT. Transcriptomic analysis of the hypothalamus of adult animals from mothers treated with 0.9% NaCl during gestation and lactation revealed altered expression of several balance-related genes from classic (*Gabrg2, Slc6a11, Gria4*) and unconventional neurotransmitters (*Ddah1* and *2*, *Mgll*), as well as elements related to intracellular signaling pathways (*Creb3l1*).

MAIN PUBLICATIONS

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ROLE OF ENDOSOMAL SORTING MACHINERY CONTROLLING AMPA RECEPTORS TRAFFICKING IN THE HIPPOCAMPUS

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Trafficking of glutamatergic AMPA receptors (AMPAR) plays a crucial role in modulating synaptic transmission in the hippocampus. AMPAR density at postsynaptic sites is thought to be determined by a combination of constitutive and signal-regulated protein trafficking pathways that comprise of polarized sorting from the trans golgi network (TGN) to somatodendritic membranes, endocytosis, endosomal recycling and lysosomal targeting. Sorting of transmembrane proteins at the plasma membrane, the TGN and endosomes is mediated by interactions of sorting-motifs present in the cytosolic tail of transmembrane proteins with adaptor molecules that are components of vesicle coats. Consistently, the cytosolic tail of AMPAR subunits was shown to contain information crucial for sorting. The four family members of heterotetrameric adaptor protein (AP) complexes mediate protein sorting at the late secretory pathway, and have been implicated in transport of AMPAR. GluA2 binds specifically to AP-2 and this interaction is required for GluA2 internalization following long-term depression stimuli. We have recently discovered a new interaction between endogenous activity-regulated cytoskeleton (Arc, also known as Arg3.1) Arc/Arg3.1 protein and the AP-2 complex. Over the past decade, findings from several studies showed that Arc/Arg3.1 controls changes in synaptic transmission by increasing endocytosis of AMPAR subunits 1 and 2. However, the direct link between Arc/Arg3.1 expression and the incorporation of AMPAR into the endocytotic machinery has not yet been shown. AP-2 could be the link missing as it binds directly to AMPAR subunit 2. Therefore, the main aim of this proposal is to confirm the interaction between AP-2 and Arc/Arg3.1 protein and show its functional role on surface expression of AMPAR subunits.

CELLULAR AND REGULATORY BASIS FOR EARLY PLANT ORGAN GROWTH

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This project will combine resources and expertise from the UK and from the Brazilian partners to clarify how key regulatory genes co-ordinate cell cycle progression and cell growth/ expansion in plant organ primordia. Specifically, we will: 1. use quantitative 3D analysis of cell geometry and cell cycle progression to test the following hypotheses: a) coupling of cell size and cell cycle a key feature of primordium growth that is targeted by growth regulatory genes (based on our unexpected finding that JAG is required to uncouple cell cycle progression from cell volumes in organ primordia); b) regulatory inputs from JAG, ANT and CIN-TCPs alter progression through specific phases of the cell cycle, such as S-phase, and/or alter total cell cycle length during early organ growth. 2. use quantitative image analysis lo clarify at the cellular level the genetic interactions between JAG, ANT and CIN-TCPs and to test whether these regulators converge on common cellular targets or have additive effects on organ growth. 3. identify direct targets of JAG and CIN-TCPs in organ primordia to c1arify how these genes Interface with cell cycle and cell growth control -this will test predictions arising from 1 and 2 above and provide leads lo the molecular basis for the cellular effects of JAG and CIN-TCPs.

ROLE OF EPIGENETIC CHANGES INDUCED BY SCFAS IN INTESTINAL EPITHELIAL CELLS

In the present project, we wish to lest the hypothesis that SCFA regulate innate immunity of intestinal epithelial cells (enterocytes and related cells) by affecting histone modifications, especially modifications that may metabolically directly relate to SCFA, such as lysine acetylation and crotonylation. To test our ideas we will employ intestinal organoid culture ("mini-guts"), mouse models and transcriptome and chromatin analysis to examine the effect of SCFA directly on intestinal epithelial cells. In vivo experiments in which mice will be treated directly or indirectly (fibre) with SCFAs will also be performed in orther to analyse the relevance of the findings in vitro. To reach the proposed aims, we plan the exchange of three graduation students between the research groups and visits of the researchers involved in this project. We will also promote workshops to increase and to strengthen the scientific collaborations.

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UNDERSTANDING CELL WALL STRUCTURE AND HYDROLYSIS OF TWO LEADING C4 BIOENERGY CROPS TO IMPROVE SECOND GENERATION BIOETHANOL PRODUCTION IN BRAZIL

Despite the advances in the production of second-generation bioethanol from sugarcane, the Brazilian system, with its hundreds of mills capable to efficiently produce first generation bioethanol from sucrose, still lack a solution for ethanol production from bagasse and trash by these mills. The main barrier is that of the high cost of the process, which is impared by the lack of knowledge about cell wall hydrolysis and the high cost of enzymes. At the same time, sustainability of sugarcane production could be greatly improved by increasing its productivity in the field, what would impact positively on land use and lower the competition with biodiversity and food production. The primary aim of this partnership is to conduct underpinning research essential for developing sugarcane biomass as a sustainable feedstock for second generation bioethanol production. This will be achieved by addressing three objectives: start developing integrated specific enzyme cocktails tailored to cell wall biomass properties and pretreatment methods. Initiate 'synthetic biology' approaches for the development of; I) in planta cell wall deconstruction strategies and; II) novel enzymes for increased cell wall hydrolysis efficiency. Evaluation of the impact of different environmental and genetic factors on sugarcane biomass yield and quality, with a view of growing sugarcane on marginal land. A key feature of this Research Partnership is to raise the awareness of available resources and capabilities, to generate essential knowledge and technology exchange. This will benefit and unite the sugarcane and miscanthus research communities in Brazil and the UK, and contribute to the realization of the bioeconomy concept.

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BOVINE MASTITIS: CONTROL BY LOCAL USE OF POLYPLEX NANOPARTICLES

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Mastitis control presents significant challenges, but the nature of the disease also offers opportunities for intervention. The challenges associated with antimicrobial resistance, biofilm formation and invasive strains inspired us to test the potential use of an organic polymer to kill antimicrobial resistant and intracellular pathogens. PHMB offers a compelling opportunity in the *Mastitis area*. PHMB has never been applied within the *Mastitis area*, yet it offers a sim pie "non-antibiotic" way to kill antibiotic resistant and invasive pathogens. We consider that the approach can be developed into an improved teat-dip and (in the longer term) treatment during the "dry off' period". Our approach is to use a non-antibiotic antimicrobial polymer. The main advantage of using an antimicrobial polymer, particularly the one chosen for this study, is that acquired resistance has not been observed. Also, the polymer offers additional advantages, including an ability to kill intracellular bacteria and degrade biofilms. At the very least, an antimicrobial polymer concept is different than the current antibiotic strategies and so worth testing. The main scientific objectives for the pump-prime stage are to: a) Develop an improved non-antibiotic teat-dip formulation using polyplex nanoparticles (PNPs); b) Characterise the *in vitro* host cell invasion and biofilm formation traits of *S. aureus* strains isolated from mastitis cases in Brazil; c) Measure the antimicrobial potencies of PNPs against planktonic, biofilm and intracellular *S. aureus in vitro*; d) Measure PNP adherence to teat surfaces and the speed and duration of antimicrobial action *ex vivo*.

TACKLING MENTAL HEALTH DISORDERS IN FEMALES

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The medial hypothalamus, amygdala and dorsal periaqueductal gray (dPAG) and the inferior colliculus (I C) have been grouped together as an "encephalic aversion system" (EAS). The neural substrates responsible for fear and anxiety of these structures translate information of aversive nature in behavioral and emotional adaptive output reactions. Nowadays, it is believed that the EAS possess a sensorimotor filter that functions as a gating for the threatening stimuli. Malfunctioning of this filter results in maladaptive processing that may lead to anxiety. The understanding of the neurochemical, anatomical and genetic substrates of fear and anxiety must take into account the chemistry of the "defense-system" in a broader approach and prospect. It has been proposed that GABAergic mechanisms are involved in the gating of distinct sensory information of aversive nature depending on the midbrain structure which is activated. The prefrontal cortex and the core and shell subregions of the nucleus accumbens (NAC) may also contribute to the organization of defensive reactions to threatening and dangerous situations. Besides GABA, 5-HT, opioids, dopamine, neurokinins and excitatory amino acids have ali been implicated in the regulation of anxiety-related behaviors induced by stimulation of the EAS. However, little is known on how they regulate the processing of aversive information. This project will tackle on how these neurochemical mechanisms modulate the sensory information input and the behavioral output underlying the defensive responses associated with fear and anxiety.
It is also our purpose to determine the extent to which the combined activity of the hypothalamic-pituitary-adrenal (HPA) axis and the neurochemical systems involved in the expression of conditioned and unconditioned fear responseswork together in the modulation of the defense reaction. The challenge will be to establish an integrative approach (behavioral, pharmacological, electrophysiological, neurochemical and imunohistochemical) that enable us to characterize the whole stimulus-defensive behavior process instead of treating the defense reaction in relative isolation, and secondly, the neurochemical and anatomical systems that subserve the consequences of aversive information to the organism so as to produce knowledge that might lead to therapeutic change using novel behavioral and drug therapy. This project also dedicate part of its financial resources for diffusing the acquired knowledge in the neurobiology of anxiety and depression to the general public. In this respect we act in partnership with the Institute of Neurosciences and Behavior (INeC), which is a non-profit private organization of public interest, with infrastructure set up for the organization of courses and scientific meetings, as well as for the elaboration of educational material that is available at its homepage (www.inec-usp.org).

HOW DO COMMON AND DIVERGED FEATURES OF THE REPLICATIVE STRESS RESPONSE SHAPE THE BIOLOGY OF TRITRYP PARASITES?

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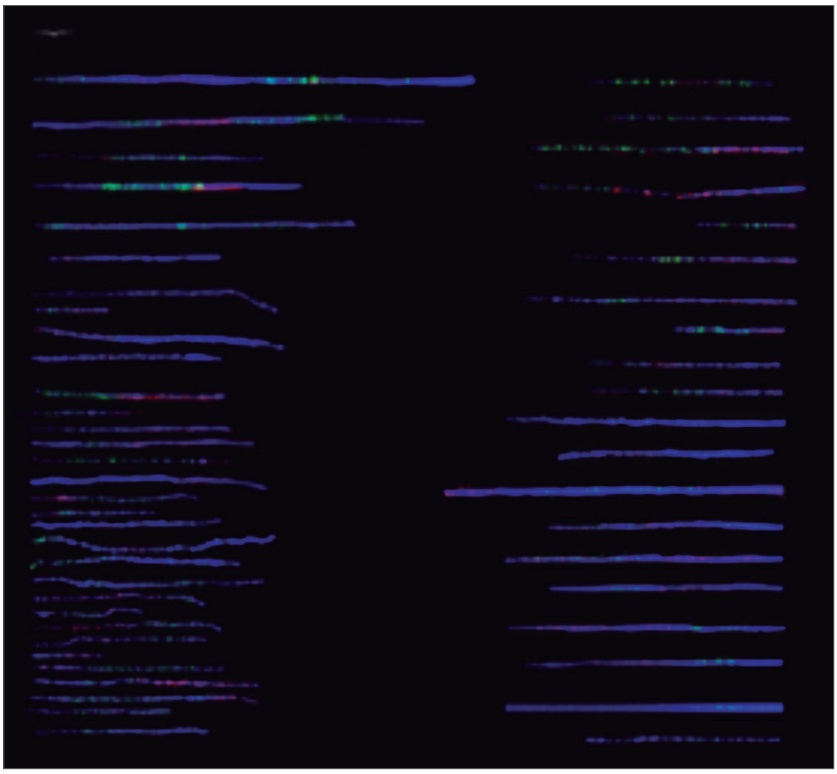
Kinetoplastids are eukaryotic microbes marked by diverged features of core eukaryotic biology. Nuclear genome sequencing has revealed that virtually all genes are grouped in directional gene clusters. In any organism, collisions between the DNA replisome and RNA Pol at genes transcribed during S phase are associated with genomic instability. The extent of the kinetoplastid genome that is transcribed, and the distances that RNA Pol II must traverse in a single direction suggest that such collisions must be pronounced in these genomes. In fact, replication origin mapping in *Trypanosoma brucei* and in *Leishmania* has shown that collisions between transcription and replication forks are not avoided. How the kinetoplastids *Trypanosoma cruzi, Trypanosoma brucei* and *Leishmania* (the 'tritryps') tackle such replication stress, and the implications of the resolution of such collisions for genome and parasite biology is the subject of this proposal.



Replication analysis after thymidine analog labeling. *Parasites that are replicating during the S phase of cell cycle incorporate the analogs IdU and CldU into their DNA during consecutive pulses. The incorporated analogs are immunodetected with specific antibodies and appear as red (IdU) and green (CldU) signals. The direction of fork replication follows the temporal order of the pulses, which is red followed by green. (Araujo et al., 2018, J Euk Microbiol, in press)*

SUMMARY OF RESULTS

Genomic plasticity and genetic variability in trypanosomatids are fundamental for the success of the infection process. Our data begin to reveal the molecular mechanisms involved in these processes. We found in *Trypanosoma cruzi* a preferential position of replication origins in regions where collisions between transcription and replication machinery are favored. In agreement with our hypothesis that these collisions are source of genetic variability, we found a positive correlation between origin location and single nucleotide polymorphism (SNP) accumulation. In *Leishmania*, we showed that HUS1 has a pivotal role in the way that this parasite handle with replicative stress, and its modulated expression is related with increment of SNPs when DNA replication is impaired. Finally, we could show that the transcription process is indeed a source of replicative stress in *Trypanosoma brucei* and the role of transcription as source of genetic variability is under investigation.

MAIN PUBLICATIONS

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Alves CL, Repolês BM, da Silva MS, Mendes IC, Marin PA, Aguiar PHN, Santos SDS, Franco GR, Macedo AM, Pena SDJ, Andrade LO, Guarneri AA, Tahara EB, Elias MC, Machado CR. 2018. The recombinase Rad51 plays a key role in events of genetic exchange in *Trypanosoma cruzi*. *Sci. Rep*. **8(1)**:13335.

Da Silva MS, Pavani RS, Damasceno JD, Marques CA, McCulloch R, Tosi LRO, Elias MC. 2017. Nuclear DNA replication in trypanosomatids: There are no easy methods for solving difficult problems. *Trends Parasitol*. **33 (11)**: 858-874.

CHEMICAL STUDY OF INSECT PLANT INTERACTIONS: A CONTRIBUTION TO BIORATIONAL CONTROL OF CROP PESTS

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The Brazilian import of pesticides hit a record high in 2015 and 2016. Pesticides are the second most important item in the import account of agricultural sector, behind only fertiliser. This information demonstrated the great need for a program for the minor use of pesticides. This proposal intends to respond to these needs, which are classified as strategic in the public policy of the Federal and State Government documents. Economic, social and environmental benefits to be achieved are related to the themes Agriculture and Sustainable Use of Biodiversity. For the implementation of this proposal researchers from different areas were aggregated into networks to transform your agricultures into a model for the control of pests with a low environmental impacto Our recently studies on bacteria, fungus and insects suggested that the flavonoids play a role in the plant-pathogen interaction. Therefore, the search for novel semisynthetic modifications of some flavonoids has attracted our attention. One strategy would be to promote the metal chelation of flavonoids. Because flavonoids activity is attributed to the generation of reduced metabolites that are involved in its antioxidant activity, it is expected that the Mg-flavonoids complex, in which the flavonoid ligand would be more accessible to oxidation, exhibits greater antioxidant activity than free one. Using this strategy we prepared the [Mg(flv)2(phen)] complex, where flv is flavonoid and phen is 1,10'-phenanthroline. In summary, the main objective ofthe project is to develop a long-term collaboration using the expertise of the Keele University, UFSCar research groups to integrate Biorational Control of Pest-Insect for the design, production, use and evaluation of high-value of the flavonoid complexes and nanoformulations of bioinsecticides, based on a bioeconomy model for the control of pests with a low environmental impact.

UNDERSTANDING THE EVOLUTION OF FUNGICIDE RESISTANCE IN FIELD POPULATIONS OF THE WHEAT BLAST PATHOGEN FROM BRAZIL: CAN WE LEAN LESSONS FOR FUTURE DISEASE MANAGEMENT?

Some plant diseases are becoming very difficult to control due to lack of host resistance cultivars and limited availability of fungicide products for crop protection. Fungicide resistance, tighter regulations and a slowing pipeline of new products are reducing the range of available chemical classes. This leads to greater dependence on fewer active ingredients with fungicide modes of action, subsequently, increases the selective pressure for further cases of resistance. In order to increase the shelf life of new and currently available fungicide actives, "evolution-smart" (i.e., guided) integrated pest management strategies are needed. This project will focus on the plant pathogen Pyricularia graminis-tritici (Pygt), the causal agent of wheat blast, an important fungal disease in Brazil that is very difficult to control, with several groups of fungicides (e.g. sterol demethylase, quinone outside and succinate dehydrogenase inhibitors) became (or having become) ineffective. To improve wheat blast control, a better understanding of the disease epidemiology, the fungicide sensitivity/resistance status and new disease management strategies are needed. In this project we will focus on ali three aspects using the lastest spore trapping technology, fungicide pheno- anel genotyping sensitivity/resistance assays as well as a fungicide target protein expression system, enabling to investigate the impact of target mutations on enzyme function and fungicide binding. These tools are generic and can be applied for other plant pathogens.

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LOVING THE POISON: MOLECULAR BASIS FOR METABOLISM AND TOXICIRY OF THE WIDELY-USED FOOD PRESERVATIVE,PROPIONATE IN *PSEUDOMONAS AERUGINOSA*

We will examine how wild-type PA01 catabolises propionate (in comparison with succinate, a control substrate). This will be done by integrating data obtained from a combination of transcriptomic (RNA-Seq), metabolomic (1N NMR, GC-MS/MS and LC-MS) and proteomic (iTRAQ) analyses. The Welch team has expertise in RNA-Seq, metabolomic and proteomic analyses, whereas the Silva-Rocha team has expertise in data integration, genome scale metabolic analyses, and regulatory network analysis, making this overall a very well-matched collaboration capable of adding significant extra value to the project. Specifically, we will use the RNA-Seq (dataset obtained in Brazil and UK) and proteomic (UK) analyses to identify which pathways are expressed during growth of wild-type cells in minimal medium containing propionate or succinate as a sole carbon source. In parallel, a genome-scale metabolic model (Brazil) will be constructed based on PseudoCyc and KEGG annotations. The transcriptomic/proteomic data will then be used to confirm pathway expression and to guide "hole filling". Candidates for hole filling will be tested by confirming the growth phenotype of the corresponding mutant on SCFAs (the UK lab hosts a copy of the two-allele comprehensive PA mutant bank). To further verify the model, we will use metabolomic profiling (UK) to confirm the presence of key predicted metabolites. This way, we aim to generate a robust model that correctly predicts the overall architecture and dynamics of PA SCFA metabolism. It is critical to note here that the analysis of SCFA metabolism has been neglected in previous PA metabolic models.

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A GENOME WIDE VIEW OF THE EVOLUTIONARY PROCESSES SHAPING GENETIC VARIATION IN NATURAL POPULATIONS

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Explaining the presence of genetic variation in fitness related traits is a fundamental problem in evolutíonary genetics because we expect selection to erode such variation. So why then do we see 50 much genetic varialíon? One particularly striking example is lhe high genetic variabilily we typically observe for success in social interactions, a trail that has clear fitness consequences. To understand the presence of genetic variation, in the context of social interactions, we propose to employ a uníquely powerful integration of computational, genomíc and experimental approaches using the social amoeba D. discoideum. Specifically, we will: 1) Identify molecular variation underlying natural variation in social and non-social traits using high throughput phenotyping and genome sequencing of natural isolates, providing unprecedented insights lnto genetic architecture in natural microbial populations. 2) Understand the importance of pleiotropy in shaping variation by examining different fitness related traits to determine the degree to which lraits presumed to be under selection are controlled y lhe same loci, providing insights into the genetic constralnts (trade-offs) lhat shape pattems of varíatíon. 3) Validate the causal role of genes associated with natural trait varialion by generating gene knock-out and allelic replacement straíns to experimentally confirm lhe causal influence and pleiotropic effects of genes putatively underlying natural genetic diversity. 4) Examine signatures of selection on social and non-social genes to understand the processes shaping diversily in genes identified by association analyses as well as those predicted or previously confirmed to play a role in social and non-social traits by experimental approaches.

OVERCOMING INSECTICIDE RESISTANCE USING DIVERSE FUNGAL PATHOGENS AND HETEROGENEOUS AGRICULTURAL LANDSCAPES

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Pesticide-resistant insects remain among the most importante obstacles to global food security: each newly developed control measure imposes intense selection on insect pests, wich inevitably evolve resistance. Evolutionary genetic theory has established that balancing selection (which is needed to maintain genetic diversity for susceptible alleles) is more likely in heterogeneous environments that contrast sharply with industrial monocultures. However, practical considerations, such as difficulties in harvesting polycultures, have constrained previous efforts to incorporate this insight and overcome insecticide resistance. Our proposal exploits the fact that natural insect pathogens have substantially divergente modes of action that have been shaped over millions of years to elude resistance, and overlays this heterogeneity with practically feasible approaches to increasing the complexity of the agricultural landscape. In the pump-priming phase of our project, we will use a quantitative genetics experimente to demonstrate the theoretical principles with relevant insect pests and pathogens, alongside lab experiments to measure the effects of several fungal isolates on pest insects, and demonstrate that these isolates can operate in Brazil under relevant field conditions.

TARGETING THE SURFACE PROTEOME OF *TRYPANOSOMA CRUZI*

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The surface of protozoan parasites represents the interface with the host, and plays roles in invasion, immune evasion, signaling, and more. We recently identified a conserved ubiquitylation pathway in African trypanosomes that controls the surface copy number of important trans-membrane domain proteins, and which provides a means for the first time to manipulate trans-membrane domain proteins in this parasite to assess their importance to host cell invasion and virulence. This application seeks to assess the importance of the surface protein ubiquitylation pathway in Trypanosoma cruzi for: 1) Parasite viability, host cell invasion and life cycle progression; 2) Maintenance of the surface coat, specifically trans-membrane domain proteins and their impact on the global surface proteome; 3) Possible value as a therapeutic target the work will combine state of the art genome editing using CRISPR/Cas approaches, together with SILAC proteomics for unbiased analysis of the surface cellular proteome.

ABOUT THE PROJECT

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AN INTEGRATED APPROACH TO EXPLORE A NOVEL PARADIGM FOR BIOFUEL PRODUCTION FROM LIGNOCELLULOSIC FEEDSTOCKS

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In this project we intend to demonstrate that it is more sensible (logical and economic) not to pre-treat lignocellulose so harshly, and have a more "holistic" approach to the process delivering the desired products whilst minimising overall process energy and cost by working on the optimisation of generating partial breakdown products and ensuring that the subsequent fermentation organism is able to convert these directly to product. The most commonly employed class of fermentation organisms – yeasts – will be engineered to be able to convert the oligomeric sugars directly. However, there is a class of organisms – Geobacillus – that have been quite extensively studied by one of the UK groups, which already naturally has the propensity to utilise oligomeric sugars and can also be readily engineered to optimise key metabolic pathways. Therefore, in this project we will use a representative of this group of bacteria to compare performance with the engineered yeast. We also propose to consider three different lignocellulosic feedstocks in this study, all of which have the potential to be used for sustainable fuels and chemicals production: Brazilian cane straw – which is current left in the fields after harvesting, Miscanthus – which is grown in the UK for burning in power stations (co-firing) and has a lot of similarities to cane straw, and Eucalyptus forestry residues, which are abundant in Brazil and represent a different type of opportunity and material to evaluate. Some of the team involved will focus on developing methods to convert these to oligosaccharides that can be taken up by these new strains. This will be a combination of less severe (than currently) pre-treatment and the use of selected enzymes to produce the oligo-saccharides required. Another part of the team will focus on producing the enzymes required for these conversions to oligosaccharides, while a third group will engineer the yeast strains to use oligosaccharides of both xylose and glucose. To increase the energy efficiency of the feedstocks in the new lignocelulose mills we are going to recover chemicals and biogas from the liquid effluents, vinasse and hemicellulose hydrolysates, by integrating anaerobic digestion (AD) to the process. AD with mixed culture fermentation will improve the energy ratio bringing biogas production and fertilizers as products. Underpinning all this is the need to ensure that the outputs of this work remains relevant to the industry processes that they potentially feed into. Therefore, we have a team of LCA experts ensuring that feedstock/ product choice is appropriate, that the proposed process optimisation approaches are delivering a positive impact on process performance and pinpointing where further changes/ modifications could be made to further improve matters.

BURKHOLDERIA SSP. IN SUGARCANE CROP: THE CONUNDRUM OF ANTIFUGAL PRODUCTION INTRINSIC ANTIMICROBIAL RESISTANCE AND PEST CONTROL

Burkholderia spp. is the main component of the sugarcane cultivable bacterial community. Members of this genus produce antifungal compounds and serve to phytopathogens control and plant growth promotion. However, *Burkholderia cepacia* complex (Bcc) are described as potential opportunistic agents of pulmonary infection and present intrinsic antimicrobial (iAMR) against different classes of antibiotics including antimicrobial peptides. iAMR is multifactorial and we have shown that production of hopanoids, polyamines and modifications of cell surface polysaccharides provide high-Level resistance, and increased bacterial virulence in the *Galleria mellonella* (Lepdoptera: Pyralidae) infection model. However, the relationship between iAMR and antifungal production is not established, but our previous results have shown that strains with high-Level antimicrobial resistance display higher capacity to inhibit pathogenic fungi. Thus, this proposal will explore a hypothesis that antifungal production triggers iAMR by influencing the production of membrane hopanoids and polyamines, and modification of cell surface polysaccharides. Our first aim will evaluate in *Burkholderia spp*. the relationship between the organization and expression of hopanoid genes cluster, iAMR and antifungal production. Also, we will evaluate the organization and expression of capsule and lipopolysaccharide gene clusters in Burkholderia spp. in relation to iAMR and the antifungal synthesis, as well as the expression of polyamine genes. Since we have observed that *B. seminalis* displays high virulence in the *G. mellonella*, our second aim will evaluate *B. seminalis* as a pest biocontrol agent against *Diatraea saccharalis* (Lepdoptera: Crambidae), a major pest for sugarcane. This proposal will address underpinning mechanisms associated to antifungal production and iAMR, and will enable us to translate this information into a practical biocontrol approaches.

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FAPESP Process 2017/50447-2
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FROM ORANGE WASTE TO CHEMICALS: CONTRIBUTIONS OF AN INTEGRATED BIOREFINARY APPROACH TOWARDS SUSTAINABLE DEVELOPMENT IN BRAZIL

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There is a pressing need for renewable and optimal uses of resources towards sustainable primary production and processing systems worldwide. In this context, the biorefinery integrates facilities for the conversion of biomass into multiple value-added products, to create flexible, zero waste networks. Using a variety of low value local feedstocks and also, contributing significantly to a bioeconomy. The main objective of this collaborative project is to strengthen the research network between the Green Chemistry Centre of Excelence (GCCE, the University of York, UK) and the Natural Products Research Group (NPRG, Federal University of São Carlos, Brazil) around Brazilian citrus chain valorisation based on the biorefinery and green chemistry concepts. A techno-economic and environmental assessment of the whole Brazilian citrus chain will be performed using methods developed by the SEI green-economy group (e.g. Life Cycle Assessment, LCA), encompassing food, energy, water, environmental and social impacts. According to previous data obtained by both groups, there is a wide spectrum of extractable compounds from orange waste with huge possible marketable applications (flavonoids, pectin, cellulose, d-Limonene, a-terpineol, waxes, alkanes, sugars, among others that can be used as additives of personal care products, flavour and fragrances, cosmetics, nutraceuticals, bio-solvents, biopolymers and active ingredients for insect repellents), as well as a number of green methods and techniques which can be employed in lab- and large-scale processes. The integrated (biorefinary approach applied to citrus waste needs to be further explored and advanced, considering the Brazilian economic, scientific, social and environmental characteristics. In this project, the events (workshops, conferences, courses, lectures and scientific meetings) and short-research stays planned are of ultimate importance to build long-term partneship between the GCCE and NPRG groups, which are considered as references in their areas of expertise ali over the world (e.g., green technologies and waste valorization in the UK as well as the development of alternatives to promote sustainable agriculture in Brazil) and the creation of links between them will impact markedly the present and future actions and research proposals on orange waste exploitation, contributing to sustainable development in Brazil. This innovative initiative will also permit the creation of a new Centre of Excellence in Green Chemistry and Sustainability based in São Carlos (SP), a full member of the Global Network of Green Chemistry Centres (G2C2), in order to promote and deepen the dialogue between the academia, government and industry sectors, helping to constitute a belter equipped community to develop excellent research outcomes and related activities around strategic topics in Brazil.

PERPETRATION OF INTIMATE PARTNER VIOLENCE BY MALE SUBSTANCE ABUSERS: A RESEARCH CROSS-CULTURAL LEARNING ALLIANCE

The aim of this research project is to quantitatively and qualitatively examine and compare the prevalence and cultural construction of intimate partner violence (IPV) (i.e. physical, sexual or psychological abuse or controlling behaviour perpetration by males in substance abuse treatment in London and São Paulo against their current or ex female partner/wife). The findings will inform cultural theory of IPV perpetration and substance abuse, and a theory based IPV assessment instrument for men in substance abuse treatment. In addition, current strategies, protocols and care pathways for male substance abusing IPV perpetrators in both London and São Paulo will be reviewed, and key stakeholders will be interviewed to identify the barriers and facilitators to working with this client group. The research will inform the development of an evidence and theory based cross-cultural Capacity Framework for working effectively with male IPV perpetrators in substance abuse treatment.
An International Learning Alliance will be established at lhe initialion of the project; to strengthen and support the exchange and dissemination of information and best practice and will determine how alcohol and drug services can best respond to IPV perpetralion by male cíients in England, Brazil, Spain and the U.S. Local Learning Alliances networks will be established in London and São Paulo to enhance translation of findings to policy and practice.

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(RE)CONNECT THE NEXUS (RCTN): YOUNG BRAZILIANS' EXPERIENCES OF AND LEARNING ABOUT FOOD-WATER-ENERGY

Recent research about the food-water-energy nexus has tended to focus on flows (e.g. between producers and consumers) and ways of governing the nexus. However, there is a real need to examine how people (especially young people) understand, learn about and participate in the nexus, in their everyday lives. Only by doing so can we address crucial concerns - such as persistently high levels of poverty amongst Brazil's children, their unequal access to nexus resources, their resilience to nexus threats, and the role of education in addressing the those threats in the future. In Brazil, as in similar countries, young people are a hugely important group, demographically and socially. In Brazil, young people (aged 0-24) make up 42% of the population. Moreover, we already know that in diverse global contexts, young people are instrumental in terms of securing access to resources (including nexus resources), economic productivity, societal resilience, and community life. In addition, young people are often the main recipients of education programmes - especially Education for Sustainability (EfS) - that attempt to address nexus threats and sustainable development goals. However, there is scant research - either in Brazil or globally - that focuses on young people and their interactions with the nexus. This unique, collaborative research will address these important gaps. This project's main aim is to examine young people's (aged 10-24) understandings, experiences and participation in the nexus in Brazil. It focuses on this age group as older children/young adults are a key target group for EfS, and research shows that they are likely to have greater capacities for reflection on the nexus than younger children. In achieving this aim, the project will address three core research questions (with several sub-questions).

1: What are young people's (aged 10-24) understandings, experiences and participation in the nexus in Brazil? Focussing on the Metropolitan Region of Paraiba do Sul River Basin and Sao Paulo State North Shore (Sao Paulo State) as a case study, how do these experiences vary in terms of young people's diverse geographical (urban, suburban, rural) and socio-economic positioning (focussing on age, gender, class and ethnicity)? Amidst the complexities of the food-water-energy nexus, what are the key priorities for young people, their families and communities? How are young people included or (not) in accessing parts of the nexus?

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2: What is the role of '(re)connection' in young people's engagements with the nexus? What are the everyday choices that young people - with adult others - must make in, for instance, choosing between the food, water or energy that fuel their bodies, homes and public services? What does it mean for young people to have 'closer' or more 'distant' connections with food in a Brazilian context - and does the principle of 'reconnection', so important to EfS and other programmes for sustainable development have salience there? To what extent do young people's experiences challenge (perhaps Minority World) assumptions about what constitutes 'food', 'water' and 'energy'?

3: How does EfS in Brazil address the nexus? Given that EfS is present, but not compulsory, in Brazil's National Education Plan, to what extent does learning about the nexus currently support young people's understandings of food-water-energy? How can EfS in Brazil be developed to support greater societal resilience against nexus threats? The research questions will be addressed by producing both a baseline survey of ca. 5,000 young people and detailed, multi-method, qualitative research with 100 young people. The project will be undertaken by an established, inter-disciplinary team of UK and Brazilian social scientists and engineers, building on the work of a Newton Research Partnerships Grant. Such collaboration is vital to achieving a step-change in research and societal impacts on (young) people and the nexus.

SUMMARY OF RESULTS

The research is in an intermediate stage – a video competition was concluded; two qualitative surveys – one with young people and the other with key professionals involved with food, water and energy – were completed and are their results are under discussion in the research group for the statement of conclusions and submission of results to high-impact journals. A quantitative survey with 5,000 young people's respondents is under development and is intended to be concluded in May 2018. Therefore, we have limited findings. However, the following are highlights:

1) For young people, food is the easiest part of the food-water-energy nexus to talk about. It is most tangible to their lives. However, this varies with social class - wealthier young people take water and energy for granted, whereas less well-off young people may have less ready access. In addition, many young people talked about the relationship between food and their identities, especially in terms of 'Brazilian' foods. The project has found significant evidence that 'pushes back' against Western ideas that young people should be 're-connected' with nature and natural resources (e.g. food) through, for instance, trips to natural places. Rather, it identified a number of important ways in which notions of 'connection' to nature are conceived differently in Brazil - through care in communities/families, through dialogical forms of education, and through children's complex embodied engagements with food.

2) When thinking about different parts of the nexus, most young people thought that, in Brazil, water was most important. However, this was a function of education, with the importance of water being transmitted to children at an early age through popular songs.

3) Young people expressed strongly politicised views about food, water and energy, especially in terms of social justice for poorer groups. They argued that municipal authorities should do more to support access to these resources for the poor. They also made a range of comments about how their everyday experiences of food, water and energy are connected to the current political and economic situation in Brazil. Other key emerging themes from young people include: temporalities and daily rhythms; the multiscalar experience of the food-water-energy nexus; the ways in which the food-water-energy nexus is complicated by other material objects - modes of transport, waste, technologies; the central significance of political and financial corruption to how children view 'solutions' to nexus threats, and the key role of young people (and the internet/social media) in pushing back against corruption; the centrality of work and money (and precarity for many young people) to securing access to resources; the importance of education not only to 'connect' to questions of sustainability (as per point 1) but to 'raise consciousness' - individually, within communities, and nationally.

4) Policy-makers explained that the situation surrounding Education for Sustainability (EfS) in Brazil is complicated. Brazil has a diverse model for funding and organising education. Therefore, there is no one approach or curriculum for EfS - and any attempts (for instance by the research team) to influence EfS must therefore bear this in mind. Key themes emerging from policy-makers interviews were as follows:

1. Climate change and human-environment relations
2. Corporate socio-environmental responsibility
3. Energy
4. Environmental economics
5. Environmental education
6. Environmental governance
7. Food
8. Factors driving innovation or continuity in production and consumption
9. Land use
10. Materiality of the food-water-energy nexus
11. Media and marketing
12. Narratives of material scarcity, security and affluence
13. Nexus resources, public health and the body
14. Nexus trade-offs and synergies
15. Participant reflections on connections and disconnections
16. Perceived barriers to nexus thinking
17. Reflections on politics, policies and citizenship
18. Resource management
19. Social imaginaries of young people
20. Society, consumption and sustainability
21. Waste and wastage
22. Water

GENETIC AND ELECTRONIC MEDICAL RECORDS TO PREDICT OUTCOMES IN HEART FAILURE PATIENTS: BRIDGING BRAZILIAN AND UNITED KINGDOM GENETIC EPIDEMIOLOGY IN HEART FAILURE PATIENTS BRIDGING BRAZILIAN AND UNITED KINGDOM GENETIC EPIDEMIOLOGY IN HEART FAILURE

Studies adopting electronic medical records (EMR) and genomic information are becoming widespread. Through this new modality of research, it is possible to study how genetic variants influence susceptibility towards chronic conditions and can improve patient care. Both Brazil and UK are developing projects towards using this information to predict different outcomes in heart failure patients. Our aim is to develop a collaborative project using Brazilian heart failure patients with genome-wide data already available, conduct genome-wide association studies (GWAS) for derivation of target hits associated with heart failure-related phenotypes and use UK-based cohort studies to validate the hits disclosed. Methods: patients between 18 and 80 years old with heart failure diagnosis of different etiologies and left ventricular ejection fraction < 50%, with already generated GWAS data will be eligible for enrollment on the study. GWAS analysis will be conducted using as dependent variables, etiology, left ventricular ejection fraction and combined incidence of cardiovascular outcomes (all-cause mortality, cardiovascular mortality, hospitalization for worsening heart failure and current medication use). The discovery phase will use data on 1,000 Brazilian patients. We will investigate the effects of multiple data imputation algorithms (using 1000 genomes data with or without Brazilian genomes). Main hits will be tested against available UK-cohort studies in a second-stage analysis. Expected Results: to create a UK-Brazil working group focused on the development and implementation of algorithms for validation and application of medical routines using genetic information for heart failure management. Moreover, to build capacity of young researchers, to do a pilot study of plasma or serum samples on metabolomics with metabolon US platform and with a proteomics platform and 10 show proof of concept with Brazilian GWAs data using Brazilian sequencing data for imputation and the impact of population stratification on known genetic hits for a well-established trait available in the Brazilian cohort.

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BIOCHEMICAL INVESTIGATION OF THE ENZYME PRMT7 FUNCTION IN *LEISHMANIA SPP.* PARASITE INFECTIVITY: SCREENING TARGETS FOR LEISHMANIASIS RELEVANCE

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The Leishmaniases are the ninth largest disease burden amongst infectious diseases and the second biggest killer of parasitic diseases, threatening one tenth of the world's population. Who estimates 0.7-1.2 million new cases of cutaneous Leishmaniases annually while visceral Leishmaniasis infects 200,000-400,000 killing 10-20% of them. Brazil is stricken by all pathologies of this disease with 30,000 new infections every year. No vaccine exists and there is a growing resistance to available treatments; which are expensive, highly toxic and unsuitable for children. Despite the urgent need for intervention, leishmaniases remains a neglected disease. Leishmania spp. parasites adapt to drastic changes in environments during transmission between insect vectors and human hosts. Lifecycle-specific adaptions enable parasite transmission between hosts and perpetuate parasitic infections and diseases. Molecular regulators that coordinate the fitness of these parasites to different hosts and promote parasite infection are critically important to our broader understanding of this disease. In a recent collaboration, Angela Cruz and Pegine Walrad laboratories initiated the investigation of the role of a relevant molecular regulator in Leishmania major, the arginine methyl transferase PRMT7, which resulted in a publication on the scientific journal Molecular Microbiology. The enzyme PRMT7 of the parasite is differentially expressed during L. major development and is a novel regulator of Leishmania virulence. We seek to combine the expertise of both groups and facilities to biochemically characterize PRMT7 function and explore how it and its target proteins enable parasite infectivity. PRMT7 is the first Leishmania methylating enzyme to be implicated in host-parasite interactions. Preliminary evidence suggests it may act via modification of regulatory RNA binding proteins, RBPs. We will initiate this study by crosslinking Leishmania cells and immune precipitating associating proteins. We will identify candidate targets by utilizing the foremost iTRAQ LC-MS and gel free 20 fractionation technologies of the Centre for Excellence in Mass Spectrometry in University of York. This strategy is up to fifty times more sensitive than standard methods. We will compare results with those previously isolated. Also, we will conduct in vitro methyltransferase assays using [3H] AdoMet, recombinant PRMT7 and target candidates coupled to high resolution cation exchange chromatography to verify monomethyl arginine formation by PRMT7. We will isolate associating transcripts of two confirmed, prioritized RNA binding protein targets of PRMT7 and test whether RNA interactions are changed in PRMT7 knockout parasites. Associating RNAs will be identified via RNA Hi-Seq at the MRC Centre for Genomic Research (UK).We will examine and discuss the data implications from this work and it will direct and inspire our joint grant proposal for BBSRC-FAPESP call. Understanding the function and activity of PRMT7 enzyme implicated in infectivity will provide useful insight into ways to combat Leishmaniasis.

REGULATING THE TRANS-REGULATORS: INVESTIGATING THE PRMT7 MOLECULAR PATHWAY AS AN EPIGENETIC REGULATOR OF LEISHMANIA VIRULENCE

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Species of Leishmania threaten 350 million people worldwide on four continents. New treatments and vaccines are desperately needed and the UK and Brazilian governments are committed to the World Health Organization's recent call to further support Neglected Tropical Disease research. The single-cell Leishmania parasite differentiates in distinct forms during its lifecycle to adapt to different hosts; moving from mammals to sandflies and back to mammals by sandfly bites. Major changes to the parasite's morphology, metabolism and virulence proteins occur during these transitions that enable them to survive. Leishmania gene expression relies almost exclusively upon mRNA regulation. In response to changes in the environment, specific parasite proteins bind mRNAs and target them for protein production to guide and promote adaptation. Proteins that control the adaptation of these parasites enable them to survive in and infect humans. Such proteins are essential for the virulence and spread of the Leishmania parasite infection. We have recently isolated a major control panel "Regulator" protein, PRMT7, which controls Leishmania parasite virulence in mammalian infections. Very few Leishmania regulator proteins have yet been identified and this finding represents a major leap forward to isolate and examine this regulatory pathway and interfering with parasite virulence. To study the PRMT7 regulation pathway and identify the way this protein functions, we have assembled a team of experts in Leishmania parasite PRMT proteins, RNA regulators and protein interactions. We believe insight into this pathway may help to understand some parasite resources to successfully establish human infections. We have identified some downstream target proteins of PRMT7 and now seek to determine if they are regulated by PRMT7 and whether they participate in Leishmania parasite virulence. These Leishmania proteins are different from human proteins; therefore we can use these differences to target Leishmania-specific virulence factors, block their function and block Leishmaniasis from developing. Significant findings may provide insight to Leishmaniasis research. We propose to find more regulators of Leishmania virulence using the PRMT7 virulence pathway. We will identify how these regulators function, and test whether any are essential for parasite survival. The novelty and importance of our project is four fold: 1. PRMT7 is the only Protein aRginine Methyl Transferase enzyme that has been characterized in Leishmania parasites thus far and we demonstrated an inverse correlation between the protein level and virulence (Ferreira et al., 2014). 2. Methylation as a protein modification is uncharacterised in *Leishmania spp.* parasites. 3. Regulatory RNA binding proteins (RBPs) that are important in parasite lifecycle differentiation, human infectivity and virulence are largely unknown in Leishmania. 4. The 3-dimensional molecular structures of RBPs and mRNA: protein complexes are largely unknown in all parasites and are absent in Leishmania.

STRENGTHENING THE INCLUSION OF PERSONS WITH DISABILITIES IN THE HEALTH SYSTEM IN BRAZIL

The prevalence of disability is significant all over the world, and it is expected to rise further as population ages, health behaviours worsen and often disabling chronic conditions prevail. Evidence shows that people with disabilities have higher healthcare needs and that these are often not met. They are found to experience poorer access to health services and worst health outcomes than people without disabilities, especially in low and middle income countries, such as Brazil. Although Brazilian policy and law strongly supports the inclusion of people with disabilities in the health system, the Zika epidemic revealed gaps in access to mainstream health care and specialized rehabilitation services. There are multiple benefits in improving the inclusion of people with disabilities in the health system, but evidence on what we need to promote it is still lacking. This research is predominantly exploratory and descriptive in focus, and its approach is multi-disciplinary and uses mixed-methods to collect and analyse data. The project is expected to produce recommendations for stakeholders for the strengthening of the inclusion of people with disabilities and provisio of rehabilitation within the Brazilian health system, and to propose standard indicator for measuring access to health care and inclusion of people with disabilities within the health system.

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MULTI-PEPTIDE VACCINE TO CONFER SEROTYPE-INDEPENDENT PROTECTION AGAINST PNEUMONIA

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The development of a vaccine based on "common pneumococcal proteins" offers the potential for serotype-independent protection overcoming the problem of serotype replacement that emerged after pneumococcal conjugate vaccine widespread use. Researchers at the Butantan Institute have been evaluating the pneumococcal antigens PspA and PspC as vaccine candidates. Although these proteins are variable among different clinical isolates, some variants are able to induce antibodies with broad reactivity, that recognise different PspA and PspC variants. We aim to determine the epitopes (parts of the protein) that are targeted by these broad-reacting sera in mice immunized with different fragments of these proteins and further in human serum of healthy adults and pneumonia patients. Samples from adults exposed during an experimental colonization model will provide information on peptides that are recognized during natural exposure to the bacteria and therefore are important for the natural acquired immunity that protects adults against pneumonia. Based on mice and human data we will select broad-reactive epitopes and construct a multiple-epitope protein. Cross-reactivity of serum will be assessed in ELISAs and Western Blots and cross-protection in animal models using pneumococcal strains expressing different PspA and PspC variants. Finally we will assess if serum and brochoalveolar lavage from patients with pneumonia (elderly) present lower levels of antibodies against the multiple-epitope protein compared to healthy adults and therefore their susceptibility to the disease.

DEVELOPMENT OF NEW GPCRS INTERACTING DRUGS TO TREATMENT OF INFLAMMATORY DISEASES

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Inflammatory diseases are a complex and heterogeneous group of diseases that affect more than 10% of the word population. The current options for the treatment of these diseases are still limited and in some cases, inefficient due to in understanding of the mechanisms underlying these diseases. In this context, the aim of the present is to create an international collaborative consortium between the Center for Research in Inflammatory Diseases (CRIO) located at Ribeirão Preto Medical School (FMRP) and School of Pharmacy of Ribeiro Preto (FCFRP), University of São Paulo (USP), and University of Nottingham (UoN). The overarching objective is to build capacities to promote knowledge transfer and offer relevant training for graduate students from the Partner Institutions, in order to establish a framework for an integrative research in drug discovery. In this context, our goals will be to identify: 1) To establish an intercontinental collaborative consortium between the University of Nottingham and the University of Sao Paulo for the study of G protein-coupled receptors relevant to inflammatory disease; 2) To conduct an initial pilot study to develop biased agonists for the beta1-adrenoceptor and evaluate their potential as inotropic agents for the treatment of septic shock following acute infection; 3)To establish a knowledge transfer partnership to enhance bidirectional transfer of knowledge and training among scientists, postdoctoral fellows and graduate students from the Universities of Nottingham and São Paulo.

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SYSTEMS BIOLOGY OF TYPHOID FEVER: UNRAVELLING REGULATION OF HUMAN HOST-RESPONSES TO INFECTION WITH *SALMONELLA TYPHI* AND LIVE ORAL VACCINATION

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Infectious diseases caused by enteric pathogens are endemic specifically in developing countries, and are responsible for several thousands of deaths every year. This proposal will focus on enteric fever caused by Salmonella Typhi and Paratyphi as a model for intestinal infections. Typhoid fever significantly affects South America, sub-Saharan Africa and South-East Asia with approximately>22 million new infections resulting in a 1% fatality rate annually. Control of the disease is hindered due to insufficient understanding of disease pathogenesis and immune responses to the infection, inaccurate diagnostic tests and poor efficacy of licensed vaccines. Thus understanding human host-responses to enteric infections is pivotal in developing improved diagnostic tests and vaccines. The Oxford Vaccine Group (OVG) has recently developed a human challenge model for S. Typhi and Paratyphi. This model was subsequently used to test vaccine efficacy by vaccinating participants prior to ingestion of the bacteria. Systems biology/vaccinology is an interdisciplinary field that combines systems-wide measurements, networks, and predictive modelling in the context of biology, vaccines and infectious disease. Particularly important in this context are regulatory mechanisms, which consist of complex networks involving multiple transcriptional and genetic components. Recently, it has become clear that long non-coding RNAs (lncRNAs) play a pivotal role in the regulation of biological processes by a diverse range of mechanisms. Applying systems biology to samples derived from these unique and highly controlled clinical trials allows us to directly investigate human responses to enteric infections and vaccination. In this proposal, we will specifically address the following three aims: (1) Identifying signatures predictive of vaccine-conferred protection; (2) Identifying diagnostic signatures; (3) Assessing the role of lncRNAs in enteric infection and vaccination. We propose to build a long-lasting partnership between the University of São Paulo and University of Oxford by performing state-of-the-art applied systems biology on samples derived from clinical trials in Oxford and the field, complemented with clinical and immunological/biological data.

CD4 T CELL IMMUNE CORRELATES OF ZIKA VIRUS EXPOSURE

A feature common to the pathogenesis of flavivirus exposure in humans is the diversity of clinical outcomes. In the case of exposure to Zika virus, outcomes can range from asymptomatic exposure to fever, rash, joint pain, conjunctivitis, Guillain Barre syndrome and probably, neonatal microcephaly. Some regions of Brazil (including Sao Paulo where our study will be based) have witnessed a sharp peak of microcephaly reporting, and this has caused considerable alarm, including pregnant women seeking abortions and women being advised to avoid pregnancy. While host immunity to Zika virus is essentially uncharted territory, it may be possible to extrapolate some broad principles from studies of immunity to the most closely related arbovirus, West Nile virus (WNV). Eddie James and Bill Kwok, co-investigators on this proposal, have been arguably the world-leaders in characterizing T cell immune correlates of disease outcome in WNV exposure. Their studies have been centred on detailed characterization of T cell subsets and phenotypes through flow cytometric selection with HLA/peptide WNV tetramers - an approach that will here be applied to Zika. At a time when steps are being taken to roll-out of various Zika vaccine candidates (including the NIH-VRC candidate) and design protocols for their evaluation, our rationale is that it will be vital to have a clear grasp of T cell immune phenotypes associated with different disease outcomes, based on the premise that not all response phenotypes are beneficial and some may be explicitly pathogenic. This offers the opportunity to supply novel insights into Zika protection versus pathogenesis with the potential for direct impact through informing patient management.

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FROM THE VLT TO THE E-ELT: BUILDING A BRAZILIAN-UK PARTNERSHIP ON ASTRONOMICAL INSTRUMENTATION FOR THE WORLD'S LARGEST TELESCOPES

The world's largest optical-infrared telescope: the science case for the E-ELT spans the whole range of contemporary astronomy, from observations of the most distant galaxies known at the very dawn of time, to searches for biological tracers in the atmospheres of planets outside of our own solar system. The first stages of construction of the E-ELT are now under way. We intend to develop instrumentation for the E-ELT, as well as for the VLT. The main objectives of this proposal are the development of instrumentation, in particular the CUBES spectrograph for the VLT, and the MOSAIC spectrograph for the E-ELT, and the related science, in ollaboration with UK partners.

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AMELIORATION OF THE AUTONOMIC IMBALANCES OF OLD AGE WITH EXERCISE – EXPLORING THE MOLECULAR AND PHYSIOLOGICAL MECHANISMS

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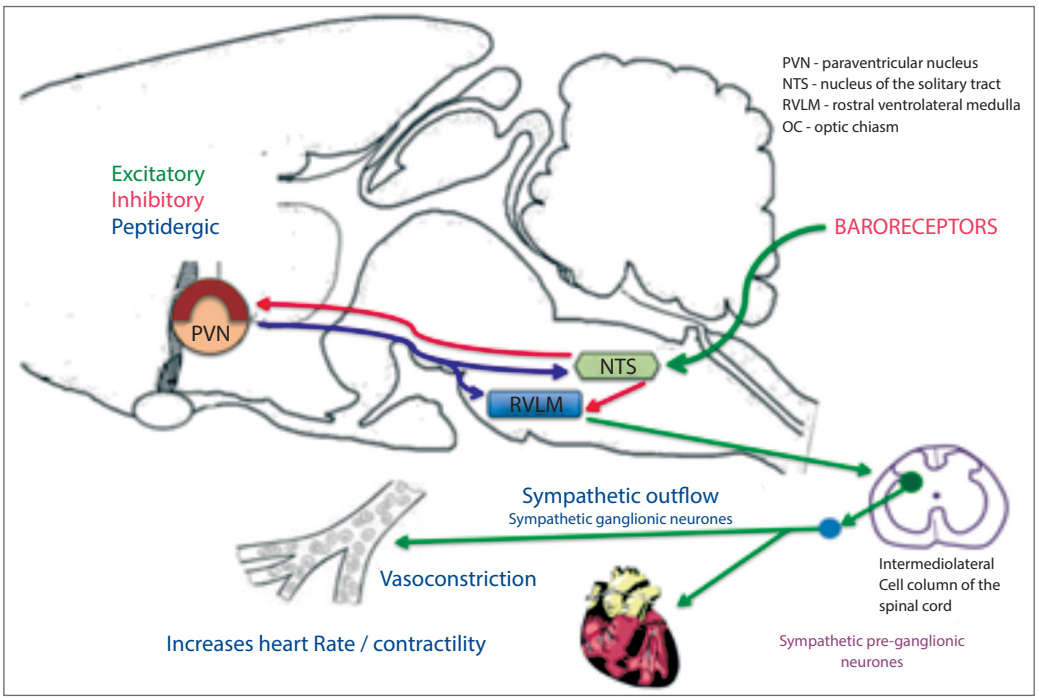
One of the most important advances of the medicine in the last century – lifespan augmentation of human beings – was not accompanied by improvement of quality of life of elder people, since autonomic balance to heart and vessels declines with aging. The imbalance between sympathetic (the accelerator, which predominates) and vagal outflow (decreased brake), observed in elder and hypertensive individuals, results in drastic reduction of dynamic flexibility of the system with increased morbimortality. Although lifestyle modifications, as improved physical activity, are important conditioners of wellbeing benefits, our knowledge of mechanisms underlying these changes is still scant.

Young and old spontaneously hypertensive (SHR) and normotensive rats were analyzed at weeks 0, 2 and 8 of sedentary and training protocols. The prompt and almost complete correction of autonomic control in young trained SHR is accompanied by marked changes in gene expression, downregulation of renin angiotensin system, reduced oxidative stress and inflammation, with faster responses in hypothalamic than brainstem autonomic areas. Exercise also improves autonomic control in old SHR with smaller and later adaptive responses.



Cartoon illustrating brain pathways involved in the regulation of autonomic output. Autonomic brain areas within the hypothalamus (PVN) and brainstem (NTS and RVLM) receive and integrate information from peripheral afferents (baroreceptors) to generate autonomic output (sympathetic and parasympathetic activity) to heart and vessels.

SUMMARY OF RESULTS

Besides resulting in original research, open doors for international collaboration, allow the exchange of graduate students, this project permitted the training of academic personnel. One Master (Raul Pinheiro) and 3 PhD thesis (Adriana Ruggeri, Lais Delacqua and Carla Santos), produced during the 4-years extension of the project, were presented and approved by our Graduate Program in Human Physiology, Department of Physiology and Biophysics, University of Sao Paulo. It is important to note that the sequential transcriptome analysis performed in 3 different brain autonomic areas of young and old, sedentary and trained SHR and normotensive controls resulted in a huge amount of data that are still being analyzed by our collaborators at the University of Bristol, UK. These data prompt us to uncover not only the effects of age, hypertension and training on hundreds of genes involved in autonomic control of the circulation, but also allow us to analyze the interaction, timing and hierarchy of autonomic hypothalamic and brainstem areas involved in cardiovascular control. Other comprehensive papers will be published for sure.

MAIN PUBLICATIONS

Masson GS, Costa TSR, Yshii L, Fernandes DC, Soares PPS, Laurindo FR, Scavone C, Michelini LC. 2014. Time-dependent effects of training on cardiovascular control in spontaneously hypertensive rats: Role for brain oxidative stress and inflammation and baroreflex sensitivity. *PLOS One* **9**: e-94927.

Lozić M, Greenwood MP, Tasić T, Martin A, Hindmarch C, Šarenac O, Paton J, Murphy D, Japundžić-Žigon N. 2014. Over-expression of oxytocin receptors in the hypothalamic PVN increases BRS and buffers cardiovascular short-term variability in conscious rats. *British J. Pharmacol*. **171**:4385-4398.

Santos CR, Ruggeri A, Ceroni A, Michelini LC. 2018. Exercise training abrogates age-dependent loss of hypothalamic oxytocinergic circuitry and maintains high parasympathetic activity. *J. Neuroendocrinol*. 30: e12601, doi: 10.1111/jne12601.

CLUSTER RANDOMISED CONTROLLED TRIAL FOR LATE LIFE DEPRESSION IN SOCIOECONOMICALLY DEPRIVED AREAS OF SAO PAULO,BRASIL

Depression in later life is a major public health issue. Studies in Brazil show that depression is common, often goes untreated and produces as a wide range of social, economic and health consequences. The Brazilian population is ageing rapidly, and the health care system is poorly prepared to meet these challenges. Primary health care is the key place to deal with depression. Most treatments for late life depression in primary care that proved effective were developed and tested in high income countries, and used stepped care collaborative models. These models are complex, involve multiple components interventions with various health professionals collaborating simultaneously to deliver the planned care. To improve the treatment of depression in the Brazilain Universal Health System it is necessary to develop simple, feasible and affordable evidence-based primary care interventions. Before conducting a definite evaluation of such interventions, they should be piloted thoroughly. For this reason, we conducted a two-arm non-randomized controlled cluster trial to evaluated the feasibility of a collaborative care psychosocial intervention for depressed older adults residents in socioeconomically disadvantaged areas, supported by technology and with strong community-based and task-shifting components, customized to the existing Brazilian primary care setting.

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2013/50953-4
Term: Mar 2015 to Feb 2017
Thematic Project
UKRI – MRC

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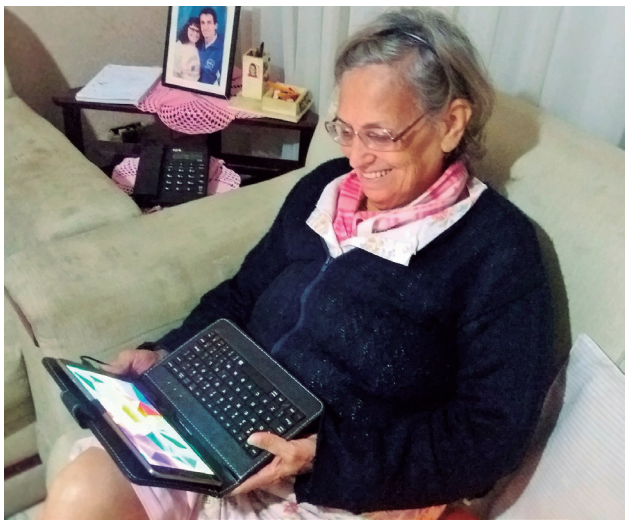

Participant of the pilot study testing the application that assisted Health Workers delivery of the home psychossocial sessions.

SUMMARY OF RESULTS

Participants were older adults registered with two primary care clinics adhering to the Family Health Strategy in São Paulo. In the control clinic, 25 individuals received enhanced usual care. In the intervention clinic, alongside the enhanced usual care, 33 individuals received a 17-week psychosocial intervention (PROACTIVE) delivered at home by trained non-specilised health workers (community health workers and nurse assistants). The intervention consisted of a unique blend of psychosocial techniques (psychoeducation and behaviour activation) embedded with support mechanisms (supervision and use of an application instaled in tablets) for non-specialist health workers delivering the intervention. The consent rate in the intervention and control clinics were 82% and 89%, respectively, and follow-up rates were above 90% in the two clinics. Identification and engagement of clinics, and initial and follow-up assessments proved to be feasible. Participants accepted to be seen by non-specilised health workers and approved the use of techonology during the home sessions. Results support the conduction of a definitive cluster randomized controlled trial targeting late life depression in primary care in Brazil.

MAIN PUBLICATIONS

Scazufca M, de Paula Couto MCP, Henrique MG, Mendes AV, Matijasevich A, Pereda PC, Franzin RM, Seabra AC, van de Ven P, Hollingworth W, Peters TJ, Araya R. Pilot study of a two-arm non-randomized controlled cluster trial of a psychosocial intervention to improve late life depression in socioeconomically deprived areas of São Paulo, Brazil (PROACTIVE). Submitted for publication.

van de Ven P, Araya R, de Paula Couto MCP, Henrique MG, Meere D, Mendes AV, Peters TJ, Seabra AC, Franzin RM, Pereda PC, Hollingworth W, Scazufca M. An investigation into software requirements for systems supporting task-shifted interventions in mental health. Submitted for publication.

CLUSTER RANDOMISED CONTROLLED TRIAL (RCT) FOR LATE LIFE DEPRESSION IN SOCIOECONOMICALLY DEPRIVED AREAS OF SÃO PAULO, BRAZIL (PROACTIVE)

PRINCIPAL INVESTIGATORS

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FAPESP Process 2017/50094-2
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Thematic Project
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This will be a two-arm cluster randomised controlled trial aiming to compare the cost-effectiveness of adding to usual care a psychosocial, community-based intervention (PROACTIVE) delivered at home by Community Health Workers employed by the existing Brazilian primary care system with an 'enhanced' usual care in reducing depressive illness among older adults 60 years or older from poor backgrounds in Guarulhos, Brazil. The protocol and the feasibility of conducting this study in the Brazilian primary care were evaluated in a pilot study conducted by our research group. PROACTIVE consists of 8 to 11 home sessions delivered over 17 weeks, with those with milder conditions receiving less sessions whereas those with more severe symptoms receiving a more intensive intervention. Community Health Workers will be equipped with tablet computers to assist with the delivery and supervision. We anticipate recruiting 1,440 participants from 20 clinics in the Municipality of Guarulhos. We will compare recovery across arms at 8 and 12 months after entering the trial. Several secondary outcomes will be also measured including quality of life and levels of functioning. Direct and indirect costs will be measured to undertake a cost-effectiveness analysis.

One of the 20 primary care clinics in the Municipality of Guarulhos where the study will be conducted.

SUMMARY OF RESULTS

The project started on 1st August 2018. We have recruited two excellent post-docs and enlisted the Municipality of Guarulhos as the area where the project will take place. Guarulhos is in the Great São Paulo and approximately 11% of its 1,340,00 inhabitants are 60 years or over.

HOW IS THE CURRENT CRISIS RESHAPING BRAZIL'S HEALTH SYSTEM? STRENGTHENING HEALTH WORKFORCE AND PROVISION OF SERVICES IN SÃO PAULO AND MARANHÃO

This project aims to evaluate the impacto of the current economic crisis in the Brazilian Health System, especially in health human resources and in the offer of health services to vulnerable population. To achieve that, we will analyze secondary data, collect primary quantitative and qualitative data. The study will be conducted in the states of São Paulo and Maranhão, chosen for their disparities in economic reality, health system organization, availability of medical workforce and in the health status of the population. We expect, with de result of this study, to support policy making and adoption of measures to attenuate eventual impacts of the economic crisis in Brazil's health.

PRINCIPAL INVESTIGATORS

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FAPESP Process 2017/50356-7
Term: Jun 2018 to May 2020
Public Policy Research Grant
UKRI – MRC (Newton Fund)

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THE EFFICACY AND SAFETY OF STEM CELL THERAPIES IN MOUSE MODELS OF KIDNEY DISEASE

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The prevalence of end-stage renal disease (ESRD) has been rising dramatically over the last decade and it is now recognised as a worldwide public health problem with major social and economic implications1. In ESRD, both kidneys are so damaged that they cannot sustain life, so that dialysis or renal transplantation, both with significant morbidity and mortality, are the only treatment options. Thus, we need to devise interventions that prevent or delay the onset of ESRD, which itself usually develops from a worsening of chronic kidney disease (CKD), associated with atrophy of glomerular and tubular epithelia, fibrosis, and a reduced glomerular filtration rate (GFR). This progression of disease is a well-documented phenomenon in humans and in several animal models, including the ischemia reperfusion (IR) and adriamyin (Adr)-induced injury models we will use in this Project 2,3. Over recent years, severa l studies have shown that stem cell-based therapies involving kidney-derived stem cells (KSCs) and mesenchymal stem/stromal cells (MSCs) can have beneficial effects when administered to rodents with kidney disease4-10. Whilst encouraging, these studies collectively have the following shortcomings, which must be addressed before such therapies could be used in the clinic: (i) variability in study design -the vast differences in cell-types, dosing regimes, administration routes, disease models and types of analyses used, makes it difficult to compare studies, and consequently, it is not possible to say which (if any) of these many forms of cell-based therapies would be most appropriate for clinical use; (ii) potential safety issues -due to limitations in in vivo imaging technologies, the extent to which the administered cells integrate into non-target organs and tissues tends not to be addressed, thus precluding any attempt to monitor the potential adverse effects of the cells on the surrounding tissues, the most common effects being inflammation, fibrosis, maldifferentiation or tumourigenesis; (iii) lack of knowledge regarding mechanism -in most cases, it is not clear how the administered stem cells ameliorate kidney damage. Knowledge of the mechanisms involved could allow such therapies to be improved or refined so that they are more efficacious and safer.

BIOMARKERS OF TREATMENT NAIVE PSYCHOSIS

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The investiqation of individuais during their first-episode psychosis (FEP) before the proqression of the disorder and particularly before treatment with antipsychotic medications is helpful for understanding the complexity of schizophrenia. Several studies suggested that gene expressron in blood could serve as a diagnosis tool for brain-related diseases. Considering that schizophrenia is a chronic condiction that requires a lifelong treatment, disease progression and use of antipsychotic medication can confound results on gene expression and DNA methylation. Our main aim of this study is to identify genetic markers using genomic, transcriptomic and methylomic approaches in a longitudinal cohort of FEP. The patients will be assessed in the baseline, all antipsychotic naive, (anFEP, N=80), and after eight weeks (FEP-8w, N=80) and one year (FEP-1Y, N=30) of antipsychotic treatment. Until this moment, we collected and isolated the mRNA and the DNA of more than 75 anFEP, 75 FEP-8w and 20 FEP-1Y. The remaining patients will be collected during the first semester of this Project. The DNA Genotyping array will be performed in Brazil using the PsychChip array with a GWAS core backbone and specific content from the Psychiatric Genomics Consortium, under the hypothesis that gene expression and methylation differences for FEP individuals and for treatment response are determined by genetic variance. Transcriptomic and methylomic approaches will be performed in UK. For the whole gene expression arrays we are going to use the "HumanHT -12 v4 Expresston BeadChip". witch provides genome-wide transcriptional coverage of well-characterized genes (approx. 25,000 genes). Concerning DNA methylation analysis, we will generate data using the Infinium Human Methylation 450 BeadChip, which interrogates more than 485,000 methylation sites per sample. With these data, we expect to find potential blood biomarkers for disease and for treatment response (anFEP x FEP-8w and FEP-1 Y). Moreover, we will hold an advanced course in bioinformatics focusing on gene expression and methylation analysis at UNIFESP lasting a week. This will be available to 30 PhD students of São Paulo State with no charge. The analysis course will be leaded by Dr. Breen's team. This Project is a great opportunity for both sides. Dr. Breen will contribute with this expertise in bioinformatics and will analyze the "big data" generated by transcriptome and methylome analysis. Moreover, his team will teach for a grad students about this analysis. Thus, we would be able to perform it by ourselves. On the other hand, the Brazilian group will contribute with a unique anFEP cohort including a multimodal assessment, besides expertise and background in genomic and epigenomic techniques. Both sites will contribute equally to the Project performance, helping to find out genetic markers to schizophrenia.

PULMONARY DELIVERY OF A TARGETED MUCOSAL NANOCARRIER VACCINE FOR PNEUMONIA

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Streptococcus pneumoniae utilizes as a portal of entry into the body causing community acquired-pneumonia (CAP), bacteraemia, meningitis and sepsis (invasive pneumococcal disease, IPD). Current pneumococcal conjugate vaccine (PCV13) comprises 13 of the most common S. pneumoniase serotypes and is administered via the parental route resulting in low levels of lung mucosal immunity. Several trials indicated the efficacy of PCVs against CAP to be lower than IPD. Hence, pneumococcal disease to have a high burden due to limited protection against the total number of serotypes, variation in serotype distribution worldwide and the occurrence of non-vaccine serotype replacement in S. pneumoniase carriage. This led to development of protein antigens such as recombinant pneumococcal surface protein A (PspA), genetically detoxified pneumolysin (PdT) and PspA - PdT fusion protein. These proteins provide serotype independent protection in order to counter replacement disease. Moreover, delivery in a nanocarrier system directly to the lung dendritic cells (DCs) can enhance mucosal and systemic. We will investigate polymer- based nanoparticle (NPs) composed of two polymers in a layer-by-layer approach, as they are biodegradable and biocompatible with tissues/cells, promote the uptake of protein antigens by CDs and as adjuvants aiding in activating cellular and humoral immune responses, potentially reduce the quantity of antigen required and number of vaccine administrations. Lung mucosal immunization offers the advantage of needle-free vaccination, reducing blood-borne infections, and formulated as dry powders (DP) eliminates cold-chain requirements while maintaining antigen stability and integrity. The NPs will be formulated within biocompatible excipients (carbohydrates), amino acids, and combinations) generating DP nanocomposite microparticle carriers (NCMPs) of suitable size (1-5um) for deposition in the respirable tract. The excipients protect the NPs and against the shear forces and increased temperatures during spraying and aides in NPs dispersion in the lung lining fluid for targeting DCs and antigen stability during storage. LJMU will investigate NPs and NCMPs formulations with protein antigens provided by Institute Butantan. The optimum formulation will evaluated for cellular and humoral immune responses in mice, and protection against intranasal challenge of S. pneumoniase, compared to antigen alone at Institute Butantan.

ECOFOR: BIODIVERSITY AND ECOSYSTEM FUNCTIONING IN DEGRADED AND RECOVERING AMAZONIAN AND ATLANTIC FORESTS

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FAPESP Process 2012/51872-5
Term: Aug 2013 to Dec 2017
Thematic Project – BIOTA Program
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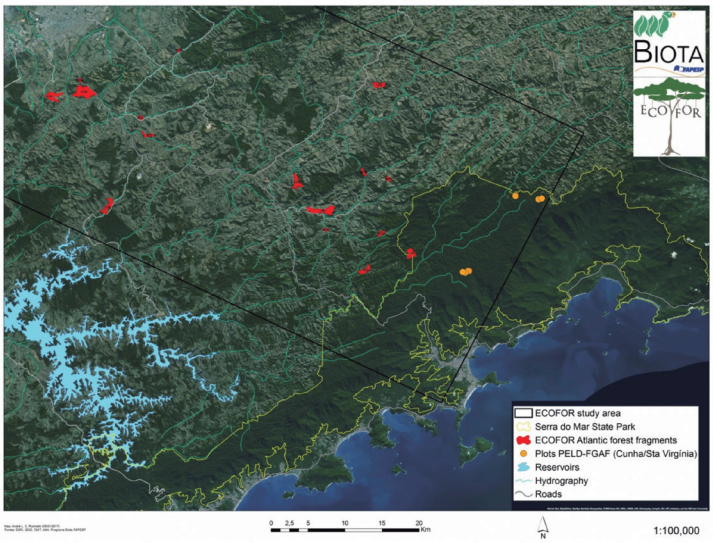
The ECOFOR Project (http://ecofor.hmtf.info/) is jointly supported by the British NERC/Natural Environment Research Council and FAPESP. Within NERC the project is part of the Human-Modified Tropical Forests/HMTF (http://www.nerc.ac.uk/research/funded/programmes/forests/) and within FAPESP it is part of the BIOTA/FAPESP Program (www.biota.org.br).

There is growing consensus that the combined impact of degradation processes such as logging and fire on forest biodiversity and carbon stocks is of comparable magnitude to deforestation. In areas where no intact forests remain, these heavily modified ecosystems are the last refuges for many endemic species. Yet we still have a limited understanding of how these disturbed forests are functioning, their ability to provide critical ecosystem services, and the prospects for long-term biodiversity persistence.

In both the Atlantic and the Amazon Forests, we are assessing changes in biodiversity and ecosystem functioning across gradients of human-modification, comparing intact primary forests with those that have been logged, burned or are regenerating after clear-felling. As far as possible we have balanced our design in the Atlantic Forest and the Amazon, providing a strong basis for comparative work with respect to both ecological findings and policy development. In the Amazon we have been closely monitoring disturbances in forest in and around the FLONA do Tapajós, near Santarém, while in the Atlantic Forest we are studying areas in and around the Serra do Mar State Park, mainly Nucleus Santa Virgínia. We are assessing biodiversity as well as undertaking detailed measurements of forest recovery and carbon cycling. These assessments are accompanied by a thorough evaluation of soil conditions and the main leaf traits of the dominant plant species in the plots. This is the largest carbon monitoring of its kind in disturbed tropical forests, and it is unique in linking plant physiology with ecosystem functioning. Through our permanent plot network, we will be able to understand the main ecophysiological characteristics of the species that dominate forest recovery, providing important insights into the resilience of disturbed Amazonian and Atlantic forests.



Project Structure (work packages integration and information flow)

SUMMARY OF RESULTS

At the microcosm level we developed and applied models of bio-refinery processes concerning the process to produce sugar and ethanol. Two approach were studied: the overall mass and energy balances considering the industrial data of sugar/ethanol yield and the more detailed phenomenological models of all process of the sugar-cane industry. An open platform for sugarcane process simulation was developed.

At the macrocosm level, the analysis of the economic impacts of biogas insertion in the product mix of sugarcane mills (ethanol, sugar, and electricity) was developed using a portfolio model, robust optimization techniques, and conditional-value-at-risk, accounting for all operational constraints and uncertainties (market and price volatilities). A portfolio optimization model was also developed to estimate investor's willingness to increase their bioenergy generation, taking into account financial risks associated with all products in their portfolio, sugar, ethanol and bioenergy generated from residues. The current state of the gas and electricity supply system in Brazil has been studied and forecasting models for energy demand were developed to analyze the government's policies for electricity dispatch.

MAIN PUBLICATIONS

Joly CA, Metzger JP, Tabarelli M. 2014. Experiences from the Brazilian Atlantic Forest: ecological findings and conservation initiatives. *New Phytologist*. **204**: 459-473. doi: 10.1111/nph.12989.

Berenguer E, Ferreira J, Gardner T A, Aragão LEOC, Camargo PB, Cerri C E, Durigan M, Oliveira Jr RC, Vieira ICG, Barlow J. 2014. A large-scale field assessment of carbon stocks in human-modified tropical forests. *Global Change Biology*. **20(12)**: 3713-3726. doi:10.1111/gcb.12627.

Solar RRC, Barlow J, Ferreira J, Berenguer E, Lees AC, Thomson JR, Louzada J, Maués M, Moura NG, Oliveira VHF, Chau JCM, Schoereder JH, Vieira ICG, Mac Nally R, Gardner TA. 2015. How pervasive is biotic homogenization in human-modified tropical forest landscapes? *Ecology Letters*. **18(10)**: 1108-1118. doi:10.1111/ele.12494.

Barlow J, Lennox GD, Ferreira J, Berenguer E, Lees AC, Mac Nally R, et al. 2016. Anthropogenic disturbance in tropical forests can double biodiversity loss from deforestation. *Nature*. **535(7610)**: 144-147. doi:10.1038/nature18326.

SOS RARE:MULTIDISCIPLINARY RESEARCH TOWARDS A SECURE AND ENVIRONMENTALLY SUSTAINABLE SUPPLY OF CRITICAL RARE EARTH ELEMENTS (Nd AND HREE)

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FAPESP Process 2014/50819-9
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The rare earth elements (REE) are vital raw materials for a wide range of modern technology. Almost all of the world's production of the REE comes from a group of mines in China. Since 2010, they are considered as critical metals, and has driven substantial exploration and research. The highest REE concentrations are typically found in association with alkaline igneous rocks and carbonatites, or in magmatic-hydrothermal deposits. Deposits of the REE are characterised by varied mineralogy, with over 50 minerals being considered as potential REE ore minerals. This complex mineralogy has significant implications for the mining and processing of REE ores, and represents one of the key challenges that must be overcome to enable new REE mines to succeed. In Brazil, there are several incompletely studied rocks containing earth-rare elements, such as the alkaline rocks of Poços de Caldas in Minas Gerais, and the Jacupiranga carbonatite in Cajati, São Paulo, where some new minerals have been described and others are in study. Mineralogical studies (chemical and crystallographic) of these and other minerals of Brazilian occurrence are being carried out.

Parisite-(La) from Novo Horizonte, Bahia, Brazil (Menezes Filho et al. 2018)

SUMMARY OF RESULTS

During the development of this project two new rare earth minerals were described, waimirite-(Y) and parisite-(La). Also the gadolinite supergroup of minerals was established and a nomenclature system for them was developed. The most interesting feature of the new mineral waimirite-(Y), YF_3, from both the crystal chemical and potential application aspects, is the distribution of REEs. Ideal waimirite-(Y) contains 60.93 wt% of yttrium, whereas Y content in ideal xenotime-(Y) is 48.35 wt%. Waimirite-(Y) could be therefore a spectacular ore mineral. Parisite-(La), ideally $CaLa_2(CO_3)_3F_2$, is the second new mineral studied and is the La-dominant analogue of parisite-(Ce). Gadolinite is a very important ore for three metals of beryllium, thorium, and yttrium (this metal is used to provide red color in color TV sets). Also, thorium is often occurs as an impurity within the body of the mineral (thorium is a radioactive metal that may be converted to fissionable uranium-233).

MAIN PUBLICATIONS

Atencio D, Bastos Neto AC, Pereira VP, Ferron JTMM, Hoshino M, Moriyama T, Watanabe Y, Miyawaki R, Coutinho JMV, Andrade MB, Domanik K, Chukanov NV, Momma K, Hirano H, Tsunematsu M. 2015. Waimirite-(Y), orthorhombic YF_3, a new mineral from the Pitinga mine, Presidente Figueiredo, Amazonas, Brazil, and from Jabal Tawlah, Saudi Arabia: Description and crystal structure. *Mineralogical Magazine.* **79**: 767-780.

Bačík, P, Miyawaki, R, Atencio, D, Cámara, F, Fridrichová, J. 2017. Nomenclature of the gadolinite supergroup. *European Journal of Mineralogy.* **29**: 1067-1082.

Menezes Filho, LAD, Chaves, MLSC, Chukanov, NV, Atencio, D, Scholz, R, Pekov, I, Costa, GM, Morrison, SM, Andrade, MB, Freitas, E, Downs, RT, Belokovskiy, DI. 2018. Parisite-(La). Parisite-(La), ideally $CaLa_2(CO_3)_3F_2$, a new mineral from Novo Horizonte, Bahia, Brazil. *Mineralogical Magazine.* **82**: 133-144.

SATELLITE ESTIMATES OF MARINE NET COMMUNITY PRODUCTION IN THE SOUTH ATLANTIC OLIGOTROPHIC GYRE FROM SENTINEL-3

The project has the following objectives: 1. The purpose of this work will be firstly to evaluate the accuracy of Level 2 Reflectance & Chlorophyll-a (Chia) Products from S-3 Ocean and Land Colour Instrument using in situ data collected in the South Atlantic Ocean on the Atlantic Meridional Transect and along the Brazilian coast by National Institute for Space Research, Brazil (INPE), University of Sao Paulo (USP) and State University of Sao Paulo (UNESP). 2. Using the most accurate S-3 Chia product to derive primary production (PP), a preliminary assessment of algorithms to predict Net Community Production (NCP) along the Brazilian coast and in the South Atlantic Gyre will then be conducted. INPE/USP/UNESP have tested different ocean colour PP model which we will be compared those developed at PML. 3. The NCP algorithm will be applied to S-3 data to make a preliminary assessment of the role of the South Atlantic Gyre as a CO2 sink or source, to or from the atmosphere.

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FAPESP Process 2016/50221-1
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FUNCTIONAL DIVERSITY OF INTACT AND REGENERATING AMAZON, ATLANTIC, AND CERRADO SYSTEMS USING HYPERSPECTRAL IMAGERY

More specifically, the Young Investigator project will tackle the following questions across the three biomes: Can airborne spectroscopy from an unmanned aerial vehicle (UAV) adequately characterize canopy chemistry? Are ecosystem biogeochemical flows in plant matter identifiable in the hyperspectral images? To what extent can hyperspectral data of canopies be used to estimate biomass production and storage in intact versus regenerating vegetation? Da higher levels of diversity confer resilience to environmental disturbances? And, in combination with Landsat and MODIS images, to what extent are Amazon and Cerrado systems shifting? Our in-depth exploration of the potential of hyperspectral techniques is expected to provide new methods to describe and explore ecosystems services at larger scale, and their relationships with functional biodiversity. Give current lack of knowledge on the role of functional diversity in maintaining ecosystem services in the face of global change the project will substantially advance the state-of-the-art research for the Brazilian biomes.

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FAPESP Process 2015/50484-0
Term: Oct 2016 to Sep 2020
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MARINE FERROMANGANESE DEPOSITS A MAJOR RESOURCE OF E-TECH ELEMENTS

Minerals are essential for economic development, the functioning of society and maintaining our quality of life. We are also using a greater variety of metals than ever before. Of particular concern are 'critical' raw materials (E-tech element), so called because of their growing economic importance and essential contribution to emerging 'green' technologies, yet which have a high risk of supply shortage. The following E-tech elements are considered to be of highest priority for research: cobalt, tellurium, selenium, neodymium, indium, gallium and the heavy rare earth elements. Some of these E-tech elements are highly concentrated in seafloor deposits (ferromanganese nodules and crusts), which constitute the most important marine metal resource of future exploration and exploitation. Our research programme aims to improve understanding of E-tech element concentration in seafloor mineral deposits, which are considered the largest yet least explored source of E-tech elements globally. Our research will focus on two key aspects: The formation of the deposits, and reducing the impacts resulting from their exploration. Our primarily focus is on the processes controlling the concentration of the deposits and their composition at a local scale (10's to 100's square km). These will involve data gathering by robotic vehicles across underwater mountains and small, deep-sea basins off the coast of North Africa and Brazil. By identifying the processes that result in the highest-grade deposits, we aim to develop a predictive model for their occurrence worldwide. We will also address how to minimize the environmental impacts of mineral exploitation. Seafloor mining will have an impact on the environment. It can only be considered a viable option if it is environmentally sustainable. By gathering ecological data and experimenting with underwater clouds of dust that simulate those generated by mining activity, we will explore of extent of disturbance by seafloor mineral extraction. Metal extraction from ores is traditionally very energy consuming. To reduce the carbon footprint of metal extraction we will explore the novel use of organic solvents, microbes and nano-materials. An important outcome of the work will be to engage with the wider community of stakeholders and policy makers on the minimizing the impacts of seafloor mineral extraction at national and international levels. This engagement will help inform policy of the governance and management of seafloor mineral exploitation.

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Thematic Project
UKRI – NERC

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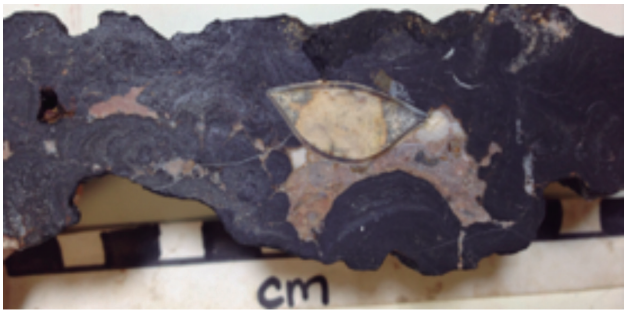

A ferromanganese crust sample collected from Rio Grande Rise during research expedition organized by the Oceanographic Institute of the University of São Paulo in January 2018.

SUMMARY OF RESULTS

1. The polymetallic nodules from different ocean regions studied exhibit common characteristics and are formed fundamentally by the same two processes, the oxic diagenetic and the hydrogenetic accretion of Mn and Fe oxides.

2. The presence of biogenic magnetite, which is, in turn, a result of magnetotactic bacteria (MTB) in ferromanganese nodules can be a leading pathway for the future research to understand the formation and growth of ferromanganese nodules.

3. Regarding the vertically integrated chemoautotrophic prokaryotic production in the water column, our results showed that the bathy-, meso-, and epipelagic zones contributed with 63%, 33% and 4%, respectively, to the total organic matter production via chemosynthesis.

4. The mining of cobalt-rich crusts (CRCs) will effectively remove the particular hard substrate permanently. Consequently, associated benthic ecosystem functioning will be impaired for decades, and likely even centuries. It is extremely likely that there is no such thing as "sustainable deep-sea mining". Secondary impacts like crushing and smothering, increased sediment loading, release of contaminants and underwater noise are extremely likely to have long-lasting impacts on surrounding ecosystems.

MAIN PUBLICATIONS

Montserrat F, Guilhon M, Corrêa PVF, Bergo NM, Signori CN, Tura PM, Hassan MB, Benites M, Millo C, Jovane L, Pellizari VH, Sumida PYG, Brandini FP, Turra A. 2018. Deep-sea mining on the Rio Grande Rise (Southwestern Atlantic): a review on environmental baseline, ecosystem services and potential impacts. (*already submitted*)

Hassan MB, Jovane Luigi, Rodelli D & Benites M. 2018. Presence of biogenic magnetite in ferromanganese nodules. (*to be submitted*)

Benites M, Millo C, Hein J, Nath BN, Murton B, Galante D, Jovane L. 2018. Integrated geochemical and morphological data provide insights into the genesis of ferromanganese nodule. (*already submitted*)

Signori CN, Pellizari VH & Brandini FP. 2018. Dark carbon fixation in the pelagic zones of the Southwestern Atlantic. Poster Presentation. 2018. Ocean Carbon & Biogeochemistry, Woods Hole Oceanographic Institution.

NORDESTE: NEW SCIENCE FOR A NEGLECTED BIOME

PRINCIPAL INVESTIGATORS

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COLIN PRENTICE
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ABOUT THE PROJECT

FAPESP Process 2015/50488-5
Term: Sep 2016 tp Aug 2019
São Paulo Excellence Chair
UKRI – NERC (Newton Fund)

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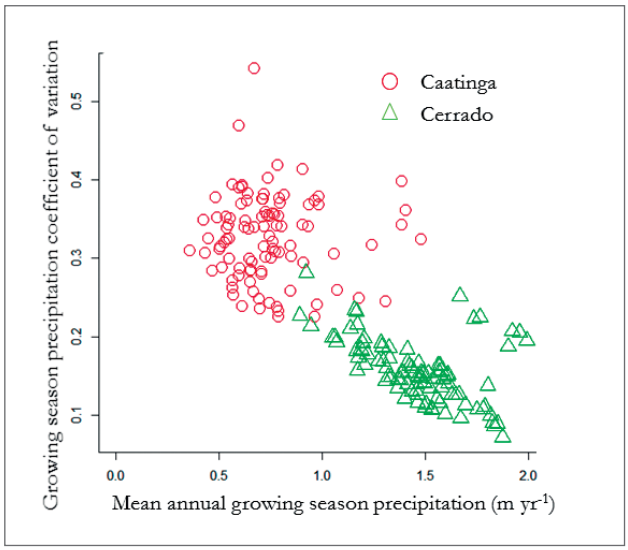
The northeast region of Brazil is relatively dry compared to the rest of the country but the soils there are relatively fertile and the area is reasonably densely populated. This has led to extreme land-use pressures on the natural vegetation and widespread degradation of remaining lands.

The natural vegetation of the area is a form of deciduous scrub, known locally as caatinga which has been relatively neglected to date, in terms of both conservation programmes and scientific enquiry. This is despite the area being of a high biodiversity and a home to many endemic species. Caatinga may also be considered an analogue to the sort of vegetation that might be expected should areas of the Amazon Basin dry out as a result of climate change.

Designed as a ca. £2M integrated research program involving both Brazilian and UK researchers 'Nordeste' aims to:

- establish a permanent plot network similar to that existing in tropical forests for the monitoring of short- and long-term responses of caatinga vegetation to climate change.
- better quantify and understand the biodiversity of the region
- understand and model the key plant adaptions associated with success in a semi-arid environment



As well as being located in the driest areas of Brazil, a second characteristic of caatinga vegetation is that the vegetation there is subject to extreme variations in precipitation amount from year to year. This is shown in the accompanying diagram where a simple inter-annual precipitation variability index is plotted as a function an average mean annual precipitation (1961-2010) is compared for 100 randomly chosen areas of caatinga shrubland versus cerrado savanna vegetation.

SUMMARY OF RESULTS

During the development of this project two new rare earth minerals were described, waimirite-(Y) and parisite-(La). Also the gadolinite supergroup of minerals was established and a nomenclature system for them was developed. The most interesting feature of the new mineral waimirite-(Y), YF_3, from both the crystal chemical and potential application aspects, is the distribution of REEs. Ideal waimirite-(Y) contains 60.93 wt% of yttrium, whereas Y content in ideal xenotime-(Y) is 48.35 wt%. Waimirite-(Y) could be therefore a spectacular ore mineral. Parisite-(La), ideally $CaLa_2(CO_3)_3F_2$, is the second new mineral studied and is the La-dominant analogue of parisite-(Ce). Gadolinite is a very important ore for three metals of beryllium, thorium, and yttrium (this metal is used to provide red color in color TV sets). Also, thorium is often occurs as an impurity within the body of the mineral (thorium is a radioactive metal that may be converted to fissionable uranium-233).

MAIN PUBLICATIONS

Atencio D, Bastos Neto AC, Pereira VP, Ferron JTMM, Hoshino M, Moriyama T, Watanabe Y, Miyawaki R, Coutinho JMV, Andrade MB, Domanik K, Chukanov NV, Momma K, Hirano H, Tsunematsu M. 2015. Waimirite-(Y), orthorhombic YF_3, a new mineral from the Pitinga mine, Presidente Figueiredo, Amazonas, Brazil, and from Jabal Tawlah, Saudi Arabia: Description and crystal structure. *Mineralogical Magazine.* **79**: 767-780.

Bačík, P, Miyawaki, R, Atencio, D, Cámara, F, Fridrichová, J. 2017. Nomenclature of the gadolinite supergroup. *European Journal of Mineralogy.* **29**: 1067-1082.

Menezes Filho, LAD, Chaves, MLSC, Chukanov, NV, Atencio, D, Scholz, R, Pekov, I, Costa, GM, Morrison, SM, Andrade, MB, Freitas, E, Downs, RT, Belokovskiy, DI. 2018. Parisite-(La). Parisite-(La), ideally $CaLa_2(CO_3)_3F_2$, a new mineral from Novo Horizonte, Bahia, Brazil. *Mineralogical Magazine.* **82**: 133-144.

IMPACT OF CLIMATE EXTREMES ON ECOSYSTEMS AND HUMAN HEALTH IN BRAZIL: PULSE-BRAZIL

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2011/51843-2
Term: Apr 2012 to Mar 2016
Regular Research Grant
UKRI – NERC

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The general aim of this NERC-FAPESP joint proposal is to create the PULSE-Brazil system (where "PULSE= Platform for Understanding Long-term Sustainability of Ecosystems") for analyzing, visualizing and understanding the interactions between climate, ecosystems and human health in Amazonia. Our mission, in developing this system, is to facilitate the analysis and interpretation of complex data, by academics, the general public and policymakers. PULSE-Brazil will enable these stakeholders to explore the consequences of different policy options for adaptation and mitigation of environmental change in the Brazilian Amazon. Specifically, the objectives of PULSE-Brazil are to: 1. support collaboration between UK Universities, the Met Office, FIOCRUZ - Brazil, the University of Minas Gerais - Brazil, the National Institute for Space Research (INPE) - Brazil, Brazilian State Governments and the wider international community on topics related to the impact of climate extremes on ecosystem and human health and potential mitigation and adaptation strategies; 2. develop and evaluate a spatially explicit database of recent climate extremes and their impacts on ecosystems and human health to establish the relationships between climatic variables and environmental and human health data; 3. provide future climate change projections for Amazonia using state-of-the-art regional (Eta) and global climate models (MBSCG and UK Met Office-Hadley Centre models), covering a range of emission and land-use scenarios (through an associated Brazilian-funded project); 4. develop a user-friendly GIS-based tool capable of integrating information of recent extremes and their impacts on ecosystems and human health (02) with relevant physical climate variables and metrics from future climate projections (03), supporting stakeholders (i.e. the public in general, government officers and decision makers) and educators to develop their own understanding of the interactions between climate, ecosystems and human health in Amazonia, and ultimately, explore the consequences of different policy options.

SOUTH AMERICAN MONTANE FORESTS IN A WARMING WORLD

Montane forests in the Andes and the South-eastern Brazilian Mountain Range host the highest plant biodiversity on Earth. Current rates of warming in the Andes are three times higher than elsewhere in S. America, and higher than average warming of 5-60C is predicted by the end of this century. Hence, the (sub) tropical mountain ranges in Latin America form a high-priority area in which to study the response of tropical trees under future environmental change. Tropical forests also play a crucial role in the global carbon budget, accounting for more than half of terrestrial net primary production and storing around 40% of plant biomass. The carbon balance of the tropical ecosystems is responsible for a large proportion of the inter-annual variability in the carbon cycle, and comprises a large component of the uncertainty in atmospheric C02 concentrations under any given scenario of anthropogenic C02 emissions. However, the current generation of Dynamic Global Vegetation and Earth System Models do not include a representation of montane forest functioning, which stems from the lack of empirical understanding, leading to a consideration of only lowland tropical forests in models. We intend to address this knowledge gap by initiating a Latin America-wide network of tropical montane forest sites to gather existing understanding in order to model the contribution of these forests to the regional and global carbon and water cycles, under current and future climate change. This will be achieved via a dedicated workshop at the Uni-Campinas, Brazil, hosted by PP-FAPESP Nagy, with the participation of empirical experts across the network together with DGVM and ESM modellers.

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FAPESP Process 2017/50239-0
Term: Sep 2018 to Aug 2020
Regular Research Grant
UKRI – NERC

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UK/BRAZIL RESEARCH NETWORK FOR AN AMAZONIAN CARBON OBSERVATORY

The Amazon is one of the largest forest regions in the world and it represents the largest reservoir of above ground organic carbon. Despite its important role for the global carbon cycle, the Amazonian region is only poorly constrained by data integrating processes over large spatial scales. The Amazon is currently the focus of major UK and Brazilian research projects that aim at improving our knowledge of the Amazonian carbon cycle using detailed, but localized aircraft observations and the next logical step is to aim now for more complete and denser coverage by combining in-situ observations with complementary satellite observations of greenhouse gases (GHG). We propose to establish a network of scientists to bridge the.gap between in-situ and remote sensing observations and to develop a combined approach for monitoring of the Amazonian carbon balance to accelerate progress in carbon cycle science. The network will join space-based greenhouse gas observations efforts and community with the ongoing joint UK/Brazilian atmospheric GHG observation program to evaluate the feasibility of remote sensing of greenhouse gas concentrations over the Amazon and to develop confidence in the space-borne measurements by comparing them with highly-accurate concentration measurements that remain the gold standard for carbon cycle science. Once consistency between space-based and in-situ observations is established, space-based data can be used for the purpose of GHG flux monitoring over Amazonia.

PRINCIPAL INVESTIGATORS

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FAPESP Process 2011/51841-0
Term: Apr 2012 to Dec 2015
Regular Research Grant
UKRI – NERC

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DEEP SEA CORALS IN THE SOUTH ATLANTIC: NEW INSIGHTS FROM AN INTERDISCIPLINARY STUDY

In contrast to their shallow-water counterparts, azooxanthellate cold-water corals do not live in symbiosis with photosynthetic dinoflagellates. The South Atlantic holds numerous records of azooxanthellate species. These records encompass more than 60 species and grow under the influence of water masses originating in high northern and Southern latitudes. These Waters have very diferente properties such as nutrient concentrations, pH and temperature. With diversity in habitat and water column properties, the South Atlantic is na ideal testing ground to explore large scale controls on deep-sea coral distributions and to make use of coral researchers in the UK and BR, Kitahara (BR) is funded by FAPESP to improve our understanding of the evolution of scleractinian corals and its relationship to climate chance. At the same time Professor Robinson (UK) is funded by NERC to apply geochemical techniques to deep-sea corals to reconstruct past climates and deep sea coral biogeography. Dr Taylor (UK) joins the Project as na expert in deep-sea ecosystems as well as genetic connectivity across the Atlantic and Southern Ocean. This pump-priming proposal in na ideal oportunity for these scientists to initiate a long-term partnership to build a coherent view of the long term controls on deep-sea corals. With access to samples within the South Atlantic (BR) and to the North and South (UK) we are proposing to come together in a new collaboration to share our ideas, samples, and techniques. Within the two-year program we will organize visits to exchange knowledge, establish a shared specimen database, share samples, and access to laboratories and facilities. We also plan to collaborate on writing a paper, and will seek to establish additional support to continue these efforts beyond the scope of this initial proposal.

PRINCIPAL INVESTIGATORS

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FAPESP Process 2017/50229-5
Term: Dec 2018 to Nov 2020
Regular Research Grant
UKRI – NERC

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BRAZIL-UK NETWORK FOR INVESTIGATION OF AMAZONIAN ATMOSPHERIC COMPOSITION AND IMPACTS ON CLIMATE (BUNIAACIC)

The BUNIAACIC collaboration aims to develop a coherent strategy for UK studies of atmospheric composition and impacts in the Amazon. A network of Brazilian and UK atmospheric researchers will be established to scope potential collaborative opportunities by exploiting and extending the infrastructural framework of the FAPESP AEROCLIMA Thematic Grant. An early secondment of CAS staff to São Paulo followed by a broad kick-oft workshop will be used to initiate the scoping study. Potential UK activities at various stages of development will be drawn into a broader strategy of International collaboration and opportunities for further consortium scale activities will be developed. A UK office for collaboration on Amazonian atmospheric research will be established at the University of Manchester. The long-term particulate monitoring programme within AEROCLIMA will be expanded to include online aerosol composition measurements at the pristine rainforest site. Secondment of São Paulo staff to CAS will ensure adequate training is provided in the operation of the instrumentation, data analysis and quality control. A pump-priming pilot scale intensive deployment of the CAS container laboratory with additional particulate measurement instrumentation will be used to i) validate the long-term measurements; ii) quantitatively interpret the impacts of aerosol composition on physical properties of climate relevance in the context of the long-term variability; iii) act as a focal measurement suite around which a broader consortium-scale activity can be developed. A strategy for the medium and longer term collaborative efforts will be developed based on the initial scoping study and consultation throughout the UK research community. This strategy will be consolidated into a White Paper outlining the Brazil-UK collaborative opportunities and recommended participation of UK groups in Amazonian atmospheric research.

PRINCIPAL INVESTIGATORS

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FAPESP Process 2010/52658-1
Term: Aug 2011 to Jul 2014
Regular Research Grant
UKRI – NERC

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SUSTAINABLE GAS PATHWAYS FOR BRAZIL: FROM MICROCOSM TO MACROCOSM

PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2015/50684-9
Term: Jun 2016 to May 2019
Thematic Project
UKRI – NERC (Newton Fund)

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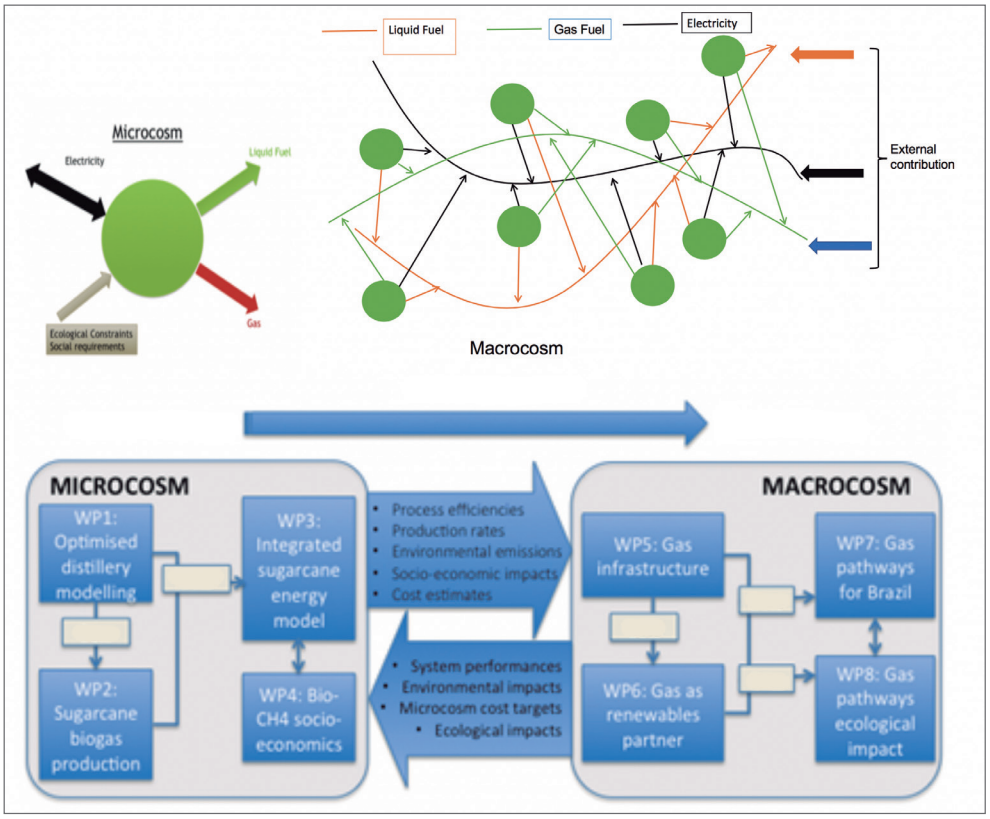
Both in Brazil and globally, gas (gaseous energy sources composed predominantly of methane). is at a crossroads. On one hand it is abundant, has an increasing share in global energy supply, is relatively clean-burning and is often an economically competitive fuel. On the other hand the gas supply chain and its combustion emit climate forcing CO_2 and methane, alongside having non-trivial life cycle interactions with natural capital and ecosystem services. The balance between these opposing attributes will determine the role for gas in future energy systems.

The objective of this project is to comprehensively assess the most challenging issues concerning a future sustainable role of gas in the Brazilian energy system, covering the technical, environmental and socio-economic factors.

The research considers gas futures at both the technology, process and community level (i.e. the MICROCOSM, focused production of biogas from residuals of the Brazilian bioethanol industry) and at the national whole systems level (the MACROCOSM), by the analysis of biomethane and electricity technologies linked with the broader systems view and opportunities.



Project Structure (work packages integration and information flow)

SUMMARY OF RESULTS

At the microcosm level we developed and applied models of bio-refinery processes concerning the process to produce sugar and ethanol. Two approach were studied: the overall mass and energy balances considering the industrial data of sugar/ethanol yield and the more detailed phenomenological models of all process of the sugar-cane industry. An open platform for sugarcane process simulation was developed.

At the macrocosm level, the analysis of the economic impacts of biogas insertion in the product mix of sugarcane mills (ethanol, sugar, and electricity) was developed using a portfolio model, robust optimization techniques, and conditional-value-at-risk, accounting for all operational constraints and uncertainties (market and price volatilities). A portfolio optimization model was also developed to estimate investor's willingness to increase their bioenergy generation, taking into account financial risks associated with all products in their portfolio, sugar, ethanol and bioenergy generated from residues. The current state of the gas and electricity supply system in Brazil has been studied and forecasting models for energy demand were developed to analyze the government's policies for electricity dispatch.

MAIN PUBLICATIONS

Dutenkefer RM, Ribeiro CO, Mutran VM, Rego EE, 2018. The insertion of biogas in the sugarcane mill product portfolio: A study using the robust optimization approach. *Renewable and Sustainable Energy Reviews.* **91**: 729-740.

Rego EE, Ribeiro CO, Costa OLV, Ho LL, 2017. Thermoelectric dispatch: From utopian planning to reality. *Energy Policy.* **106**: 266-277.

Mutran VM, Ribeiro CO, Nascimento CAO, Rêgo EE, 2018. Bioenergy investments in sugarcane mills: an approach combining portfolio theory with neural networks. *Computer Aided Chemical Engineering*. **44**: 967-972.

de Castro RE, Alves RMB, Hawkes A, Nascimento CAO, 2018. Open sugarcane process simulation platform. *Computer Aided Chemical Engineering*. **44**: 1819-1824.

Castro REN, Alves RMB, Nascimento CAO, Giudici R. Assessment of sugarcane-based ethanol production. In: *Ethanol*, ISBN 978-953-51-6711-2, IntechOpen.

Oliveira LL, Ribeiro CO, Tomei J, Rego EE. Insertion of renewable sources in the Brazilian electricity matrix: an analysis through portfolio theory. *Computer Aided Chemical Engineering.* **44**: 1831-1836.

British Council – 52 grants approved

FAPESP Process 1997/09663-8

PHILIP HUSBANDS | SCHOOL OF COGNITIVE AND COMPUTING SCIENCES – ENGLAND
PI: Pedro Paulo Balbi de Oliveira
Research and Development Institute / University of Vale do Paraíba (UNIVAP)
Term: Oct 1997 to Dec 1997
VISITING RESEARCHER PROGRAM FROM ABROAD

FAPESP Process 1998/05820-4

PHILIP HUSBANDS | UNIVERSITY OF SUSSEX – ENGLAND
PI: Pedro Paulo Balbi de Oliveira
Research and Development Institute / University of Vale do Paraíba (UNIVAP)
Term: Jun 1998 to Jun 1998
VISITING RESEARCHER PROGRAM FROM ABROAD

FAPESP Process 2001/08996-0

RICHARD JOHN SMITH | LANCASTER UNIVERSITY– UNITED KINGDOM
PI: Ricardo Antunes de Azevedo
Luiz de Queiroz College of Agriculture / University of São Paulo (USP)
Term: Nov 2001 to Nov 2001
VISITING RESEARCHER PROGRAM FROM ABROAD

FAPESP Process 2002/03538-7

PETER JOHN LEA | LANCASTER UNIVERSITY – UNITED KINGDOM
PI: Ricardo Antunes de Azevedo
Luiz de Queiroz College of Agriculture / University of São Paulo (USP)
Term: Oct 2002 to Nov 2002
VISITING RESEARCHER PROGRAM FROM ABROAD

FAPESP Process 2013/50567-7

TRENDS IN FUTURE COMMUNICATIONS: HIGH PERFORMANCE NETWORK INFRASTRUCTURE FOR FUTURE INTERNET | CAMPINAS – SP
PI: Júlio César Rodrigues Fernandes de Oliveira
Research and Development Center (CPqD)
Term: Feb 2014 to Feb 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2013/50574-3

COMPARATIVE APPROACHES TO SECURITY SECTOR REFORM, WITH SPECIAL FOCUS ON THE PENAL SYSTEM | SÃO PAULO – SP
PI: Renato Sérgio de Lima
Forum Brasileiro de Segurança Pública (FBSP)
Term: Mar 2014 to Mar 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2013/50578-9

PSYCHIATRY MEETS CRIMINOLOGY: TOWARDS A BIO-SOCIAL UNDERSTANDING OF THE DEVELOPMENT OF ANTISOCIAL BEHAVIOUR | SÃO PAULO – SP
PI: Guilherme Vanoni Polanczyk
School of Medicine / University of São Paulo (USP)
Term: Mar 2014 to Mar 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2013/50585-5

EVIDENCE-BASED PRACTICE IN A GLOBAL CONTEXT: BUILDING SUSTAINABLE COMMUNITIES OF PRACTICE | SÃO PAULO – SP
PI: Cássia Baldini Soares
School of Nursing / University of São Paulo (USP)
Term: Feb 2014 to Feb 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2013/50597-3

FLOURIDE METABOLISM AND PUBLIC HEALTH: A QUESTION OF DETAIL | BAURU – SP
PI: Marília Afonso Rabelo Buzalafs
Bauru School of Dentistry / University of São Paulo (USP)
Term: Mar 2014 to Mar 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2013/50599-6

ALÉM DO DIGITAL: MEMÓRIA COLETIVA, REDES SOCIAIS E CONFLITOS GLOBAIS | SÃO PAULO – SP
PI: Gilson Liberato Schwartz
School of Communication and Arts / University of São Paulo (USP)
Term: Apr 2014 to Apr 2014
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50477-0

ELECTROCHEMICAL SOLUTIONS FOR CONTEMPORARY PROBLEMS | SÃO CARLOS – SP
PI: Ernesto Chaves Pereira de Souza
Technology and Exact Sciences Center (CCET) / Federal University of São Carlos (UFSCar)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50479-3

GLOBAL CHANGE IN COASTAL MARINE ECOSYSTEMS: SCIENCE, POLICY AND SUSTAINABLE DEVELOPMENT | SANTOS – SP
PI: Ronaldo Adriano Christofoletti
Health and Society Institute / Federal University of São Paulo (UNIFESP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50488-2

MECHANISMS UNDERLYING DEVELOPMENTAL PROGRAMMING IN METABOLIC DISEASES: INSIGHT INTO PREVENTIVE STRATEGIES | SÃO PAULO – SP

PI: Rui Curi
Institute of Biomedical Sciences / University of São Paulo (USP)
Term: Feb 2015 to Feb 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50490-7

WATER AS THE FRONTIER OF AGRIBUSINESS: POLITICO-ECOLOGICAL AND SOCIO-ECONOMIC CONNECTIONS FROM FARMS TO GLOBAL MARKETS | RIO CLARO – SP

PI: Jose Gilberto de Souza
Institute of Geosciences and Exact Sciences / São Paulo State University (UNESP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50491-3

PEOPLE WITH DISABILITIES BECOMING VISIBLE: COMPARING INCLUSIVE AND SPECIAL EDUCATION POLICIES, PRACTICES AND RESEARCH IN BRAZIL AND UK | SÃO CARLOS – SP

PI: Enicéia Gonçalves Mendes
Education and Human Sciences Center / Federal University of São Carlos (UFSCar)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50492-0

NEW APPROACHES TO MONITORING AND MANAGING WATERBORNE DISEASE TRANSMISSION IN BRAZIL AND THE UK | SÃO PAULO – SP

PI: Maria Ines Zanoli Sato
Companhia Ambiental do Estado de São Paulo / Secretaria do Meio Ambiente (São Paulo)
Term: Feb 2015 to Feb 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50493-6

ENVIRONMENTAL AND METABOLIC CONTROL OF PLANT GROWTH AND DEVELOPMENT CAMPINAS – SP

PI: Michel Georges Albert Vincentz
Center for Molecular Biology and Genetic Engineering / University of Campinas (UNICAMP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50494-2

RESEARCH EXCELLENCE AND INTERNATIONAL COLLABORATION ON CORPORATE RESPONSE TO CLIMATE CHANGE | SÃO PAULO – SP

PI: Isak Kruglianskas
School of Economics, Administration and Accounting / University of São Paulo (USP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50498-8

INNOVATION SYSTEMS AND POLICY MIX TOWARDS MULTIDIMENSIONAL DEVELOPMENT | CAMPINAS – SP

PI: Sergio Luiz Monteiro Salles Filho
Institute of Geosciences / University of Campinas (UNICAMP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50500-2

A 'ONE HEALTH - ONE WELFARE' APPROACH TO ANIMAL AND HUMAN WELL-BEING IN DIVERSE URBAN, PERI-URBAN AND RURAL COMMUNITIES IN SÃO PAULO | PIRASSUNUNGA – SP

PI: Adroaldo Jose Zanella
School of Veterinary Medicine and Animal Husbandry / University of São Paulo (USP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50501-9

THE NEW HISTORICAL LINGUISTICS AND THE WORLD OF ANNOTATED CORPORA | CAMPINAS – SP

PI: Charlotte Marie Chambelland Galvesa
Institute of Language Studies / University of Campinas (UNICAMP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50503-1

MODELLING AIDED DESIGN SUPPORT VEHICLE CRASHWORTHINESS AND VEHICLE SAFETY HARMONIZATION | SÃO PAULO – SP

PI: Marcílio Alves
Polytechnic School / University of São Paulo (USP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50504-8
SPORT AND SOCIAL TRANSFORMATION IN BRAZIL | SÃO PAULO – SP
PI: Ricardo Ricci Uvinha
Schoool of Arts, Sciences and Humanities / University of São Paulo (USP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50506-0
QUALITATIVE STUDY DESIGN HEALTHCARE-ASSOCIATED INFECTION RESEARCH | SÃO PAULO – SP
PI: Maria Clara Padoveze
School of Nursing / University of São Paulo (USP)
Term: Feb 2015 to Feb 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50507-7
INTEGRATIVE RESEARCH CHALLENGES OF COMPLEX SYSTEMS FOR TECHNOLOGICAL APPLICATIONS | SÃO PAULO – SP
PI: José Roberto Castilho Piqueira
Polytechnic School / University of São Paulo (USP)
Term: Mar 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2014/50509-0
USING SYSTEMS AND SYNTHETIC BIOLOGY TO TAILOR PLANT CELL WALLS FOR A BETTER FUTURE | SÃO PAULO – SP
PI: Marcos Silveira Buckeridge
Institute of Bioscience / University of São Paulo (USP)
Term: Jan 2015 to Mar 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50144-4
RESEARCHER CONNECT - COMMUNICATION SKILLS FOR RESEARCHERS | SÃO PAULO – SP
PI: Hamilton Brandão Varela de Albuquerque
Pró-Reitoria de Pesquisa / University of São Paulo (USP)
Term: Feb 2016 to Feb 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50145-0
RESEARCHER CONNECT - COMMUNICATION SKILLS FOR RESEARCHERS | SÃO PAULO – SP
PI: José Marcos Pinto da Cunha
Institute of Philosophy and Human Sciences / University of Campinas (UNICAMP)
Term: Aug 2015 to Aug 2015 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50146-7
RESEARCHER CONNECT COMMUNICATION SKILLS FOR RESEARCHERS | SANTO ANDRÉ – SP
PI: Gilberto Marcos Antônio Rodrigues
Center for Engineering, Modeling and Applied Social Sciences / Federal University of ABC (UFABC)
Term: Feb 2016 to Feb 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50232-0
AGEING AND HEALTH - HOW TO GET THERE? | SÃO PAULO – SP
PI: Valquiria Bueno
Paulista School of Medicine / Federal University of São Paulo (UNIFESP)
UK PI: Janet M. Lord
Term: Mar 2016 to Mar 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50257-3
EXTRACELLULAR VESICLES AND NON-CELLULAR RNA: ROLES IN HEALTH AND NEGLECTED TROPICAL DISEASES | SÃO PAULO – SP
PI: Emmanuel Dias-Neto
A C Camargo Cancer Center / Antonio Prudente Foundation (FAP)
UK PI: David Carter
Term: May 2016 to May 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50294-6
ENHANCING RELEVANCE AND IMPACT IN BRAZIL FOR RESEARCH IN GREEN TECHNOLOGY MANAGEMENT & PRODUCT SERVICE SYSTEMS | SÃO PAULO – SP
PI: Marly Monteiro de Carvalho
Polytechnic School / University of São Paulo (USP)
Term: Mar 2016 to Mar 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50661-9
MANAGING THE RHIZOSPHERE TO ALLEVIATE FOOD POVERTY: MOBILISING SOIL NUTRIENTS | PIRACICABA – SP
PI: Elke Jurandy Bran Nogueira Cardoso
Luiz de Queiroz College of Agriculture / University of São Paulo (USP)
UK PI: Paul Withers
Term: Jun 2016 to Jun 2016
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2015/50680-3

METHODS, STRATEGIES AND TOOLS TO GENERATE, ANALYZE AND INCORPORATE GENOMIC DATA INTO LIVESTOCK BREEDING PROGRAMS | JABOTICABAL – SP

PI: Lucia Galvão de Albuquerque
School of Agricultural and Veterinary Studies / São Paulo State University (UNESP)
UK PI: John Hickey
Term: Jun 2016 to Jun 2016
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2016/50282-0

RESEARCHER CONNECT - SCIENTIFIC COMMUNICATION | RIBEIRÃO PRETO – SP

PI: Suzelei de Castro França
Universidade de Ribeirão Preto (UNAERP)
Term: Sep 2016 to Sep 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2016/50283-7

BRITISH COUNCIL RESEARCHER CONNECT 2016 | SÃO PAULO – SP

PI: Miriam Galvonas Jasiulionis
Paulista School of Medicine / Federal University of São Paulo (UNIFESP)
Term: Oct 2016 to Oct 2016 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2016/50284-3

FAPESP - BRITISH COUNCIL RESEARCHER CONNECT 2016 | SÃO CARLOS – SP

PI: Márcia Regina Cominetti
Center for Biological and Health Sciences / Federal University of São Carlos (UFSCar)
Term: Feb 2017 to Feb 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2016/50285-0

RESEARCHER CONNECT - BRITISH COUNCIL/CONFAP | SÃO BERNARDO DO CAMPO – SP

PI: Rafael Celeghini Santiago
Center for Engineering, Modeling and Applied Social Sciences / Federal University of ABC (UFABC)
Term: Feb 2017 to Feb 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2016/50286-6

RESEARCHER CONNECT COMMUNICATION SKILLS FOR RESEARCHERS | SÃO PAULO – SP

PI: Hamilton Brandão Varela de Albuquerque
São Carlos Institute of Chemistry / University of São Paulo (USP)
Term: Feb 2017 to Feb 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50192-4

BRAZIL-ENGLAND COOPERATION INTERDISCIPLINARY PRACTICES DIALOGUE | BAURU – SP

PI: Vera Lúcia Messias Fialho Capellini
School of Sciences / São Paulo State University (UNESP)
Term: Mar 2018 to Mar 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50193-0

RESEARCHER CONNECT - BRITISH COUNCIL/CONFAP 2017 | SANTO ANDRÉ – SP

PI: Yossi Zana
Mathematics, Computing and Cognition Center / Federal University of ABC (UFABC)
Term: Sep 2017 to Sep 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50194-7

RESEARCHER CONNECT BRITISH COUNCIL 2017 | SÃO CARLOS – SP

PI: Ariadne Chloe Mary Furnival
Education and Human Sciences Center / Federal University of São Carlos (UFSCar)
Term: Feb 2018 to Feb 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50195-3

FAPESP - BRITISH COUNCIL RESEARCHER CONNECT 2017 | SÃO PAULO – SP

PI: Mario Henrique Ogasavara
Superior School of Advertising and Marketing (ESPM)
Term: Sep 2017 to Sep 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50196-0

WORKSHOP ON SCIENTIFIC WRITING | SÃO PAULO – SP

PI: Karina de Cássia Braga Ribeiro
College of Medical Sciences at Santa Casa in São Paulo
Term: Mar 2018 to Mar 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50197-6

BRITISH COUNCIL RESEARCHER CONNECT 2017

PI: Roxane Maria Fontes Piazza
Butantan Institute
Term: Oct 2017 to Oct 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50198-2

RESEARCHER CONNECT COMMUNICATION SKILLS FOR RESEARCHERS 2017 | SÃO PAULO – SP

PI: Hamilton Brandão Varela de Albuquerque
Pró-Reitoria de Pesquisa / University of São Paulo (USP)
Term: Feb 2018 to Feb 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50200-7

IDENTIFYING AND ADDRESSING SHARED CHALLENGES IN CONDUCTING HEALTH AND SOCIAL CARE RESEARCH FOR OLDER PEOPLE (OPAL) | BOTUCATU – SP

PI: Alessandro Ferrari Jacinto
School of Medicine / São Paulo State University (UNESP)
UK PI: Adam Gordon
Term: Jun 2018 to Jun 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50201-3

BNRL - FOOD SECURITY FOR VULNERABLE POPULATIONS: THE FUNGAL THREAT | RIBEIRÃO PRETO – SP

PI: Gustavo Henrique Goldman
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Simon Avery
Term: Sep 2018 to Sep 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50375-1

FAZENDAS DE VESPAS SOCIAIS COMO BIOCONTROLADORAS NATURAIS PARA A AGRICULTURA SUSTENTÁVEL

PI: Fábio Santos do Nascimento
Ribeirão Preto School of Philosophy, Science and Literature / University of São Paulo (USP)
UK PI: Seirian Sumner
Term: Aug 2018 to Jul 2019 – **Newton Fund**
REGULAR RESEARCH GRANT

FAPESP Process 2017/50415-3

BNRL REMOTE SENSING BIODIVERSITY ECOSYSTEM SERVICES INVENTORY | SÃO JOSÉ DOS CAMPOS – SP

PI: Jean Pierre Henry Balbaud Ometto
National Institute for Space Research (INPE) / Ministry of Science, Technology, Innovation and Communications
UK PI: Thomas R. Meagher
Term: Jun 2018 to Jun 2018 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

FAPESP Process 2017/50465-0

MODELLING THE ECOLOGICAL AND HUMAN RISK IMPACTS OF INVASIVE HEDYCHIUM CORONARIUM CAPYBARA DYNAMICS IN SÃO PAULO STATE, BRAZIL

PI: Dalva Maria da Silva Matos
Center for Biological and Health Sciences / Federal University of São Carlos (UFSCar)
UK PI: Wayne Dawson
Term: Jun 2018 to May 2019 – **Newton Fund**
REGULAR RESEARCH GRANT

FAPESP Process 2016/50240-6

CLIMATE CHANGE INITIATIVE FOR ADAPTATION RESILIENCE AND MITIGATION | SÃO JOSÉ DOS CAMPOS – SP

PI: Haroldo Fraga de Campos Velhos
National Institute for Space Research (INPE) / Ministry of Science, Technology, Innovation and Communication
UK PI: Trystan Pryer
Term: Aug 2017 to Sep 2017 – **Newton Fund**
ORGANIZATION OF SCIENTIFIC OR TECHNOLOGICAL MEETINGS

ACADEMIES

The partnership between FAPESP and the Academy of Medical Sciences, the British Academy, the Royal Academy of Engineering, and the Royal Society has been strategic to support increased research and innovation exchange and collaboration supporting long-term collaboration between researchers from São Paulo and from the United Kindgom.

It works in two ways. The UK Academies offer Fellowship or Mobility grants to the Brazilian research community covering the fields of natural sciences, social sciences and humanities, engineering, and medical sciences (including clinical and patient-orientated research); FAPESP, in the other hand, offers scholarships, grants and mobility support to researchers from the United Kingdom to Sao Paulo State institutions covering all areas of knowledge;

The Royal Academy of Engineering and FAPESP have launched the Leaders in Innovation Fellowships Programme (LIF) in 2017. The primary objective of the programme is to build the capacity of researchers for entrepreneurship and commercialisation of their research. 15 researchers from the State of São Paulo who had been contemplated with the FAPESP Program for Innovative Research in Small Business (PIPE) were selected for intensive training in entrepreneurship and innovation leadership. More broadly, the programme linked these researchers with international networks of innovators and technology entrepreneurs.

All initiatives have been funded in the remit of the Newton Fund.

NUTRITIONAL SUPLEMENTATION AND EXERCISE TO OPTIMIZE EXERCISE PERFORMANCE: FOCUS ON INDIVIDUAL RESPONSES AND A STEP TOWARDS PERSONALIZED SPORTS NUTRITION

Ergogenic aids are nutritional supplements predominantly directed towards enhancing exercise capacity and performance, although they may else provide health related benefits. Sodium bicarbonate, caffeine and β-alanine have become essential training additions for elite, professional and recreational athletes alike and their efficacy in improving exercise capacity and performance is supported by substantial research. Nonetheless, variability in responses has led to recent suggestion that supplementation may not be beneficial to all individuals. It is of interest to determine the sources of inter- and intra-individual variations and whether resulting information can be used to optimize dosing strategies for exercise performance. Study 1 will evaluate the consistency in responses to sodium bicarbonate supplementation, revealing whether we can viably individualise the timing of ingestion according to the individual. In study 2 we will determine whether enteric capsules can optimize the dose response to sodium bicarbonate supplementation, and alleviate some of the associated side-effects. Study 3 will elucidate the consistency in exercise responses to supplementation with sodium bicarbonate, while study 4 will determine whether changes in muscle transporter activity are related to the changes in circulating bicarbonate. Study 5 will determine the time course blood responses following caffeine ingestion between individuals with different phenotypes for caffeine metabolism, while study 6 will determine the role of phenotype upon the efficacy of caffeine for exercise. Study 7 will determine the acute metabolic responses to β-alanine supplementation pre and post 4 weeks of supplementation, while study 8 will determine whether an acute bout of training also influences these same metabolic responses. We believe that the results obtained in this comprehensive project will have significant and long-lasting impacts on the understanding of acute metabolic responses to supplementation and exercise, and will play a fundamental part in the optimization of supplementation for athletic populations, as well as directing future work in the area.

PRINCIPAL INVESTIGATORS

BRYAN SAUNDERS
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ABOUT THE PROJECT

FAPESP Process 2016/50438-0
Term: April 2017 to March 2021
Young Investigator Award
NEWTON FUND

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COMPANIES

Partnerships with companies are of vital importance for the scientific and technological development of institutions from the State of Sao Paulo. In FAPESP, the collaboration is through the co-funding with the partner company of Research Partnership for Technological Innovation (PITE, in Portuguese) and Engineering Research Centres Program and fellowships

PITEs are expected to contribute to creation of knowledge or technological innovation of interest of the partner company, as well as contributing to the advancement of knowledge and highly qualified human resources from Sao Paulo research institutions.

Engineering Research Centres are long-term shared investments by FAPESP and partner companies, with a core mission to establish a long-term world class Research Centre with effective mechanisms for education and dissemination of knowledge, and technology transfer.

These programs require not only long-term financing but also a reasonably high degree of delegated authority in the application of the funding. They further require a strong institutional connection to the co-funding partner, and a regular and rigorous assessment of the Centre's performance.

In order to identify the best research in the State of Sao Paulo for collaboration with industry, FAPESP has established key partnerships with the following R&D-intensive British companies: GlaxoSmithKline, Shell, AstraZeneca and four Centres.

- GSK: Six calls have been launched, and six proposals selected, of which two are Engineering Research Centres: Centre of Excellence for Research in Sustainable Chemistry (CERSusChem), focused in the principles of sustainable chemistry, and Centre of Excellence in New Target Discovery (CENTD) researching targets for inflammatory events, and neglected diseases. In 2018, GSK, FAPESP and the Embassy of The United Kingdom of Great Britain and Northern Ireland signed a memorandum of understanding planning from 2019 to 2021 the organisation of lectures and/or conferences to be given by prestigious UK based scientists, including Nobel Prize winners, to the scientific community members from the State of São Paulo, Brazil.
- Shell and FAPESP are co-funding two Engineering Research Centres: the New Energy Innovation Centre will conduct research that aim to identify technologies that unlock business opportunities in New Energies and Chemicals that are structurally better than what is available today, and the Research Centre for Gas Innovation (RCGI) addresses the current technology challenges that Brazil faces in maximising the penetration of natural gas.
- AstraZeneca and its subsidiary Medimmune are FAPESP's partners in launching call for proposals, and selecting a research project that generate knowledge about new techniques, methodologies, processes and technologies in cardiovascular diseases.

Details on some of the projects funded are in the following pages.

CHARACTERIZATION OF THE OPTIMAL HIPSC-DERIVED CARDIAC CELL POPULATION FOR HEART REGENERATION AFTER MYOCARDIAL INFARCTION

The main goal of this project is to characterize the optimal hiPSC-derived cell population for cardiac regeneration after MI, using a preclinical model of MI in pigs. First, human iPSCs will be generated from either human fibroblasts or urine samples using a non-integrative reprogramming strategy based on episomal transfection. hiPSCs will be characterized to ensure they show the typical features of pluripotent stem cells. Then, we will differentiate them toward the cardiac lineage using an efficient modified protocol based on small molecules enabling Wnt pathway control. The second aim of this project is a thoroughly characterization of cell populations at different stages of differentiation, from immature mesoderm cells to mature cardiomyocytes (targeting committed, although not fully differentiated cardiomyocytes). We will then perform a pilot study using a rat model of myocardial infarction to identify the optimal cell.

PRINCIPAL INVESTIGATOR

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ABOUT THE PROJECT

FAPESP Process 2015/50216-5
Term: Aug 2016 to Jul 2019
Research Partnership for Technological Innovation (PITE)
ASTRAZENECA/MEDIMMUNE

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RESEARCH DIVISION 1 – DENSE ENERGY CARRIERS

The Dense Energy Carrier Division will consolidate expertise in materials processing, advanced characterization and physics of semiconductors devices of LNNano/CNPEM with that of Universidade Estadual de Campinas (UNICAMP), Universidade Federal do ABC (UFABC) and Universidade Federal de São Carlos (UFSCar) in electrochemistry and photoelectrochemestry to develop state-of-the-art research in the field of solar driven routes to synthesize molecules via photoelectrochemical approach. Molecules offer the highest energy densities when compared to any form of electricity storage and are therefore referred to as 'Dense Energy Carriers (DEC)'. However, most of molecules used as fuel nowadays are processed by non-renewable and non-sustainable technologies or by bio-fuels technologies. Certainly, solar driven routes to synthesize molecules based on the photoelectrochemical approach are alternative ways to be explored in order to produce liquid fuel in a sustainable and "green" way. Keeping this in mind, the focus of this research division is the development of efficient solar driven routes to synthesize relevant product molecules from molecules that are widely available in the environment. In this way, we intend to explore the following routes to obtain high efficiency materials regarding the solar energy conversion into molecules: i) Understand materials and manufacturing challenges (e.g. thin films, inkjet printing, coatings, and atomic layer deposition process) ii) Development of novel materials and nanostructured materials (e.g. electrodes, and structured catalyst) for photoelectrochemical conversion iii) Production of H2, alcohols or hydrocarbons from CO2 and water using electrochemical and photoelectrochemical conversion In terms of technology readiness level (TRL), i.e., in terms of technology maturity, most of our research projects are located in a level classified from 1 to 3. We intend to upgrade projects that reach TRL level 3 into TRL level 4 in the first 5 years of financial support. This will be the more important task of the Technology Transfer Coordinator (TTC), in the Innovation division of our research center. The main proposal is that the Innovation Division acts as a bridge between academic research and industrial research. Innovation Division will seek to fill the gap (in terms of TRL) between academic research and industrial development. The Innovation Division(...)

PRINCIPAL INVESTIGATOR

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Claudia Longo
Ernesto Chaves Pereira de Souza

ABOUT THE PROJECT

FAPESP Process 2017/11986-5
Term: Aug 2018 to Jul 2023
Engineering Research Centers/Applied Research Center
BG E&P DO BRASIL

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(...)

will promote also workshops to demonstrate the technologies under development in the research division as well as, workshops to discuss the implementation of public policy for alternative and renewable energy. Other important point of our proposal are the activities that the Education and Dissemination of Knowledge division will implement during the duration of the project. Basically, two lines of action will be developed under this proposal: 1. prioritizing the theme of renewable energy, mainly related to solar driven routes to synthesize liquid fuels; 2. developing new products and specific projects. The planned actions will target different segments of the public, ranging from communication among the New Energy Research Center (NERC) researchers themselves to efforts directed to students (and teachers) from primary and secondary school, including also communication via the mainstream media (through press advisory activities) and activities aimed at the public at the beginning of their university education; these actions will also deal, concomitantly, with the elementary physical and chemical processes associated with the topics addressed and the more advanced applications to be developed during the investigations, as well as with cross-cutting issues such as, in particular, environmental issues.

A SUSTAINABLE PATH TO METHANE CONVERSION BY ADVANCED ELECTROCHEMICAL TECHNOLOGIES

PRINCIPAL INVESTIGATOR

FABIO CORAL FONSECA
Energy and Nuclear Research Institute (IPEN)

CO-PRINCIPAL INVESTIGATOR

Andre Santarosa Ferlauto

ABOUT THE PROJECT

FAPESP Process 2017/11937-4
Term: Aug 2018 to Jul 2023
Engineering Research Centers/Applied Research Center
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As a part of the New Energies Research Center (NERC), a joint initiative from FAPESP and Shell, this Research Division 3 - Methane to Products (RD3) is built to grow as a world-class scientific center for research on advanced technologies for methane conversion to high-value products. In this context, RD3 addresses potentially disruptive technologies to tackle methane conversion beyond traditional catalytic or biological routes. The proposed division covers a broad range of topics that comprises a sustainable path for transforming methane to a feedstock using photo and electrochemical processes. The RD3 is based on the association of two leading institutions of São Paulo metropolitan area: Instituto de Pesquisas Energéticas and Nucleares (IPEN) and Universidade Federal do ABC (UFABC). This two institutions ensure their strong commitment to the NERC by: i) the collaborative effort of a highly trained and experienced research team that will address cutting-edge topics on the methane conversion in the RD3; iii) allocating the existing infrastructure of participant laboratories, the institutional facilities, and technical staff to carry on the planned research; ii) effectively supporting administrative activities to unburden the scientific team; iii) keeping a strong link between research and education in both undergraduate and graduate levels, and iii) providing the personnel and organization for dissemination and intellectual property actions. The RD3 team recognizes the gigantic challenges proposed by the NERC for the development of scientific knowledge and technological advances for methane conversion. In that context, the research group of RD3 has teamed up with leading academics from other countries to extend the scientific capabilities. Therefore, RD3 is organized to deliver relevant results in a broad range of activities that includes world-class research, technology transfer, and education, to be an effective partner of the New Energies Research Center.

QUANTUM CHEMISTRY SCREENING OF THE PHYSICAL AND CHEMICAL PROPERTIES OF TRANSITION-METAL NANOCLUSTERS

PRINCIPAL INVESTIGATOR

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São Carlos Institute of Chemistry
University of São Paulo (USP)

CO-PRINCIPAL INVESTIGATORS

Eudes Eterno Fileti
Kaline Rabelo Coutinho

ABOUT THE PROJECT

FAPESP Process 2017/11631-2
Term: Aug 2018 to Jul 2023
Engineering Research Centers/Applied Research Center
BG E&P DO BRASIL

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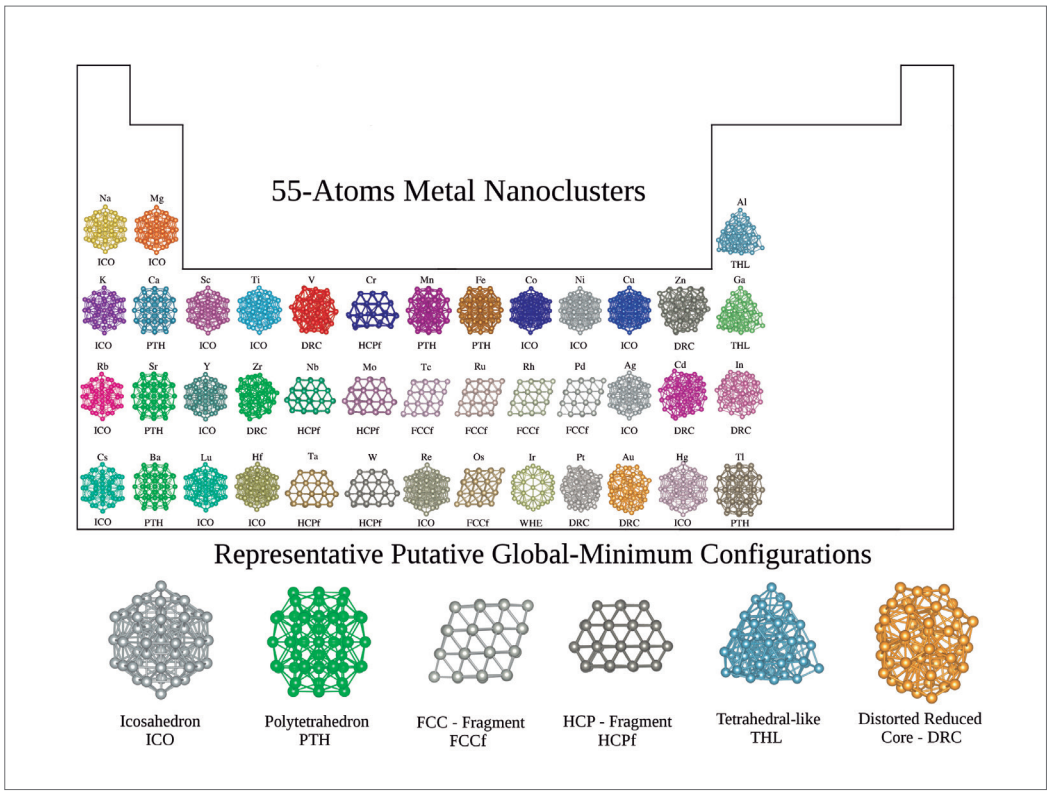
A large number of scientific achievements have been made in the field of nanoscience, and nowadays, it is possible to control the synthesis of transition-metal (TM) nanoclusters as a function of size (atom by atom), shape, and composition, charge state, etc. However, our atom-level understanding of the atomic structure, thermodynamic stability, electronic, and reactivity properties of TM nanoclusters as a function of size is far from satisfactory. In our group, Quantum Theory of Nanomaterials – QTNano, we have investigated the physical and chemical properties in gas-phase and under ambient conditions, e.g., temperature, of TM nanoclusters employing the state-of-the-art in quantum chemistry computational calculations. Beyond of those techniques, our group implemented from scratch the Revised Basin Hopping Monte Carlo (RBHMC), which have been employed to obtain putative global minimum configurations for nanoclusters, and the Parallel Tempering Monte Carlo, for temperature effects investigation.



QUANTUM CHEMISTRY SCREENING OF THE PHYSICAL AND CHEMICAL PROPERTIES OF TRANSITION-METAL NANOCLUSTERS

SUMMARY OF RESULTS

A large data base of nanoclusters configurations were build up by the RBHMC combined with empirical potencials for the TM systems, which was employed as candidate structures for density functional calculations. Based on that, we investigated the bebavior of the most important physical and chemical properties of TM clustes from n = 2 to 15 [1], and for 55-atom [2] nanoclusters. We identified the magic number clusters within the investigated size range, and found that 10 different structures can yield the putative global minimum configuration for 42 metal systems. Beyond of that, those systems were also the base for the study of nanoalloys, and we identified the compositions that leads to the high stability among several nanoalloys, e.g., PtFe, PtCo, PtNi, PtCu, PtZn [3], which is a key step to develop new nanocatalysts.

MAIN PUBLICATIONS

Chaves AS, Piotrowski MJ, Da Silva JLF. 2017. Evolution of the Structural, Energetic, and Electronic Properties of the 3d, 4d, and 5d Transition-Metal clusters (30 TM_n Systems for n= 2–15): A Density Functional Theory Investigation. *Phys. Chem. Chem. Phys.***19**: 15484-15502.

Piotrowski MJ, Ungureanu CG, Tereshchuk P, Batista KEA, Chaves AS Chaves, Guedes-Sobrinho D, Da Silva JLF. 2016. Theoretical Study of the Structural, Energetic, and Electronic Properties of 55-Atom Metal Nanoclusters: A DFT Investigation within van der Waals Corrections, Spin–Orbit Coupling, and PBE+U of 42 Metal Systems. *J. Phys. Chem*. **C 120 (50):** 28844-28856.

Guedes-Sobrinho D, Nomiyama RK, Chaves AS, Piotrowski MJ, Da Silva JLF. 2015. Structure, Electronic, and Magnetic Properties of Binary Pt_nTM_(55–n) (TM = Fe, Co, Ni, Cu, Zn) Nanoclusters: A Density Functional Theory Investigation. *J. Phys. Chem*. **C 119 (27)**: 15669-15679.

BRASIL RESEARCH CENTRE FOR GAS INNOVATION

The FAPESP - BG BRASIL RESEARCH CENTRE FOR GAS INNOVATION (FAPESP-BG/CEPID) aims to build up a new world class Centre for Advanced Natural Gas Studies, which will focus on the sustainable uses of natural gas in the coming years. The Centre complements Fapesp's experiences in supporting high-level scientific research and technology development in energy fields. It aims to establish a world class Research Centre focused in Natural Gas investigations, innovation and dissemination of knowledge. In this venture the Natural Gas challenges are dealt with according to three distinct, but complementary, research programmes: Engineering, Physical and Chemistry and Energy Policies and Economics. The Centre brings together a technical and scientific team that has been involved, along the past years with Energy and Natural Gas problems and proposed partial solutions in conjunction with one of the cited programmes. It is the intention of the Centre to integrate this effort, exploring the distinct focuses complementarily; to give answers and provide solutions innovatively, accordingly to the better possible form, to the matters raised by the concrete engineering and economical policies problems associated to natural gas. The State of Sao Paulo's and BG global competitiveness is the main goal of USP's proposal for the FAPESP-BG/CEPID.

PRINCIPAL INVESTIGATOR

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CO-PRINCIPAL INVESTIGATORS

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ABOUT THE PROJECT

FAPESP Process 2014/50279-4
Term: Dec 2015 to Nov 2020
Engineering Research Centers/Applied Research Centers

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ADVANCED ENERGY STORAGE DIVISION

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School of Chemical Engineering/ University of Campinas (Unicamp)

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Antonio Riul Júnior

ABOUT THE PROJECT
FAPESP Process 2017/11958-1
Term: Aug 2018 to Jul 2023
Engineering Research Centers/Applied Research Center
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By 2050 it is expected that electricity will move from 18 to 50% of the worldwide energy matrix, renewable sources of energy will expand four times from the current installed capacity, but CO2 emissions are expected to be half of today's value. In this scenario it is imperative to build novel solutions for energy storage that are still unavailable today and can cope with the predicted demands. Also, the worldwide increasing of portable and wearable electronic devices encourages researches on low-cost, flexible, light-weight, and environmentally friendly energy storage and supply devices. In order to effectively store and supply energy, advancement of battery and supercapacitor is vital to make them economically more viable for applications from communications to transport. The ability of those devices to effectively and efficiently store and redistribute energy is highly dependent on the engineering of their constructions and chemistry of the electrode surfaces and electrodes/electrolytes interfaces. High surface area, chemically stable electrodes and electrode/electrolyte interface knowledge are crucial for both batteries and supercapacitors. In order to have insights into the operation and to develop new and more efficient materials and electrolytes for devices a comprehensive chemical and structural understanding of the interface phenomena is fundamental.
In this project, we aim to nuclei a Center for Advanced Energy Storage, where we are going to study state-of-the-art batteries and supercapacitors under dynamic conditions by Raman and FTIR spectroscopies and high-intensity synchrotron X-ray. Raman and FTIR will be carried out using optical fibers, coupling cell to spectrometers, allowing us to monitor the reactions during charge and discharge of a device. In situ high resolution and time-resolved X-ray diffraction will be performed in the LNLS line. The in situ techniques will be developed for operando conditions to address fundamental interfacial phenomena that could be linked with multiscale calculations and molecular dynamic simulations. This tailored tool will work in synergy with novel material synthesis based on high surface carbon and fast charge transfer electrodes. The center will also rely on a strong integration from its partners at Brazil and abroad to create a better understanding of the chemistry and engineering for the devices. The Center will properly care about human resource formation, technology transfer, and education and knowledge dissemination under the HUB proposal from LNNano/CNPEM.

DESIGN, SYNTHESIS AND PHARMACOLOGICAL EVALUATION OF NEW HYBRID DRUGS USEFUL TO TREAT HEMATOLOGICAL DISORDERS

Sickle Cell Disease (SCD) is characterized by a punctual mutation (GTG to GAG) at the sixth codon of the β-globin gene what leads to the substitution of glutamic acid to valine residue in the gene for β-globin chain. Nowadays, hydroxyurea (HU) is the only drug approved to treat the disease. However, the drug has several adverse effects such as mielosuppression and genotoxicity in long term therapy. AH these factors together justify the discovery of new drugs to treat SCD symptoms. Resveratrol, a stilbenoid, is a phytoaiexin produced naturally by several plants and it is present in large quantity in red wine. It has been reported that this compound demonstrated potent antioxidant, antiinflamatory and analgesic effect useful to treat SCD symptoms. In addition, some studies have shown that resveratrol is able to induce gamma-globin gene expression. Nitric oxide has an important role in SCD. The beneficial effects of NO include: vasodilation, inhibition of platelet aggregation and induction of gamma globin gene expression. We have previously reported that nitric oxide donor compounds are also able to induce gamma-globin gene expression and fetal hemoglobin. In a continuing effort to develop new candidate drugs to treat hemoglobinophaties symptoms (such as SCD) with improved pharmacodynamic profile, we propose here the design, synthesis, and pharmacological evaluation of new resveratrol derivatives (compounds 1-12), obtained by molecular hybridization of the prototypes resveratrol (1) and NO donors subunits represented by furoxan and organic nitrate esters.

PRINCIPAL INVESTIGATOR

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ABOUT THE PROJECT

FAPESP Process 2012/50359-2
Term: Sep 2013 to Dez 2015
Research Partnership for Technological Innovation (PITE)
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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VACCINES FOR DENGUE FEVER CONTROL DELIVERED VIA INTRADERMAL AND TRANSCUTANEOUS ROUTES

The search for an effective vaccine against dengue is a global priority. Currently vaccines in advanced development stages are based on attenuated or recombinant viruses. However, difficulties encountered in the induction of balanced immune responses and, above all, safety issues suggest that innovative vaccine strategies against the disease should be supported. The proposed research aims to develop a novel vaccine formulation against dengue using administration routes (intradermal and transcutaneous) more compatible with the natural infection process. The vaccine strategy is supported by four technological advances achieved by the Laboratory of Vaccine Development at USP in the last few years, namely: (i) development of technology for production of DENV2 recombinant structural (envelope) and nonstructural (NS1) proteins with structural and immunological features similar to the native viral proteins, (ii) development and production capacity of adjuvants (derived from the heat-labile toxin produced by enterotoxigenic strains of Escherichia coli) with ability to increase and modulate immune responses after i.d. and t.c. administration; (iii) established expertise on administration of vaccines in experimental models using the i.d and t.c. (including preparation of adhesive vaccine patches); and (iv) discovery of a new experimental model for evaluation of vaccine protective effects and safety with a DENV2 isolate naturally capable to infect mice and reproduce symptoms seen in severe cases the disease.

PRINCIPAL INVESTIGATOR

LUIS CARLOS DE SOUZA FERREIRA
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ABOUT THE PROJECT

FAPESP Process 2012/50362-3
Term: Sep 2013 to Aug 2015
Research Partnership for Technological Innovation (PITE)
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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EXPLORING EPIGENETIC TARGETS TO FIGHT NEGLECTED DISEASES: SELECTIVE SIRTUIN-2 INHIBITORS AS LEISHMANICIDAL COMPOUNDS

The disease burden of leishmaniases is widely studied and is an important instrument to plan a strategy to control or prevent this disease. One featured scenario is the lack of innovation in drug discovery toward novel anti-parasitic agents to control and treat leishmaniases. This is an important concern, and the genome sequencing of several Leishmania species is able to accelerate the identification of new drug targets. In this context, the parasites epigenome rises as an interesting target to drug discovery programs. Epigenetics comprises a series of chemical modifications of DNA and their associated histone proteins and it is known to be an especially important aspect of parasite biology, although it is underexplored in drug discovery programs. In this context, this project targets at the parasitic Sirtuins, which are important epigenetic regulator enzymes that acts in the deacetylation of the N-terminal tails of histones. This family of proteins is known to be essential for parasitic growth and the recent identification of sirtuin-related gene from L. amazonensis opened the possibility for the development of novel and specific sirtuin-based drugs. Our proposal is to develop a library of inhibitors for L. amazonensis sirtuin-2 based on a computer-aided drug discovery and classical medicinal chemistry approaches. The proposal is multidisciplinary and brings together molecular parasitology, enzymology, medicinal chemistry, organic synthesis and pharmacology toward the development of a versatile platform to explore the epigenetic of L. amazonensis to find drug candidates to treat leishmaniasis and also diseases caused by other trypanosomatides.

PRINCIPAL INVESTIGATOR

FLAVIO DA SILVA EMERY
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ABOUT THE PROJECT

FAPESP Process 2013/50677-7
Term: Dec 2014 to Dec 2016
Research Partnership for Technological Innovation (PITE)
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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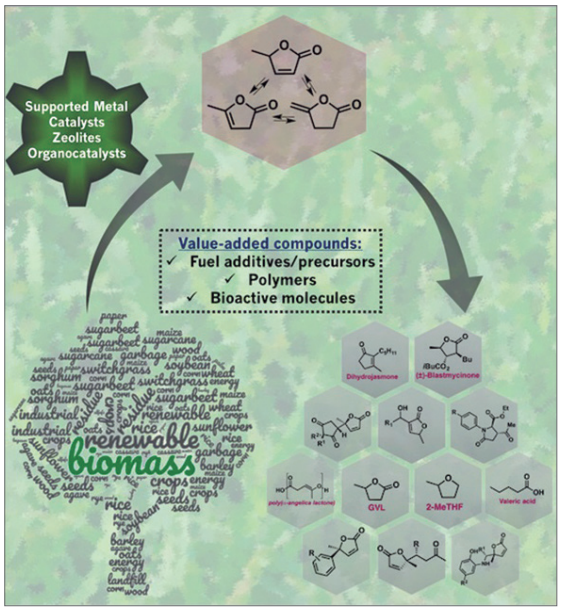
GREEN CHEMISTRY: SUSTAINABLE SYNTHETIC METHODS EMPLOYING BENIGN SOLVENTS, SAFER REAGENTS, AND BIO-RENEWABLE FEEDSTOCK

The Centre of Excellence for Research in Sustainable Chemistry (CERSusChem) is a GSK-FAPESP Engineering Research Centre whose core mission is to develop world-class research and, in addition, effective means for technology transfer and knowledge dissemination. Although CERSusChem headquarter is based at the Chemistry Department of the Federal University of São Carlos, it is composed by 18 faculty members from 5 different public universities: UFSCar, UNICAMP, USP, UNESP and UFSC. The Centre features novel strategies from across pharma, biotech and academia to meet current challenges in organic synthesis encompassing the principles of sustainable chemistry, which involves: organocatalysis, biocatalysis, multicomponent reactions, nanomaterials, photo- and electrochemistry, solvent-free approaches or use of biobased solvents, and new models for protein ligand assays. The technology transfer, education and knowledge dissemination actions aim to involve all segments of society, and special attention has been given to produce experimental training focused in qualifying industry employees and secondary school teachers.



Graphical abstract of the CERSusChem review: Lima CGS, Monteiro JL, Lima TD, Paixao MW, Correa AG. 2018 Angelica Lactones: From Biomass-Derived Platform Chemicals to Value-Added Products. *ChemSusChem.* **11(1)**: 25-47. DOI: 10.1002/cssc.201701469

PRINCIPAL INVESTIGATOR

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CO-PRINCIPAL INVESTIGATORS

Adriana Vitorino Rossi, Anita Jocelyne Marsaioli, Lucia Helena Mascaro Sales, Márcio Weber Paixão, Quezia Bezerra Cass

ABOUT THE PROJECT

FAPESP Process 2014/50249-8
Term: Apr 2016 to Mar 2021
Engineering Research Centers/Applied Research Center
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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MAIN PUBLICATIONS

Jorge EYC, Lima TD, Lima CGS, Marchini L, Castelblanco WN, Rivera DG, Urquieta-Gonzalez EA, Varma RS, Paixao MW. 2017 Metal-exchanged magnetic beta-zeolites: valorization of lignocellulosic biomass-derived compounds to platform chemicals. *Green Chem*. **19(16)**:3856-3868.

dos Santos DA, Deobald AM, Cornelio VE, Avila RMD, Cornea RC, Bernasconi GCR, Paixao MW, Vieira PC, Correa AG. 2017 Asymmetric synthesis and evaluation of epoxy-α-acyloxycarboxamides as selective inhibitors of cathepsin L. Bioorg. *Med. Chem*. **25(17)**: 4620-4627.

Saba S, Rafique J, Franco MS, Schneider AR, Espindola L, Silva DO, Braga AL. 2018. Rose Bengal catalysed photo-induced selenylation of indoles, imidazoles and arenes: a metal free approach. *Org. Biomol. Chem*. **16(6)**:880-885.

SUMMARY OF RESULTS

In its initial two years, the CERSusChem activities have been focused on the development of stereoselective, eventually one-pot, sequences leading to complex hybrid molecules. These approaches enable the incorporation of different molecular fragments into a single skeleton at a very low synthetic cost. Thus, by using organocatalysts, new bioactive compounds such as natural product-like hydroquinolines, hydantoins, γ-butenolides, triazoles, and peptidomimetics have been efficiently prepared. Furthermore, employing photochemical approaches allowed us to successfully achieve important *N*-heterocycles. Studies with nanomaterials has allowed to contribute in different areas, including the upgrading of biomass-derived compounds. Concerning the biocatalysis, results on nitrile hydratases, transaminases and imine reductases have showed that those are able to promote reactions with high selectivity. The anchoring of target enzymes in solid matrixes and their use in bioaffinity chromatography is also promising. Regarding the transfer of knowledge and technology activities, one of the highlights is the webinar program, with broad audience in academy and industry.

QUINOXALINE DERIVATIVES AS ANTIPARASITIC DRUGS: PROOF OF CONCEPT

Quinoxalines are a class of heterocyclic compounds that have been intensively studied for their biological activities, showing promising activity against protozoa, in an ongoing study towards the discovery of new antiparasitic compounds, we have synthesized a library of quinoxaline derivatives, which has been evaluated in vitro against epimastigote, promastigote, and trypomastigote forms of *Trypanossoma cruzi* and intracellular amastigote and promastigote forms of *Leishmania amazonensis*. From this screening, we have selected the most active compounds for in vivo and mechanistic studies. The main objective of this project is to prove the biological activity of these compounds in the drug development for tropical diseases such as Chagas' disease and leishmaniasis. More specifically, our goal is the synthesis of quinoxaline derivatives aiming at improving yield, a scalable and safe process and decreasing of chemical residues. Looking into pharmaceutical application of these drug candidates, they will be evaluated *in vitro* and *in vivo* in order to determine their mechanism of action against *T. cruzi* and *L. amazonensis*.

PRINCIPAL INVESTIGATOR

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ABOUT THE PROJECT

FAPESP Process 2013/50680-8
Term: Nov 2014 to Feb 2017
Research Partnership for Technological Innovation (PITE)
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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RATIONAL APPROACH FOR SEARCHING MOLECULAR TARGETS INVOLVED IN INFLAMMATORY EVENTS AND CELL SURVIVAL

Successful drug development requires a disease target that plays a vital role in the causation and/or progression of the disease phenotype and that can be modulated with a drug molecule. In other words, therapeutically relevant targets are both "disease-modifying" and "druggable". It has been estimated that around 10% of the entire human genome is involved in disease onset or progression, resulting in approximately 3000 potential targets suitable for therapeutic intervention. Thus, the rapid and reliable identification of the most promising targets for drug discovery efforts would be the major challenge for the pharmaceutical industry. Moreover, the knowledge of the mechanisms that govern the inflammatory process and cell survival, generated by basic research, is essential for the identification and validation of potential and more specific molecular target. Natural products are a rich source of biologically active compounds. Many of today's medicines are either obtained directly from a natural source or were developed from a lead compound originally obtained from a natural source. Venoms and toxins from animals, plants, snakes, spiders, scorpions, insects, slugs, and microorganisms are extremely potent because the often have very specific interactions with a macromolecular target in the body. As a result, they have proved to be important not only as lead compounds in the development of novel drugs, but also as tools in studying receptors, ion channels, and enzymes. In our research group, interesting bioactive molecules from animal venoms and secretions, such as proteins (wild or recombinant form) and derived-peptides, targeting the homeostatic system and inflammatory events, have been exploited and are in different phases of development. We have been focusing our efforts on understanding their mechanism of action through the exploitation of specific signaling pathways in order to identify and validate novel molecular targets. Among the proteins' families taken into account are lipocalins, hemolins, serine protease inhibitors, phospholipases and chaperones. In this regard, the main idea is to consider the expertise of the Butantan Institute researchers already have in computer-aided molecular design/bioinformatics/OMICS (transcriptome, proteome) field, molecular and cellular biology and immunology approaches (in vitro assays), and in vivo models and image techniques in order to create a Center of Excellence for Research in Target Discovery.

PRINCIPAL INVESTIGATOR

ANA MARISA CHUDZINSKI-TAVASSI
Butantan Institute

CO-PRINCIPAL INVESTIGATORS

Catarina de Fatima Pereira Teixeira
Denise Vilarinho Tambourgi
Irina Kerkis
Olga Celia Martinez Ibanez
Yara Cury

ABOUT THE PROJECT

FAPESP Process 2015/50040-4
Term: Dec 2015 to Nov 2020
Engineering Research Centers/Applied Research Center
GLAXOSMITHKLINE (GSK) BRASIL LTDA.

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UNIVERSITIES

Over the years, FAPESP has funded over 180 research projects and fellowships in partnerships with UK universities.

1 Bangor University
2 Brunel University London
3 Cardiff University
4 Coventry University
5 Durham University
6 Heriot-Watt University
7 Imperial College London
8 Keele University
9 King's College London
10 LSE - London School of Economics and Political Science
11 Oxford University
12 Queen's University of Belfast
13 University College London
14 University of Bath
15 University of Birmingham
16 University of Cambridge
17 University of East Anglia
18 University of Edinburgh
19 University of Glasgow
20 University of Leeds
21 University of Manchester
22 University of Nottingham
23 University of Southampton
24 University of Surrey
25 University of Warwick
26 University of York

Bangor University — 5 grants approved

FAPESP Process 2013/50197-5

TROPICAL AND TEMPERATE MARINE ECOSYSTEMS – ADAPTING TO A CHANGING WORLD
PI: Alexander Turra
Oceanographic Institute / University of São Paulo (USP)
UK PI: Ian McCarthy
Term: Aug 2013 to Aug 2015
REGULAR RESEARCH GRANT

FAPESP Process 2013/50198-1

LOCATING VULNERABLE DEEP-SEA ECOSYSTEMS ON THE BRAZILIAN SHELF: MAXIMISING RESEARCH POTENTIAL
PI: Paulo Yukio Gomes Sumida
Oceanographic Institute / University of São Paulo (USP)
UK PI: Andrew John Davies
Term: Aug 2013 to Jul 2015
BIOTA-FAPESP PROGRAM - REGULAR RESEARCH GRANT

FAPESP Process 2013/50199-8

INTEGRATION OF MARINE ECOLOGICAL PROCESSES AT MULTIPLE SPATIAL SCALES IN THE BRAZILIAN COASTAL ZONE
PI: Aurea Maria Ciotti
Center for Marine Biology / University of São Paulo (USP)
UK PI: Stuart Rees Jenkins
Term: Aug 2013 to Jul 2015
REGULAR RESEARCH GRANT

FAPESP Process 2015/50304-1

MULTIVIEW AUTOSTEREOSCOPIC THREE-DIMENSIONAL DISPLAY FOR MEDICAL IMAGING VISUALIZATION
PI: Daniel Souza Ferreira Magalhães
Brazil University
UK PI: Ying Weng
Term: Dec 2015 to Nov 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50325-9

THE IMPORTANCE OF LARGE-SCALE VARIATION OF PREDATION PRESSURE ON THE ORGANIZATION OF SESSILE COMMUNITIES
PI: Gustavo Muniz Dias
Center for Natural and Human Sciences / Federal University of ABC (UFABC)
UK PI: Katherine Margareth Griffith
Term: Dec 2015 to Nov 2017
REGULAR RESEARCH GRANT

Brunel University London — 3 grants approved

FAPESP Process 2016/50356-4

MYC: A REGULATOR OF EXOSOME PROTEIN CARGO?
PI: Giuseppe Palmisano
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Arturo Sala
Term: Mar 2017 to Feb 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50026-7

IMPACT OF ORGANIZED SPORTS ON HEALTH CARE COSTS OF ADOLESCENTS: ABCD GROWTH STUDY
PI: Rômulo Araújo Fernandes
School of Sciences and Technology / São Paulo State University (UNESP)
UK PI: Kwame Anokye
Term: Jul 2017 to Jun 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50035-6

STUDY OF THE CHEMICAL VARIABILITY OF BRAZILIAN PROPOLIS BY MASS SPECTROMETRY WITH ISOLATION OF BIOACTIVE COMPOUNDS BY COUNTER CURRENT CHROMATOGRAPHY
PI: Alexandra Christine Helena Frankland Sawaya
Faculty of Pharmaceutical Sciences / University of Campinas (UNICAMP)
UK PI: Svetlana Ignatova
Term: Sep 2017 to Aug 2019
REGULAR RESEARCH GRANT

Durham University — 12 grants approved

FAPESP Process 2015/50007-7

THE CONCEPT OF QUASI-INTEGRABILITY
PI: Luiz Agostinho Ferreira
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Wojtek Zakrzewski
Term: Jul 2015 to Sep 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50008-3

ENGINEERING ZYMOMONAS MOBILIS FOR ENHANCED BIOETHANOL PRODUCTION AND THE INTEGRATED BIOPROCESSING OF LIGNOCELLULOSE
PI: Roberto do Nascimento Silva
Ribeirão Preto Medical School / University of São Paulo (USP)
UK PI: Adrian Walmsley
Term: Jul 2015 to Jun 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50011-4

DEFINING THE RELATIONSHIP BETWEEN SEX HORMONES, PROTEIN QUALITY CONTROL AND MALE FERTILITY

PI: Maria Christina Werneck de Avellar
Paulista School of Medicine / Federal University of São Paulo
UK PI: Adam Maurice Benhaam
Term: Oct 2015 to Jan 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50028-4

NEURAL BASES OF ANXIETY AND SOCIAL BEHAVIOURS

PI: Newton Sabino Canteras
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Colin Lever
Term: Jul 2015 to Jun 2017
REGULAR RESEARCH GRANT

FAPESP Process 2017/50381-1

SYNTHESIS SCALE UP AND METABOLIC STUDIES OF NATURAL AND SYNTHETIC BIOACTIVE COMPOUNDS

PI: Norberto Peporine Lopes
School of Pharmaceutical Sciences of Ribeirão Preto / University of São Paulo (USP)
UK PI: Patrick Stell
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50382-8

SUPERCONDUCTING NANOWIRES FOR HIGH-FIELD APPLICATIONS

PI: Rafael Zadorosny
School of Engineering / São Paulo State University (UNESP)
UK PI: Damian Peter Hampshire
Term: May 2018 to Apr 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50385-7

THE KNOWLEDGE OF POWER: ENVIRONMENTAL EDUCATION AND THE PUBLIC UNDERSTANDING OF ENERGY

PI: Pedro Roberto Jacobi
Institute of Energy and Environment / University of São Paulo (USP)
UK PI: Simone Abram
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/14799-4

DEVELOPMENT OF PLATFORMS TO STUDY TRANSMEMBRANE PROTEINS – TOWARDS MEDICAL, AGRICULTURAL AND BIOTECHNOLOGICAL BENEFITS

PI: Ariel Mariano Silberr
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Paul William Denny
Term: Dec 2018 to Nov 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/15194-9

DIPLOMACY AND THE ARTS CLASSICAL RECEPTION AS CIVILIZATIONAL ENCOUNTER

PI: Angela Brandão
School of Philosophy, Literature and Human Sciences / Federal University of São Paulo (UNIFESP)
UK PI: Stefano Cracolici
Term: Dec 2018 to Nov 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/15344-0

QUANTIFYING THE INTERACTIONS AND IMPACTS OF INVASIVE SPECIES IN THE ATLANTIC FOREST BIODIVERSITY HOTSPOT, BRAZIL

PI: Dalva Maria da Silva Matos
Health and Biological Sciences Center / Federal University of São Carlos (UFSCar)
UK PI: Wayne Dawson
Term: Dec 2018 to Nov 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/07728-3

THE CONCEPT OF QUASI-INTEGRABILITY

PI: Luiz Agostinho Ferreira
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Wojtek Zakrzewski
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

FAPESP Process 2015/50025-5

EXPLOITING THE MOLECULAR CONTROL OF CARBON NANOTUBES FOR MATERIAL COMPUTATION

PI: Osvaldo Novais de Oliveira Junior
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Michael Charles Petty
Term: Jul 2015 to Jun 2017
REGULAR RESEARCH GRANT

Heriot-Watt University — 2 grants approved

FAPESP Process 2016/50196-7

DESIGN AND DEVELOPMENT OF NANOPARTICLES AIMING AGRICULTURE AND ENVIROMENTAL APPLICATIONS: A BILATERAL COOPERATION BETWEEN UNESP/ SOROCABA AND HWU

PI: Leonardo Fernandes Fraceto
Science and Technology Institute of Sorocaba / São Paulo State University (UNESP)
UK PI: Valeria Arrighi
Term: Dec 2016 to Nov 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50197-3

A NOVEL COGNITIVE BIOMARKER TO SCREEN FOR DEMENTIA ACROSS CULTURES AND COUNTRIES

PI: Monica Sanches Yassuda
School of Medicine / University of São Paulo (USP)
UK PI: Mario A. Parra Rodriguez
Term: Sep 2016 to Aug 2018
REGULAR RESEARCH GRANT

Imperial College London — 18 grants approved

FAPESP Process 2014/50452-8

ECOSYSTEM MULTIFUNCTIONALITY UNDER ENVIRONMENTAL CHANGE

PI: Luiz Antonio Martinelli
Center of Nuclear Energy in Agriculture / University of São Paulo (USP)
UK PI: Cristina Banks-Leite
Term: Dec 2014 to Nov 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50453-4

INCORPORATING PHYLOGENY INTO A NEW INTEGRATED DATASET OF SOUTH AMERICAN TROPICAL TREE TRAIT CHARACTERISTICS

PI: Tomas Ferreira Domingues
Ribeirão Preto School of Philosophy, Science and Literature / University of São Paulo (USP)
UK PI: Jonathan Lloyd
Term: Dec 2014 to Nov 2016
BIOTA-FAPESP PROGRAM – REGULAR RESEARCH GRANT

FAPESP Process 2014/50454-0

A LAB SYSTEM TO STUDY PLASMODIUM VIVAX TRANSMISSION AND INTERACTIONS WITH THE VECTOR

PI: Jayme Augusto de Souza-Neto
Biotechnology Institute / São Paulo State University (UNESP)
UK PI: George Christophides
Term: Feb 2015 to Jan 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50458-6

EVALUATION OF INPIRATORY AND EXPIRATORY MUSCLES IN RESPIRATORY DISEASES

PI: Pedro Caruso
School of Medicine / University of São Paulo (USP)
UK PI: Nick Hopkinson
Term: Nov 2014 to Sep 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50459-2

ADVANCED CHARACTERISATION TECHNIQUES FOR PROBING BURIED INTERFACES AND FILM MORPHOLOGY IN ORGANIC ELETRONIC DEVICESS

PI: Roberto Mendonça Faria
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Jenny Nelson
Term: Nov 2014 to Oct 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50460-0

OPTICAL NONLINEARITY IN WAVEGUIDES AND SUBSTRATES CONTAINING GRAPHENE AND GRAPHENE-LIKE MATERIALS: A COLLABORATION BETWEEN THE FEMTOSECOND OPTICS GROUP (FOG IC) AND THE GRAPHENE

PI: Christiano José Santiago de Matos
Graphene and Nanomaterials Research Center / Mackenzie Presbyterian University
UK PI: James Roy Taylor
Term: May 2015 to Apr 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50467-5

ASSESSING AND GUIDING SUSTAINABILITY IN BRAZILIAN SUGAR CANE PRODUCTION

PI: Carlos Clemente Cerri
Center of Nuclear Energy in Agriculture / University of São Paulo (USP)
UK PI: Jeremy Woods
Term: Dec 2014 to Nov 2016
REGULAR RESEARCH GRANT

FAPESP Process 2016/50003-4

EVALUATION OF THE RESPIRATORY BIOREACTIVITY OF NANOPESTICIDES AND DEVELOPMENT OF SAFE, EFFECTIVE PESTICIDES

PI: Leonardo Fernandes Fraceto
Science and Technology Institute / São Paulo State University (UNESP)
UK PI: Terry Tetley
Term: Aug 2016 to Jul 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50004-0

DISSECTING THE PARACOCCIN INTERACTION WITH TOLL-LIKE RECEPTORS N-GLYCANS: A NECESSARY STEP IN THE DESIGN OF A NOVEL IMMUNOMODULATORY AGENT APPLICABLE TO CONFER PROTECTION AGAINST FUNGAL DISEASES

PI: Maria Cristina Roque Antunes Barreira
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Ten Feizi
Term: Sep 2016 to Aug 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50006-3

BAYES IN THE MILKY WAY – DETERMINING THE DARK MATTER PROFILE IN OUR GALAXY, A NOVEL APPROACHES

PI: Fabio Iocco
Institute for Theoretical Physics / São Paulo State University (UNESP)
UK PI: Roberto Trotta
Term: Aug 2016 to Jul 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50010-0

INVOLVEMENT OF SOCS-JAK-STAT SIGNALLING IN THE EFFECTS OF AEROBIC EXERCISE IN A MODEL OF ASTHMA

PI: Rodolfo de Paula Vieira
UNINOVE University
UK PI: Maria Gabriela Belvisi
Term: Aug 2016 to Jul 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50013-0

DARK MATTER SEARCH AT LHC

PI: Sergio Ferraz Novaes
Scientific Computing Center / São Paulo State University (UNESP)
UK PI: Oliver Buchmuleler
Term: Aug 2016 to Jul 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50055-4

COHERENT DYNAMICS IN COMPLEX NETWORKS UNDER NOISY ENVIRONMENTS

PI: Tiago Pereira da Silva
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: Jeroen Steven Willibrod Lamb
Term: Jun 2016 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2017/50136-7

UK - BRAZIL COLLABORATION ON THE NEW INTEGRATED ASSESSMENT MODEL MUSE

PI: Reinaldo Giudici
Polytechnic School / University of São Paulo (USP)
UK PI: Sara Budinis
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50137-3

LONG NONCODING RNA INTERPLAY WITH THE HOST MICROBIOME MAY DETERMINE MUCOSAL INFLUENZA VACCINE IMMUNOGENICITYS

PI: Helder Takashi Imoto Nakaya
School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Thushan De Silva
Term: Sep 2017 to Aug 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50139-6

RIGIDITY IN MILDLY SMOOTH 1-D SYSTEMS

PI: Edson de Faria
Institute of Mathematics and Statistics / University of São Paulo (USP)
UK PI: Sebastian Van Strien
Term: Dec 2017 to Nov 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50175-2

FURTHER STUDIES – CD4 T CELL IMMUNE CORRELATES OF ZIKA VIRUS EXPOSURE

PI: João Santana da Silva
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Daniel Martin Altmann
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50189-3

USING BIG DATA FOR SMALL AREA EPIDEMIOLOGICAL STUDIES: DEVELOPING A NEW UK-BRAZIL PARTNERSHIP

PI: Maria Regina Alves Cardoso
School of Public Health / University of São Paulo (USP)
UK PI: Ana Hansel
Term: Oct 2017 to Sep 2019
REGULAR RESEARCH GRANT

Keele University — 1 grant approved

FAPESP Process 2013/11343-6

CHARACTERIZATION OF THE MICROBIOTA-MEDIATED ANTI-DENGUE MECHANISMS IN WILD AEDES AEGYPTI POPULATIONS

PI: Jayme Augusto de Souza-Neto
School of Agronomic Sciences / São Paulo State University (UNESP)
Term: Nov 2013 to Oct 2018
RESEARCH GRANT – YOUNG INVESTIGATORS GRANT

King's College London — 29 grants approved

FAPESP Process 2010/51330-2

OBESITY AND SEX HORMONES IN LUNG INJURY

PI: Wothan Tavares de Lima
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Yanira Riffo Vasquez
Term: Sep 2010 to Aug 2012
REGULAR RESEARCH GRANT

FAPESP Process 2010/51457-2

SKILLS FOR HEALTH NEEDS ASSESSMENT IN NURSING

PI: Emiko Yoshikawa Egry
School of Nursing / University of São Paulo (USP)
UK PI: Sarah Cowley
Term: Sep 2010 to Dec 2011
REGULAR RESEARCH GRANT

FAPESP Process 2010/51458-9

CONSTRUCTION OF DIPLOID STREPTOMUYCES BACTERIA: IMPLICATIONS FOR GENOME EVOLUTION & DRUG DISCOVERY

PI: Gabriel Padilla
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Paul F. Long
Term: Sep 2010 to Nov 2012
REGULAR RESEARCH GRANT

FAPESP Process 2010/51459-5

SCIENTIFIC COOPERATION FOR THE STUDY OF CLINICAL, CELLULAR AND MOLECULAR ALTERATIONS IN THE HAEMOGLOBINOPATHIES AND THE UNDERSTANDING OF THE REGULATION OF FETAL HAEMOGLOBIN

PI: Nicola Amanda Conran Zorzetto
Center of Hematology and Hemotherapy / University of Campinas (UNICAMP)
UK PI: Swee Lay Thein
Term: Sep 2010 to Aug 2012
REGULAR RESEARCH GRANT

FAPESP Process 2010/51462-6

ORAL EPITHELIAL STEM CELLS: EVALUATION OF RESPONSE TO INJURY AND SELF-RENEW CAPACITY

PI: Andrea Mantesso Pobocik
School of Dentistry / University of São Paulo (USP)
UK PI: Paul T. Sharpe
Term: Dec 2010 to Aug 2011
REGULAR RESEARCH GRANT

FAPESP Process 2010/51472-1

ROLE OF ARHGAP21 AND FMNL1 PROTEINS IN RHO GTPASES SIGNALLING AND CANCER PROGRESSION

PI: Sara Teresinha Olalla Saad
School of Medical Sciences / University of Campinas (UNICAMP)
UK PI: Anne Ridley
Term: Sep 2010 to Aug 2013
REGULAR RESEARCH GRANT

FAPESP Process 2010/51473-8

BRIDGING THE GAP BETWEEN STATISTICS, MACHINE LEARNING AND CLINICAL PRACTICE: AN INTERDISCIPLINARY COLLABORATIVE STUDY ON HUMAN BRAIN MAPPING

PI: João Ricardo Sato
Center of Mathematics, Computation and Cognition / Federal University of ABC (UFABC)
UK PI: Michael John Brammer
Term: Sep 2010 to Apr 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/50576-0

PLATO AND ARISTOTLE IN ANTIQUITY

PI: Marco Antônio de Ávila Zingano
School of Philosophy, Literature and Human Sciences / University of São Paulo (USP)
UK PI: M. M. McCabe
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50577-7

FROM TRYPANOSOMES TO LEISHMANIA: NOVEL DRUG CANDIDATES FOR THE TREATMENT OF NEGLECTED PARASITIC DISEASES

PI: André Gustavo Tempone Cardoso
Adolfo Lutz Institute
UK PI: Gerd Wagner
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50578-3
DEVELOPMENT OF ADAPDATED MODULES FOR E-LEARNING TRAINING ON MEDICAL PHYSICS AND MEDICAL ENGINEERING
PI: Paulo Roberto Costa
Physics Institute / University of São Paulo (USP)
UK PI: Slavik Tabakov
Term: Jun 2011 to Nov 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50579-0
IMPROVING HEALTH PROFESSIONAL'S SKILLS IN USING APPROPRIATE TECHNOLOGIES TO STRENGTHEN CONTINUITY OF PRIMARY CARE
PI: Anna Maria Chiesa
School of Nursing / University of São Paulo (USP)
UK PI: Debra Bick
Term: Jul 2011 to Jun 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/50584-3
THE PATHOLOGIES OF MODERNITY AND THE REMEDIES FROM HUMANITIES
PI: Dante Marcello Claramonte Gallian
Paulista School of Medicine / Federal University of São Paulo
UK PI: Brian Hurwitz
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50613-3
COMPUTATIONAL NANOSCIENCE FOR ENERGY MATERIALS: HYDRIGEN STORAGE AND PRODUCTION AND ETHANOL CATALYSIS THROUGH METALLIC NANOCALLOYS
PI: Alex Antonelli
"Gleb Wataghin" Institute of Physics / University of Campinas (UNICAMP)
UK PI: Francesca Baletto
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50614-0
NATIONAL INSTITUTE OF PUBLIC POLICY FOR ALCOHOL AND OTHER DRUGS
PI: Ronaldo Laranjeira
Paulista School of Medicine / Federal University of São Paulo
UK PI: John Strang
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50616-2
MINERALOCORTICOID RECEPTOR POLYMORPHISM AND FUNCTION IN PATIENTS WITH DEPRESSION AND EARLY LIFE STRESS
PI: Mario Francisco Pereira Juruena
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Anthony James Cleare
Term: Jul 2011 to Jun 2013
REGULAR RESEARCH GRANT

FAPESP Process 2012/50550-4
OBESITY AND SEX HORMONES IN LUNG INJURY
PI: Wothan Tavares de Lima
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Yanira Riffo Vasquez
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50580-0
IS THERE A SALIVARY BIOMARKER FOR PERIODONTITIS ASSOCIATED WITH WEIGHT REDUCTION THERAPIES?
PI: Silvia Helena de Carvalho Sales Peres
Bauru School of Dentistry / University of São Paulo (USP)
UK PI: Guy Carpenter
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50581-7
IMPROVING THE DESCRIPTION OF INJECTION HEIGHT AND AEROSOL COMPOSITION IN BIOMASS BURNING EMISSION IN ATMOSPHERIC CHEMISTRY-TRANSPORT MODELS
PI: Yosio Edemir Shimabukuro
National Institute for Space Research (INPE) / Ministry of Science, Technology, Innovation and Communications
UK PI: Martin Wooster
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50582-3
SCIENTIFIC COOPERATION FOR THE STUDY OF HAEMOGLOBINOPATHIES: CLINICAL, CELLULAR AND MOLECULAR ALTERATIONS
PI: Nicola Amanda Conran Zorzetto
Center of Hematology and Hemotherapy / University of Campinas (UNICAMP)
UK PI: Swee Lay Thein
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50588-1

EVALUATION OF THE SYNERGISTIC EFFECTS OF NITRIC OXIDE AND SINGLET OXYGEN PRODUCED BY RUTHENIUM-PHTHALOCYANINE COMPLEXES IN LUNG TUMORS: PHOTOCHEMICAL AND PHOTOPHYSICAL STUDIES, IN VITRO AND IN VIVO CYTOTOXICITY

PI: Roberto Santana da Silva
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Lea Ann Dailey
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50589-8

IS TRANSIENT RECEPTOR POTENTIAL ANKYRIN 1 (TRPA1) SIGNALING REQUIRED FOR INNATE IMMUNITY AGAINST INCREASED ASTHMA SUSCEPTIBILITY DUE TO EARLY AIR POLLUTANT CONTACT?

PI: Soraia Katia Pereira Costa
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Susan Diane Brain
Term: Oct 2012 to Dec 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50722-0

FACTORS MODULATING NEURAL PROCESSING TIME MEASURED USING FMRI

PI: Edson Amaro Junior
School of Medicine / University of São Paulo (USP)
UK PI: Thomas White
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2014/50150-1

GEOMETRY IN LONDON AND SÃO PAULO

PI: Claudio Gorodski
Institute of Mathematics and Statistics / University of São Paulo (USP)
UK PI: Jurgen Berndt
Term: Nov 2014 to Oct 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50151-8

CONTEXT-AWARE INTELLIGENT TRANSPORT NETWORKS

PI: José Alberto Cuminato
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: Nishanth Sastry
Term: Nov 2014 to Oct 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50153-0

INVESTIGATION OF NOVEL CELL FUNCTIONS OF ARHGAP21 AND ANKHD1 PROTEINS

PI: Sara Teresinha Olalla Saad
Center of Hematology and Hemotherapy / University of Campinas (UNICAMP)
UK PI: Anne Ridley
Term: Feb 2015 to Jan 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50154-7

EVALUATION OF ELECTROSPUN SCAFFOLDS AS BIOMATERIALS FOR BONE REGENERATION

PI: Luiz Henrique Catalani
Chemistry Institute / University of São Paulo (USP)
UK PI: Eileen Gentleman
Term: Nov 2014 to Apr 2017
REGULAR RESEARCH GRANT

FAPESP Process 2016/50307-3

MENTAL HEALTH, MIGRATION AND THE MEGACITY (SÃO PAULO) - M3SP

PI: Laura Helena Silveira Guerra de Andradelani
Psychiatry Institute Dr Antonio Carlos Pacheco e Silva / Hospital das Clinicas – University of São Paulo – School of Medicine
UK PI: Nikolas Rose
Term: Apr 2017 to Mar 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50419-9

INVOLVEMENT OF TRPM2, HCN2 ION CHANNELS AND AT2 RECEPTORS IN INFLAMMATORY DISEASES

PI: Thiago Mattar Cunha
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Peter Anthony Mcnaughto
Term: Aug 2018 to Jul 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50435-4

WILSON LOOPS IN GAUGE THEORY AND HOLOGRAPHY

PI: Diego Trancanelli
Physics Institute / University of São Paulo (USP)
UK PI: Navad Drekker
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

LSE – London School of Economics and Political Science

2 grants approved

FAPESP Process 2016/50201-0

THE POLITICS OF PATRONAGE APPOINTMENTS IN BRAZIL

PI: George Avelino Filho
São Paulo School of Business Administration / Getulio Vargas Foundation
UK PI: Francisco Panizza
Term: Oct 2016 to Nov 2018
REGULAR RESEARCH GRANT

FAPESP Process 2017/50120-3

PROMOTING AND REGULATING GENERIC MEDICINES IN LATIN AMERICA

PI: Elize Massard da Fonseca
Institute of Education and Research (INSPER)
UK PI: Kenneth Shadlen
Term: Oct 2017 to Oct 2018
REGULAR RESEARCH GRANT

Oxford University

5 grants approved

FAPESP Process 2015/50075-2

BRAZILIAN BIODIVERSITY AS A SOURCE FOR NOVEL DRUG SCAFFOLDS AGAINST NEGLECTED PROTOZOAN DISEASES

PI: André Gustavo Tempone Cardoso
Adolfo Lutz Institute
UK PI: Edward Alexander Anderson
Term: Nov 2015 to Oct 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50105-9

RECOVERY AND STORAGE OF RENEWABLE ENERGY FROM BIOREFINERY WASTEWATER

PI: Eduardo Cleto Pires
São Carlos School of Engineering / University of São Paulo (USP)
UK PI: René Bañares Alcantaran
Term: Dec 2015 to Nov 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50109-4

IMPROVING THE EFFICIENCY OF WATER AND NITROGEN USE BY CROP PLANTS

PI: Helenice Mercier
Institute of Bioscience / University of São Paulo (USP)
UK PI: James Andrew Charles Smith
Term: Nov 2015 to Oct 2017
REGULAR RESEARCH GRANT

FAPESP Process 2017/50118-9

PLASMONIC NANOPARTICLES SUPPORTED ON SEMICONDUCTORS AND ITS APPLICATIONS IN PHOTOCATALYSIS

PI: Pedro Henrique Cury Camargo
Chemistry Institute / University of São Paulo (USP)
UK PI: Edman Tsang
Term: Oct 2017 to Sep 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50159-7

UK-BRAZIL COLLABORATION FOR THE DEVELOPMENT OF RENEWABLE ENERGY: GAS, AIR AND WATER

PI: Julio Romano Meneghini
Polytechnic School / University of São Paulo (USP)
UK PI: Richard H. J. Willden
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

Queen's University of Belfast

6 grants approved

FAPESP Process 2014/50740-3

MULTILEVEL PARTY ORGANISATION: BRAZIL AND WESTERN EUROPE IN COMPARATIVE PERSPECTIVE

PI: Pedro José Floriano Ribeiro
Center for Education and Human Sciences / Federal University of São Carlos (UFSCar)
UK PI: Elodie Fabre
Term: Jun 2015 to May 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50743-2

ENVIRONMENTAL TRACERS OF WATER RESOURCES MANAGEMENT

PI: Daniel Marcos Bonotto
Institute of Geosciences and Exact Sciences / São Paulo State University (UNESP)
UK PI: Trevor Elliot
Term: Feb 2016 to Jan 2018
REGULAR RESEARCH GRANT

FAPESP Process 2014/50755-0

METAQUA: METABOLITE/METABOLOMIC PROFILING IN AQUACULTURE RESEARCH WITH A VIEW TO MAINTAINING FOOD SAFETY/SECURITY AND ANIMAL/HUMAN HEALTH

PI: Jonas Augusto Rizzato Paschoal
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Mark Mooney
Term: Feb 2016 to Jan 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50306-4

PREDICTING THE AVAILABILITY OF TOXIC TRACE ELEMENTS IN FIELD CROPS: PERFORMANCE STUDY, AND DEVELOPMENT FOR NEW DGT APPROACHES TO PREDICT AS, CD AND PB TRANSFER FROM SOILS TO PLANTS

PI: Amauri Antonio Menegário
Environmental Studies Center / São Paulo State University (UNESP)
UK PI: Paul Nicholas Williams
Term: Mar 2016 to Feb 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50327-1

UNDERSTANDING MICROBIAL RESPONSES TO ENVIRONMENTAL STRESS: INTEGRATED MOLECULAR AND PALAEOCOLOGICAL APPROACHES USING TESTATE AMOEBAE

PI: Daniel José Galafasse Lahr
Institute of Bioscience / University of São Paulo (USP)
UK PI: Helen M. Roe
Term: May 2017 to Apr 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50304-7

ENTROPY PRODUCTION IN NON-EQUILIBRIUM QUANTUM PROCESSES: FROM FOUNDATIONS TO QUANTUM TECHNOLOGIES

PI: Gabriel Teixeira Landi
Physics Institute / University of São Paulo (USP)
UK PI: Mauro Paternostro
Term: Mar 2018 to Feb 2020
REGULAR RESEARCH GRANT

University College London — 1 grant approved

FAPESP Process 2016/50195-0

HEALTH AND ABILITIES MEASUREMENT IN POPULATION SURVEYS: AN APPLICATION OF THE GENERALIZED LATENT VARIABLE MODELING FRAMEWORK TO HIGH DIMENSIONAL DATA

PI: Hugo Cogo Moreira
Paulista School of Medicine / Federal University of São Paulo
UK PI: George Basil Ploubidis
Term: Nov 2016 to Oct 2018
REGULAR RESEARCH GRANT

University of Bath — 14 grants approved

FAPESP Process 2013/50202-9

COMPARISON OF INTRA- AND INTER-SPECIFIC GENETIC ARCHITECTURE OF SPECIATION IN SOUTH-AMERICAN FRUIT FLIES

PI: Reinaldo Otávio Alvarenga Alves de Brito
Health and Biological Sciences Center / Federal University of São Carlos (UFSCar)
UK PI: Jason Wolf
Term: Aug 2013 to Jan 2016
REGULAR RESEARCH GRANT

FAPESP Process 2013/50204-1

LONG-SHORT WAVE INTERACTIONS IN THE ATMOSPHERIC DYNAMICS

PI: Carlos Frederico Mendonça Raupp
Institute of Astronomy, Geophysics and Atmospheric Science University of São Paulo (USP)
UK PI: Paul Milewski
Term: Aug 2013 to Jul 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50317-3

MOBILITY OF RESEARCHERS FOR PROTECTION OF HIGH VOLTAGE DIRECT CURRENT LINES

PI: Denis Vinicius Coury
São Carlos School of Engineering / University of São Paulo (USP)
UK PI: Simon Le Blond
Term: Jul 2014 to Jun 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50325-6

BIOCOMPATIBLE AND BIODEGRADABLE NANOPATICLES STEM CELL ENGENEERING

PI: Amilton Martins do Santos
Lorena School of Engineering / University of São Paulo (USP)
UK PI: Ram Sharma
Term: Jul 2014 to Jun 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50326-2

PATHOGENICITY OF DERMATOPHYTES

PI: Sandro Rogerio de Almeida
School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Albert Bolhuis
Term: Dec 2014 to Nov 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50327-9
DEVELOPMENT OF TECHNOLOGY PLATFORM FOR OBTAINING NANOSTRUCTURED SYSTEMS WITH POTENTIAL APPLICATION IN THE TREATMENT OF NEGLECTED DISEASES
PI: Nádia Araci Bou Chacra
School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Niloletta Fotaki
Term: Dec 2014 to Nov 2016
REGULAR RESEARCH GRANT

FAPESP Process 2015/50082-9
TOWARDS NOVEL BIOSENSOR DEVICES FOR IMPROVED CANCER DIAGNOSIS
PI: Marcelo Mulato
Ribeirão Preto School of Philosophy, Science and Literature / University of São Paulo (USP)
UK PI: Pedro Miguel de Lemos Correia Estrela
Term: Aug 2015 to Jul 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50083-5
NEW EMPIRICAL APPROACHES TO UNDERSTANDING INFOVIS
PI: Maria Cristina Ferreira de Oliveira
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: Stephen Payne
Term: Aug 2015 to Jul 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50094-7
ASYMPTOTICS AND SIMULATION OF COMPLEX FLUIDS
PI: José Alberto Cuminato
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: Jonathan David Evans
Term: Aug 2015 to Jul 2017
REGULAR RESEARCH GRANT

FAPESP Process 2016/50014-6
TAILORING OXIDE BASED NANOPARTICLES FOR THE MINERAL NUTRITION OF PLANTS
PI: Hudson Wallace Pereira de Carvalho
Center of Nuclear Energy in Agriculture / University of São Paulo (USP)
UK PI: Davide Mattia
Term: Jun 2016 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50336-3
PREDICTING SURVIVAL IN NON-SMALL-CELL LUNG CANCER: A LINK BETWEEN CANCER CACHEXIA, CARDIORESPIRATORY FITNESS AND CANCER IMMUNE SURVEILLANCE?
PI: Patricia Chakur Brum
School of Physical Education and Sports / University of São Paulo (USP)
UK PI: James Turnet
Term: Nov 2016 to Jan 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50043-9
LOW-COST APTAMER-BASED CAPACITANCE BIOSENSORS
PI: Paulo Roberto Bueno
Chemistry Institute / São Paulo State University (UNESP)
UK PI: Pedro Miguel de Lemos Correia Estrela
Term: Oct 2017 to Sep 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50295-8
MODELLING DROP IMPACT AND HAMILTONIAN DYNAMICS IN FARADAY-DROP THEORIES
PI: Clodoaldo Grotta Ragazzo
Institute of Mathematics and Statistics / University of São Paulo (USP)
UK PI: Paul Antoine Milewski
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50321-9
EXPLOITING THE ANALYTIC PROPERTIES OF CUMULATIVE HAZARDS FOR SURVIVAL ANALYSIS
PI: Francisco Louzada Neto
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: Alejandro Anaya Izquierdo
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

University of Cambridge — 3 grants approved

FAPESP Process 2014/50306-1
CIRCARDIAN AND SUGAR SIGNALLING IN GRASSES
PI: Carlos Takeshi Hotta
Chemistry Institute / University of São Paulo (USP)
UK PI: Alexander A. R. Webb
Term: Aug 2014 to Jul 2016
PROGRAM FOR RESEARCH ON BIOENERGY (BIOEN) – REGULAR PROGRAM GRANT

FAPESP Process 2014/50308-4
TRANSCRIPTOMIC META-ANALYSIS OF POSITIONALLY CONSERVED LONG NONCOING RNAS
PI: Helder Takashi Imoto Nakaya
School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Tony Kouzarides
Term: Aug 2014 to Jul 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50324-0
TOWARDS SAFER AMINOGRYCOSIDE ANTIBIOTICS: STRUCTURE, FUNCTION AND ENGINEERING STUDIES OF KEY BIOSYNTHETIC ENZYMES
PI: Marcio Vinicius Bertacine Dias
Brazilian Center for Research in Energy and Materials (CNPEM)
UK PI: Peter Leadlay
Term: Feb 2015 to Jan 2017
REGULAR RESEARCH GRANT

University of Edinburgh — 5 grants approved

FAPESP Process 2014/50203-8
TACKLING CULTURAL BARRIERS IN COGNITIVE ASSESSMENT AND EARLY DETECTION OF DEMENTIAS
PI: Monica Sanches Yassuda
School of Medicine / University of São Paulo (USP)
UK PI: Mario Parra Rodriguez
Term: Oct 2014 to Sep 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50206-7
NUCLEAR PHYSICS AND ASTROPHYSICS WITH LOW ENERGY BEAMS OF EXOTIC NUCLEI
PI: Rubens Lichtenthäler Filho
Physics Institute / University of São Paulo (USP)
UK PI: Philip J. Woods
Term: Sep 2014 to Aug 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50207-3
A PLATFORM FOR THE MANAGEMENT OF A DISTRIBUTED CLUSTER FOR INNOVATIVE GAMING AND ANIMATION COMPANIES
PI: Flávio Soares Corrêa da Silva
Institute of Mathematics and Statistics / University of São Paulo (USP)
UK PI: David Stuart Robertson
Term: Sep 2014 to Aug 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50208-0
COMBINATION OF NEW PHYSICS SEARCHES AT THE HADRON COLLIDER
PI: Sergio Ferraz Novaes
Institute for Theoretical Physics / São Paulo State University (UNESP)
UK PI: Christos Leonidopoulos
Term: Mar 2015 to Feb 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50228-0
FORMULATIONS AND SOLUTION METHODS FOR VEHICLE ROUTING PROBLEMS WITH DATA UNCERTAINTY
PI: Pedro Augusto Munari Junior
Technology and Exact Sciences Center / Federal University of São Carlos (UFSCar)
UK PI: Jacked Gondzio
Term: Feb 2015 to Mar 2017
REGULAR RESEARCH GRANT

University of Glasgow — 4 grants approved

FAPESP Process 2016/50183-2
ROLE OF THE REDOX ENVIRONMENT AND PROTEIN TYROSINE PHOSPHATASE OXIDATION IN ATHEROSCLEROTIC PLAQUE VULNERABILITY
PI: Rita de Cassia Aleixo Tostes Passaglia
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Rhian Touyz
Term: Nov 2016 to Nov 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50186-1
THE INFLUENCE OF ASPERGILLUS FUMIGATUS MITOGEN ACTIVATED PROTEIN (MAP) KINASES AND PHOSPHATASES ON MYCOFILM FORMATION
PI: Gustavo Henrique Goldman
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Gordon Ramage
Term: Nov 2016 to Oct 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50193-8
ARE DEVOLVED FUNCTIONS OF COMPONENTS OF THE 9-1-1 COMPLEX A COMMON FEATURE OF TRITRYP GENOME BIOLOGY?
PI: Luiz Ricardo Orsini Tosi
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Richard Mcculloch
Term: Nov 2016 to Oct 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50332-8
THE ROLE OF O-GLCNACYLATION IN THE HOST IMMUNE RESPONSE AND BONE RESORPTION
PI: Sandra Yasuyo Fukada Alves
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Shauna Culshaw
Term: Nov 2016 to Oct 2018
REGULAR RESEARCH GRANT

University of Manchester — 20 grants approved

FAPESP Process 2014/50294-3
PULMONARY ASPERGILLOSIS AND CORRELATION BETWEEN CLINICAL FORMS AND DIFFERENTIAL EXPRESSION OF VIRULENCE ATTRIBUTES IN ASPERGILLUS FUMIGATUS
PI: Arnaldo Lopes Colombo
Paulista School of Medicine / Federal University of São Paulo
UK PI: David Denning
Term: Feb 2015 to Apr 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50297-2
COMBINED AEROSOL MASS SPECTROMETRY IN THE AMAZON
PI: Paulo Eduardo Artaxo Netto
Physics Institute / University of São Paulo (USP)
UK PI: James Donald Allan
Term: Nov 2014 to Oct 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50298-9
REAL TIME ELEMENTAL IMAGING OF HIGHLY CONTROLLED NANOPARTICLE SYNTHESIS AND DEGRADATION
PI: Pedro Henrique Cury Camargo
Chemistry Institute / University of São Paulo (USP)
UK PI: Sarah Jane Haig
Term: Nov 2014 to Feb 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50304-9
STEREOCHEMICAL CHARACTERIZATION OF CYCLOTIDES FROM CERRADO SPECIES USING RAMAN OPTICAL ACTIVITY
PI: Vanderlan da Silva Bolzani
Chemistry Institute / São Paulo State University (UNESP)
UK PI: Ewan William Blanch
Term: Mar 2015 to Feb 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50058-0
CHARACTERIZATION AND MODELLING OF AQUEOUS TWO-PHASE SYSTEMS (ATPS) COMPOSED OF IONIC LIQUIDS (ILS) AND POLYMERS: A BOOST TOWARDS DEVELIPING SUSTAINABLE BIOPHARMACEUTICAL SEPARION
PI: Jorge Fernando Brandão Pereira
School of Pharmaceutical Sciences / São Paulo State University (UNESP)
UK PI: Maria Gonzales-Miguel
Term: Aug 2015 to Jul 2017
REGULAR RESEARCH GRANT

FAPESP Process 2016/50319-1
QUANTUM TRANSPORT IN DIRAC METAL AND FLUID BASED ON HGTE QUANTUM WELLS
PI: Gennady Gusev
Physics Institute / University of São Paulo (USP)
UK PI: Vladmir Falko
Term: Sep 2017 to Aug 2019
REGULAR RESEARCH GRANT

FAPESP Process 2016/50330-5
DEVELOPING ADVANCED SCINTILLATION LIGHT READ OUT SYSTEMS FOR LIQUID ARGON NEUTRINO DETECTORS
PI: Ettore Segreto
"Gleb Wataghin" Institute of Physics / University of Campinas (UNICAMP)
UK PI: Andrzej Szelc
Term: Nov 2016 to Oct 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50342-3
ADVANCED EPR SPECTROSCOPY APPLIED TO MECHANISTIC STUDIES ON METALLODRUGS-BIOMOLECULES INTERACTIONSS
PI: Ana Maria da Costa Ferreira
Chemistry Institute / University of São Paulo (USP)
UK PI: Floriana Tuna
Term: Mar 2017 to Feb 2019
REGULAR RESEARCH GRANT

FAPESP Process 2016/50357-0
INTERCONTINENTAL SCIENCE DIPLOMACY: THE CASE OF EU-BRAZIL COOPERATION
PI: Janina Onuki
Institute of International Relations / University of São Paulo (USP)
UK PI: Simone Turchetti
Term: Mar 2017 to Feb 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50297-0
NEW CELL FACTORY PLATFORMS FOR MANUFACTURE OF COMPLEX HUMAN THERAPEUTICS
PI: Kamilla Swiech
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Alan Dickson
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50298-7
THE ROLE OF THE CYSTEINE AND GLYCINE-RICH PROTEIN-3 (CRP3) IN MECHANOSENSING OF CARDIOVASCULAR SMOOTH MUSCLE CELLS
PI: Ayumi Aurea Miyakawa
Heart Institute (InCor) - Hospital das Clinicas / University of São Paulo – School of Medicine
UK PI: Christoph Ballestrem
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50300-1
MULTISCALE MODELING OF CLEAVAGE FRACTURE AND APPLICATIONS TO STRUCTURAL INTEGRITY ASSESSMENTS
PI: Claudio Ruggieri
Polytechnic School / University of São Paulo (USP)
UK PI: Andrey Jivkov
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50301-8
IV-VI MATERIALS: MARRYING 2D MORPHOLOGY AND PLASMONIC PROPERTIES FOR ENABLING NEXT GENERATION PHOTOCATALYTIC SYSTEMS
PI: Pedro Henrique Cury Camargo
Chemistry Institute / University of São Paulo (USP)
UK PI: David John Lewis
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50303-0
SUSTAINABLE CITRUS WASTE BIOREFINING AS A SOURCE OF VALUE ADDED BIOPRODUCTS
PI: Valéria de Carvalho Santos Ebinuma
School of Pharmaceutical Sciences / São Paulo State University (UNESP)
UK PI: James Winterburn
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50309-9
PREVENTIVE AND RESPONSIVE STRATEGIES TO DEAL WITH THE IMPACTS OF EXOGENOUS SHOCKS TO URBAN MOBILITY SYSTEMS
PI: Antonio Nelson Rodrigues da Silva
São Carlos School of Engineering / University of São Paulo (USP)
UK PI: Nuno Pinto
Term: Feb 2018 to Jan 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/13981-3
WEAR, LIFETIME AND FAILURE MODE OF MATERIALS PROCESSED VIA CAD-CAM
PI: Paulo Francisco Cesar
School of Dentistry / University of São Paulo (USP)
UK PI: Nikolaos Silikas
Term: Dec 2018 to Nov 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/14030-2
UNDERSTANDING PLANT CELL WALL ARCHITECTURE TO IMPROVE ENZYMATIC HYDROLYSIS OF LIGNOCELLULOSE
PI: Richard John Ward
Ribeirão Preto School of Philosophy, Science and Literature / University of São Paulo (USP)
UK PI: Jolanda Margaretha van Munster
Term: Dec 2018 to May 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/15235-7
MACROPHAGE METABOLISM AS A TARGET FOR CANCER THERAPY
PI: José Carlos Farias Alves Filho
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Daiana Leila Drehmer
Term: Feb 2019 to Jan 2021
REGULAR RESEARCH GRANT

FAPESP Process 2018/15308-4
RANDOM WALKS WITH STRONGLY CORRELATED MEMORY AND APPLICATIONS TO BIOLOGY
PI: Marco Antonio Alves da Silva
Ribeirão Preto School of Pharmaceutical Sciences / University of São Paulo (USP)
UK PI: Sergei Fedotov
Term: Dec 2018 to Nov 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/50330-8
DEVELOPMENT OF AN ARTIFICIAL KIDNEY MEDICAL IMPLANT
PI: Niels Olsen Saraiva Câmara
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Glen Cooper
Term: Aug 2018 to Jul 2020
REGULAR RESEARCH GRANT

University of Nottingham and University of Birmingham — 21 grants approved

FAPESP Process 2012/50888-5
URBAN WATER QUALITY MANAGEMENT: SURFACE WATER, GROUNDWATER AND ECOSYSTEM INTERACTIONS
PI: Juliana Gardenalli de Freitas
Envoronmental, Chemistry and Pharmaceutical Sciences Institute / Federal University of São Paulo (UNIFESP)
UK PI: Colin Reginald Thorne and Michael Rivett
Term: Feb 2013 to Jan 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50890-0
IMPROVEMENT OF SURFACE PROPERTIES OF STAINLESS STEEL USED IN THE OIL AND GAS INDUSTRIES THROUGH PLASMA ASSISTED THERMOCHEMICAL TREATMENT
PI: Andre Paulo Tschiptschin
Polytechnic School / University of São Paulo (USP)
UK PI: Hanshan Dong
Term: Feb 2013 to Jul 2015
REGULAR RESEARCH GRANT

FAPESP Process 2012/50891-6
IS BRAZIL AN EMERGING GLOBAL POWER? EVALUATING BRAZIL'S RISE AND ITS IMPLICATIONS FOR WORLD ORDER
PI: Amâncio Jorge Silva Nunes de Oliveira
School of Philosophy, Literature and Human Sciences / University of São Paulo (USP)
UK PI: Marco Antonio Vieira and Sara Motta
Term: Feb 2013 to Jan 2015
REGULAR RESEARCH GRANT

FAPESP Process 2012/50892-2
GENOME FOOTPRINTS OF SELECTION TO ENVIRONMENTAL STRESSES AND REPRODUCTIVE FITNESS IN CROSSBREED TAURINE X ZEBU CATTLE POPULATIONS
PI: José Fernando Garcia
School of Veterinary Medicine / São Paulo State University (UNESP)
UK PI: Oliver Hanotte
Term: Feb 2013 to Mar 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50894-5
MAGNETIC RESONANCE IMAGING AND IN VIVO SPECTROSCOPY METHODS FOR NEUROIMAGING AND MULTIMODAL NEUROSCIENCES STUDIES
PI: Alberto Tannús
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Peter Gordon Morris and Andrew Bagshaw
Term: Feb 2013 to Jan 2016
REGULAR RESEARCH GRANT

FAPESP Process 2012/50896-8
CANNABIDIOL REGULATION OF FEAR MEMORY PROCESSING AND ASSOCIATED BRAIN FUNCTION
PI: Francisco Silveira Guimarães
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Carl William Stevenson and Jonathan Loon Choon Lee
Term: Feb 2013 to Jan 2015
REGULAR RESEARCH GRANT

FAPESP Process 2012/50938-2
DEVELOPMENT OF QUANTUM SENSORS FOR PRECISION POSITIONING AND UNDERGROUND MAPPING
PI: Philippe Wilhelm Courteille
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Peter Kruger and Jon Golswin
Term: Feb 2013 to Jan 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50221-6
DO FLEXIBLE INSTITUTIONS ENHANCE DEMOCRACY? A COMPARATIVE ANALYSIS OF PUBLIC GOVERNANCE INNOVATIONS IN BRAZIL AND THE UK
PI: Elizabeth Balbachevsky
School of Philosophy, Literature and Human Sciences / University of São Paulo (USP)
UK PI: Chris Skelchere
Term: Apr 2015 to Mar 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50227-4
THE ROLE OF PRIVATE SECTOR IN CUSTOMS AND BORDER MANAGEMENT REFORMA COMPARATIVE STUDY IN BORDER MANAGEMENT PERFORMANCE
PI: Cristiano Morini
Applied Sciences School / University of Campinas (UNICAMP)
UK PI: Andrew Grainger
Term: Sep 2014 to Aug 2016
REGULAR RESEARCH GRANT

FAPESP Process 2014/50232-8
IMPACT OF NEONICOTINOIDS ON GENE EXPRESSION AND SYNAPTIC PLASTICITY IN BEE BRAINS
PI: Thaisa Cristina Roat
Biosciences Institute / São Paulo State University (UNESP)
UK PI: Reinhard Stoger and Matthias Soller
Term: Jun 2015 to May 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50241-7
ESTABLISHING OF A JOINT X-RAY CRYSTALLOGRAPHIC PIPELINE FOR STRUCTURAL ANALYSIS OF MEMBRANE TRANSPORTERS
PI: Igor Polikarpov
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Vassiliy Bavro
Term: Mar 2015 to Feb 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50258-7
STRATEGIES TO COMBAT SARCOPENIA: A RESEARCH COLLABORATION BETWEEN UNIVERSITY OF SÃO PAULO AND UNIVERSITY OF BIRMINGHAM
PI: Eduardo Ferriolli
Ribeirão Preto School of Medicine / University of São Paulo (USP)
UK PI: Caronyn Anne Greig
Term: Feb 2015 to Sep 2018
REGULAR RESEARCH GRANT

FAPESP Process 2014/50259-3
TESTING FUNDAMENTAL GRAVITY AND VALIDATING GRAVITATIONAL WAVEFORMS
PI: Riccardo Sturani
Institute for Theoretical Physics / São Paulo State University (UNESP)
UK PI: Alberto Vecchio
Term: Mar 2015 to Feb 2017
REGULAR RESEARCH GRANT

FAPESP Process 2014/50261-8
EVALUATION OF MYELOID DERIVED SUPPRESSOR CELLS IN ELDERLY INDIVIDUALS: BRAZILIAN DNA BRITISH POPULATION
PI: Valquiria Bueno
Paulista School of Medicine / Federal University of São Paulo
UK PI: Janet Lord
Term: Apr 2015 to May 2017
REGULAR RESEARCH GRANT

FAPESP Process 2017/07944-5
EPIGENETIC REGULATION OF OSTEOGENIC POTENTIAL IN MESENCHYMAL STEM CELLS DERIVED FROM PERIODONTAL LIGAMENT
PI: Denise Carleto Andia
Institute of Health Science / Paulista University (UNIP)
UK PI: Malgorzata Wiench
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/07972-9
DEVELOPMENT OF LEAD AGENTS FOR PROPHYLAXIS AND TREATMENT OF CARDIOVASCULAR DISEASES
PI: Maria Luiza Vilela Oliva
National Institute of Pharmacology / Federal University of São Paulo (UNIFESP)
UK PI: Jonas Emsley
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/07973-5
THERMODYNAMICS AND INFORMATION TECHNOLOGIES WITH CONTINUOUS VARIABLE QUANTUM SYSTEMS
PI: Gabriel Teixeira Landi
Physics Institute / University of São Paulo (USP)
UK PI: Gerardo Adesso
Term: Jul 2018 to Jun 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/08000-0
INVESTIGATING CELLULAR HOMEOSTATIC MECHANISMS UNDERLYING RARE AND PREVALENT NEURODEGENERATIVE DISEASES USING HUMAN INDUCED PLURIPOTENT STEM CELLS
PI: Tatiana Rosado Rosenstock
College of Medical Sciences at Santa Casa in São Paulo (FCMSCSP)
UK PI: Sovan Sarkar
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

FAPESP Process 2017/08012-9
REAL-TIME, RAPID DETECTION AND SEQUENCING OF ARBOVIRUSES IN BRAZIL: ZIKA, DENGUE, CHIKUNGUNYA AND YELLOW FEVER
PI: Ester Cerdeira Sabino
São Paulo Institute of Tropical Medicine / University of São Paulo (USP)
UK PI: Nicholas Loman
Term: Nov 2017 to Oct 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/08014-1
UNVEILING MECHANISMS OF ABERRANT HEART FUNCTION IN MARFAN SYNDROME (MFS)
PI: Lygia da Veiga Pereira
Institute of Bioscience / University of São Paulo (USP)
UK PI: Chris Denning
Term: May 2018 to Oct 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/08754-5
RE-INHABITING THE CITY: BRINGING NEW LIFE TO CITY CENTRES OF EMERGING ECONOMIES IN A CHANGING CLIMATE: THE CASE OF SÃO PAULO
PI: Joana Carla Soares Gonçalves
School of Architecture and Urbanism / University of São Paulo (USP)
UK PI: Lucelia Taranto Rodrigues
Term: Nov 2017 to Oct 2018
REGULAR RESEARCH GRANT

University of Southampton — 12 grants approved

FAPESP Process 2011/51225-7
HIGH FREQUENCY STRUCTURAL WAVES: ENGINEERING APPLICATIONS
PI: Ricardo Tokio Higuti
School of Engineering / São Paulo State University (UNESP)
UK PI: Timothy Waters
Term: Sep 2011 to Nov 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/51226-3
SCALE UP PHOTOELECTROCHEMICAL REACTOR USING NANOCATALYTIC MATERIAL FOR ENVIRONMENTAL REMEDIATION
PI: Christiane de Arruda Rodrigues
Envoronmental, Chemistry and Pharmaceutical Sciences Institute / Federal University of São Paulo (UNIFESP)
UK PI: Carlos Ponce de Leon Albarran
Term: Sep 2011 to Feb 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/51227-0
WORKING GROUP ON EFFECTS OF GLOBAL CHANGES IN THE MULTITROPHIC INTERACTION PLANTS: NATURAL ENEMIES
PI: Ricardo Antonio Polanczyk
School of Agricultural and Veterinary Studies / São Paulo State University (UNESP)
UK PI: Guy Poppy
Term: Sep 2011 to Oct 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/51245-8
GRAIN REFINEMENT AND PROPERTIES OF ULTRAFINE-GRAINED AI, MG AND TI ALLOYS PRODUCED BY EQUAL-CHANNEL ANGULAR PRESSING WITH BACK-PRESSURE
PI: Alberto Moreira Jorge Junior
Technology and Exact Sciences Center / Federal University of São Carlos (UFSCar)
UK PI: Terence G. Langdon
Term: Sep 2011 to May 2012
REGULAR RESEARCH GRANT

FAPESP Process 2013/50903-7
A COMPARATIVE STUDY ON THE ROLE OF BOTTOM-UP CONTROL ON THE RECRUITMENT OF MARINE INVERTEBRATES BETWEEN TEMPERATE AND SUB-TROPICAL REGIONS: USING BARNACLES AS A CASE STUDY
PI: Augusto Alberto Valero Flores
Center of Marine Biology / University of São Paulo (USP)
UK PI: Stephen J. Hawkins
Term: Mar 2014 to Feb 2016
REGULAR RESEARCH GRANT

FAPESP Process 2013/50904-3
IDENTIFYING THE REGULATING FACTORS ON BIODIVERSITY IN DEEP TIME
PI: Tiago Bosisio Quental
Institute of Bioscience / University of São Paulo (USP)
UK PI: Thomas Harold George Ezrad
Term: Mar 2014 to Feb 2016
REGULAR RESEARCH GRANT

FAPESP Process 2013/50905-0
EXPLORING HIGGS BOSON AND BEYOND THE STANDARD MODEL THEORIES AT LARGE HADRON COLLIDER
PI: Sergio Ferraz Novaes
Institute for Theoretical Physics / São Paulo State University (UNESP)
UK PI: Alexander Belyaev
Term: Mar 2014 to Aug 2016
REGULAR RESEARCH GRANT

FAPESP Process 2013/50911-0
A STUDY INTO THE SCOPE FOR TRANSFORMING TRADITIONAL SKILLS AND KNOWLEDGE INTO A COMPETITIVE ADVANTAGE IN SMALL SCALE TEXTILE INDUSTRIES THROUGH FASHION DESIGN
PI: Cláudia Regina Garcia Vicentini
Schoool of Arts, Sciences and Humanities / University of São Paulo (USP)
UK PI: John Hopkins
Term: May 2014 to Feb 2016
REGULAR RESEARCH GRANT

FAPESP Process 2016/50007-0
PROBING THE NATURE OF DARK MATTER USING SYNERGY OF MODEL BUILDING COSMOLOGY AND COLLIDER PHYSICS
PI: Oscar José Pinto Eboli
Physics Institute / University of São Paulo (USP)
UK PI: Alexander Belyaev
Term: Jul 2016 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50016-9
ADVANCED CRITERIA FOR DYNAMIC MESH ADAPTION IN COMPUTACIONAL SPACE WEATHER FORECASTING
PI: Margarete Oliveira Domingues
National Institute for Space Research (INPE) / Ministry of Science, Technology, Innovation and Communications
UK PI: Ralf Deiterding
Term: Aug 2016 to Oct 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50020-6
FABRICATION AND CHARACTERISATION OF NANOELECTROCHEMICAL SENSORS FOR THE STUDY OF SINGLE CELLS AND SINGLE NANOPARTICLE
PI: Mauro Bertotti
Chemistry Institute / University of São Paulo (USP)
UK PI: Guy Denuault
Term: Jun 2016 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2016/50021-2
CANCER STEM CELL INTERACTOME MAPPING
PI: Oswaldo Keith Okamoto
Institute of Bioscience / University of São Paulo (USP)
UK PI: Rob M. Ewing
Term: Jun 2016 to May 2018
REGULAR RESEARCH GRANT

University of Surrey — 15 grants approved

FAPESP Process 2011/50168-0
BETWEEN SUBJECTS REAL TIME FMRI INTERACTION: A PLATFORM TO STUDY INTERPERSONAL FEEDBACK LOOP DURING MOTOR LEARNING
PI: Edson Amaro Junior
School of Medicine / University of São Paulo (USP)
UK PI: Adam McNamara
Term: May 2011 to Apr 2012
REGULAR RESEARCH GRANT

FAPESP Process 2011/50169-6
WORK SCHEDULES, LIGHT EXPOSURE AND THEIR EFFECTS ON BIOLOGICAL RHYTHMS OF WORKERS IN AN AMAZON EXTRACTIVE RESERVE
PI: Claudia Roberta de Castro Moreno
School of Public Health / University of São Paulo (USP)
UK PI: Debra Jean Skene
Term: May 2011 to Apr 2013
REGULAR RESEARCH GRANT

FAPESP Process 2011/50181-6
THE INVOLVEMENT OF NURSES IN END-OF-LIFE DECISION MAKING: A CROSS CULTURAL EXPLORATION
PI: Regina Szylit
School of Nursing / University of São Paulo (USP)
UK PI: Ann Gallagher
Term: May 2011 to Apr 2013
REGULAR RESEARCH GRANT

FAPESP Process 2012/50207-8
EFFECTS AND NEUROBIOLOGICAL MECHANISMS OF ENVIRONMENTAL MANIPULATIONS ON ETHANOL AND NICOTINE INDUCED BEHAVIOURAL EFFECTS: INVOLVEMENT OF THE STRESS CIRCUITRY
PI: Rosana Camarini
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Alexis Bailey
Term: Jun 2012 to May 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/50218-0
A COMPARISON OF LIVING CONDITIONS AND HEALTH STATUS OF OLDER PEOPLE AGED 80 AND OVER AND THE ROLES AND RELATIONSHIPS WITH THE FAMILY (UK AND BRAZILIAN PERSPECTIVES)
PI: Yeda Aparecida de Oliveira Duarte
School of Nursing / University of São Paulo (USP)
UK PI: Khim Hortom
Term: Jun 2012 to May 2014
REGULAR RESEARCH GRANT

FAPESP Process 2012/51444-3
WORLDSHEET APPROACH TO STRING AND FIELD THEORY
PI: Victor de Oliveira Rivelles
Physics Institute / University of São Paulo (USP)
UK PI: Konstantinos Sfetsos
Term: Feb 2013 to Jan 2015
REGULAR RESEARCH GRANT

FAPESP Process 2014/50769-1
HAND TRACKING FOR OCCUPATIONAL THERAPY
PI: Roberto Marcondes Cesar Junior
Institute of Mathematics and Statistics / University of São Paulo (USP)
UK PI: Janko Calics
Term: Nov 2015 to Oct 2018
REGULAR RESEARCH GRANT

FAPESP Process 2014/50792-3
DEVELOPMENT AND CHARACTERIZATION OF MOLECULARLY IMPRINTED POLYMER-BASED SENSOR FOR BIOMARKER DETECTIONY
PI: Thiago Regis Longo Cesar da Paixão
Chemistry Institute / University of São Paulo (USP)
UK PI: Subrayal Medapati Reddy
Term: May 2015 to Apr 2016
REGULAR RESEARCH GRANT

FAPESP Process 2016/50454-6
DEVELOPMENT AND CHARACTERIZATION OF CHROMIUM-FREE LAYERS APPLIED ON GALVANISED STEEL
PI: Célia Regina Tomachuk dos Santos Catuogno
Lorena School of Engineering / University of São Paulo (USP)
UK PI: Mark Alan Bakery
Term: Feb 2017 to Jan 2019
REGULAR RESEARCH GRANT

FAPESP Process 2016/50457-5
MULTI-OBJECTIVE EVOLUTIONARY METHODS FOR HIERARCHICAL AND MULTI-LABEL CLASSIFICATION
PI: Ricardo Cerri
Technology and Exact Sciences Center / Federal University of São Carlos (UFSCar)
UK PI: Yaochu Jinry
Term: Jun 2017 to May 2019
REGULAR RESEARCH GRANT

FAPESP Process 2016/50470-1
PARTICLES AND BLACK CARBON EXPOSURE TO LONDON AND SÃO PAULO BIKE-LANE USERS (PEDALS)
PI: Maria de Fátima Andrade
Institute of Astronomy, Geophysics and Atmospheric Science / University of São Paulo (USP)
UK PI: Prashant Kumar
Term: Feb 2017 to Jan 2019
REGULAR RESEARCH GRANT

FAPESP Process 2016/50489-4
ASSISTIVE MEDIA FOR HEALTH AND WELLBEING IN AGEING – UK AND BRAZIL NETWORK
PI: Maria da Graça Campos Pimentel
Institute of Mathematical and Computer Sciences / University of São Paulo (USP)
UK PI: David Mark Frohlich
Term: Feb 2017 to Jan 2019
REGULAR RESEARCH GRANT

FAPESP Process: 2017/50380-5
NON WOVEN CARBON NANOTUBE COMPOSITE FIBER ELECTRODES FOR ELECTROCHEMICAL ENERGY CONVERSION/STORAGE DEVICES
PI: Jose Mauricio Rosolen
Phylosophy, Sciences and Languages School / University of Sao Paulo in Ribeirão Preto (USP)
UK PI: Ravi Silva
Term: Apr 2018 to Mar 2020
REGULAR RESEARCH GRANT

FAPESP Process: 2018/10714-4
NOVEL HIGH-RESOLUTION SPATIAL MAPPING OF HEALTH AND CLIMATE EMISSIONS FROM URBAN TRANSPORT IN SÃO PAULO MEGACITY (NOTS)
PI: Pedro Jose Perez Martinez
Engineering, Modelling, and Applied social Sciences Center / Federal University of ABC (UFABC)
UK PI: Prashant Kumar
Term: Nov 2018 to Oct 2020
REGULAR RESEARCH GRANT

FAPESP Process: 2018/11037-6
THE INVOLVEMENT OF MACROPHAGES ON THE EFFECTS OF OMEGA-3 FATTY ACIDS ON THE WOUND HEALING PROCESS: FROM BENCH TO BEDSIDE
PI: Hosana Gomes Rodriguez
Applied Sciences School / University of Campinas (UNICAMP)
UK PI: Fernando Oneissi Martinez Estrada
Term: Nov 2018 to Oct 2020
REGULAR RESEARCH GRANT

University of Warwick — 10 grants approved

FAPESP Process 2015/50070-0
NARRATIVES OF WATER (NOW): A CROSS-CULTURAL EXPLORATION OF DIGITAL HYDRO-CITIZENSHIP IN THE UK AND BRAZIL
PI: Danilo Rothberg
School of Architecture, Arts and Communication / São Paulo State University (UNESP)
UK PI: Joanne Garde-Hansen
Term: Oct 2015 to Sep 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50076-9
CHARACTERISATION OF POTYVIRUSES INFECTING VEGETABLE CROPS IN BRAZIL AND THE STABILITY OF RESISTANCE IDENTIFIED IN EUROPE TO SOUTH AMERICAN POTYVIRUSES
PI: Marcelo Eiras
Biological Institute / São Paulo Agribusiness Technology Agency (APTA)
UK PI: John Antony Walsh
Term: Oct 2015 to Sep 2017
REGULAR RESEARCH GRANT

FAPESP Process 2015/50077-5
DISPLACEMENTS: THE NOVEL WITHOUT FRONTIERS
PI: Sandra Guardini Teixeira Vasconcelos
School of Philosophy, Literature and Human Sciences / University of São Paulo (USP)
UK PI: Ross Forman
Term: Feb 2016 to Jan 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50093-0
BRAZIL AND UK COLLABORATION FOR ENERGY STORAGE AND SUPPLY
PI: Hudson Giovani Zanin
School of Electrical and Computer Engineering / University of Campinas (UNICAMP)
UK PI: Rohit Bhagat
Term: Dec 2015 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2015/50102-0
EXTENDING SYNTHETIC BIOLOGY COLLABORATIONS BETWEEN WISB AND BSSB
PI: Marie-Anne van Sluys
Institute of Bioscience / University of São Paulo (USP)
UK PI: Katherine J. Denby
Term: Dec 2015 to May 2018
REGULAR RESEARCH GRANT

FAPESP Process 2017/50140-4
MECHANISMS OF RING FORMATION IN INOPHORE POLYETHER TETRONATES
PI: Marcio Vinicius Bertacine Dias
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Manuela Tosin
Term: Sep 2017 to Aug 2019
REGULAR RESEARCH GRANT

FAPESP Process 2017/50144-0
DYNAMICAL PROCESSES ON MULTILAYER AND DYNAMIC NETWORKS
PI: Francisco Aparecido Rodrigues
Institute of Mathematical and Computer Science / University of São Paulo (USP)
UK PI: Colm Connaughton
Term: Mar 2018 to Feb 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/08413-6
UK-BRAZIL COLLABORATION FOR INVESTIGATING THE NEXUS BETWEEN WATER, HEALTH AND URBAN RESILIENCE
PI: Eduardo Mario Mendiondo
São Carlos School of Engineering / University of São Paulo (USP)
UK PI: João Porto de Albuquerque
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/08380-0
IDENTIFICATION OF KEY TARGET GENES FOR THE MANIPULATION OF FLOWERING IN SUGARCANE
PI: Luciana Rossini Pinto Machado da Silva
Agronomy Institute / São Paulo Agribusiness Technology Agency (APTA)
UK PI: Stephen Jackson
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

FAPESP Process 2018/08334-9
NEW ADVANCED MATERIALS FOR SENSING APPLICATIONS: A COLLABORATIVE PROJECT ON STRUCTURAL AND SPECTROSCOPIC CHARACTERISATION OF NOVEL RARE-EARTH SOLIDS
PI: Paulo Cesar de Sousa Filho
Institute of Chemistry / University of Campinas (UNICAMP)
UK PI: Richard Ian Walton
Term: Sep 2018 to Aug 2020
REGULAR RESEARCH GRANT

University of York — 4 grants approved

FAPESP Process 2012/50565-1

ADAPTIVE COMPRESSIVE SENSING-AWARE TECHNIQUES: DESINF ALGORITHMS AND APPLICATIONS

PI: Vitor Heloiz Nascimento
Polytechnic School / University of São Paulo (USP)
UK PI: Rodrigo Caiado de Lamare
Term: Oct 2012 to Jan 2015
REGULAR RESEARCH GRANT

FAPESP Process 2012/50986-7

GRAPH SPECTRA AND COMPLEX NETWORK EVOLUTION

PI: Luciano da Fontoura Costa
São Carlos Institute of Physics / University of São Paulo (USP)
UK PI: Edwin Robert Hancock
Term: Oct 2012 to Jun 2015
REGULAR RESEARCH GRANT

FAPESP Process 2012/51018-4

NEW APPROACHES TO COMBINATION CHEMOTHERAPY FOR HUMAN LEISHMANIASIS

PI: Silvia Reni Bortolin Uliana
Institute of Biomedical Sciences / University of São Paulo (USP)
UK PI: Deborah F. Smith
Term: Oct 2012 to Sep 2014
REGULAR RESEARCH GRANT

FAPESP Process 2014/50765-6

KNOWLEDGE-AIDED SIGNAL PROCESSING: THEORY, ALGORITHMS, IMPLEMENTATION AND APPLICATIONS

PI: Vitor Heloiz Nascimento
Polytechnic School / University of São Paulo (USP)
UK PI: Yuriy Zakharov
Term: Jul 2015 to Jun 2017
REGULAR RESEARCH GRANT

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