This Annual Report covers the Instituto Gulbenkian de Ciência’s financial year, from 1st January to 31st December 2016.

Cover Image
Fluorescence stereoscope image of a colony of two identical strains (blue and red) of the fission yeast Schizosaccharomyces pombe, mixed in equal proportions, seeded on an agar plate and grown for 24 hours at 32°C. The two strains form micro-colonies that touch each other but do not overlap. © Lília Perfeito, IGC.
CONTENTS

1 RESEARCH

Oliveira, Raquel A. / External Associated Groups 2016
Xavier, Karina B. / Bacterial Signalling
Telley, Ivo A. / Physical Principles of Nuclear Division
Teixeira, Luís / Host-Microorganism Interactions
Sucena, Élio / Evolution and Development
Soares, Miguel P. / Inflammation
Rocha, Luís M. / Perfeito, Lília / Pereira Leal, José / Penha Gonçalves, Carlos / Parkhouse, Michael / Oliveira, Rui F. / Moita, Luís Ferreira / Mirth, Christen / Martins, Vera / Mallo, Moisés / Adrain, Colin / Athanasiadis, Alekos / Amorim, Maria João / Alves, Filipa / Biosafety

2 SUPPORT TO RESEARCH

CORE FACILITIES

Animal House Facility
Plant Facility
Bioinformatics and Computational Biology Unit
Gene Expression Unit
Genomics Unit
Histopathology Unit
Advanced Imaging Unit
Electron Microscopy Facility
Flow Cytometry Facility
Antibody Service

SUPPORT TO RESEARCH

3 PUBLICATIONS

PEER-REVIEWED PUBLICATIONS

In-house publications
Epib ahead of print
IGC current address
Associated groups

OTHER PUBLICATIONS

Proceedings
Book chapters

4 PRIZES & HONOURS

148 Prizes & Honours

5 GRADUATE EDUCATION & TRAINING

152 PhD programme in Integrative Biology and Biomedicine | IBB
158 Graduate Programme Science for Development | PGED
160 Gulbenkian Training Programme in Bioinformatics | GTPB
162 Postdoctoral Training
163 Summer Internship Programme
164 Theses
166 Teaching at other PhD programmes

6 SEMINARS & MEETINGS

170 Seminars at the IGC
180 Meetings, Conferences & Workshops
184 Presentations by IGC researchers
184 - at international meetings and seminars
191 - at national meetings and seminars

7 PUBLIC ENGAGEMENT IN SCIENCE

198 Institutional communication
199 Science education projects
200 Public events
202 Art and science projects
203 Fundraising
205 ACKNOWLEDGEMENTS
I t is remarkable how often the IGC has been eval-
uated in the four years since I became Director.
Every year, now four times, the 9 eminent mem-
ers of our Scientific Advisory Board (SAB) have
come to look over the entire institute for reassurance
that our overall standards are being maintained, to
confirm new Group Leader appointments, to examine
in detail the performance of cohorts of Group Lead-
ers who have been working for a number of years at
the IGC, and to speak freely about our successes and
failures to the Management Committee and Board
of Administration of our headquarters and principal
financial support, the Calouste Gulbenkian Foun-
dation (FCG). The diligence of the SAB in returning
every year with their sharp critical judgement, their
loyalty to the overarching idea and philosophy of the
IGC, the subtlety and insight of their mediation and
representation between the IGC and the Foundation,
are all beyond praise. These yearly doses of criticism
and advice at the highest level are the best guaran-
tee that the IGC will continue to foster its strengths
and recognise its weaknesses. The SAB also provides
an essential link between the scientists of the IGC and
the non-scientists of the Foundation. The Foundation
undoubtedly shares our aspirations in a general sense,
our striving for scientific excellence, for first-rate publi-
cations, for generous funding from competitive sources, and
perhaps above all for an international reputation.
Nevertheless the only way the Foundation can find out
how well we are achieving these goals is by asking oth-
er people. The essential virtue of the SAB is that it pro-
vides the Foundation with an unvarnished, objective evaluation of nationally-funded research institutes
in all fields, including the IGC. In previous years, au-
tonomous research institutes had been bundled togeth-
er for FCT funding purposes into larger structures, the
Laboratórios Associados (LA), an exercise in top-down
planning for coordinated translational programmes,
but not well-suited to the kind of investigator-initiated research practised by the IGC. The “Units of Research
and Development” (UID) planned for the 2013/2014
evaluation were defined differently, with the qualities
of transparency and internal coherence being favoured
that were not apparent in the LA structures. In this
spirit, the Laboratório Associado de Oeiras that includ-
ed not only the IGC, but our respected neighbour in-
istitutes the ITQB, IBET and CEDOC, broke apart to
form a constellation of new, smaller and more targeted
UID structures. The IGC maintained its unity, with
the exception of our plant scientists who joined a new
UID devoted to plant research while keeping their own
research laboratories at the IGC. Sensitive to the risk
that embedded prejudices and rivalries on the Portu-
guese research landscape could tarnish the evaluation
of the new UIDs, the FCT prudently invited the Euro-
pean Science Foundation to undertake the review. The
ESF is an established European organisation formerly
prominent in the sponsorship of scientific conferences
and small meetings, more recently converted into a Eu-
rope-wide agency for research evaluation with a large
index of qualified non-Portuguese academic reviewers
at its disposal. Despite a ferocious and deeply damag-
ing political controversy in Portugal over the broader
intentions of the FCT, the objectivity and competence of the ESF review were widely (if not universally) ap-
preciated. The IGC was proud to emerge from the ESF
review with the rare designation of “exceptional” and
a generous infrastructure grant for 3 years from 2015, with a
further review at 3 years. Grounds indeed for celebration, but
as it turned out not for resting on our laurels.
My appointment as Director of the IGC in 2012 was integrat-
ed into a new 5-year plan of support by the Calouste Gulben-
kiian Foundation, the “New Scientific Project”. This, among
other prescriptions, included a review of the Institute’s work
and achievements, to be conducted in 2016 by an International
Review Committee, a group of academic referees of the high-
est distinction entirely outside the sphere of influence of the
SAB. This group of 8 scientists, assembled and headed by Prof.
Herbert Jaeckle, from the Max Planck Institute of Biophysical
Chemistry in Göttingen and until recently Vice-President for
the Biological and Medical Sciences section of the Max-Planck
Society, visited the IGC in June of 2016. Measured and critical,
At the end of 2016 the IGC has every reason to feel vindicated in its science as in its philosophy, yet all is not fixed yet. Our new government has reminded us that the fellowship mode of employment, in Portuguese “Bolsas”, is rapidly falling out of use in Europe. In many European countries now even the PhD students have taxable salaried work contracts providing for the full range of social security benefits; at the IGC at the end of 2016 we have about 350 employees of whom fewer than 100 have security of employment through a work contract. A new law passed in August imposes strict limitations on the employment of post-doctoral scientists on fellowships, whether as Group Leaders, “postdocs”, technicians, lab managers, or facility managers. I do not believe a single person at the IGC thinks that this is a bad thing. Frankly speaking, it comes as a relief to many, considering that the IGC’s extensive use of fellowships has been a convenience for its cheapness, simplicity and flexibility but has also been effectively an exploitation of the charms of the IGC as a place to work and recently of the dire economic state of the Portuguese nation.

There is another aspect to all these reviews that should give us pleasure and encouragement, and that is the repeated endorsement of the IGC style of science, the diversity, the small groups, the level of interaction, collaboration and internal criticism, the insistence on creativity and excellence, the maturity of our PhD students.

Perhaps the fellowship system fitted better to the IGC when it was young and growing, but now as a mature institution it is past time to celebrate the loyalty and expertise of its many outstanding members by the provision of proper work contracts.

Science itself is changing, but the value of the individual creative mind working in an open, supportive and honest environment will not be replaced.

Perhaps the fellowship system fitted better to the IGC when it was young and growing, but now as a mature institution it is past time to celebrate the loyalty and expertise of its many outstanding members by the provision of proper work contracts. Certain it is, however, that the enforced replacement of fellowships with work contracts comes at a time when the government has no resources to pay for it. At the end of 2016 a team of professionals from Deloitte helped us to understand the complexities of the IGC employment situation. Mastering the full cost implications of their report, and reconciling the new labour legislation with the necessity for flexibility and turnover are the challenges for 2017. We are now facing in 2017 the prospect of our next evaluation, the three-year interim review of the UID that provides critical public financial support for our infrastructure. Much has changed in the Portuguese political landscape since 2014 when the UID was first evaluated, and it is clear that the evaluation will be significantly influenced by these changes. We know that the success with which an institution responds to the new law on fellowships will be a specific evaluative criterion that was absent in 2014. We can also guess that the furore surrounding the previous UID evaluation, albeit focused more on the priorities of the FCT than on the integrity of the process itself, will influence the conduct of the evaluation, but in ways that are hard to predict. That the ESF will play no part in the new evaluation seems all but certain, but who or what will replace their role, and how and by whom they will be selected, is still unknown.

There is another aspect to all these reviews that should give us pleasure and encouragement, and that is the repeated endorsement of the IGC style of science, the diversity, the small groups, the level of interaction, collaboration and internal criticism, the insistence on creativity and excellence, the maturity of our PhD students.
The Instituto Gulbenkian de Ciência (IGC) was founded by the Calouste Gulbenkian Foundation (FCG) in 1961. The direct governance of the Institute is made through the Director, a Deputy Director with primary responsibility for financial administration, and a Deputy Director for Science. The Director is in turn answerable to a Management Committee, appointed by the FCG Board of Trustees, which acts on behalf of the Board and reports directly to them. An eminent external Scientific Advisory Board oversees the scientific activity of the IGC, whereas the Ethics Committee assures the ethical conduct of the scientific related to vertebrate animals or human beings.

**CALOUSTE GULBENKIAN FOUNDATION BOARD OF TRUSTEES**

Artur Santos Silva | Chairman  
Isabel Mota  
Teresa Gouveia  
Martin Essayan  
José Neves Adelino  
Guilherme d’Oliveira Martins  
Emilio Rui Vilas  
Joaquim Gomes Canotilha  
António Gutteres  
* Non-executive Trustees

**INSTITUTO GULBENKIAN DE CIÊNCIA MANAGEMENT COMMITTEE**

José Neves Adelino (FCG) | Chairman  
António Coutinho (IGC and Champalimaud Foundation)  
Eduardo Marçal Grilo (FCG)  
Diogo de Lucena (Universidade Nova de Lisboa)  
Guilherme d’Oliveira Martins (FCG)  
Jonathan Howard (IGC)

**CALOUSTE GULBENKIAN FOUNDATION BOARD OF TRUSTEES**

Kai Simons (Max Planck Institute, Dresden, Germany) | Chairman  
Martin Raff (University College London, UK)  
Gines Morata (Universidad Autónoma de Madrid, Spain)  
David Sabatini (New York University, USA)  
Terrence Sejnowsky (The Salk Institute, USA)  
Tony Hyman (Max Planck Institute, Dresden, Germany)  
Linda Partridge (Max Planck Institute, Cologne, Germany)  
Ruslan Medzhitov (Yale University, USA)  
Paul Schmid-Hempel (ETH Zurich, Switzerland)

**SCIENTIFIC ADVISORY BOARD**

**ETHICS COMMITTEE**

Tânia Carvalho (PhD, DVM, Instituto de Medicina Molecular) | Chairperson  
Carlos Penha-Gonçalves (PhD, DVM, IGC)  
Manuel Rebelo (PhD, IGC)  
Miguel Fontes (MD, External member)  
Isabel García (Civil servant, External member)  
Vera Martins (PhD, IGC)  
María de Althuyde Tavares (Lawyer, External member)  
Vasco Trigo (Journalist, External member)  
Ana Cristina Borges (PhD, IGC)
The Instituto Gulbenkian de Ciência (IGC) is a private institute devoted to basic biological and biomedical research, and to graduate training. The IGC is free from hierarchical structure, with small independent research groups working in an environment designed to foster interaction and cooperation. The scientific programme of the IGC is multidisciplinary, including Cell and Developmental Biology, Evolutionary Biology, Inflammation, Immunology, Host-Pathogen Interactions, Disease Genetics, Plant Biology, Neurosciences, Theoretical and Computational Biology.

THE IGC MISSIONS ARE THUS:
1. To promote multidisciplinary science of excellence in basic biological and biomedical research;
2. To identify, educate and incubate new research leaders, providing state-of-the-art facilities and full financial and intellectual autonomy to pursue research projects;
3. To promote the reciprocal exchange of knowledge between the laboratory bench, clinical medicine and industry with a view to enhancing the value of fundamental research to society;
4. To provide international graduate teaching and structured training programmes that respond to present-day imperatives;
5. To promote the values of science in society, scientific literacy, and the active participation of citizens in scientific research, through engagement with different communities and stakeholders.

The institute is part of the Oeiras Campus, home to several other basic and applied research centres in biology, biotechnology and chemistry.

Since 1998
the IGC has hosted 88 research groups; 44 of these have moved on to other research institutes, 28 to research centres in Portugal. 29 research groups in Portugal are IGC-associated groups, with access to IGC facilities and services.

The IGC pioneered graduate training in Portugal. Since 1993, 10 PhD Programmes have been set up, with approximately 80 speakers/year/programme. By December 2016 over 550 PhD students had started their science education at the IGC in programmes and research groups.

FACTS & FIGURES in 2016*

392 PEOPLE WORK AT THE IGC
including 20 Visitors
163 males
229 females

298 RESEARCHERS
of which 142 are PhD holders

42 GROUP LEADERS
24 Portuguese
18 Rest of the World
20 Female
22 Male

11 CORE FACILITIES
46 Core Facility Staff, of which 55 are PhD holders (includes 5 heads that are also Group Leaders)

9 SERVICE UNITS
35 Service Units staff, of which 8 are PhD holders

33 NATIONALITIES
278 Portuguese
114 Rest of the World

* As of December 31st, 2016

SCIENTIFIC COMMUNICATION

In the last 5 years
768 PEER-REVIEWED PUBLICATIONS FROM IN HOUSE GROUPS
149 PEER-REVIEWED PUBLICATIONS FROM ASSOCIATED GROUPS
917 TOTAL

In 2016
2 BOOK CHAPTERS
13 PEER-REVIEWED PUBLICATIONS FROM ASSOCIATED GROUPS
140 PEER-REVIEWED PUBLICATIONS FROM IN HOUSE GROUPS

Albania 1  
Argentina 1  
Armenia 1  
Belgium 1  
Brazil 6  
Canada 2  
Cabo Verde 9  
Colombia 2  
Cyprus 1  
France 14  
Germany 10  
Greece 3  
Hungary 1  
India 6  
Ireland 2  
Italy 6  
Japan 3  
Montenegro 1  
Nepal 1  
Netherlands 4  
Nigeria 2  
Poland 5  
Portugal 278  
Romania 1  
Serbia 3  
Spain 13  
Sweden 1  
Switzerland 1  
Tanzania 1  
Turkey 1  
United Kingdom (UK) 7  
United States (USA) 3  

The IGC AT A GLANCE
Annual Report 2016

PUBLISHED ITEMS WITH IGC ADDRESS IN EACH YEAR

<table>
<thead>
<tr>
<th>Year</th>
<th>Total publications</th>
<th>In house publications</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>191</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>210</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>182</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>181</td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>153</td>
<td></td>
</tr>
</tbody>
</table>

Source: Web of Science, January 2017

CITATIONS TO IGC PAPERS IN EACH YEAR

<table>
<thead>
<tr>
<th>Year</th>
<th>In house citations</th>
<th>TOTAL CITATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Web of Science, January 2017

RESEARCH GRANTS STARTED IN 2016

30 FCT-Scientific Research & Technological Development Project Grants
2 Human Science Frontier Programme - Young Investigator Grants
2 Maratona da Saúde Awards
1 Bill & Melinda Gates Project Grant/Investment
1 European ERA-NET
1 AFM Telethon Research Grant

OTHER RESEARCH GRANTS AWARDED IN 2016

2 European ERA-NET
2 Programa de Atividades Conjuntas (COMPETE 2020)
1 NARSAD Young Investigator Grant
1 H2020 Infrastructures consortium project
2 FLAD/NSF Research Networks Program
1 EFSD/JDRF/Lilly European Programme in Type 1 Diabetes Research
1 Bolsa Investigação Bial
1 L’Oréal for Women in Science Award

IN THE LAST 5 YEARS

127 GRANTS

Source: IGC Research Funding Affairs

COMPETITIVE AWARDS SECURED BY IGC RESEARCHERS

56 PRIZES AND HONOURS, INCLUDING

1 Gilbert S. Omenn Prize
1 Pulido Valente Science Award
1 L. Oristl for Women in Science Award
1 Women in Science Award
1 Dona Antónia Adelaide Ferreira Revelation Award
1 First Degree Honour Medal Award for Educational Merit
1 President-Elect for Society for Social Neuroscience
1 Fulbright Scholar Program

OTHER FUNDING STARTED IN 2016, INCLUDING BILATERAL COLLABORATION, TRAVEL GRANTS AND CONFERENCE ORGANIZATION

37

OTHER RESEARCH GRANTS

2 European ERA-NET
2 Programa de Atividades Conjuntas (COMPETE 2020)
1 NARSAD Young Investigator Grant
1 H2020 Infrastructures consortium project
2 FLAD/NSF Research Networks Program
1 EFSD/JDRF/Lilly European Programme in Type 1 Diabetes Research
1 Bolsa Investigação Bial
1 L’Oréal for Women in Science Award

RESEARCH GRANTS BREAKDOWN BY FUNDING SOURCE 2012–2016

63%

EUROPEAN COMMISSION

15%

PUBLIC

8%

PRIVATE

11%

PUBLIC–PRIVATE

3%

PUBLIC-PUBLIC

IN THE LAST 5 YEARS
BUDGET OVERVIEW 2016

TOTAL BUDGET

16.8M €

BREAKDOWN OF IGC EXPENDITURE

- **53%** EXTERNAL FUNDING
- **47%** INTERNAL FUNDING including Calouste Gulbenkian Foundation

PERSONNEL
- staff and researchers
- 20%

FELLOWSHIPS
- 32%

OPERATIONS
- facility costs, others
- 25%

INFRASTRUCTURE
- building maintenance, refurbishments
- 16%

EQUIPMENT
- 8%

INTERNAL FUNDING

TOTAL BUDGET

16.8M €
“Aqui há Ciência” reunion at the IGC
Kindergarten and primary school teachers that participated in the “Aqui há Ciência” project gathered at the IGC for a special event.

Call for the 2017 PhD Programme IBB
Applications for the IGC PhD Programme in Integrative Biology and Biomedicine (IBB) were opened.

Ceremony of the Pulido Valente Science Award 2015
Bahtyar Yilmaz, former PhD student in Miguel Soares’ laboratory, won the Pulido Valente Science Award 2015 for the discovery of a natural defence mechanism against malaria transmission triggered by resident bacteria in the gut.

IGC researchers honoured by Ciência Viva
Raquel Oliveira, Mónica Bettencourt Dias, Ana Domingos and Karina Xavier, group leaders at the IGC, were honoured in the exhibition and book “Mulheres na Ciência” (in English, “Women in Science”).

Director of the PhD Programme PGCD
honoured by the Cabo Verde Government
Joana Gonçalves Sá, Director of the Graduate Programme Science for Development (PGCD) and group leader at IGC, received the First Degree Medal Award for Educational Merit by the Prime Minister of Cabo Verde.

IGC researchers honoured by Ciência Viva

“Ciência em Três” a new platform with educational resources for teachers
“Ciência em Três” (in English, “Science in Three”), a new platform with educational resources for teachers and educators developed by the IGC, was launched.

IGC researchers awarded with HSFP Young Investigator grants
Ana Domingos and Ivo Telley, both group leaders at the IGC, received a Young Investigator grant from the Human Frontier Science Program (HFSP) worth over 1 million USD.

EMBO Workshop on Neural Control of Metabolism and Eating Behaviour
International scientists attended this EMBO workshop in Cascais, organised by Ana Domingos.

Two IGC researchers awarded with “Maratona da Saúde” grants
Two projects of Íris Caramalho and Ana Domingos won the Maratona da Saúde Awards dedicated to Diabetes.

IGC researchers awarded with “Maratona da Saúde” grants

IGC at Futurália
Under the motto “Is doing research your scene?”, the IGC participated in Futurália, the largest education, training and employability Fair in Portugal.

Hands on Immunology” - IGC opened its doors for Immunology Day
The IGC joined the Portuguese Society of Immunology (SPI) to celebrate the International Immunology Day and prepared a full programme of activities for high school students.

XLII Annual SPI meeting
Over 150 scientists gathered at the IGC for the XLII Annual Portuguese Society of Immunology (SPI) meeting.

Director of the PhD Programme PGCD

Omenn Prize awarded to IGC PhD Student
João Barroso Batista, PhD student of the Evolutionary Biology group at the IGC, was the 2015 recipient of the Gilbert S. Omenn Prize.

Omenn Prize awarded to IGC PhD Student

Two IGC scientists awarded with HSFP Young Investigator grants

IGC at Belém Art Fest
For the second consecutive year, the IGC participated in Belém Art Fest with an art & science installation.

IGC at Maker Faire Lisbon
The IGC participated at the Maker Faire Lisbon with an art&science installation.

IGC at Maker Faire Lisbon

IGC at Belém Art Fest

XLII Annual SPI meeting

JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE

A WALK THROUGH 2016

18 / Annual Report 2016
IGC Scientist received Dona Antónia 2015 Award
Raquel Oliveira, group leader at the IGC, was honoured with the Revelation Award Dona Antonia Adelaide Ferreira, awarded by Sogrape Vinhos.

IGC at NOS Alive
Science and music came together for the 9th year running at the NOS Alive’16 music festival.

First Scientific Meeting of PGCD
PhD students of the three editions of the Graduate Programme Science for Development (PGCD) gathered at the IGC for the first time.

IGC at “Ao Leme com a Ciência Viva” Festival
IGC participated at the Science Festival “Ao Leme com a Ciência Viva”, an event organised by Ciência Viva to celebrate its 20th anniversary.

EMBO Young Scientists’ Forum 2016
The EMBO Young Scientists’ Forum 2016, organised by 5 IGC scientists, was held at the Calouste Gulbenkian Foundation.

IGC researcher awarded with NARSAD Young Investigator Grant
Rosalina Fonseca, group leader at IGC, was awarded with a NARSAD Young Investigator Grant from the Brain & Behavior Research Foundation.

IGC Open Day
Under the motto “Science in Zoom”, the 8th edition of the IGC Open Day brought 1800 visitors to the IGC.

Call for the 2017 PGCD
Applications to the 2017 edition of the Graduate Programme Science for Development (PGCD) were opened.

3rd Cross-Institutional Meeting of Young Researchers
This meeting brought together more than 100 postdocs from the IGC, ITQB-NOVA, IMM and Champalimaud Research for 3 days of intense scientific activity.

3rd Cross-Institutional Meeting of Young Researchers
This meeting brought together more than 100 postdocs from the IGC, ITQB-NOVA, IMM and Champalimaud Research for 3 days of intense scientific activity.

‘Lab in a Box’ – bringing science to students in Africa
The project “Lab in a Box”, developed by IGC researchers and science communicators, kicked off in Cabo Verde.

The Bill & Melinda Gates Foundation funded IGC scientists
The research group led by Miguel Soares at IGC was specifically selected by The Bill and Melinda Gates Foundation to help finding a vaccine against malaria.

EMBO course on “3D Developmental Imaging”
The 5th edition of this EMBO workshop, organised by Gabriel Martins, head of the Advanced Imaging Unit at IGC, focused on one of the main challenges of development biology: visualising in vivo embryos.

IGC researcher elected President of the Society for Social Neuroscience
Rui Oliveira, group leader at IGC, was elected President of the Society for Social Neuroscience, a scientific international society with headquarters in the USA.

World premiere of “Quatuor pour l’aurore des temps”
Gulbenkian Orchestra soloists played the “Quatuor pour l’Aurore des Temps” from Camille van Lunen, artist in residence at the IGC, in a world premiere at the Calouste Gulbenkian Foundation.

Gulbenkian Training Programme in Bioinformatics reaches 5000 students
Celebrating its 17th year anniversary, the Gulbenkian Training Programme in Bioinformatics (GTPB) hosted the number 5000 student during the course IB16S-Introductory Bioinformatics.

New Artist in Residence
Simon Bill, a British painter and novelist, is the new Artist in Residence for a period of 6 months.

IGC at the Science and Technology Week
IGC joined the National Week of Science and Technology 2016 with an online platform of biology-related puzzles and an art & science installation at the Electricity Museum in Lisbon.
MEMBRANE TRAFFIC

GROUP LEADER
ADRAIN, COLIN

LAB MEMBERS IN 2016

Marina Badenes, Postdoc
Miguel Cavadas, Postdoc
Abdulbasit Amin, PhD student, 2016 IBB
Catarina Gaspar, External PhD student
Ioanna Oikonomidi, PhD student, 2014 IBB
Joana Perdigão, Masters student
Emma Burbridge, Lab manager
Inês Félix, Technician

RESEARCH INTERESTS

- Regulation of signalling by metalloproteases;
- Role of the ER quality control machinery, in vivo.

MAIN ACHIEVEMENTS

Control of metalloprotease “shedding”: Our work focuses on understanding “shedding”, the stimulated release of signalling molecules from the cell surface by metalloproteases. Diverse cues stimulate the metalloprotease TACE—the enzyme that cleaves TNF, and the activating ligands of the EGFR. We previously identified proteins called iRhoms to be essential for TACE trafficking to the Golgi apparatus, where it undergoes an essential activation step. We now identify a novel role for iRhom2: shedding stimuli trigger phosphorylation of iRhom2. iRhom2 phosphorylation is required for substrate shedding, without affecting TACE trafficking (iRhom2’s established role). We propose a new function for iRhom2 as a transducer of shedding signals through iRhom2, via an ‘inside out’ mechanism.

A novel iRhom cofactor: We identified a cytoplasmic protein that binds specifically to both mammalian iRhom paralogues. Our data suggest that this new protein, iTAP (iRhom tail-associated protein) is a novel component of the iRhom/TACE pathway, essential to facilitate the ER exit of iRhom/TACE.

Role of UBXD8 in lipid homeostasis: We aim to understand, at an organismal level, the contribution made by the ER protein quality control machinery. We have generated mice mutant in the ER/lipid droplet-localised protein, UBXD8. Our preliminary data imply a role for UBXD8 in the control of adipose tissue homeostasis.

Figure: 200x images of hematoxylin and eosin-stained tissue sections from brown adipose tissue (BAT) isolated from wild type (WT) versus Ubxd8 mutant mice. Whereas the WT BAT contains adipocytes with a normal characteristic multilocular appearance, the Ubxd8 mutant BAT contains smaller numbers of mostly large unilocular adipocytes (i.e., containing a single large lipid droplet). The interstitium of UBXD8 mutant BAT also contains substantially more infiltrating immune cells.
RESEARCH GROUPS

BIOPHYSICS AND GENETICS
OF MORPHOGENESIS

GROUP LEADER
ALVES, FILIPA

RESEARCH INTERESTS

Throughout development and growth, gene expression and cell metabolism are regulated both in space and in time, leading to complex patterns of cell differentiation from seemingly simpler initial conditions. We use mathematical modelling to study how the dynamic behaviour of key regulatory networks can generate well-defined sharp state transitions in the cells, triggered by critical changes in their biophysical parameters.

MAIN ACHIEVEMENTS

We are investigating two distinct, yet related, mechanisms:

1) Cells express different genes depending on their spatial location. We are analysing the pigmentation pattern in butterfly wings to investigate how local gene regulation and tissue architecture act together to define organised patterns of cell differentiation and how this interplay both generates and constrains the phenotypic variation observed within and between species.

2) Cells express different genes at different points in time. We are studying the developmental switch of ovary maturation in Drosophila as a model system for how the patterning of individual organs is coordinated in time as whole body development and growth progress and how the regulatory mechanisms involved ensure robustness against environmental and physiological perturbations.

To quantitatively compare modelling and experimental results, we are developing tailored quantitative image analysis methods, acquisition systems and databases, focusing on dissecting different quantitative traits from complex patterning phenotypes.

SOFTWARE

MathColor/FijiColor

These packages comprise a growing set of interactive applications implementing novel methods for the quantitative analysis of colour patterns in natural colour images and gene expression patterns in fluorescence labelled images.

WingPatterns

This knowledge base combines in the same platform the experimental image collections (with the respective associated metadata) and the quantitative analysis results of the gene expression patterns in larvae and pupae, adult pigmentation, vein patterning and wing shape, among other morphometric traits. Associated with the database, we are developing automated image analysis algorithms and data-mining techniques.

Public website: http://wingpatterns.igc.gulbenkian.pt

FIGURE

Patterned cell fate determination in butterfly wings. A) Bicyclus anynana adult hindwing (ventral side), highlighting vein outlines (upper panel). The bottom panel shows a wing modular spatial unit defined by adjacent veins and wing margin. B) Candidate regulatory network for wing margin and vein signalling during focal determination (details in the main text). C) Left: Adult wing eye spots, with insets showing the corresponding Dil expression patterns in the larval wing disc; Right: Model results corresponding to changes in different parameter values. The plots show the relative level of Dil expression along the wing proximal-distal (P-D) and posterior-anterior (P-A) axes. The wild type pattern is shown in the first plot. If the space between two consecutive veins is wider than normal, the resulting Dil expression pattern and the corresponding adult eyepspot become rod-shaped (second plot). If Dil repression close to the wing margin (by the unidentified gene X) becomes weaker, the resulting eyepspot is elongated along the wing proximal-distal axis (third plot). D) Candidate regulatory network underlying eye spot patterning. E) Adult wing eyespots (left), with insets showing the corresponding sal (magenta) and en (green) expression patterns in the pupal wing. Increasing or decreasing the level of Dpp production (or the number of focal cells) results in bigger or smaller eyespots (first row plots). If the strength of the inhibitory effect of engrailed is increased, the black ring is almost completely replaced by gold coloured scales, and the reverse happens if the inhibitory action of spalt becomes stronger (second row plots).

The developmental switch of ovary maturation in Drosophila. F) Network considered in the model, including two alternative hypotheses for the regulatory interaction between the insulin and the ecdysone signalling pathways. G) Model results for the relative level of engrailed expression as a function of ecdysone concentration, considering three different initial levels or ISS/TOR signalling (arrow direction indicates stronger signalling). Upper panel: Expected dynamics in the case the ISS/TOR signalling is acting on engraved expression by regulating the availability of Ecr/USP in the ovary (Hypothesis 1 in the network diagram). Bottom panel: Expected dynamics in the case the ISS/TOR signalling was acting on engraved expression by regulating the binding probability of 20E to the Ecr/USP complex (Hypothesis 2).

E-MAIL filipaalves@igc.gulbenkian.pt

IGC WEBPAGE: http://www.igc.gulbenkian.pt/alves
CELL BIOLOGY OF VIRAL INFECTION

GROUP LEADER
AMORIM, MARIA JOÃO

RESEARCH INTERESTS

Influenza A virus (IAV) is a major human pathogen. We focus on how IAV modulates host membrane trafficking, altering cellular architecture and host immunity to assist viral infection.

MAIN ACHIEVEMENTS

We made considerable progress in understanding:

Viral assembly: IAV genome contains 8 distinct RNA segments (vRNPs), packaged in a budding virion, but the location of complex formation remains unclear. Recent reports propose that genome assembly and vRNP transport outward recycling vesicles are connected events. Our 2016 manuscript suggests an alternative model, whereby binding of vRNPs to vesicles outcompetes that of its host cognate partners, impairing flow and resulting in vesicular clustering. Such impairment creates vRNP hotspots and facilitates complex formation downstream. An additional manuscript shows that among the cognate partners, the motor KIF13A, is still able to bind recycling vesicles and propel movement. Hence, the step hindered in recycling flow occurs a posteriori.

Modulation of host innate immunity: In specific cells, the recycling endosome is involved in cytokine secretion; MHC-I presentation and phagocytosis. Hence, the IAV induced impairment may modulate host immunity, a hypothesis we are investigating. In addition, other membrane trafficking alterations occur upon infection. Using the mouse model, we identified the host GPI-anchored protein DAF as a factor modulated by infection, that leads to more severe outcomes and we are currently dissecting the underlying mechanism.

LAB MEMBERS IN 2016

Marta Alenquer, Postdoc
Silvia Costa, Postdoc
Nuno Santos, PhD student, 2016 PGCD | Started in October
Zoe Vaz Da Silva, PhD student, 2013 PIBS
Filipe Ferreira, Lab manager | Started in March
Ana Nascimento, Masters student | Left in August
Joana Perdigão, Masters student | Started in August
Maria Veríssimo, Masters student | Left in August

PUBLICATIONS


Figure: Models proposed for assembly of IAV segmented genome – Model 1 suggests that collision of recycling endosome segmented genome carrying vRNPs, on route to the budzone, promotes RNA-RNA interactions and sequentially leads to IAV genome assembly. This model is supported by super-resolution based approaches assessing co-localisation among distinct segments. Model 2 originates from our work and proposes that vRNP binding to recycling vesicles hinders their flow, leading to vesicular clustering. Clustering creates hotspots of all vRNPs that become in close proximity, which might facilitate assembly downstream. Correlative light and electron microscopy based approaches support model 2. Note that we found no evidence of assembled genomes zones of vesicular clustering.
**PROTEIN NUCLEIC ACIDS INTERACTIONS**

**GROUP LEADER**
ATHANASIADIS, ALEKOS

**RESEARCH INTERESTS**
For the vertebrate innate immune system nucleic acids represent a major Pathogen Associated Molecular Pattern (PAMP) capable of triggering interferon responses and apoptotic/necroptotic cell death. We are interested in understanding how cells distinguish self-nucleic acids from foreign and the molecular mechanisms involved in maintaining homeostatic balance. We are studying the dsRNA pathway and the role of A to I RNA editing to render cellular transcripts non recognisable by the innate immune sensors.

**MAIN ACHIEVEMENTS**
We developed tools to study the localisation and interaction partners of a domain family uniquely found in proteins involved in the recognition of nucleic acids in the cytoplasm. We demonstrated the association of such domains with Stress Granules (SGs) involved in storage of stalled ribosomes and their associated mRNAs and identified relevant interaction partner proteins. Together with our previous work with viral inhibitors of the cellular sensors showing a similar localisation our results point to SGs as a centre for the innate immune sensing pathway.

**FUNDING**
- Fundação para a Ciência e a Tecnologia

**PUBLICATIONS**

**LAB MEMBERS IN 2016**
- Luisa Gabriel, Postdoc | Left in July
- Gabrielle Kosoy, Technician | Started in September

**E-MAIL**: alekos@igc.gulbenkian.pt
**IGC WEBPAGE**: http://www.igc.gulbenkian.pt/aathanasiadis

**Figure**: A) Interaction of Zalpha domains with dsRNA and dsDNA. B) Zalpha domains (green) localise in arsenite induced Stress Granules as indicated with anti-TIAR (pink). This localisation is lost in mutant Zalpha domains that abolish RNA binding.
PLANT STRESS SIGNALLING

GROUP LEADER
BAENA GONZÁLEZ, ELENA

RESEARCH INTERESTS
Mounting evidence suggests that in plants environmental information is partly conveyed through sugar signals. One central component of the signalling network that monitors the plant sugar status is the SNF1-related Protein Kinase1 (SnRK1). SnRK1 regulates energy homeostasis and in doing so, it promotes tolerance to stress and influences numerous growth and developmental processes. We seek to understand how this key pathway is regulated and how it operates as a first step to understand how sugar signals influence stress tolerance and shape plant development.

MAIN ACHIEVEMENTS
Our work has uncovered several mechanisms by which SnRK1 is regulated:

a) SnRK1 activity results in the SUMOylation-dependent ubiquitination of several subunits of the complex and their subsequent degradation through the proteasome. This is important for resetting SnRK1 signalling and preventing detrimental pathway overactivation.

b) In collaboration with Paula Duque (IGC) we have found that the SR45 splicing factor negatively regulates SnRK1 stability and are currently investigating the underlying mechanisms.

c) Using a luciferase-based mutant screen we have identified two factors that impinge on SnRK1 activity. Current efforts aim at unravelling the mechanistic basis for this.

In collaboration with Wolfram Weckwerth (Vienna) we have performed high throughput phosphoproteomics analysis that have uncovered numerous potential SnRK1 targets, implicated e.g. in translation control or photosynthesis.

FUNDING
• Fundação para a Ciência e a Tecnologia

SELECTED PUBLICATIONS*


*The complete list of publications is available on section 3. Publications.
Work in the Evolutionary Dynamics group is focused on the study of evolution, and in particular on the population genetics of adaptation and speciation. Questions at the interface between theoretical and empirical biology are approached through theoretical modeling, computational methods, and statistical data analysis, and via targeted collaborations with wet-lab researchers.

Can we predict fitness landscapes?
Using the concept of fitness landscapes, we aim at understanding the relative roles of stochastic and deterministic processes in adaptive evolution. We analysed a large multi-allelic intragenic fitness landscape of 640 engineered mutations in yeast Hsp90. Using a combination of existing and novel theoretical approaches, we studied the accessibility of the global fitness peak and the potential for predictability of the fitness landscape topography. We found local ruggedness of the landscape and the existence of epistatic hotspot mutations, which together make predictability inherently difficult if mutation-specific information is not considered.

Can we kill a virus by increasing its mutation rate?
We studied the evolutionary dynamics of influenza A virus under different concentrations of Favipiravir, which is a drug that leads to an increase in mutation rate across the genome. By tracking down real-time evolution of several populations we were able to evaluate the extinction dynamics and the potential adaptive response of the virus to different drug treatments.
We are studying sexual reproduction and early embryogenesis, with a particular focus on (epi)genetic mechanisms acting during male gametogenesis. Male gametes in the plant and animal kingdom carry complex sets of RNA molecules, including not only mRNAs but also small RNAs. We have shown that in the angiosperm Arabidopsis thaliana epigenetic reprogramming during male gametogenesis seems to be partially responsible for these distinct transcriptomes. In addition, the CCR4-NOT complex seems to play a role through its regulation of mRNA decay rates. The extant bryophyte Physcomitrella patens serves as our EVO-DEVO model. We have created a comprehensive transcriptome atlas as a starting point to analyse how genetic and epigenetic regulation during male gametogenesis evolved in land plants. Intercellular communication between male and female gametes (recognition and fusion) are additional questions we are addressing. Our analysis of Arabidopsis tetraspanins has led to the identification of two functionally redundant sperm cell expressed tetraspanin-binding partners. A double mutant results in severe fertility defects associated with predominant single fertilisation events, supporting our hypothesis that tetraspanins and their associated binding partners can form signalling complexes with essential functions in gamete recognition and fusion.
Our Eco-Evo-Devo research combines concepts and approaches from various disciplines to characterise genetic and environmental factors that account for intra-specific variation, the raw material for natural selection and a universal property of biological systems. Understanding the mechanisms that generate this variation is a key challenge. What are the genetic changes that contribute to evolutionarily relevant variation? How do they interact with environmental factors to regulate developmental trajectories and outcomes? For the dissection of variation in complex, diversified and ecologically-relevant phenotypes, the lab uses two complementary models: Bicyclus anynana butterflies and Drosophila melanogaster flies.

In 2016, the lab focused mostly on the role of the external environment on the generation of novel genetic variants (through the mobilisation of transposable elements, TEs; Marta Marialva’s PhD thesis defended in Nov) and of novel phenotypic variants (through developmental plasticity). Main findings were: 1) the effect of environmental perturbation on TE mobilisation during oogenesis depends on genotype and TE identity, 2) identification of loci contributing to inter-genotype differences in levels of TE activity and developmental plasticity, 3) unravelling non-additive environment by environment effects on the development of plastic traits, and 4) successful establishment of genome editing to study gene function in wing pattern development in B. anynana.
Our laboratory is interested in general principles in biology regarding the counting and assembling of complex subcellular structures, and their variations observed during development, in disease and evolution. We use complex cytoskeletal assemblies, such as centrioles and cilia, as study subjects. We follow three complementary research lines in their output: mechanisms of biogenesis & function, disease (cancer) and evolution.

**MAIN ACHIEVEMENTS**

We have discovered that centrioles are not intrinsically stable but need to be stabilised by their matrix. In doing so, we have discovered a mechanism by which centrosomes are inactivated and eliminated in oogenesis. During oogenesis, the centriole associated matrix (PCM) is lost, leading to centriole loss. Centrioles are then contributed paternally by the sperm, for embryo development. We are able to prevent centrosome loss in the egg, which led to problems in embryo development.
QUANTITATIVE ORGANISM BIOLOGY

GROUP LEADER
CARNEIRO, JORGE

RESEARCH INTERESTS

The Quantitative Organism Biology group studies the multilevel mechanisms that give rise to properties of the whole organism, in search for general principles of biological organisation and, eventually, the design of artificial systems. Our approach is two fold: on the one hand, we create mathematical models of specific exemplary systems aiming to uncover basic principles, and on the other hand, we develop the quantitative methods required to assess the properties and predictions of these models.

MAIN ACHIEVEMENTS

We have a long-standing interest in understanding cellular form and motility through the development of quantitative frameworks that describe the morphodynamics of individual cells. The calibration and estimation of the parameters of such morphodynamical models is a major challenge as it involves rigorous quantitative comparison of the model predictions with live-imaging data. We have recently made a breakthrough by fitting a complex model of a swimming spermatozoon to raw imaging data by maximising the cross-correlation between experimental microscopy images and synthetic image generated with the model. We demonstrated that mechanistic information contained in the model is able to uncover missing information in the imaging data, identifying patterns that escape or are hidden from the human eye. An extreme example of this approach is the successful prediction of the flagellum conformation and position in space based only on the dynamics of optical density of the sperm heads alone.

LAB MEMBERS IN 2016

Delphine Pessoa, PhD student, 2014 IBB
Pedro Silva, External PhD student
Eleonora Tulumello, PhD student, 2015 IBB
Marco Louro, Masters student
Luis Ponce, Visitor

Figure: Reconstituted conformation and swimming trajectories of spermatozoa of the L. pictus (brown, left) and S. purpuratus (purple, right) imaged when confined to the water-solid interface plane and when swimming freely in 3 dimensions and the corresponding solutions of a morphodynamical model based on resistive-force theory (white).
MOLECULAR NEUROBIOLOGY

GROUP LEADER
CASTRO, DIOGO S.

RESEARCH INTERESTS

Our research is focused on the gene regulatory networks that operate in the developing vertebrate nervous system, to control the generation of neurons from multipotent neural stem cells. To address the regulatory logic of neurogenesis, we study the activity of proneural transcription factors such as Ascl1. These function as master regulators being both required and sufficient to induce a full programme of neuronal differentiation. We aim to understand how Ascl1 coordinates neurogenesis by investigating: i) its mutual interactions with the chromatin landscape, and ii) how it interacts with other transcriptional networks, in particular the Notch signalling pathway. We also investigate how key transcriptional networks that underlie neural stem cell function are used in a malignant context. We develop these studies in cancer stem cell models of Glioblastoma, the most common and deadly of brain tumours.

MAIN ACHIEVEMENTS

We have shown the zinc-finger factor MyT1 is directly activated by Ascl1, and promotes neurogenesis by counteracting Notch signalling at multiple levels. It targets both pathway components and downstream targets, including known regulators of the neural stem cell programme.

In collaboration with David J. Solecki, we studied the function of the zinc-finger transcription factor Zeb1 in neurogenesis in the mouse cerebellum. We found that Zeb1 controls neuron differentiation and germinal zone exit in this brain region, by regulating a mesenchymal-epithelial-like transition programme.

RESEARCH GROUPS

E-MAIL: dscastro@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/dcastro

FUNDING

• European Comission

PUBLICATIONS


Figure: Mouse embryo. Image from Francisca Vasconcelos.

LAB MEMBERS IN 2016

Alexandre Raposo, Postdoc
Francisca Vasconcelos, Postdoc | Left in November
Pedro Rosmaninho, PhD student
Mário Soares, PhD student, 2015 IBB
Vera Telheira, Lab manager
Javier Cores, Trainee | Started in July; left in August
Alexandra Vargas, Visitor | Started in April; left in July

LAB MEMBERS IN 2016

Alexandre Raposo, Postdoc
Francisca Vasconcelos, Postdoc | Left in November
Pedro Rosmaninho, PhD student
Mário Soares, PhD student, 2015 IBB
Vera Telheira, Lab manager
Javier Cores, Trainee | Started in July; left in August
Alexandra Vargas, Visitor | Started in April; left in July

PUBLICATIONS


Figure: Mouse embryo. Image from Francisca Vasconcelos.

FUNDING

• European Comission

PUBLICATIONS


Figure: Mouse embryo. Image from Francisca Vasconcelos.
**SOFTWARE DEVELOPMENT IN 2016**

GINsim

Supports the definition and analysis of logical models of regulatory/signalling networks. This tool is in constant development, implementing most of our methodological advances.

Public website: http://ginsim.org

EpiLog

Supports the extension of the logical modelling approach to multi-cellular systems represented as hexagonal grids of communicating cells. We have recently implemented stochastic updating modes to overcome the inherent synchrony of cellular automata.

Public website: http://epilog-tool.org/

**RESEARCH INTERESTS**

Complementary to experimental approaches, mathematical models allow to get further insights into the functioning of complex regulatory networks and to formulate hypotheses, e.g. identify proper strategies to enforce or prevent certain behaviours. We mainly rely on a discrete, logical framework, which can uncover key characteristics of the dynamics of such networks. Our activity is organised along three lines: 1) Theoretical work with the definition of efficient methods to analyse large models; 2) Computational work with the development of software tools; 3) Modelling work with the study of specific networks, in collaboration with experimentalists.

A modelling study of primary sex determination in placental mammals has been published (Sánchez & Chaouiya, 2016). Moreover, we have contributed to the analysis of an extended model of T cell differentiation, characterising T cell plasticity (Abou-Jaoudé et al., Front Genet., 2016).

Concerning methodological achievements, a SAT (Boolean SATisfiability testing) has been used to study the numbers of stable patterns of Boolean models composed over hexagonal grids*. Furthermore, we have formally defined an efficient procedure to explore the basins of attraction of logical models by using their reverse dynamics (publication in preparation).


**MAIN ACHIEVEMENTS**

A modelling study of primary sex determination in placental mammals has been published (Sánchez & Chaouiya, 2016). Moreover, we have contributed to the analysis of an extended model of T cell differentiation, characterising T cell plasticity (Abou-Jaoudé et al., Front Genet., 2016).

Concerning methodological achievements, a SAT (Boolean SATisfiability testing) has been used to study the numbers of stable patterns of Boolean models composed over hexagonal grids*. Furthermore, we have formally defined an efficient procedure to explore the basins of attraction of logical models by using their reverse dynamics (publication in preparation).


**RESEARCH GROUP LEADER**

CHAOUIYA, CLAUDINE

**PUBLIC PUBLICATIONS**


**FUNDING**

- Fundação para a Ciência e a Tecnologia

**E-MAIL:** chaouiya@igc.gulbenkian.pt

**IGC WEBPAGE:** http://www.igc.gulbenkian.pt/chaouiya

**EXTERNAL WEBSITE:** http://compbio.igc.gulbenkian.pt/nmd/
**RESEARCH INTERESTS**

We are interested in how adaptation to stressful environments is affected by interactions between organisms. For this purpose we use a multilevel approach that ranges from genes to ecosystems in the context of experimental evolution with *Caenorhabditis elegans* and different bacteria. The focus is on intra-population mechanisms, by which negative feedbacks can lead to the maintenance of genetic variability, or on interactions between species, where strong selective pressures occur between predators and prey, or host and parasites.

In this context we want to broadly know:

1. If adaptation to a new environment is affected primarily by the type (host/parasite, host/commensal, predator/prey, etc.) or by the strength of interactions;
2. If the strength and type of interactions between organisms can change due to co-evolution during adaptation.

**MAIN ACHIEVEMENTS**

- Performed experimental adaptation of *Escherichia coli* populations to standard *C. elegans* growth medium under normal and high salt concentrations.
- Showed that competition between *Serratia marcescens* mutants results in higher virulence towards *C. elegans*.
- Demonstrated that fission yeast (*Schizosaccharomyces pombe*) cells that reach *C. elegans* gut intact maintain viability.

**FUNDING**

- Fundação para a Ciência e a Tecnologia
POPULATION AND CONSERVATION GENETICS

GROUP LEADER
CHIKHI, LOUNÈS

RESEARCH INTERESTS

The Population and Conservation Genetics group is interested in understanding the properties of genetic data in populations as a consequence of the demographic history of species. This evolutionary history can be seen as a series of major events such as population collapses, expansions, and admixture processes when populations separated for some time are reconnected as a consequence of natural or anthropogenic events. We develop new and use/test existing methods to improve our understanding of the recent evolutionary history of species. We also, and crucially, want to understand the limits of genetic or genomic data as inferential tools. Applications go from human evolution to conservation genetics of wild (lemurs, baboons, dolphins) and domesticated species. The group is increasingly interested in the way population and social structure influence patterns of genomic diversity.

MAIN ACHIEVEMENTS

We developed the notion of IICR (Inverse Instantaneous Coalescence Rate) formalised by O. Mazet from the Institut de Mathématiques de Toulouse. This parameter provides a new framework to interpret genetic data from structured populations. It can be used to re-interpret the history of humans, not as a history of population size changes but rather as a history of changes in connectivity. We have shown that elephants from Borneo, and Colobus monkeys from Guinea, are influenced by human-dominated habitats and that existing populations may suffer from inbreeding if nothing is done to reconnect them in the future.

LAB MEMBERS IN 2016

Inês Carvalho, Postdoc
Bárbara Parreira, Postdoc
Tânia Rodrigues, Postdoc
Jordi Salmona, Postdoc | Left in June
Jade Brucaux, External PhD student | Started in October; left in December
Gabriele Sgarlata, PhD student, 2016 IBB | Started in July
Barbara Le Pors, Technician
Tiago Maia, Technician
Patrícia Santos, Technician | Left in December
Tiago Zoeten, Technician | Started in October

FUNDING

* Fundação para a Ciência e a Tecnologia

SELECTED PUBLICATIONS*


*The complete list of publications is available on section 3. Publications.

Figure: Propithecus coquereli (Coquerel’s sifaka) is one of the more than 100 species of lemurs currently recognised. Lemurs are only found in Madagascar. P. coquereli lives in the north west from Madagascar, and is one of the nine recognised species of the genus Propithecus.
RESEARCH INTERESTS

We are concerned with those properties of the immune system that guarantee tissue integrity as well as immune tolerance to foetuses, commensals and food antigens, while maintaining the ability to mount efficient responses to infectious agents and some tumours. When these properties fail, as in central immune-regulation disorders, we question the mechanisms defining which organ is targeted. Symmetrically, in aggregated autoimmune diseases we ask which central immune-regulation process is affected. We also maintained a line of research assessing the consequences of the RAG activity, a recombinase responsible for the diversification of immune cells, on genomes integrity. Our interests led us to lead, or get involved, in various collaborative works, including with clinicians.

MAIN ACHIEVEMENTS

We demonstrated that mouse strain specific resistance to induced autoimmune prostatitis is dependent on regulatory T cells activity that dampens a potential for tissue infiltration and associated destruction. We confirmed an evolutionary constrain imposed by the co-optation of the RAGs, and evidenced adaptation in vertebrates through the purging of RSS at domains of open chromatin exposed to RAG activity. We followed for one year a cohort of patients treated with anti-TNF biologicals, and evidenced that regular immunogenicity monitoring provides clinicians with pertinent information for educated therapeutic choices.
OBESITY

GROUP LEADER
DOMINGOS, ANA I.

RESEARCH INTERESTS

Our laboratory is interested in the function of the nervous system in weight control, aiming at identifying neurons that play a fundamental role in eating behaviour and metabolism. We rely on newly developed targeted mouse strains that enable the application of state-of-the-art neuro-genetic techniques: we use optogenetics to establish the role of molecularly identified populations of neurons, and translational ribosome affinity purification – TRAP – to identify molecular targets with neuromodulatory activity enriched in those key neurons. We believe that our experimental approach will pave the way for the identification of novel molecular targets with potential in the treatment of obesity.

MAIN ACHIEVEMENTS

- Roksana Pirzgalska was awarded the 2016 Vasco Pudlido Valente Award.

LAB MEMBERS IN 2016

- Elsa Seixas, Postdoc
- Inês Mahó, PhD student, 2014 IBB
- Roksana Pirzgalska, External PhD student
- Nadya Kubasova, Technician | Left in January
- Imogen Morris, Technician
- Mariana Costa, Trainee | Started in July; left in August
- Madalena Grilo, Trainee | Started in June; left in September
- Beatriz Silveira, Trainee | Started in July; left in August
- Ana Campos, Visitor | Started in May; left in July
- Aparajita Lahree, Visitor | Started in August; left in November
- Miguel Vasques, Visitor | Started in September

FUNDING

- EMBO
- Fundação para a Ciência e a Tecnologia
- Human Frontiers Science Program
- Maratona da Saúde

Figure: Nerve bundles dissected from inguinal fat pad contain sympathetic neurons (TH+, orange).
PLANT MOLECULAR BIOLOGY

GROUP LEADER
DUQUE, PAULA

RESEARCH INTERESTS

Our group uses Arabidopsis thaliana as a model system to investigate how plants sense and respond to environmental stress at the molecular level. We are focusing on the role of alternative splicing, which is likely to contribute chiefly to the stress tolerance essential for plant survival. Another major ongoing project in the lab is uncovering a role for transporters of the Major Facilitator Superfamily (MFS) in plant abiotic stress responses. Interestingly, the functional analysis of these membrane proteins has been revealing striking examples of the biological impact of alternative splicing in plants.

MAIN ACHIEVEMENTS

In support of our hypothesis that alternative splicing plays a key role in plant stress tolerance, we have shown that two Arabidopsis proteins, belonging to the highly conserved SR family of alternative splicing modulators, control the response to distinct environmental signals via regulation of the abscisic acid (ABA) stress signalling pathway. The identification of the physiological transcripts targeted by these SR splicing factors to achieve plant stress tolerance is under way.

In 2016, we reported that the Arabidopsis SR-like protein SR45 regulates sugar signalling during early seedling development via modulation of the levels of the energy-sensing SNRK1 protein kinase and broadly controls alternative splicing in vitro including that of the SR45 gene itself. We have also established a protocol to monitor and quantify root responses to stress imposed by various heavy metals.

LAB MEMBERS IN 2016

Tom Laloum, Postdoc | Started in March
Guionar Martin, Postdoc | Started in November
Esther Novo-Uzal, Postdoc | Started in June
Dale Richardson, Postdoc
Dora Szakonyi, Postdoc
Maria Nito-Gonzalez, PhD student
Filipa Lopes, Masters student | Left in October
Vera Nunes, Technician
Marius Brechtenkamp, Trainee | Left in March
Inês Travancä, Trainee | Started in January; left in February
Aya Yokota, Trainee | Started in January; left in June
Catarina Gouveia, Visitor | Started in July; left in September

LAB MEMBERS IN 2016

T om Laloum, Postdoc | Started in March
Guionar Martin, Postdoc | Started in November
Esther Novo-Uzal, Postdoc | Started in June
Dale Richardson, Postdoc
Dora Szakonyi, Postdoc
Maria Nito-Gonzalez, PhD student
Filipa Lopes, Masters student | Left in October
Vera Nunes, Technician
Marius Brechtenkamp, Trainee | Left in March
Inês Travancä, Trainee | Started in January; left in February
Aya Yokota, Trainee | Started in January; left in June
Catarina Gouveia, Visitor | Started in July; left in September

FUNDING

• Fundação para a Ciência e a Tecnologia

PUBLICATIONS


Figure: A knockout mutant for the Arabidopsis SR45 splicing factor displays a sugar-specific growth arrest during early seedling development.
It is estimated that one in three people will be diagnosed with cancer during their lifetime (source: CancerStats, CRUK). The strongest risk factor for cancer is age, with 75% of cases diagnosed in people aged 60 and over. Our goal is to investigate the mechanisms underlying chromosome-end protection and the outcomes of its failure, not only at the cellular level but also at the organism level. Our work will allow the discovery of key regulators guarding cells from genomic instability. Ultimately, we aim at preventing the incidence of age-associated cancer, by identifying and manipulating the agents responsible for its increase.

We finished our comparative study of telomere dynamics, DNA Damage Response (DDR), and aging-related dysfunction and disease in different tissues, in wild type (from 3 to 42 months) and telomerase mutant zebrafish (Carneiro et al., 2016). Briefly, in naturally aged organisms, shortening of telomeres in specific tissues coincides with rise of DNA damage, decline in cell proliferation and age-specific organ decline. For example, critically short telomeres accumulate in the gut and muscle, leading to tissue damage that culminates in local disruption of organ homeostasis. Additionally, critically short telomeres are recognised as threatening DNA breaks and accumulate DNA damage (Telomere Induced Foci, TIF), further contributing to tissue decline. Our findings strongly support that telomere shortening acts as a major contributor to the increase in DNA damage, tissue dysfunction and disease observed in aging.

We finished our comparative study of telomere dynamics, DNA Damage Response (DDR), and aging-related dysfunction and disease in different tissues, in wild type (from 3 to 42 months) and telomerase mutant zebrafish (Carneiro et al., 2016). Briefly, in naturally aged organisms, shortening of telomeres in specific tissues coincides with rise of DNA damage, decline in cell proliferation and age-specific organ decline. For example, critically short telomeres accumulate in the gut and muscle, leading to tissue damage that culminates in local disruption of organ homeostasis. Additionally, critically short telomeres are recognised as threatening DNA breaks and accumulate DNA damage (Telomere Induced Foci, TIF), further contributing to tissue decline. Our findings strongly support that telomere shortening acts as a major contributor to the increase in DNA damage, tissue dysfunction and disease observed in aging.

For example, critically short telomeres accumulate in the gut and muscle, leading to tissue damage that culminates in local disruption of organ homeostasis. Additionally, critically short telomeres are recognised as threatening DNA breaks and accumulate DNA damage (Telomere Induced Foci, TIF), further contributing to tissue decline. Our findings strongly support that telomere shortening acts as a major contributor to the increase in DNA damage, tissue dysfunction and disease observed in aging.

The Telomeres and Genome Stability Group focuses on understanding the role of telomere dynamics and telomere dysfunction in aging and disease. They aim to investigate the mechanisms underlying chromosome-end protection and the outcomes of its failure, not only at the cellular level but also at the organism level. Their research allows the discovery of key regulators guarding cells from genomic instability and ultimately aims at preventing the incidence of age-associated cancer by identifying and manipulating the agents responsible for its increase.

Their main achievements include the comparative study of telomere dynamics, DNA Damage Response (DDR), and aging-related dysfunction and disease in different tissues, in wild type (from 3 to 42 months) and telomerase mutant zebrafish (Carneiro et al., 2016). They found that critically short telomeres accumulate in the gut and muscle, leading to tissue damage that culminates in local disruption of organ homeostasis. Additionally, critically short telomeres are recognized as threatening DNA breaks and accumulate DNA damage (Telomere Induced Foci, TIF), further contributing to tissue decline. Their findings strongly support that telomere shortening acts as a major contributor to the increase in DNA damage, tissue dysfunction, and disease observed in aging.

Their research indicates that telomeres shorten naturally over time in specific zebrafish organs, such as gut and muscle (but not testis), regardless of differences in proliferation rates. This shortening, together with the accumulation of local telomere damage, precludes the onset of tissue dysfunction events in aging, including intestinal inflammation and sarcopenia (Carneiro et al., 2016). Critically short telomeres in the gut and muscle may be sufficient to disrupt homeostasis in other tissues where telomeres do not erode, by generating systemic signals of dysfunction that create a "disease-permissive" environment.

**Figure:** Telomeres shorten at different rates, anticipating local and systemic dysfunction in zebrafish aging. Telomeres shorten naturally over time in specific zebrafish organs, such as gut and muscle (but not testis), regardless of differences in proliferation rates. This shortening, together with the accumulation of local telomere damage, precludes the onset of tissue dysfunction events in aging, including intestinal inflammation and sarcopenia (Carneiro et al., 2016). Critically short telomeres in the gut and muscle may be sufficient to disrupt homeostasis in other tissues where telomeres do not erode, by generating systemic signals of dysfunction that create a “disease-permissive” environment.
Systemic Lupus Erythematosus (SLE) is a human autoimmune disorder where altered physiologies and self-reactive repertoires of both B- and T-cells are intimately connected. Autoreactive IgG antibodies are the diagnostic hallmark of SLE and diversify over long time periods before disease becomes manifest, however, this depends also on innate-immune and other nonspecific factors. Our approach is to model the ways in which genetic factors, molecular mechanisms and immune repertoires are interconnected in SLE pathogenesis.

In SLE patients, FOXP3+ T-regulatory cells (Tregs) are functionally deficient, associated to their reduced surface expression of the high-affinity IL-2 receptor CD25. Evaluating our previous FCT-funded project, we are now about to publish the first part of its results, showing that SLE patients and their unaffected first-degree relatives both shared reduced CD25 on early Tregs, while only Tregs of manifest SLE patients showed a specific and drastic reduction or absence of the otherwise strong CD25 upregulation upon Treg activation. Also studying separate longitudinal sample collections from 33 SLE patients, we have found that disease activity-associated Treg measures were not time-invariant but rather reflected the degree of frequency fluctuation over time, and that time courses of the individual patients were compatible with periodic oscillations. Based on this, we are currently following the hypothesis that the IL-2 dependent T-cell regulation defect in SLE essentially consists in a dynamic instability of Treg homeostasis. We found corroborating evidence for this in cytokine profiles, gene expression and a dynamic differential equation-based model.

**Figure:** Surface CD25 in FOXP3+ Treg subsets in SLE patients, unaffected first-degree relatives and unrelated healthy controls. Each line represents an individual; lines are drawn from early to late Treg subsets.
CELLULAR & SYSTEMS NEUROBIOLOGY

GROUP LEADER
FONSECA, ROSALINA

In the last decade, memory maintenance has evolved as a highly dynamic process. The synaptic-tagging and capture model (STC), now extended from synaptic to system level including to humans, provides a conceptual basis for how short-term memory can be consolidated to long-term memory within a specific time frame. The experimental demonstration of STC has revealed that associative forms of synaptic plasticity can occur within large time-windows, relying on the sharing of a common pool of plasticity-related proteins.

MAIN ACHIEVEMENTS

Synaptic cooperation and competition are two synaptic integration mechanisms that allow events, separated in time by several minutes, to be associated as long-term memories. To address the significance of the rules observed at the cellular level to memory maintenance, we used a system very well know from the anatomically and behaviourally point of view and were able to show that the thalamic and cortical synapses projecting to pyramidal neurons of the lateral amygdala also engage in synaptic cooperation. We also found that the endocannabinoid signalling plays a crucial role in determining the temporal window for synaptic cooperation. Interestingly, cortical and thalamic synapses also engage in synaptic competition and their temporal dynamics is different. Also, the endocannabinoid receptor, CB1R is involved in this asymmetric synaptic competition. We are currently addressing whether these rules are relevant for discriminative fear learning.

Figure: A) Graphic representation of the connections to the lateral nucleus (LA) of the amygdala. The thalamic nuclei MGv and MGm receive information from the tone and project strongly to the auditory cortex and to the LA respectively. The MGm nuclei also project weakly to the auditory cortex contributing to an indirect connection to the LA nuclei. B) Image from a coronal brain slice showing the LA and the positioning of both stimulating electrodes and the recording electrode. C) A transient LTP induced by weak stimulating the cortical input (open red symbols) is converted into a long-lasting LTP (solid red symbols) by subsequent strong stimulation of the thalamic pathway (solid blue symbols). This thalamic-to-cortical cooperation operates within a long time scale (30 min) and is dependent on protein synthesis (data not shown). D) Similarly, transient LTP induced by weak thalamic stimulation (light blue symbols) is converted into L-LTP by subsequent strong stimulation of the cortical input (red symbols). However, cortical-to-thalamic cooperation only occurs within a shorter time scale (7.5 min).

See https://www.youtube.com/watch?v=ExiDGpOApSQ&t=2s for description of this work.

E-MAIL: rfonseca@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/rfonseca
MATHEMATICAL MODELLING OF BIOLOGICAL PROCESSES

GROUP LEADER
GJINI, ERIDA

RESEARCH INTERESTS

We develop mathematical and computational frameworks to understand population dynamics, interactions, and intervention effects in microbial ecosystems. Our models are data-driven, integrated with sophisticated parameter estimation procedures. With the models, we aim to extract processes from patterns that are observed at different biological, temporal and spatial scales, and test competing mechanistic hypotheses about the data. Our research spans a wide range of systems, including Streptococcus pneumoniae bacteria, African trypanosomes and antigenic variation, antimicrobial resistance dynamics and evolution, infection control and host immunity processes.

MAIN ACHIEVEMENTS

- 2 new papers departing from previous research and with new collaborators.
- Established 2 important collaborations in the USA at University of Tennessee and University of Michigan.
- First research grant in collaboration with University of Michigan – awarded by FLAD-NSF.
- 3 invited talks in Portuguese institutions.
- 3 other papers completed and in review by the end of 2016.
- Media attention on the PLOS Comp. Biology paper (Portuguese national newspaper, RTP TV channel, and Antena 1 radio programme).

SOFTWARE DEVELOPMENT IN 2016

R-package SiMRiv
(In collaboration with Lorenzo Quaglietta and Miguel Porto)
Individual-based, spatially-explicit simulation and analysis of multi-state movements in river networks and heterogeneous landscapes. Provides functions to generate and analyse individual-based spatially-explicit simulations of multi-state movements in heterogeneous landscapes, based on “resistance” rasters.
Public website: https://cran.r-project.org/web/packages/SiMRiv/index.html

SELECTED PUBLICATIONS*


Figure: Model diagram for co-colonisation dynamics in a multi-strain system. A) Pathogen subtypes are grouped in two sets, V and N, characterised by within-group and between-group interaction. B) Susceptible-Infected-Susceptible model structure with single and dual colonization. The black arrows refer to acquisition of a first clone. The grey arrows refer to altered acquisition of a secondary clone in an already colonised host, where clone interactions can range from competition to cooperation. The dashed arrows depict colonization clearance. The white arrows reflect host demographic processes: birth and death. This model is studied in the Theor Ecol paper (2016), where a slow-fast dynamics approach interpolates between a neutral and non-neutral model for multi-strain coexistence, and quantifies the asymmetries that are important for the maintenance and stabilisation of diversity.

E-MAIL: egjini@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/egjini
EXTERNAL WEBSITE: https://biomathematica.wordpress.com/

LAB MEMBERS IN 2016

Joana Teixeira. Masters student | Started in September
Maria Galvão. Technician | Started in May; left in July
Maria Pereira. Trainee | Started in January; left in March
Patricia Brito. Visitor | Started in July

*The complete list of publications is available on section 3. Publications.
RESEARCH INTERESTS

Individual decisions can have a large impact on society as a whole. This is obvious for political decisions, but still true for daily decisions made by common citizens. Individuals decide how to vote, whether or not to stay at home when they feel sick, to drive or to take the bus. In isolation, these individual decisions have a negligible social outcome, but collectively they determine the results of an election and the start of an epidemic. We are interested in understanding these decision-making events, particularly the behaviours that affect health and disease, expecting that this deeper knowledge will lead to better public decisions. We use a systems-level and big data approach to study complex problems at the interface between Biology, Computation, Social Sciences and Mathematics.

MAIN ACHIEVEMENTS

- Developed a computational system to identify the onset of flu in 8 countries. It was tested in real-time by Portuguese health authorities, during the 2015/16 flu season. This work was accepted for publication.
- Co-organised the “Citizen Forum”: a panel of citizens, randomly sampled to mirror society’s diversity. The first deliberative session will take place in the first week of 2017.
- The PI coordinated “Lab in a Box”, a scientific kit aimed to bring science to the classroom. Approximately 70 protocols (in Life, Environmental and Physical Sciences) were developed and tested by a large team of volunteers. As a pilot, 50 kits with materials were sent to Cabo Verde and teachers were trained to use it. This project is supported by UNESCO, among others.

Figure: 3-step flow diagram. Data Sources and diagrammed method. Left column (labelled Data Sources) shows the different data used at the different stages; the middle column (labelled Methods Steps) shows the different methods and approaches developed; the column on the right (labelled Outputs) shows the fits and curves used for comparison. Alternative Influenza Like Illness (ILI)-related data sources (bottom left column) were used as input to create a Prediction Onset (PO) function (blue line, bottom right column). The PO is chosen in an iterative process, in real-time, as the one that minimises the difference to the Identified Onset (orange line). The IO is the "gold-standard", created from traditional data.

E-MAIL: mjsa@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/mjsa
The area of our research interests is Evolutionary Biology, with a great focus on microbial evolution. We combine both theoretical and empirical methods aiming at a better understanding of the major forces that shape variation in microbial populations. Present and future projects of the lab include:
- Study the process of adaptation in the context of ecosystems using Escherichia coli as a model organism.
- Test theoretical models of adaptive evolution against genotypic and phenotypic data obtained in experimentally adapted bacterial populations.
- Determine the level of epistatic interactions on fitness between mutations that confer resistance to commonly used antibiotics.
- Study the evolution of mutation rates and determine the factors that influence polymorphism for mutation rates in bacterial populations.

In the context of antibiotic resistance, we have shown that environmental variation may greatly affect the fitness effects of multiple resistance in bacteria. In particular, we show that double resistance to two commonly used antibiotics can (unfortunately) increase bacteria survival in environments typical of infection.

In the context of health and the microbiota, we have shown that a regime of strong mutation-strong selection is characteristic of the evolutionary process experienced by a typical bacteria, thus suggesting that, unlike what is currently assumed, the time scale of ecological and evolutionary change in the microbiota may be similar.

*The complete list of publications is available on section 3. Publications.*
RESEARCH INTERESTS

We use the protozoan parasite *Toxoplasma gondii* and a natural host, the house mouse, to understand the interplay between mechanisms of virulence on the part of the parasite, and mechanisms of resistance on the part of the host. These opposing processes usually achieve the desired balance of pathogen transmission and host survival.

MAIN ACHIEVEMENTS

To understand the adaptive significance of hyper-virulent *Toxoplasma* strains.

LAB MEMBERS IN 2016

Joana Loureiro, Postdoc
Catalina Alvarez, PhD student, 2015 IBB
Ana Rodrigues, PhD student, 2015 PGCD
Cláudia Campos, Lab manager
Julia Saggau, Trainee
Helen Springer-Frauenhoff, Visitor

SELECTED PUBLICATIONS*


*The complete list of publications is available on section 3. Publications.

FUNDING

- European Commission

E-MAIL: jhoward@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/jhoward

Figure: IFN gamma-induced murine fibroblast (6hrs) at 7 hours post-*Toxoplasma gondii* infection. The intracellular *Toxoplasma* Gra7 (red), Irgb6 (green) and cell nucleus (blue) are marked.
ACTIN DYNAMICS

GROUP LEADER
JANODY, FLORENCE

RESEARCH INTERESTS

The actin cytoskeleton being the engine of cellular migration, much attention has been focused on identifying actin regulators involved in the dissemination of malignant tumour cells away from the primary tumour. However, actin dynamics is also involved in a multitude of other cellular functions that are all affected during epithelial cell carcinogenesis, including cell polarity, shape and stiffness, trafficking, signalling and cytokinesis. Thus, actin dysregulation is probably a central contributor to all stages in the evolution of epithelial cancers. Using Drosophila melanogaster, inducible human cell lines that recapitulate the multistep development of cancer, tumour samples and computational modelling, we aim to understand how cancer pathways hijack the actin cytoskeleton to control key cellular functions involved in the development of pre-malignant and malignant features.

MAIN ACHIEVEMENTS

We have shown that prior to cells acquiring malignant features, they undergo a transient stress-fibre-dependent stiffening state leading to cell proliferation and the progression towards a fully transformed state (Tavares et al., resubmitted; collaboration J. Paredes; J. Pereira Leal and J. Guck). We have demonstrated that the nuclear protein related to the Sno/Ski family of co-repressors Dachshund potentiates Hedgehog signalling to ensure the proper timing of Drosophila eye differentiation and the accuracy of cell cycle control (Bras-Pereira et al., 2016; collaboration F. Casares).

LAB MEMBERS IN 2016

Catarina Brás-Pereira, Postdoc | Left in August
Prachi Jain, PhD student, 2014 IBB
Sandra Tavares, PhD student, 2012 PIBS
Clara Barreto, Masters student
Filipe Viegas, Masters student | Left in October
Margarida Araújo, Trainee | Left in December

PUBLICATIONS


FUNDING

• Fundação para a Ciência e a Tecnologia
• Associação Laço

Figure: Loss of dachshund function in cells with impaired Decapentaplegic signalling abrogates Drosophila retinal development. (dac, smo double-mutant clones marked positively with GFP (green), stained with phalloidin (purple) to outline the cell shape. (Upper image) Standard confocal image (mutant cells are not label). (Bottom image) Cross-section through the eye disc epithelium along the morphogenetic furrow.

E-MAIL: fjanody@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/fjanody
EPIGENETIC MECHANISMS

GROUP LEADER
JANSEN, LARS E.

RESEARCH INTERESTS

The genome is propagated through cell division by duplication of a full set of chromosomes followed by the faithful separation of each chromosome copy into two new daughter cells during mitosis. In addition, so-called “epigenetic” chromosome structures that maintain functional chromosomes and that “memorize” the transcriptional state of a cell lineage are also maintained through mitotic and sometimes even meiotic divisions.

Although the mechanism of duplication and mitotic transmission of DNA sequences has been worked out decades ago, how the more fluid epigenetic information of gene activities and chromosome structure is maintained in time is not understood. We are interested in resolving this.

MAIN ACHIEVEMENTS

In 2016, we completed a major research line in our lab that focused on how epigenetically-controlled centromeric chromatin is replicated along the cell cycle. This work, driven by Ana Stankovic, a PhD student, has revealed how major cell cycle kinases link the process of centromeric chromatin assembly to cell cycle progression. This work has been accepted for publication in *Molecular Cell*. In addition, we have developed a novel tool to determine histone dynamics and inheritances, genome-wide. This has led to the direct demonstration that histone turnover changes during mouse differentiation and defined new putative enhancer regions that may be involved in control of gene expression in mouse ES cells. This work was published this year in *eLife*.

LAB MEMBERS IN 2016

Inês Milagre - Postdoc | Started in September
Sreyoshi Mitra - Postdoc
Marina Pineda - Postdoc
Wojciech Siwek - Postdoc
Dragan Stajic - PhD student, 2013 PIBS
Ana Stankovic - PhD student, 2011 PIBS
Ruben Abreu - Masters student | Left in February
Sebastiaan Van Den Berg - Masters student | Started in January; left in December
João Mata - Technician
Samuel East - Trainee | Started in August; left in October

FUNDING

- European Research Council

PUBLICATIONS


Figure: Human cancer cells are arrested in mitosis. Chromosomes are condensed and arranged for separation into daughter cells that will inherit both genetic and epigenetic information. Centromeres that are responsible for chromosome segregation are marked in green.
The ultimate goal of our research group is to understand the molecular mechanisms translating patterning information into morphogenetic processes during vertebrate embryonic development. One of the main current focuses of our laboratory aims at determining what regulates the function of the axial progenitors that make the different body elements and the role they play in the evolution of the vertebrate body plan. Most of our work uses the mouse as the model system by means of in vivo functional analyses complemented with in vitro differentiation systems involving stem and progenitor cells. We have recently incorporated other model systems to address Evo-Devo questions derived from our research.

We have shown that the balance between Oct4 and Gdf11 signalling activities is a key regulator of the trunk length diversity among vertebrates. This conclusion was built on experiments in mice modulating the activity of these factors using loss and gain of function approaches. We also showed that the extremely long trunks of snakes resulted from persistent Oct4 activity, derived from their acquisition of a different set of Oct4 regulatory elements. We have shown that the Snai1 gene is responsible for the epithelial to mesenchymal transition that relocates the axial progenitors from the epiblast into the tail bud during the trunk to tail transition. Using a genetic trick, we isolated pure populations of axial progenitors and identified their molecular fingerprint using an RNA-seq approach.

**SELECTED PUBLICATIONS**


*The complete list of publications is available on section 3. Publications.*

**FUNDING**

- Fundação para a Ciência e a Tecnologia
- Santa Casa da Misericórdia de Lisboa

**RESEARCH INTERESTS**

The ultimate goal of our research group is to understand the molecular mechanisms translating patterning information into morphogenetic processes during vertebrate embryonic development. One of the main current focuses of our laboratory aims at determining what regulates the function of the axial progenitors that make the different body elements and the role they play in the evolution of the vertebrate body plan. Most of our work uses the mouse as the model system by means of in vivo functional analyses complemented with in vitro differentiation systems involving stem and progenitor cells. We have recently incorporated other model systems to address Evo-Devo questions derived from our research.

We have shown that the balance between Oct4 and Gdf11 signalling activities is a key regulator of the trunk length diversity among vertebrates. This conclusion was built on experiments in mice modulating the activity of these factors using loss and gain of function approaches. We also showed that the extremely long trunks of snakes resulted from persistent Oct4 activity, derived from their acquisition of a different set of Oct4 regulatory elements. We have shown that the Snai1 gene is responsible for the epithelial to mesenchymal transition that relocates the axial progenitors from the epiblast into the tail bud during the trunk to tail transition. Using a genetic trick, we isolated pure populations of axial progenitors and identified their molecular fingerprint using an RNA-seq approach.

**MAIN ACHIEVEMENTS**

We have shown that the balance between Oct4 and Gdf11 signalling activities is a key regulator of the trunk length diversity among vertebrates. This conclusion was built on experiments in mice modulating the activity of these factors using loss and gain of function approaches. We also showed that the extremely long trunks of snakes resulted from persistent Oct4 activity, derived from their acquisition of a different set of Oct4 regulatory elements. We have shown that the Snai1 gene is responsible for the epithelial to mesenchymal transition that relocates the axial progenitors from the epiblast into the tail bud during the trunk to tail transition. Using a genetic trick, we isolated pure populations of axial progenitors and identified their molecular fingerprint using an RNA-seq approach.

**LAB MEMBERS IN 2016**

Ana Rita Aires, Postdoc
Ana Casaca, Postdoc
Luísa Machado, Postdoc
Irma Varela Lasaheras, PhD student, 2011 PIBS
André Dias, Masters student
André Mesquita, Masters student | Started in September
Ana Nóvoa, Technician

**SELECTED PUBLICATIONS**


*The complete list of publications is available on section 3. Publications.*
LYMPHOCYTE DEVELOPMENT & LEUKEMOGENESIS

GROUP LEADER
MARTINS, VERA

RESEARCH INTERESTS
Research in the lab focuses on the development of T lymphocytes and on the processes that lead to leukaemia from precursors of T lymphocytes. We use mouse models that enable us to assess small cell populations in the thymus (where T lymphocytes develop) and learn how they interact with each other. One of our major goals is to learn about the genes that regulate these interactions and whether they are involved in the early steps of leukaemogenesis.

MAIN ACHIEVEMENTS
I established the independent research group I came to start in September 2015. We now manage one of the largest mouse colonies at IGC, which we greatly owe to the outstanding support of the Animal Facility team. With the support of the Transgenics Unit and the substantial contribution of Moisés Mallo, we established one novel mouse mutant line, and have two others in the pipeline (the three very demanding from the technical point of view). The conditions for Flow cytometry analysis have greatly improved and we can now perform analysis using complex multicolor panels on a daily basis. A postdoc and a PhD student joined the team, which means we are progressing in the 3 fronts of the research programme I proposed when joined the IGC.

Figure: (Upper image) Section of a wild type thymus graft deprived of progenitor import and stained for the T lymphocyte markers CD4 (green) and CD8 (red). (Bottom image) The same section was also stained for cytokeratin 5 (cyan), which identifies medullary epithelial cells and enables the visualisation of medullary areas in this thymus graft.

LAB MEMBERS IN 2016
Luna Ballesteros, Postdoc | Started in April
Rafael Paiva, PhD student, 2016 IBB | Started in July
Carolina Alves, Lab manager
Joana Silva, Technician
Rita Simões, Trainee | Left in June

E-MAIL: vmartins@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/vmartins
RESEARCH INTERESTS

Changes in the environment profoundly shape developmental and behavioural responses in all organisms, a process known as phenotypic plasticity. In my laboratory, we seek to understand how environmental cues influence development and behaviour and how these interactions evolve to generate species-specific phenotypes. We approach this problem at multiple biological levels with the goal of understanding: 1) the mechanisms that allow the environment to modify the synthesis of hormones necessary for development; 2) how organs interpret hormonal cues to coordinate their development with that of the whole body; and; 3) how the choices animals make while foraging impact their development and life history.

MAIN ACHIEVEMENTS

In 2016, my lab continued to contribute to our understanding of how nutrition regulates organ and body growth. Our studies in the ovary demonstrate that the steroid hormone ecdysone switches the relative roles of the signalling pathways that regulate growth and patterning in this organ (Mendes & Mirth, 2016). This highlights a mechanism that alters organ sensitivity to environmental conditions, a hallmark of plasticity. In addition, we identified two peptide hormones that relay the larval nutritional status to the rest of the body to regulate growth and developmental timing (Koyama et al., 2016). The findings from these studies have broadened our perspective of how environmental conditions like nutrition alter development.
INNATE IMMUNITY AND INFLAMMATION

GROUP LEADER
MOITA, LUIŠ FERREIRA

RESEARCH INTERESTS
Severe sepsis remains a poorly understood systemic inflammatory condition with high mortality rates and limited therapeutic options outside of infection control and organ support measures. Based on our recent discovery in mice showing that anthracycline drugs prevent organ failure without affecting the bacterial burden in a model of severe sepsis, we propose that strategies aimed at target organ protection have extraordinary potential for the treatment of sepsis and possibly for other inflammation-driven conditions. However, the mechanisms of organ protection and disease tolerance are either unknown or poorly characterised. The central goal of this research programme is to identify and characterise novel cytoprotective mechanisms, with a focus on DNA damage response dependent protection activated by anthracyclines as a window into stress-induced genetic programmes leading to tissue protection.

MAIN ACHIEVEMENTS
1. Proposed the addition of a novel component to the current conceptual framework for the initiation of innate immune responses based on the surveillance of homeostasis perturbations.
2. European patent on the use of anthracyclines to treat sepsis awarded to our laboratory.

LAB MEMBERS IN 2016
Ana Costa, Postdoc
Rita Ferreira, Postdoc
Catarina Moita, Postdoc
Philippe Seidel, Postdoc | Started in May
Henrique Colaço, PhD student, 2015 IBBI
Isa Santos, External PhD student
Tiago Velho, External PhD student
André Barros, Technician | Started in September
Dora Pedroso, Technician | Started in February
Sarah Macris, Trainee | Started in May; left in June
Kirandeep Saini, Trainee | Started in July; left in September
Susana Moreira, Visitor

SELECTED PUBLICATIONS*
*The complete list of publications is available on section 3. Publications.

FUNDING
• European Research Council
• Fundação para a Ciência e a Tecnologia

PATENTS IN 2016
• Anthracycline for using in the treatment of sepsis, 12780554.7, 15.12.2016, Luis Ferreira Moita

Figure: Initiation of innate immune responses by surveillance of homeostasis perturbations.
**RESEARCH INTERESTS**

The Chromosome Dynamics Lab studies how chromosome architecture contributes to faithful genome segregation. Genome stability relies on the fact that at each round of cell division, the genetic information is properly segregated into the two daughter cells. Proper completion of this process, in turn, depends on major changes in chromosome organisation including cohesion between the two sister chromatids and condensation of the long DNA fibbers. We aim to dissect how mitotic chromosomes are assembled and how their physical properties contribute to faithful cell division. By studying the contribution of chromosome structure in the mechanics of nuclear division we aim to identify novel routes to aneuploidy that underlie several human conditions, including developmental diseases, cancer and infertility.

**MAIN ACHIEVEMENTS**

To study mitotic chromosome organisation, we adopted a “reverse and acute approach” to reveal the requirements for key proteins in the maintenance of chromosome structure, with unprecedented temporal resolution. We have shown that topoisomerase II inhibition results in rapid chromosome decondensation while, unexpectedly, condensin I inactivation leads to over-condensation of chromosome arms. This over-condensation results from the re-intertwining of previously separated sister chromatids. These results highlight that maintenance of chromosome architecture throughout metaphase is a far more dynamic process than previously anticipated. (Piskadlo et al., in preparation).

---

**LAB MEMBERS IN 2016**

- Sara Carvalhal, Postdoc | Started in January
- Leonardo Guilgur, Postdoc
- Mihailo Mirkovic, PhD student, 2014 IBB
- Ewa Piskadlo, PhD student, 2013 PIBS
- Cintia Ramos, PhD student, 2014 PGCD
- Alexandra Tavares, Lab manager
- Catarina Freire, Trainee | Started in July; left in September
- Tiago Santos, Trainee | Started in July; left in September

---

**FUNDING**

- EMBO
- European Commission
- European Research Council
- Fundação para a Ciência e a Tecnologia
INTEGRATIVE BEHAVIOURAL BIOLOGY

GROUP LEADER
OLIVEIRA, RUI F.

Our main research interest is the integrative study of social behaviour, which combines the study of proximate causes (gene modules, hormones, neural circuits, cognitive processes) and ultimate effects (evolutionary consequences). In particular, we aim to understand how brain and behaviour can be shaped by social environment, and how the cognitive, neural and genetic mechanisms underlying plasticity in the expression of social behaviour have evolved. For this purpose we use zebrafish and other selected fish species as study models. Current research questions centre on four topics: 1) evolution of social cognition and of its neuromolecular mechanisms; 2) genomic and epigenomic mechanisms of social plasticity; 3) neuroendocrinology of social interactions and of social plasticity; 4) fish cognition and welfare.

MAIN ACHIEVEMENTS

During 2016, the Oliveira lab particularly focused on the study of the role of oxytocin in social cognition in zebrafish, using relevant transgenic and mutant lines. Three main studies found: (1) developmental effects of oxytocin on zebrafish sociality in adulthood; (2) genotype-environment interaction in the effect of the oxytocin receptor gene on different aspects of zebrafish social behaviour, namely social attraction, social memory and shoaling behaviour; and (3) effects of oxytocin in animacy (i.e. biological motion) detection. During this year the Oliveira lab started a new FCT grant, published 5 papers in peer-reviewed journals, and 2 PhD theses were completed.

LAB MEMBERS IN 2016

Felipe Espigares, Postdoc | Started in March
Ana Nunes, Postdoc
Gonçalo Oliveira, Postdoc | Started in January; left in August
Magda Teles, Postdoc
Ibukun Akinrinade, PhD student, 2015 IBB
Sara Cardoso, External PhD student
Ana Faustino, External PhD student | Left in May
Ana Sofia Félix, External PhD student
Cláudia Gonçalves, PhD student, 2016 PGCD | Started in November
Júlia Pinho, External PhD student
Leonor Carreira, Masters student
Diogo Ribeiro, Masters student | Left in December
Daniela Santos, Masters student | Started in September
Raul Martins, Technician | Left in September
Nasser Karmali, Trainee | Started in November
Diana Abad, Visitor | Started in June; left in September

SELECTED PUBLICATIONS*


*The complete list of publications is available on section 3. Publications.
INFECTION & IMMUNITY

GROUP LEADER
PARKHOUSE, MICHAEL

RESEARCH INTERESTS

• Pathogen modulation of host cell biology and innate immunity
• Control of neurocysticercosis

MAIN ACHIEVEMENTS

• The African Swine Fever virus encoded non-essential, non-homologous, gene I329L inhibits Toll-like receptor activation through two mechanisms.

• The non-homologous HCMV gene UL76 induces cell cycle arrest via its conserved N-terminal domain and induces expression of IL-8 via its variable C-terminal domain.

• Development of a lateral flow assay for the rapid detection of extraparenchymal neurocysticercosis.

LAB MEMBERS IN 2016

Silvia Correia, Postdoc
Rute Nascimento, Postdoc
Júlio Henriques, Masters student | Started in September
Pedro Moura, Technician | Started in February; left in August
Diogo Tomaz, Technician | Started in September
Catarina Azevedo, Trainee | Started in December
Ana Catarina Oliveira, Trainee | Started in May

SELECTED PUBLICATIONS


The complete list of publications is available on section 3. Publications.

FUNDING

• Fundação para a Ciência e a Tecnologia

Figure: Sphere model of a putative I329L-TLR3 heterodimer.

E-MAIL: parkhouse@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/parkhouse
Our research in genetics of inflammatory responses to malaria infection drove us to ask how infection/inflammation impacts on cellular metabolism and organ physiology.

Main lines of research are focused on:

a) How placental inflammation caused by malaria leads to placental dysfunction;

b) The role of brain microvessel endothelial cells in the inflammatory response that leads to the development of cerebral malaria;

c) The inflammatory responses in the liver during acute and chronic insults.

MAIN ACHIEVEMENTS

- Identifying vasoactivator pathways activated in trophoblasts upon exposure to erythrocytes infected with the malaria parasite.

- Finding that mouse brain endothelial cells produce interferon upon exposure to erythrocyte derived microvesicles.

- Finding that CD26 plays a role in activated Kupffer cells in the context of fatty liver disease induced by western diets in mouse models.

- Describing phenotype shifts in macrophage populations during liver fibrosis and fibrosis regression in a mouse model of chronic liver injury.
We are interested in the evolutionary mechanisms underlying the origins and evolution of cellular life and the complex structures within the cell, and in the medical applications of evolutionary genomics. Our specific domains of application revolve around the endomembrane system, microtubule organising centres and systems where cells live inside other cells (endosymbiosis, endoparasitism, endosporulation).

**MAIN ACHIEVEMENTS**

We have improved the Rabifier pipeline and turned it into an open source project, available for community development, under the title Rabifeir 2.0. We used this bioinformatics pipeline to discover that there are Rab-like sequences in Archaea, and that these miss specific structural features that allow us to propose an order of events in the emergence of the complex Rab prenylation cycles that are characteristic of Eukaryotes. We have performed additional work to understand the impact of tree reconciliation in the inference of selection, a problem that is particularly relevant for the inference of selection in the Rab family of GTPases that we are performing. We identified a series of novel species and even managed to reconstruct full genomes from full environmental metagenomics sequencing from African samples. We are currently collaborating in the characterisation of deep-sea waters and sediments.

**SELECTED PUBLICATIONS**


*The complete list of publications is available on section 3. Publications.*

**FUNDING**

- Fundação para a Ciência e a Tecnologia
Can we predict evolution? This is one of the most fundamental questions in biology today. If we can predict evolution, we can control it. Doing so will change the way we understand biology, the way we use living organisms in biotechnology, the way we treat disease and the way we see ourselves.

The Evolution and Genome Structure research group aims to create a predictive framework of evolutionary biology by addressing how variations in genetic background in general, and chromosome structure in particular affect the evolutionary path of populations.

**RESEARCH INTERESTS**

We continued our work on the evolvability of different genomic backgrounds while we also developed the framework that will allow us to analyse and interpret the data. Specifically, we showed that any mutation that increases the growth rate of populations is inherently epistatic, i.e., its evolutionary outcome depends on the genetic background where it appears. On the experimental side, we have measured the adaptation rate of 17 different yeast genotypes. As previously observed, their rate of accumulation of mutations is highly dependent on initial fitness. In collaboration with the group of Eco-Evolutionary Genetics, we are developing a bacteria-nematode system to study the evolution of a nematicidal protein. This project has implications to our fundamental understanding of how toxins evolve. Importantly, it is a proof-of-principle that experimental evolution can be used to improve molecules of economic and medical importance.

**MAIN ACHIEVEMENTS**

*Figure: Example of a beneficial mutation (large red area) increasing in frequency during the growth of a fission yeast colony.*

**LAB MEMBERS IN 2016**

- Diogo Santos, PhD student, 2014 IBB
- Mariana Delgadinho, Masters student
- Simone Delgado, Technician

**FUNDING**

- Fundação para a Ciência e a Tecnologia
We are interested in the informational properties of natural and artificial systems, which enable them to adapt and evolve. This means both understanding how information is fundamental for controlling the behaviour and evolutionary capabilities of complex systems, as well as abstracting principles from natural systems to produce adaptive information technology. This theoretical and applied research agenda is organised in three main threads: Complex Networks & Systems, Computational & Systems Biology, and Computational Intelligence.

Projects in the group range from Biomedical Literature and Social Media Mining to understanding redundancy, robustness, modularity and control in Complex Networks, Collective Intelligence on the Web and in Social Systems, and Agent-based models of Evolutionary Systems such as RNA Editing and Artificial Immune Systems. We are also committed to interdisciplinary research, teaching and graduate training.

PI became a Fulbright Scholar. In terms of research outputs, we are particularly happy with the Scientific Reports paper with PhD student Alexander Gates. This paper was very well received by the community and we have received many invitations to speak about this work. We are also very happy of the paper on Drug Interaction discovery from Instagram with PhD student Rion Correia. This paper was considered to be one of the top 30 papers in Translational Bioinformatics in 2016 and has similarly resulted in several invitations to speak about the work.

**Selected Publications**


*The complete list of publications is available on section 3. Publications.*
INFLAMMATION

GROUP LEADER
SOARES, MIGUEL P.

RESEARCH INTERESTS

• To understand the biology of inflammation and immunity as it pertains to the maintenance of homeostasis.
• To identify and develop therapeutic strategies with impact in human diseases associated with major morbidity and/or mortality.

MAIN ACHIEVEMENTS


*The complete list of publications is available on section 3. Publications.

LAB MEMBERS IN 2016

Patricia Amador, Postdoc
Laura Barrio, Postdoc | Left in August
Birte Blanenhaus, Postdoc
Faouzi Braza, Postdoc
Ana Rita Carlos, Postdoc
Susana Ramos, Postdoc
Vital Domingues, PhD student, IBB 2015
Ana Ribeiro, PhD student, PIBS 2011
Sumnima Singh, PhD student, PIBS 2013
Pedro Ventura, Masters student
Soia Rebelo, Lab manager
Silvia Cardoso, Technician
Maria Moita, Research assistant | Left in November
Patrycja Michalska, Visitor | Left in April

SELECTED PUBLICATIONS*


FUNDING

• Bill & Melinda Gates Foundation
• European Research Council
• Fundação para a Ciência e a Tecnologia

Figure: Tissue damage control and disease tolerance. Tissue damage control mechanisms involve a number of stress and damage responses that act in a concerted manner to protect parenchyma cells and tissues from virulence factors emanating from pathogens and from immune-driven resistance mechanisms leading to immunopathology. Tissue damage control mechanisms rely, initially, on stress responses that rewire metabolic pathways, preserving the functional outputs of parenchyma cells. If stress persists over time, damage to intracellular metabolites, macromolecules and cellular organelles develops, which is countered by damage responses. If this second layer of tissue damage control fails to preserve the functional outputs of parenchyma cells, the default response becomes programmed cell death. This eventually leads to tissue dysfunction and damage. When this occurs, the last layer of tissue damage control is cellular regeneration and tissue repair. These layers of tissue damage control confer host protection against infection irrespectively of pathogens, establishing disease tolerance to infection.

E-MAIL: mpsoares@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/mpsoares
The Evolution and Development lab explores the interplay between evolutionary and developmental biology. Studying this interface provides insight into the mechanisms at either level as well as those operating across levels that ultimately shape variation and diversity around us. We approach this concept experimentally through both experimental evolution and the comparative method. Using Drosophila melanogaster as a reference model and other insect species, we study a) immune cell function diversity and haematopoiesis and, b) the evolution of the immune response.

MAIN ACHIEVEMENTS

Following our previous work showing the larval sessile clusters to be true haematopoietic tissues, we have demonstrated that in the haematopoietic primary organ, the lymph gland, similar mechanisms operate. The generality of the Notch-dependent transdifferentiation of plasmatocytes into crystal cells calls for a reanalysis of the established binary cell fate decision model. This finding in Drosophila is of potential relevance to the understanding of terminal differentiation of vertebrate haematopoietic lineage cells, known to be highly context-dependent and plastic. We have performed a NGS characterisation of populations adapted to bacterial infections between 2010 and 2014. We validated functionally genes that underlie the adaptive process and extended our mechanistic analysis of the evolved populations to uncover immune, physiological and behavioural processes behind these adaptations.
HOST-MICROORGANISM INTERACTIONS

GROUP LEADER
TEIXEIRA, LUIS

RESEARCH INTERESTS

Multicellular organisms and microorganisms are continuously interacting. Many of these interactions are mutually beneficial. However, multicellular organisms have to actively thwart invasion by opportunistic or overtly pathogenic microbes. We are interested in how hosts interact with microorganisms at the functional and evolutionary levels. Our group approaches this subject from the classical pathogen versus host immunity perspective and also by analysing the interaction of the host with commensals and mutualists. We address this general problem studying Drosophila melanogaster interaction with viruses, intracellular bacteria (Wolbachia), and gut microbiota, with an emphasis on symbiotic associations. We are studying them with the perception that a particular microorganism is not solely interacting with the host but also with all its other symbionts. A reductionist approach to these complex relationships is possible in Drosophila because of its powerful genetics and relatively simple symbiotic community.

MAIN ACHIEVEMENTS

We showed that adaptation to viral infection in D. melanogaster is also mediated by strong selection at the level of the Wolbachia population (Faria et al., 2016). This demonstrates that host interaction with pathogens shapes the genetic diversity of its symbionts and that these contribute to host adaptation to pathogens. This work was a collaboration with the groups of É. Sucena, S. Magalhães, and C. Schlötterer.

LAB MEMBERS IN 2016

Catarina Carmo, Postdoc
Nelson Martins, Postdoc
Elves Duarte, PhD student, 2014 PCCD
Gonçalo Matos, PhD student, 2016 IBB | Started in July
Inês Pais, PhD student, 2011 PIBS
Marta Silva, Masters student | Started in September
Rita Valente, Lab manager
Miguel Landum, Technician
Gustavo Eduardo, Technician | Started in July
Maria da Graça, Trainee | Started in March; left in July
Thomas Graham, Trainee | Started in October
Anastasia Kryzhanska, Trainee | Started in July; left in September
João Lampreia, Trainee | Started in January; left in February
Shushan Toneyan, Trainee | Started in July; left in September

PUBLICATIONS


FUNDING

• Fundação para a Ciência e a Tecnologia

Figure: Gut bacteria of Drosophila melanogaster. DNA stained with SytoxGreen. Large patches are nuclei of Drosophila gut cells, small dots are bacteria.

E-MAIL: lteixeira@sgc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/lteixeira
PHYSICAL PRINCIPLES OF NUCLEAR DIVISION

GROUP LEADER
TELLEY, IVO A.

RESEARCH INTERESTS
We are a multidisciplinary team interested in the physical aspects of intracellular organisation. As a model system, we study the earliest stage of Drosophila development, from the mature egg to fertilisation to pre-blastoderm cleavages. We focus on pronuclear fusion in the fertilised egg and how the syncytial embryo defines the inter-nuclear distance between rapid mitotic divisions. We use reconstitution approaches in egg explants combined with time-lapse light microscopy and image processing while taking advantage of Drosophila genetics.

MAIN ACHIEVEMENTS
This year, we made significant progress in deciphering the mechanism of nuclear positioning by studying mutants that decouple chromatin from centrosomal duplication. In these mutants, the cytoskeletal organisation is preserved – in the absence of nuclei – and a regular network emerges with unit lengths matching the inter-nuclear distance in wild type embryos. We have identified a microtubule-based protein module that is involved in defining the unit length of separation. We developed an extract approach to study young fertilised eggs and visualise pronuclei and sperm in time-lapse and high-resolution, something that has not been possible to date. With this approach, we study how Wolbachia infection in Drosophila affects the last stages of fertilisation. We started our efforts in reconstituting egg polarity in explants. Finally, we concluded a collaborative analysis of the mechanics of actin-myosin ring constriction during cytokinesis.

Figure: This scheme illustrates the regular arrangement of nuclei and synchronous assembly of mitotic spindles in the syncytial embryo of Drosophila melanogaster (top panel). Because there are no membranes between individual nuclei and spindles, it is not clear how the embryo is keeping a regular arrangement without collisions. We study the mechanism of nuclear positioning by reducing embryo volume and generating embryo explants that reconstitute nuclear divisions (top, inset). Knowing that microtubule asters nucleated from centrosomes play a crucial role in nuclear separation, we study mutants that form asters and that arrange these structures in a similar regularity in the absence of nuclei (bottom left). Microtubules from neighbouring asters physically interact, form antiparallel overlaps and recruit cross-linking proteins (bottom middle), leading to mechanical bridges between nuclei or spindles which help maintaining their distance and prevent collision (bottom right). A regular arrangement of nuclei at that stage is a prerequisite for subsequent developmental stages.

E-MAIL: itelley@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/itelley

FUNDING
• European Commission
• Fundação para a Ciência e a Tecnologia
• Human Fronteirs Science Program
BACTERIAL SIGNALLING

GROUP LEADER
XAVIER, KARINA B.

RESEARCH INTERESTS

Bacteria coordinate group behaviours through production, release, and detection of small chemical signals, autoinducers, via a cell-cell signalling process called quorum sensing. Many of these behaviours are important in the regulation of virulence and many other functions involved in bacteria-host interactions. The bacteria-host interactions controlled by quorum sensing can be hostile or beneficial for the host. We are interested in understanding how bacterial signalling shapes the multi-species bacterial communities that can be found in animals and plants and how these communities affect host physiology.

MAIN ACHIEVEMENTS

Bacterial communities cooperate through the production of various public goods in order to cope with multiple constraints encountered in the environment. These cooperative behaviours are under the threat of being exploited by non-producing cheaters: individuals that benefit from cooperative actions but don’t contribute to the production of the public goods. In the presence of cooperators, cheaters can increase in frequency and cause cessation of cooperation, thus inducing collapse of the entire population. We have studied emergence of social cheaters in populations of Pseudomonas aeruginosa, the major pathogen isolated from lungs of cystic fibrosis patients. Our results show that we can induce or prevent population collapse simply by manipulating carbon or iron availability. These findings can be used to improve therapeutic approaches for clearance of Pseudomonas infections.

LAB MEMBERS IN 2016

Vitor Cabral, Postdoc | Started in May
Jessica Thompson, Postdoc
Ana Rita Oliveira, PhD student, 2015 IBB
Ozhan Ozkaya, PhD student, 2011 PIBS
Inês Torcato, External PhD student
Filipe Vieira, External PhD student
Miguel Pedro, Masters student
Joana Amaro, Lab manager
André Carvalho, Technician
Joana Dias, Technician | Left in April
Catarina Pinto, Technician | Started in March

PUBLICATIONS


FUNDING

• European Comission
• Fundação para a Ciência e a Tecnologia
• Howard Hughes Medical Institute
IN-HOUSE COLLABORATIONS 2016

CELL AND DEVELOPMENTAL BIOLOGY
- Adrain, Colin • Membrane Traffic • MBT
- Bettencourt Dias, Mónica • Cell Cycle Regulation • CCR
- Castro, Diogo • Molecular Neurobiology • MNB
- Ferreira, Miguel Godinho • Telomeres and Genome Stability • TEL
- Janody, Florence • Actin Dynamics • ADY
- Jønsson, Lars • Epigenetic Mechanisms • EPM
- Mallo, Mónica • Patterning and Morphogenesis • PTM
- Oliveira, Raquel • Chromosome Dynamics • CHR
- Telley, Ivo • Physical Principles of Nuclear Division • PND

QUANTITATIVE AND COMPUTATIONAL BIOLOGY
- Alves, Filipa • Biophysics and Genetics of Morphogenesis • BGM
- Carneiro, Jorge • Quantitative Organism Biology • QOB
- Chaouiya, Claudine • Network Modelling • NMD
- Gjini, Erida • Mathematical Modelling of Biological Processes • MMB
- Gonçalves, João • Science and Policy • SCP
- Pereira Leal, José • Computational Genomics • CGN
- Rocha, Luís • Complex Adaptive Systems and Computational Biology • CSB

PLANT BIOLOGY
- Baena, Elena • Plant Stress Signaling • PSS
- Becher, Jörg • Plant Genomics • PLG
- Duque, Paula • Plant Molecular Biology • PMB

IMMUNOBIOLOGY
- Amorim, Maria João • Cell Biology of Viral Infection • CBV
- Athanasiadis, Alekos • Protein - Nucleic Acids Interactions • PNA
- Domengeot, Joélyne • Lymphocyte Physiology • LYP
- Fesel, Constantin • Lupus and Autoreactive Immune Repertoires • LAI
- Howard, Jonathan • Host-Pathogen Co-Evolution • HPE
- Martino, Vera • Lymphocyte Development and Leukemogenesis • LDL
- Moita, Luis Ferreira • Innate Immunity and Inflammation • III
- Parkhouse, Michael • Infections & Immunity • IIM
- Penha Gonçalves, Carlos • Disease Genetics • DGT
- Soares, Miguel • Inflammation • INF
- Teixeira, Luis • Host-Microorganism Interactions • HMI

EVOLUTIONARY BIOLOGY
- Bank, Claudia • Evolutionary Dynamics • EVD
- Beldade, Patricia • Variation: Development and Selection • VDS
- Chelo, Ivo • Eco-Evolutionary Genetics • EGG
- Chikhi, Lounes • Population and Conservation Genetics • PCG
- Gordo, Isabel • Evolutionary Biology • EVD
- Mirth, Christopher • Development, Evolution and the Environment • DEE
- Perfeito, Lília • Evolution and Genome Structure • EGS
- Sucena, Élio • Evolution and Development • EVO
- Xavier, Karina • Bacterial Signalling • BAS

NEUROBIOLOGY
- Domingos, Ana • Obesity • OBS
- Fonseca, Rosalina • Cellular and Systems Neurobiology • CSN
- Oliveira, Rui • Integrative Behavioural Biology • IBH
In 2016, the IGC researchers collaborated with researchers from the following external institutions:

**EUROPE**
- Aarhus University, Denmark
- Barts Cancer Institute, UK
- Bristol University, UK
- CEDOC, Portugal
- Center for Sepsis Control and Care, Germany
- Centre de Physique Théorique, Campus de Luminy, France
- Centro de Investigaciones Biológicas, Spain
- Centro Nacional de Biotecnología, Spain
- Champalimaud Research, Portugal
- CRG-Barcelona, Spain
- Ecole Normale Supérieure, France
- EMBL, Germany
- EMBL-GB, France
- EPFL, Lausanne
- Faculdade de Ciências da Universidade de Lisboa, Portugal
- Faculdade de Medicina da Universidade do Porto, Portugal
- Fleming Institute, Greece
- Ghislain Schyns, DSM Nutritional Products Ltd, Switzerland
- Gregor Mendel Institute, Austria
- Hospital Curry Cabral, Portugal
- Hospital Dona Estefânia, Portugal
- Hospital Garcia Orta, Portugal
- Hospital Santa Maria, Portugal
- Hospital Santo Antonio, Portugal
- IJS, Portugal
- ICBA/Universidade do Porto, Portugal
- Imperial College London, UK
- INEM-Hospital Necker, France
- Institut Curie, France
- Institut de Mathématiques de Luminy, France
- Institut de Biologie de l’École Normale Supérieure, France
- Institute for Biological Imaging of Helmholtz Zentrum, Germany
- Institute of Environmental Sciences, Krakow, Poland
- Institute of Organic Chemistry & Biochemistry, Czech Republic
- Institut National de Recherche Agronomie, France
- Instituto de Biología Molecular y Celular de Plantas, Spain
- Instituto de Ciencias Sociales, Portugal
- Instituto de Medicina Molecular, Portugal
- Instituto de Tecnologia Química e Biológica, Portugal
- Instituto Politécnico Leiria, Portugal
- Instituto Português de Oncologia, Portugal
- Instituto Português do Mar e da Atmosfera, Portugal
- Instituto Superior Técnico, Portugal
- Institut Pasteur de Lille, France
- IPATMUP, Porto
- ISCTE-Universidade de Lisboa, Portugal
- Iff Foundation, Italy
- IST Austria, Austria
- Jacques Monod, Paris
- Johan Wolfgang Goethe University, Germany
- Karolinska Institute, Sweden
- Leiden University Medical Center, The Netherlands
- LMICB - MRC Laboratory for Molecular Cell Biology, UK
- London School of Hygiene and Tropical Medicine, UK
- Max F. Perutz Laboratories, Austria
- Medical University of Innsbruck, Austria
- Ministério da Educação e da Ciência, Portugal
- MPI for Molecular Plant Physiology, Germany
- Pirbright Institute, UK
- Sainsbury Laboratories of Cambridge University, UK
- San Raffaele Scientific Institute, Italy
- School of Life Sciences, UK
- Swiss Institute of Bioinformatics, Switzerland
- Technical University of Munich, Germany
- Technische Universität, Germany
- The Francis Crick Institute, UK
- Centre for Experimental & Clinical Infection Research, Germany
- Umeå University, Sweden
- Universidad de Santiago de Compostela, Spain
- Universidad de Valencia, Spain
- Universidade do Algarve, Portugal
- Universidade Nova de Lisboa, Portugal
- Universidad Pablo de Olavide, Spain
- Université de Bourgogne, France
- Université de Tours, France
- Université Paul Sabatier, France
- Université Toulouse, France
- University of Bielefeld, Germany
- University of Cambridge, UK
- University of Cologne, Germany
- University of Copenhagen, Denmark
- University of Dundee, UK
- University of Durham, UK
- University of Edinburgh, UK
- University of Geneva, Switzerland
- University of Glasgow, UK
- University of Hanover, Germany
- University of Helsinki, Finland
- University of Leicester, UK
- University of Liége, Belgium
- University of Limoges, France
- University of Manchester, UK
- University of Montpellier, France
- University of Oxford, UK
- University of Sheffield, UK
- University of Sussex, UK

**AMERICA**
- Arizona State University, USA
- Carleton University, Canada
- Duke University School of Medicine, USA
- Eli Lilly, USA
- Harvard University, USA
- Indiana University, USA
- Instituto de Inmunología Molecular, Cuba
- Janelia Research Campus - HHMI, USA
- John Hopkins, USA
- Lake Forest College, USA
- NIH, USA
- NYU USA
- School of Medicine, UCSD, USA
- Sloan Kettering Institute, USA
- St. Jude Children’s Research Hospital, USA
- State University of São Paulo, Brazil
- Swarthmore College, USA
- The Rockefeller University, USA
- UNAM, Mexico
- Universidad de Carabobo, Venezuela
- Universidade de São Paulo, Brazil
- Universidade Federal de Pernambuco, Brazil
- Universidade Federal de Rio Janeiro, Brazil
- University of Cordoba, Argentina
- University of Delaware, USA
- University of Florida, USA
- University of Houston, USA
- University of Maryland, USA
- University of Massachusetts Medical School, USA
- University of Nebraska, USA
- University of Ottawa, Canada
- University of Pennsylvania, USA
- University of Pittsburgh, USA
- University of Tennessee, USA
- University of Texas, USA
- University of Virginia, USA
- Virginia Tech, USA

**ASIA**
- Haifa University, Israel
- MBI Singapore, Singapore
- National Institute of Genetics, Japan
- University of Macau
- University of Singapore, Singapore
- Weizmann Institute, Israel
- Yamaguchi University, Japan

**AUSTRALIA**
- Monash University, Australia
- University of Queensland, Australia

**AFRICA**
- Faculdade de Medicina de Benguela, Angola
The following researchers develop their research at external associated institutes and research centres, and still maintain strong scientific collaborations with IGC groups, and access to IGC facilities.

**BELO, JOSÉ ANTÓNIO**  
CEDOC – Chronic Diseases Research Center, Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Portugal

**CAREY, MEGAN**  
Champalimaud Research, Portugal

**COSTA, RUI M.**  
Champalimaud Research, Portugal

**DIAS, SÉRGIO**  
Instituto de Medicina Molecular, Portugal

**DIONÍSIO, FRANCISCO**  
Faculdade de Ciências da Universidade de Lisboa, Portugal

**DUARTE, ANTÓNIO**  
Faculdade de Medicina Veterinária, Universidade Técnica de Lisboa, Portugal

**FARO, JOSÉ**  
Universidad de Vigo, Spain

**FERNANDES, LISETE**  
Biosystems and Integrative Sciences Institute (BioISI), Portugal

**GRAÇA, LUIS**  
Instituto de Medicina Molecular, Portugal

**HENRIQUE, DOMINGOS**  
Instituto de Medicina Molecular, Portugal

**ISRAELY, INBAL**  
Champalimaud Research, Portugal

**JACINTO, ANTÓNIO**  
CEDOC – Chronic Diseases Research Center, Faculdade de Ciências Médicas, Universidade Nova de Lisboa, Portugal

**LIMA, SUSANA**  
Champalimaud Research, Portugal

**MAIEN, ZACHARY**  
Champalimaud Research, Portugal

**MARTINHO, RUI**  
Centre for Biomedical Research, Universidade do Algarve, Portugal

**MOITA, MARTA**  
Champalimaud Research, Portugal

**MOTA, MARIA**  
Instituto de Medicina Molecular, Portugal

**MOTA VIEIRA, LUISA**  
Divino Espírito Santo Hospital, Universidade dos Açores, Azores, Portugal

**OLIVEIRA, SOFIA**  
Instituto de Medicina Molecular, Portugal

**ORGER, MICHAEL**  
Champalimaud Research, Portugal

**PATON, JOSEPH**  
Champalimaud Research, Portugal

**RIBEIRO, CARLOS**  
Champalimaud Research, Portugal

**SAÚDE, LEONOR**  
Instituto de Medicina Molecular, Portugal

**SILVA SANTOS, BRUNO**  
Instituto de Medicina Molecular, Portugal

**SIMAS, JOÃO PEDRO**  
Instituto de Medicina Molecular, Portugal

**SOARES, HELENA**  
Faculdade de Ciências da Universidade de Lisboa, Portugal

**THORSTEINSÓTTIR, SOLVEIG**  
Faculdade de Ciências da Universidade de Lisboa, Portugal

**VASCONCELOS, MARIA LUISA**  
Champalimaud Research, Portugal

**VICENTE, ASTRID**  
Biosystems & Integrative Sciences Institute (BioISI), Universidade de Lisboa, Portugal and Instituto Nacional de Saúde Dr. Ricardo Jorge, Lisbon, Portugal
**ANIMAL HOUSE FACILITY**

**HEAD**

**REBELO, MANUEL**

**DESCRIPTION OF FACILITY**

The Animal House Facility (AHF) provides infrastructure and services for model organism-based research including Rodent, Aquatic (zebrafish and frog) and Fly Facilities. The AHF seeks to integrate management of the different animal facilities, namely by sharing technological development and good practices among different animal models. The AHF staff duties include husbandry procedures, general maintenance of facilities and equipment, advanced services such as Rederivation, Cryopreservation, Gnotobiology, production of germ-free animals, assistance to researchers, colony maintenance, import and export of animals, organisation of Laboratory Animal Science (LAS) Courses, and support on legal issues. The organisation of the AHF team promotes a culture of shared values and principles that contributes to a close relation with the researchers.

**NEWS IN 2016**

The AHF participated in the two most prestigious International LAS Meetings (FELASA and AALAS) with a total of 4 oral communications and 3 poster presentations. A research paper about pioneering work on zebrafish health control, fully developed at the Zebrashare, was published by the AHF team.

**STAFF IN 2016**

Ana Cristina Borges, Manager Aquatic Facility
Liliana Vieira, Manager Fly Facility
Sandra Crisóstomo, Technician
Maysa Franco, Technician
Ana Sofia Leocádio, Technician
Carina Monteiro, Technician
Marília Pereira, Technician
Adérito Vieira, Technician
João Lopes, Caretaker

**NEW EQUIPMENT IN 2016**

Rodent Facility: Bedding disposal station, funded by IGC

**TRANSGENICS UNIT**

**HEAD**

**MALLO, MOÍSES**

**DESCRIPTION OF FACILITY**

The Transgenics Unit generates genetically modified mouse and Drosophila melanogaster strains for research groups at the IGC. Our work with mice includes: 1) Production of transgenic mice by pronuclear DNA injection using both conventional expression constructs and BACs; 2) Introduction of targeted modifications into endogenous genomic loci both following embryonic stem cell-mediated approaches and with the CRISPR/Cas9 technology. Our work with Drosophila includes: 1) A microinjection service to generate transgenic or mutant flies, via p-element, CRISPR/Cas9 methods; 2) Microinjection for purposes other than the production of transgenic flies (e.g. Wolbachia transfer).

**PUBLICATIONS**


**NEWS IN 2016**

During 2016 we increased the production of mice with targeted genomic modifications with CRISPR/Cas9. Using this technique we produced 12 different lines containing inactivated genes, knock-ins (introducing tags or cre recombinase) and point mutations. We also developed projects to increase the efficiency of CRISPR/Cas9-mediated gene targeting by homologous recombination, combining addition of Radi1 and the use of single stranded DNA replacement templates. In addition, we kept our regular production of transgenic mouse lines and embryos using both regular DNA constructs and BACs. The Drosophila Transgenesis service started in March 2016. Since then, we generated 57 stable germline transgenic lines and 8 CRISPR lines, with a global success rate of 98%. Notably, we were able to successfully insert a 42kb fragment.
PLANT FACILITY

DESCRIPTION OF FACILITY
The Plant Facility at the IGC ensures the growth and maintenance of Arabidopsis thaliana and Physcomitrella patens plants, the model organisms used by the plant research groups hosted by the Institute. The facility consists of three custom-made fully controlled growth chambers with short-day and long-day light settings, as well as a walk-in plant growth room and five small reach-in chambers that allow the performance of cell-based assays and more precise phenotypical analyses. Three research groups (Plant Molecular Biology, Plant Stress Signalling and Plant Genomics) make use of the facility.

STAFF IN 2016

Vera Nunes, Technician

E-MAIL: vnunes@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/plants

BIOINFORMATICS & COMPUTATIONAL BIOLOGY UNIT
HEAD
SOBRAL, DANIEL

DESCRIPTION OF FACILITY
The Bioinformatics Unit (UBI) provides consulting services in bioinformatics and computational biology during initial stages of study design and grant proposals. We also provide a broad range of support for ongoing studies requiring external expertise in bioinformatics, including: training and consulting on the use of bioinformatic tools; development of databases and data warehousing solutions; development of bioinformatics pipelines for genomic analysis; next generation sequencing (NGS) data analysis.

STAFF IN 2016

Isabel Marques, Senior bioinformatics specialist | Left in May
Daniel Faria, Postdoc
Tiago Macedo, Systems administrator
João Costa, Technician
Mauro Truglio, Technician | Started in August
Samuel Viana, Masters student | Left in June

PUBLICATIONS


E-MAIL: dosobral@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/bioinformatics

PUBLICATIONS


STAFF IN 2016

E-MAIL: vnunes@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/plants

债权人
**DESCRIPTION OF FACILITY**

The Gene Expression Unit provides expert services using NGS and Microarray Technologies.

NGS services are provided with the unit’s Illumina MiSeq sequencer. They range from de novo and re-sequencing of small to mid-sized genomes, over amplicon sequencing (e.g. 16S metagenomics) to custom applications (e.g. RAD-Seq).

DNA microarray services focus on gene expression profiling, and range from experimental design over complete sample processing to expert advice on data analysis. The unit is an Affymetrix Core Lab with reference status for Affymetrix Core Lab Portugal since 2002. RNA and DNA quality is assessed using a Bioanalyzer.

To date, the unit has contributed to more than 200 projects, resulting in 90 publications with more than 2500 citations (http://www.researcherid.com/rid/B-9404-2012).

**NEWS IN 2016**

In 2016, the unit has produced 256 Gigabases of sequencing data with its MiSeq. These derived from 305 samples of re-sequencing, 895 samples of 16S metagenomics, and 5 samples processed for custom experiments. In addition, we have run 24 microarrays and analysed 1349 RNA/DNA samples on our Bioanalyzer.

Our existing protocols have been optimised, resulting in significant cost reductions, and we have implemented a new protocol for RNA-Seq library prep (Smart-Seq2).

**SELECTED PUBLICATIONS**


*The complete list of publications is available on section 3. Publications*

**STAFF IN 2016**

Sara Ramos, Technician | Started in March

João Sobral, Technician

---

**DESCRIPTION OF FACILITY**

The Genomics Unit provides expertise and technological support for research at the genome scale and is composed by Genotyping and Sequencing Services.

The Genotyping Service offers the AgenaBio iPLEX technology, allowing rapid SNP genotyping assays with up to forty SNPs assayed simultaneously. The facility collaborates with investigators on: SNP choice and SNP Assay Design, AgenaBio Procedure and Data Management for Genetic Studies, providing access to the BQ/GENE interface software. Genotyping Service also offers a back-couping service for users of genetically modified mice and mouse breeders.

The Sequencing Service offers DNA sequencing and fragment analysis using multiplex with automatic sequencer ABI 3130XL. SNP genotyping and gene expression are also available with Q87 (ABI) and CFX384 (BioRad) Real-Time PCR systems.

**NEW EQUIPMENT IN 2016**

- **MinION – Oxford Nanopore Sequencing system, funded by IGC**

---

**NEWS IN 2016**

The Genomics Unit started to introduce the long read DNA sequencing technologies using the MinION system.

To increase the flexibility of SNP genotyping system, the Unit installed a new geometry of chips that allows to run 24 samples at the same time.
Contrary to common perception, the process of histological diagnosis starts at examination of the gross specimen, whether human or animal, organism & organ, and then proceeds to histological analysis. The latter is not a "result" but an interpretation, subject to multiple potential confounding factors and judgment. Thus, there are both technical and interpretational skills that are required.

The Unit provides these services for all internal groups, associate laboratories and has also established cooperation protocols with other academic institutions.

Last but not least, the health monitoring of the institute’s animal models, namely zebrafish, is also a main task undertaken by our unit.

**NEWS IN 2016**

- Gabriel G. Martins appointed as WG2 leader of the NEUBIAS COST action;
- Installation of the new spinning disk confocal;
- Installation of double-sided illumination in Open- Spin light-sheet microscope;
- Organisation of the EMBO practical course on 3D Develomental Imaging;
- Participation in the 1st NEUBIAS Training School;
- Co-organisation of the Spanish-Portuguese Meeting for Advanced Optical Microscopy;
- Members of the unit contributed directly to 7 publications.

**STAFF IN 2016**

- Pedro Faisca, Veterinary Pathologist
- Joana Rodrigues, Technician
- Marta Pinto, Technician

**DESCRIPTION OF FACILITY**

The Histopathology Unit (HU) aims to provide high-quality preparations for the microscopic study of both normal and pathological cells and tissues.

As histopathology is a valuable instrument in scientific research, our technicians guide the users in their work and train them to use some of the equipment, when necessary. Furthermore, the provision of guidance in the interpretation of pathology samples and planning of necessary preparations for the microscopic study of both normal and pathological cells and tissues.

The Unit provides these services for all internal groups, associate laboratories and has also established cooperation protocols with other academic institutions.

Last but not least, the health monitoring of the institute’s animal models, namely zebrafish, is also a main task undertaken by our unit.

**Figure:** Murine model of glycerol induced acute renal failure HE 200x.

**EXTERNAL WEBSITE:**

HISTOPATHOLOGY UNIT
SOARES, MIGUEL P.

**DESCRIPTION OF FACILITY**

The Advanced Imaging Unit provides access and support to high-end light microscopy imaging to the whole IGC community. The Unit currently stands as an international reference, with cutting-edge techniques ranging from super-resolution, high-end widefield and confocal systems (high-throughput/screening capabilities), multi-photon, light-sheet microscopy, optical tomography and bioluminescence/fluorescence animal imaging. Some of these techniques are unique in Portugal and were developed in-house. The unit is also responsible for general maintenance of optical instruments, including satellite microscopes throughout the IGC. Users are trained in dedicated sessions and internal workshops. The unit also organises advanced workshops on light microscopy techniques, equipment setup, experimental design and image processing and analysis.

**STAFF IN 2016**

- Nuno Pimpão Martins, Technician
- Hugo Pereira, Technician | Left in March
- João Lagarto, Technician | Left in February
- Ana Gonçalves, Technician | Left in February

**SELECTED PUBLICATIONS**

*The complete list of publications is available on section 3. Publications


**NEW EQUIPMENT IN 2016**

Leica Spinning Disk confocal microscope of the Chromosome Dynamics group, funded by the European Research Council.

**ADVANCED IMAGING UNIT**

HEAD
MARTINS, GABRIEL G.

E-MAIL: gaby@igc.gulbenkian.pt
ELECTRON MICROSCOPY FACILITY

HEAD
TRANFIELD, ERIN

DESCRIPTION OF FACILITY
At the Electron Microscopy Facility at the IGC we believe that electron microscopy is a powerful tool that can be used to address research questions in the life sciences. With this in mind we aim to:

• Provide centralised, high quality electron microscopy infrastructure to support scientific investigation.
• Offer electron microscopy services, mentorship and skill training.
• Collaborate with researchers within our institute, our country and the scientific community to foster knowledge of technical developments in electron microscopy.

NEWS IN 2016
2016 was an exciting year in the Electron Microscopy Facility. In January and February the facility was closed for an extensive renovation to make room for a new 100kV Transmission Electron Microscope. In March the Facility re-opened and in April and May the new Transmission Electron Microscope was installed. This microscope not only doubles the number of available microscopes, it also enhances our technical capabilities for cryo-electron microscopy and correlative light and electron microscopy.

NEW EQUIPMENT IN 2016
FEI Tecnai G2 Spirit BioTWIN Transmission Electron Microscope, funded by Fundação para a Ciência e a Tecnologia

Figure: Ana Laura Sousa from the IGC EM Facility using the newly installed Tecnai G2 Spirit BioTWIN TEM.

PUBLICATIONS

STAFF IN 2016
Sara Bonucci Costa, Technician
Ana Catarina Correia, Technician | Left in July
Ana Laura Sousa, Technician

FLOW CYTOMETRY FACILITY

HEAD (S)
GARDNER, RUI / MONTEIRO, MARTA

DESCRIPTION OF FACILITY
The Flow Cytometry Facility offers high quality flow cytometry technology services and expertise, providing the necessary support to the researchers at IGC, as well as to outside groups or companies. Currently, our facility stands as a national and international reference for flow cytometry and high-throughput cell sorting. The platform is equipped with two multicolour high-speed cell sorters, four analysers and a multiplex analyte reader. Experienced laboratory staff operates cell sorters, while researchers operate analysers. All users receive training in the systems they use, and the facility personnel are available to be consulted on advice on experimental design and data analysis. The need of new flow instruments and techniques to support the demands of research projects at IGC drives a continuous development of the facility, which closely follows the advances in the flow cytometry field, seeks and develops innovative projects, and implements strategies to improve the quality of the provided services.

NEWS IN 2016
In November 2016, Marta Monteiro has been hired to be the head of the facility, and Mariana Fernandes joined the service as a technician. In the first semester of 2016 a new 4-laser BD LSR Fortessa™ X-20 analyser enabling the detection of up to 16 parameters simultaneously was acquired for the unit. The facility is one of the founders of the FlxFlow – a Portuguese network for Flow Cytometry born in 2016, which aims to bring together flow core facilities in the Lisbon area and enable the access of scientists to cutting edge applications.

NEW EQUIPMENT IN 2016
BD LSR Fortessa™ X20 (leasing), funded by Fundação para a Ciência e a Tecnologia

E-MAIL: mmonteiro@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/uic/cytometry

SELECTED PUBLICATIONS*

*The complete list of publications is available on section 3. Publications

STAFF IN 2016
Rui Gardner, Head | Left in May
Marta Monteiro, Head | Started in November
Claudia Andrade, Technician | Left in March
Claudia Bispo, Technician | Left in December
Mariana Fernandes, Technician | Started in October
Andrea Ribeiro, Technician | Started in May; left in September

E-MAIL: estranfield@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/uic/emf
EXTERNAL WEBSITE: http://facilities.igc.gulbenkian.pt/electronmicroscopy.php

* T
ANTIBODY SERVICE
HEAD DEMENGEOT, JOCELYNE

DESCRIPTION OF FACILITY
The Antibody Service provides a centralised resource for the production, purification and labelling of monoclonal antibodies. It also maintains a collection of hybridomas as well as purified and coupled antibodies for IGC investigators.

The Antibody Service offers the following procedures:
1. Quality Control of hybridomas:
   • Thawing, expanding, freezing;
   • Mycoplasma testing and cleaning;
   • Quantification of Ig production by ELISA;
2. Small to medium scale Ig production from QC hybridomas in vitro (10 to 100mg):
   • Optimization of production by sub-cloning;
   • Adaptation to serum free or IgG depleted media;
   • Purification by Protein A/G chromatography and protein quantification;
   • QC by protein gel electrophoresis.
3. Conjugation of monoclonal antibodies and other proteins to small molecules for FACS, western or immunohistology and high definition microscopy.

STAFF IN 2016
Ana Regalado, Technician

NEWS IN 2016
This year the Antibody Service supported 12 laboratories and 1 facility at IGC. It also assisted 3 laboratories outside IGC. We produced a total of 250 mg of purified Ab, and labelled 30 different Ab or proteins. We initiated a novel collection of tools for protein purification and analysis, namely, anti-tags antibodies.

Figure 1: Super resolution using dSTORM of the distribution of CENP-A in a centromere using primary antibody direct labelling with Alexa Fluor® 647. Scale bar 200nm.

Figure 2: Cetuximab antibody labelled with FITC (green) binds to colorectal cancer cells (red-DiI).

E-MAIL: jocelyne@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/antibody

TECHNICO-SCIENTIFIC SUPPORT
HEAD MORENO, NUNO

DESCRIPTION OF SERVICE
Our service supports facilities on a technical and management level, namely: homogenise the way internal accounting is made, develop tools to facilitate the communication to users and reporting, implementation of IOT (Internet Of Things) on the institute with over 200 sensors and actuators, running a seminar series dedicated to techniques and applications, development of apparatus to minimize HR burdening, 3D printing of custom devices for scientists.

STAFF IN 2016
Ana Homem, Technician
Tiago Vale, Technician

NEWS IN 2016
Implementation of LxMart: a network in the Lisbon area for sharing best practices in science management with a strong focus on scientific facilities, software tools for management and post-awarding finances.

E-MAIL: moreno@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/tss

BIOSAFETY
HEAD CARNEIRO, TIAGO

DESCRIPTION OF SERVICE
The IGC recognises the importance of ensuring the health and safety of all personnel within its Campus. Hence, the biosafety unit aims to ensure that all reasonably practicable efforts are made to safeguard the institute’s workers, visitors and contractors and also promote the security of the environment surrounding the IGC campus. In order to achieve these goals, the biosafety unit is committed to making available the adequate resources to support all relevant statutes, regulations and codes of practice and will take the appropriate steps to ensure:
1) A suitable and sufficient assessment of the risks to Health and Safety for all tasks performed by this organisation.
2) Information, instructions and the necessary training of all workers concerning health and safety.
3) The minimization of risks for health and safety in relation to the use, handling, storage and transportation of chemical and biological substances used in the institute.
4) That all equipment handled at the institute is safe and without risks to health.
5) Maintenance of a safe workplace, safe means of access to it and safe egress from it.

NEWS IN 2016
In 2016, following changes in the legal regulations, the IGC obtained authorisation to:
• Work and manipulate genetically modified microorganisms and organisms, level 1 and 2.
• Manage radiation waste storage and disposal.

E-MAIL: tcarneiro@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/biosafety
SERVICES

DESCRIPTION OF SERVICE

The Admin Unit is responsible for: a) Post-award management of scientific projects; b) Administrative assistance to the IGC Directors and researchers; c) Assistance to new incoming researchers to the IGC; d) Logistics for seminars and other visitors; e) Meetings organisation; f) Processing of fellowships; g) Accounting processes in SAP. We collaborate with the accounting and purchasing sectors.

STAFF IN 2016

Liliana Rodrigues, Secretary to the Director
Olena Shydenko, Secretary to the Deputy Directors
Pedro Alves, Meetings organisation
Anna Maria Fejfer, Meetings organisation
Rita Gusmão, Admin project manager
Tatiana Rocha, Admin project manager
André Sousa, Admin project manager
Ana Santos, General secretary | Left in February
Jorge Costa, Chauffeur (Collaborator)

ACCOUNTING AND INTERNAL AUDIT

HEAD

LEITE, JOSÉ MÁRIO

DESCRIPTION OF SERVICE

This service provides support in all administrative and accounting matters, including ordering and stores, financial and fiscal support. The accounts office provides support in preparing financial reports of research projects, and in general accounting and management of projects. The accounting and financial reporting of research projects is executed by an external society: PwC. The Pro-jects is executed by an external society: PWC. The Pro-
cial and fiscal support. The accounts office provides support in preparing financial reports of research projects, and an FCG member of the unit left for early retirement.

In 2016, the admin unit provided logistics and admin support for approximately:
• 11 national and international meetings;
• 36 seminar and/or other scientific visitors to the IGC;
• 6 new incoming researchers, including visas and social security;
The team also managed around 118 external scientific projects, prepared 18 financial reports and processed 350 fellowships.

NEWS IN 2016

The unit was re-designed towards specialisation with deeper focus on three specific areas of administrative support – senior management issues, project management and meetings organisation. The team was reduced by 2 members – support to purchasing was removed from admin unit responsibilities and an FCG member of the unit left for early retirement.

The accounting and financial reporting of research projects is executed by an external society: PwC. The Pro-jects is executed by an external society: PWC. The Pro-

STAFF IN 2016

Filipe Silva, Procurement FlyBridge
António Bretanha, Procurement FlyBridge
Tânia Lobão, Accounts officer PwC
Ana Sofia Oliveira, Team responsible PwC
Bruno Pinto, Accounts officer
Joana Gusmão, Accounts officer
Abílio Simões, Stores manager
Ana Sofia Oliveira, Team responsible PwC
Fátima Mateus, Accounts officer
Vítor Santos, Accounts and information officer
Joana Gusmão, Accounts officer
Bruno Pinto, Accounts officer
Abílio Simões, Stores manager
Ana Sofia Oliveira, Team responsible PwC
Tânia Lobão, Accounts officer PwC
António Bretanha, Procurement FlyBridge
Filipe Silva, Auditor Deloitte

E-MAIL gmartins@igc.gulbenkian.pt
IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/adminunit

INFORMATICS

HEAD

SOUSA, JOÃO

DESCRIPTION OF SERVICE

The IGC informatics (ITI) manages most of the ICT needs of the IGC including the development and maintenance of the IT and communications infrastructure, the direct support to IGC users (helpdesk), training and consulting as a service, development and maintenance of the scientific computation farm, and application development. These services are multi-layered and can be engaged fully or partially as needed. Most of the IGC infrastructure relies on the use of Open Source technologies and the competence of our dedicated staff to maintain a competitive level of service. Notable exceptions are the dedicated administrative applications that also rely on commercial

STAFF IN 2016

João Garcia, Systems analyst
Mário Neto, Systems administrator
Fernando Azevedo, Technician
Manuel Carvalho, Technician
Ana Maya, Technician (relocated to FCG headquarters)

LIBRARY

HEAD

SOUSA, JOÃO

DESCRIPTION OF SERVICE

The IGC Library is an open access, specialised library in biomedicine. Its bibliographic collection covers Biology, Biochemistry, Genetics, Pharmacology, Microbiology, Physiology, Immunology, Virology, Cell Biology, Neuroscience and Developmental Biology. The library is intended for researchers, faculty and visiting scientists, students and staff of the IGC, but is also opened to external users, either from the national scientific community or from higher education institutions. It aims to provide access to useful, diversified and up to date information, to improve services provided, to acquire, register, maintain and distribute scientific information of interest to or

STAFF IN 2016

Ana Maya, Technician (relocated to FCG headquarters)
Fátima Mateus, Accounts officer
Vítor Santos, Accounts and information officer
Joana Gusmão, Accounts officer
Bruno Pinto, Accounts officer
Abílio Simões, Stores manager
Ana Sofia Oliveira, Team responsible PwC
Tânia Lobão, Accounts officer PwC
António Bretanha, Procurement FlyBridge
Filipe Silva, Auditor Deloitte

E-MAIL jsousa@igc.gulbenkian.pt
IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/library

E-MAIL jleite@igc.gulbenkian.pt
IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/adminunit

IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/adminunit

E-MAIL jsousa@igc.gulbenkian.pt
IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/informatics

E-MAIL jsousa@igc.gulbenkian.pt
IGC WEBPAGE http://www.igc.gulbenkian.pt/facilities/library
SERVICES

RESEARCH FUNDING AFFAIRS

The RFA Unit is responsible for the implementation of a pre-award grant administration service. Its main goal is to increase the IGC’s capacity to attract competitive research funds launched by national, international, public and private grant programmes. This service reports directly to the Director, understands the different grant policies & requirements and works in collaboration with researchers, the Admin Unit, the Director and Deputy Directors. Services offered include: identification & dissemination of funding opportunities tailored to the needs of the institute; support to the development & submission of grant proposals and; post-award negotiation of grant agreements. The unit also organises and lectures several grant application training sessions and workshops for researchers at all career stages. Finally, this unit also monitors the impact of the services offered through the quantification of several criteria.

STAFF IN 2016
Teresa Costa, Pre-award grant manager

DESCRIPTION OF SERVICE

This service provides support in all general maintenance (excluding scientific equipment and units), electricity, AVAC, buildings, gardening, cleaning and gives support to other activities that need it, such as garbage – general and biohazard – reconstruction and adaptation, etc.

E-MAIL: svidal@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/facilities/rfaunit

SCIENCE COMMUNICATION

The IGC runs a dedicated science communication and outreach programme, which actively engages IGC researchers, staff and PhD students in a dialogue with the society. We aim at promoting the values of science, namely critical thinking, honesty and ethics, and openness to share and discuss new knowledge, encouraging public engagement in science. We also aim to raise the profile of the IGC and its research both nationally and internationally. Our programme involves a broad range of audiences: the media, students, teachers, general public, artists and policy makers.

STAFF IN 2016
Vanessa Borges, Public engagement officer
Inês Domingues, Communications officer
Catarina Júlio, Science education officer

NEWS IN 2016

During 2016, this service supported researchers in attracting several external competitive research funds. IGC researchers secured a total of 37 new external competitive research grants (31 FCT including 1 ERA-NET InfectERA; 2 HFSP Young Investigator Grants; 1 Bill Gates Project Grant/Investment; 1 AFM Telethon Research Grant; 2 Prémios Maratona da Saúde – Diabetes), 10 fellowships/contracts (4 FCT Postdoctoral Fellowships; 1 EMBO Long-Term Fellowship; 3 Marie Curie Individual Fellowships; 1 Liga Portuguesa Contra o Cancro-Pfizer PhD Fellowship; 1 Fulbright Core Scholar Sabbatical); 8 prizes as well as 11 other type of funds, in a total amount of about 5.9 million €.

In addition, 2 IGC members were selected to participate in European COST Actions, 2 as Management Committee National Delegates for Portugal nominated by FCT and 1 also as a Working Group Member.

E-MAIL: anamena@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/outreach

GENERAL MAINTENANCE

HEAD
LEITE, JOSÉ MARIO

DESCRIPTION OF SERVICE
Institutional communication: IGC scientific achievements were disseminated to the general public via traditional and social media. A new series of videos “PhD in a minute” was created.
Science Education: the IGC hosted visits from high-school and primary-school students, provided material for scientific activities, supported a scientific project and helped in the organization of a Science Café. Public Events: the IGC participated in: a) Futurália, the largest education fair in Portugal; b) 2 music festivals, the Belém Art Fest and the NOS Alive festival; c) the Maker Faire; d) “Ao leme com a Ciência Viva” science festival; e) the Sci & Tech week; and organised the 8th edition of its Open Day.
Art & Science: the interactive installation Musical Morphogenesis was publicly presented in 5 different venues.
The complete list of activities can be found in the Public Engagement section of this report.

E-MAIL: jleite@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/publication
RESEARCH STRUCTURES & NETWORKS

RESEARCH STRUCTURES

The Instituto Gulbenkian de Ciência (IGC) is an independent ‘Research Unit’ (Unidade de Investigação) rated as “Exceptional” under the international evaluation of Portuguese scientific research and technological development promoted by Fundação para a Ciência e a Tecnologia (FCT), in 2015. The scientific programme of the IGC Research Unit is dedicated to complex fundamental problems that fall largely into four research domains, namely quantitative biology, evolutionary biology, cell and developmental biology, and immunobiology. Modeling, quantitative biology and evolution are the conceptual substrate of the IGC, and influence thinking at the IGC in many ways. The Research Unit Team consists of 12 Research groups, each a cluster of 3 (or more) autonomous labs with sizes ranging from 3 to 15 lab members.

NATIONAL ROADMAP OF RESEARCH INFRASTRUCTURES OF STRATEGIC RELEVANCE

In 2013, FCT opened a call for research infrastructures to be included in the National Roadmap of Research Infrastructures of Strategic Relevance. This call aimed at assessing the existing research infrastructures, identifying national priority areas and introducing Portugal into the group of European countries who have produced their own national roadmaps in alignment with the European Strategic Forum on Research Infrastructures (ESFRI). In total, 40 infrastructures in all scientific domains were integrated in the Portuguese Roadmap of Research Infrastructures (ESFRI). The laboratory mouse is the most important mammalian model for studying genetic and multi-factorial diseases in Man. The European Mouse Mutant Archive (EMMA) is a not-for-profit repository for the collection, archiving (via cryopreservation) and distribution of relevant mutant strains that are essential for biomedical research. EMMA draws on the expertise of 16 leading research institutes across Europe, including the IGC, in Portugal. The IGC offers the crucial Germ-Free Service that generates, breeds and houses mice that are free of all microorganisms. These germ-free animals are crucial in studies aimed at understanding the effects of microorganisms on a host, or dissecting the molecular mechanisms underlying the function of the immune system.

THE EUROPEAN MOUSE MUTANT ARCHIVE (EMMA)

Head of the Portuguese node: Jocelyne Demengeot

The European Mouse Mutant Archive (EMMA) is a not-for-profit repository for the collection, archiving (via cryopreservation) and distribution of relevant mutant strains that are essential for biomedical research.

EMMA operates on the expertise of 16 leading research institutes across Europe, including the IGC, in Portugal. The IGC offers the crucial Germ-Free Service that generates, breeds and houses mice that are free of all microorganisms. These germ-free animals are crucial in studies aimed at understanding the effects of microorganisms on a host, or dissecting the molecular mechanisms underlying the function of the immune system.

The germ-free facility of the IGC has generated more than 20 different strains of germ-free mice, requested by researchers from Portugal, Germany, USA, France and the UK. The facility has the capacity to temporarily host scientists wishing to carry out their own research with the mice at the IGC itself.

EMMA is part of the Infrafrontier Project, that links two complementary infrastructure networks with the aim of establishing a sustainable research infrastructure for systematic phenotyping, archiving and distribution of mouse models. IGC is one of the Infrafrontier partners, together with research facilities, government departments and funding agencies from 13 European countries, Canada and Israel.

THE EUROPEAN MOUSE MUTANT ARCHIVE (EMMA)

Head of the Portuguese node: Jocelyne Demengeot

EMMA removes the expertise of 16 leading research institutes across Europe, including the IGC, in Portugal. The IGC offers the crucial Germ-Free Service that generates, breeds and houses mice that are free of all microorganisms. These germ-free animals are crucial in studies aimed at understanding the effects of microorganisms on a host, or dissecting the molecular mechanisms underlying the function of the immune system.

The germ-free facility of the IGC has generated more than 20 different strains of germ-free mice, requested by researchers from Portugal, Germany, USA, France and the UK. The facility has the capacity to temporarily host scientists wishing to carry out their own research with the mice at the IGC itself.

EMMA is part of the Infrafrontier Project, that links two complementary infrastructure networks with the aim of establishing a sustainable research infrastructure for systematic phenotyping, archiving and distribution of mouse models. IGC is one of the Infrafrontier partners, together with research facilities, government departments and funding agencies from 13 European countries, Canada and Israel.

NETWORKS

EU-LIFE

EU-LIFE is an alliance that gathers thirteen renowned European research centres in life sciences: CRG-Centre for Genomic Regulation, (Barcelona, Spain); VIB (Flanders, Belgium); Institut Curie (Paris, France); MDC-Max Delbrück Center for Molecular Medicine, (Berlin, Germany); Instituto Gulbenkian de Ciência (Oeiras, Portugal); CeMM-Research Center for Molecular Medicine of the Austrian Academy of Sciences (Vienna, Austria); IEO-European Institute of Oncology, (Milan, Italy); CEITEC-Central European Institute of Technolo- gy (Brno, Czech Republic); Netherlands Cancer Institute – Antoni van Leeuwenhoek (Amsterdam, Netherlands); FIMM-Institute for Molecular Medicine Finland (Helsinki, Finland); BRIC-Biostech Research and Innovation Centre (Copenhagen, Denmark); Babraham Institute (Cambridge, UK); FMI- Friedrich Miescher Institute for Biomedical Research (Basel, Switzerland).

Partners in EU-LIFE operate with similar principles of excellence, external review, integrity and independence, competitiveness, internationality, and social responsibility. EU-LIFE partners believe that they can join forces to better address complex questions in research, training and research management, thereby contributing to pushing European science forward. Specific working groups join efforts, share best practice, brainstorm, and design common activities in areas of common interest such as technology transfer, international collaboration, translational research, science communication, competitive funding strategies, recruitment and training.

EU-LIFE has been established as a voice for research institutes in European policy, currently participating in the two stakeholders’ platforms that advise regularly the European Commission’s DG RTD - the Open Science Policy Platform and the European Research Area Stakeholders’ platform.

ELIXIR

ELIXIR brings together life science resources from across Europe. These resources include databases, software tools, training materials, cloud storage and supercomputers. The goal of ELIXIR is to coordinate these resources so that they form a single infrastructure that makes it easier for scientists to find and share data, exchange expertise, and agree on best practices.

Together with INESC-ID, ITQB and iBET, IGC is in the consortium that started ELIXIR Portugal and contributes actively to its Platforms. Moreover, IGC is a contractor in the H2020 EXCELERATE Project, that aims at accelerating the deployment of ELIXIR infrastructural services.

EUBnet - THE EUROPEAN MOLECULAR BIOLOGY NETWORK

Instituto Gulbenkian de Ciência node manager: Pedro L. Fernandes

The European Molecular Biology Network (EUBnet) is a network of academic partners that provide connections between communities of users and providers of bioinformatics resources. It has spearheaded a series of relevant initiatives to support the development of interconnected community resources.

The IGC is an institutional member of EUBnet since 1992.

GOBLET

Instituto Gulbenkian de Ciência representative: Pedro L. Fernandes

GOBLET, the Global Organisation for Bioinformatics Learning, Education and Training, is a focused group that dedicates systematic efforts to develop and enhance Bioinformatics Training and Education methods, sharing best practice in teaching and learning methods and supporting bioinformatics trainers and teachers worldwide.

The IGC is a member of GOBLET.

NEUBIAS

Instituto Gulbenkian de Ciência representative: Gabriel G. Martins (WG leader)

NEUBIAS is a new Network of European BioImage Analysts to advance life sciences imaging, aiming to maximize impact of imaging technology in Life-Sciences, and boost productivity of bio-imaging-based research projects in Europe. NEUBIAS collaborates with EU imaging research infrastructures to set up best practice guidelines for image analysis. The Action is creating interactive databases for tools and workflows with annotated image sample datasets, to help matching practical needs in biological problems with software solutions, and to benchmark these tools.

NEUBIAS developed a novel training programme with three levels of courses, open textbooks and offers travel grants in a Short-Term-Scientific-Missions programme to foster collaborations, technology access and knowledge transfer for scientists and specialists.
3 PUBLICATIONS

140 PEER REVIEWED IN-HOUSE PUBLICATIONS

13 PEER REVIEWED PUBLICATIONS FROM ASSOCIATED GROUPS

2 BOOK CHAPTERS

5 PROCEEDINGS
**PEER-REVIEWED PUBLICATIONS 2016**

**IN-HOUSE PUBLICATIONS**


genome and is restricted in the male germ line by DNA glycosylase activity. 
Elife. 5:e13546.


EPUB AHEAD OF PRINT


ASSOCIATED GROUPS


4 PRIZES & HONOURS

PRÉMIO PULIDO VALENTE CIÊNCIA 2016

Neurociências

Atribuído a

Roksana Maria Pirzgalska

pelo trabalho intitulado


11 PRIZES

45 HONOURS
BARROSO BATISTA, JOÃO
Gilbert S. Omenn Prize, International Society for Evolution, Medicine, and Public Health

BETTENCOURT DIAS, MÓNICA
ERC Panel member - Starting Grants (LS1), European Research Council

BISPO, CLÁUDIA
Travel Award to CYTO 2016, International Society for Advancement of Cytometry (ISAC)

BRAZA, FAOUZI
Marie S. Curie Individual Fellowship, European Commission

CARVALHO, JOANA
Outstanding poster award, DrosTuga 2016

CHAOUYA, CLAUDINE
Elected as an SBML Editor, Systems Biology Markup Language (SBML)

CONFRARIA, ANA
Postdoctoral fellowship, Fundação para a Ciência e a Tecnologia

COSTA, TERESA
BESTPRACT Short term mission fellowship, European BestPract Cost Action

DEMENGEO, JOCELYN
ERC Panel member - Starting Grants, European Research Council

EMBO COST action network

DUARTE, ELVES
Best PhD student oral communication award, DrosTuga 2016

DUQUE, PAULA
Member of Editorial Board, Scientific Reports
Member of Executive Board, International PhD Programme — Plants for Life

ESPIGARES PORTUO, FELIPE
Marie S. Curie Individual Fellowship, European Commission

FERREIRA, MIGUEL GODINHO
Member of the Conselho Científico das Ciências da Vida e da Saúde, Fundação para a Ciência e a Tecnologia

FRAGATA, INÉS
Godfrey-Hewitt Mobility Award, European Society for Evolutionary Biology

GJINI, ERIDA
ESCMID Attendance Grant for Short course, ESCMID

NIMBioS support for short-term visit, NIMBioS

Member of the organising committee, European Conference of Mathematical and Theoretical Biology 2018

GONÇALVES SÁ, JOANA
First Degree Honour Medal Award for Educational Merit, Government of Cabo Verde

LALOUIM, TOM
Marie S. Curie Individual Fellowship, European Commission

LOUREIRO, JOANA
Marie S. Curie Individual Fellowship, European Commission

MALLO, MOISÉS
Editorial Board member, Developmental Dynamics
Editorial Board, ISRN Developmental Biology

Pirzgalska, Roksana
Pulido Valente Science Award 2016*, Fundação Pulido Valente and Fundação para a Ciência e a Tecnologia

Academic Editor, PLoS ONE

MARTINS, GABRIEL
Leader of the Training working group, NEUBIAS COST action network

Member of programme committee, SPAOM 2016 meeting

Member of Scientific Review panel, CORBEL

MENARDO, ANA
Chair of the Science Communication Working Group, EU-LIFE

MILAGRE, INÉS
Marie S. Curie Individual Fellowship, European Commission

MIRTH, CHRISTEN
Women in Science Award, School of Biological Sciences

NOVARRO-COSTA, PAULO
Postdoctoral award, Portuguese Society for Developmental Biology

OLIVEIRA, RAQUEL
Prêmio Dona Antonia Adelaide Ferreira (“Revelation Award”), Sigrape Vinhos Lda.

OLIVEIRA, RITA
ASM Student/Postdoc Travel Grant, American Society for Microbiology

OLIVEIRA, RUI
President-Elect, Society for Social Neuroscience

Piskadlo, Ewa
Best Poster Award, EMBO Young Scientists Forum

ROCHA, LUÍS
Core Fulbright Scholar Programme, The J. William Fulbright Foreign Scholarship Board

Special Mention Award for Service to Community, The 5th International Workshop on Complex Networks and their Applications

SOARES, MIGUEL
Member of the Scientific Committee, “Europe-an Iron Club” Meeting

Scientific Advisor, EU-FP7 Consortium VISICORT

SOUTO MAIOR, CAETANO
Best Poster Award, 21st International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology

SRIDHAR, AKILA
EMBO Long-Term Fellowship, European Molecular Biology Organization

TEIXEIRA, LUÍS
FCT investigator, Fundação para a Ciência e a Tecnologia

THOMPSON, JESSICA
Postdoctoral fellowship, Fundação para a Ciência e a Tecnologia

WERNER, SASCHA
Best Poster Award, EMBO Conference, Cilia 2016

XAVIER, KARINA
FCT investigator, Fundação para a Ciência e a Tecnologia

ERC Panel member – Consolidator Grants (L56), European Research Council

GRADUATE EDUCATION & TRAINING

- 2 PhD PROGRAMMES
- 82 ADVANCED TRAINING PROGRAMME
- 167 PhD STUDENTS ATTENDING ADVANCED TRAINING
DESCRIPTION OF THE PROGRAMME

The IGC PhD programme offers to a selected group of students the opportunity to learn biology from a combination of resident Institute researchers and invited faculty from many of the world’s most prestigious scientific institutions. Students benefit from an intensive academic semester before choosing research groups to join, and writing their thesis projects. Candidates hail from all over the globe, and diverse academic backgrounds. The class of 2016 maintains its international collaboration with the University of Cologne, and the Max Planck Institute for Plant Breeding Research, as well as local partnerships with the Champalimaud Research (Champalimaud Foundation) and the Instituto de Tecnologia Química e Biomédica (ITQB-UNL). Students also benefit from many educational courses and workshops throughout their PhD, including our popular bioinformatics training programme, weekly seminars and an annual retreat. Graduate students drive social life at the Institute, organising cultural events year round.

The IBB programme is supported by the Fundação para Ciência e a Tecnologia and the Calouste Gulbenkian Foundation and its students are awarded their degrees from Universidade Nova de Lisboa.

SUPPORT STAFF

Manuela Cordeiro, Administrative assistant | Left in October
Paula Viana, Administrative assistant

E-MAIL: esucena@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/education/ibbprogramme

STUDENTS ADMITTED IN 2016

<table>
<thead>
<tr>
<th>NAME</th>
<th>NATIONALITY</th>
<th>FIRST DEGREE INSTITUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdulbasit Amin</td>
<td>Nigeria</td>
<td>MSc (Physiology) University of Ilorin, Nigeria</td>
</tr>
<tr>
<td>Alba Rodriguez</td>
<td>Spain</td>
<td>MSc (Biology) Universidade da Coruña, Spain</td>
</tr>
<tr>
<td>Ana Morais</td>
<td>Portugal</td>
<td>MSc (Evolutionary and Developmental Biology) Faculdade de Ciências da Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Catarina Nunes</td>
<td>Portugal</td>
<td>MSc (Evolutionary and Developmental Biology) Faculdade de Ciências da Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Gabriele Sgarlata</td>
<td>Portugal</td>
<td>MSc (Molecular Biology) University of Padova, Italy</td>
</tr>
<tr>
<td>Gonçalo Matos</td>
<td>Portugal</td>
<td>MSc (Evolutionary and Developmental Biology) Faculdade de Ciências da Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Rafael Paiva</td>
<td>Portugal</td>
<td>MSc (Biomedical Research) Faculdade de Medicina da Universidade de Coimbra, Portugal</td>
</tr>
<tr>
<td>Sónia Pereira</td>
<td>Portugal</td>
<td>MSc (Biotechnology) Instituto Superior Técnico, Universidade de Lisboa, Portugal</td>
</tr>
</tbody>
</table>

MODULES | COURSES RUN IN 2016

<table>
<thead>
<tr>
<th>JANUARY 11-15</th>
<th>HISTORY OF BIOLOGICAL CONCEPTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organiser:</td>
<td>Élio Sucena</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Michael Dietrich (Dartmouth College, New Hampshire, USA), Lars Jansen, Rui Oliveira (IGC, Portugal).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JANUARY 18-23</th>
<th>STATISTICS AND QUANTITATIVE BIOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisers:</td>
<td>Jorge Carneiro and Claudiue Chasuiya</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Nuno Sepúlveda (LSHTM, London, UK), Jorge Carneiro, Claudiue Chasuiya (IGC, Portugal).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JANUARY 25-29</th>
<th>STRUCTURAL AND MOLECULAR BIOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisers:</td>
<td>Alekos Athanasiadis and Lars Jansen</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Martin Jinek (University of Zurich, Switzerland), Reuben S. Harris (University of Minnesota, USA), Alekos Athanasiadis, Lars Jansen (IGC, Portugal).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FEBRUARY 01-05</th>
<th>BIOPHYSICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisers:</td>
<td>Filipa Alves and Ivo Tolley</td>
</tr>
<tr>
<td>Faculty:</td>
<td>Luis Melo (IST, Portugal), Susana Lopes (CEDOC, Portugal), Ricardo Louro, Manuela Pereira, Smilja Todorovic, Ivo Saraiva, James Yates (ITQB-UNL, Portugal), Cláudio Franco (IM, Portugal), Gabriel Martins, Erin Tranfield, Filipa Alves, Ivo Tolley (IGC, Portugal).</td>
</tr>
</tbody>
</table>
FEBRUARY 29 - MARCH 04
DEVELOPMENTAL BIOLOGY
Organisers: Diogo Castro and Moisés Mallo
Faculty: Gonçalo Castelo-Branco (Karolinska Institute, Sweden), Laurent Nguyen (GIGA, Université de Liège, Belgium), Ram Bashir (University of Haifa, Israel), Fernando Roch (Université Paul Sabatier, France), Ana Tavares (CEDOC, Portugal), Rita Fior (Champalimaud Research, Portugal), Vera Martins, Diogo Castro and Moisés Mallo (IGC, Portugal).

MARCH 07-11
EVOLUTION
Organisers: Isabel Gordo and Lounès Chikhi
Faculty: Bret Payseur (University of Wisconsin, USA), Lounès Chikhi, Claudia Bank, Ivo Chelo, Isabel Gordo, Lilia Porfeito (IGC, Portugal).

MARCH 14-18
EVOLUTION, DEVELOPMENT AND ECOLOGY
Organisers: Patrícia Beldade and Ivo Chelo
Faculty: Christian Braendle (Université Nice Sophia, France), Johannes Jaeger (The KLI Institute, Austria), Manuel A. S. Santos (iBiMED, Portugal), Christen Mirth, Patrícia Beldade, Ivo Chelo, Takashi Koyama (IGC, Portugal).

MARCH 21-25
NEUROBIOLOGY
Organisers: Rui Oliveira and Ana Domingos
Faculty: Suzana Herculano Houzel (Universidade Federal Rio de Janeiro, Brazil), Tim Fawcett (University of Exeter, UK), Paul Cohen (Rockefeller University, USA), Suzana Herculano Houzel (Universidade Federal Rio de Janeiro, Brazil), Tim Fawcett (University of Exeter, UK), Paul Cohen (Rockefeller University, USA), Ilona Grunwald Kadow (Max Plank Institute of Neurobiology, Germany), Michael Orger, Joe Paton, Inbal Israely, Christian Machens, Carlos Ribeiro, Marta Moita, Susana Lima and Gonzalo de Polavieja (Champalimaud Research, Portugal).

MARCH 28-APRIL 05
HOST-PATHOGEN INTERACTIONS/ IMMUNOBIOLOGY
Organisers: Luís Teixeira and Miguel Soares
Faculty: Peter Murray (St. Jude Children's Research Hospital, USA), Gabriel Núñez (University of Michigan, USA), Paul Schulze-Lefort (Max Planck Institute for Plant Breeding Research, Germany), Alexander Cherovensky (University of Chicago, USA), Tatjana Golovkina (University of Chicago, USA), Vasco Barreto (CEDOC, Portugal), Bruno Silva Santos (IMM, Portugal), Vera Martins, Luís Mota, Luís Teixeira, Miguel Soares, Jocelyne Demengeot, Jonathan Howard (IGC, Portugal).

APRIL 10-15
ECOLOGY
Organiser: Sara Magalhães (FCUL, Portugal)
Faculty: Paul Schmidt (University of Pennsylvania, USA), Marc-André Selosse (Musée National d’Histoire Naturelle, France), Ioannis Michalakis (IRD, France), Sara Magalhães (FCUL, Portugal).

APRIL 18-22
SYSTEMS BIOLOGY
Organiser: Claudine Chaouiya
Faculty: Nils Bluethgen (Charité Universitätsmedizin Berlin, Germany), Edda Schulz (Max Planck Institute for Molecular Genetics, Germany), Anais Baudot (Institut de Mathématiques de Marseille, France), Albert Goldbeter (Université Libre de Bruxelles, Belgium), Claudine Chaouiya, Erida Gjini (IGC, Portugal).

APRIL 25-29
PLANT BIOLOGY (Cologne, Germany)
Organiser: Isabell Witt (University of Cologne, Germany)
Faculty: Stanislav Koprica, Ute Hicker, Maria Alnahi (University of Cologne, Germany), Andreas Weber, Urte Schluter, Vera Göhr, Heinrich-Heine (Universität Dusseldorf, Germany), Elena Baena-González, Jörg Becker, Paula Duque (IGC, Portugal).

MAY 02-06
FROM CELLS TO ORGANISMS
Organisers: Karina Xavier and Miguel Godinho Ferreira
Faculty: Marco Demaria (ERIBA, University Medical Center Groningen, The Netherlands), Adriano O. Henriques, Mónica Serrano (ITQB-UNL, Portugal), Siêgo Dias, Bruno Bernardes de Jesus (IMM, Portugal), Karina Xavier, Miguel Godinho Ferreira, Ozhan Ozkaya (IGC, Portugal).

MAY 09-13
HYPOTHESIS DRIVEN RESEARCH
Organisers: Jocelyne Demengeot and José Leal
Faculty: Jocelyne Demengeot, José Leal, António Coutinho (IGC, Portugal).
DESCRIPTION OF THE PROGRAMME

The Graduate Programme Science for Development (PGCD) is an advanced training programme designed to prepare students from the various Portuguese Speaking African Countries (PALOP) to pursue research careers in Science and Technology, particularly in the Life Sciences.

It is currently being developed as a partnership between the IGC, the FCT and the MESCO of Cabo Verde, with three main goals:

1) To train the next generation of Portuguese-speaking African students, giving them the opportunity to learn advanced science;

2) To improve the quality of science education and scientific research in the PALOP;

3) To use science and technology as effective tools for development.

The programme offers basic training in the life sciences, particularly Plant Biology, Marine Biology and Tropical Diseases, consisting of one year of graduate courses, taking place in Praia, Cape Verde, followed by a 40 month research period leading to a PhD thesis, divided between the home countries and select institutes and universities abroad.

SUPPORT STAFF

Inês Maciel, Assistant
Carla Semedo, Assistant

STUDENTS ADMITTED IN 2016

<table>
<thead>
<tr>
<th>NAME</th>
<th>NATIONALITY</th>
<th>FIRST DEGREE</th>
<th>INSTITUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>António Sambundo Kapitão</td>
<td>Angola</td>
<td>Medicine</td>
<td>Faculdade de Medicina de Benguela, Angola</td>
</tr>
<tr>
<td>Bernardete Leonardo Camilo</td>
<td>Mozambique</td>
<td>Oceanography</td>
<td>Universidade Eduardo Mondlane, Mozambique</td>
</tr>
<tr>
<td>Cláudia da Cruz Gonçalves</td>
<td>Cabo Verde</td>
<td>Psychology</td>
<td>Université de Moncton, Canada</td>
</tr>
<tr>
<td>Danilo da Silva Lopes</td>
<td>Cabo Verde</td>
<td>Biotechnology</td>
<td>Universidade Estadual de São Paulo, Brazil</td>
</tr>
<tr>
<td>Dizimalta dos Santos Missitai</td>
<td>Mozambique</td>
<td>Biology</td>
<td>Universidade Pedagógica, Mozambique</td>
</tr>
<tr>
<td>Hamilton Diniz Chiango</td>
<td>Mozambique</td>
<td>Forestry</td>
<td>Instituto Superior de Agronomia, Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Hélio Ribeiro Rocha</td>
<td>Cabo Verde</td>
<td>Public Health</td>
<td>Universidade Jean Piaget, Cabo Verde</td>
</tr>
<tr>
<td>Irina Suheila Fonseca</td>
<td>Cabo Verde</td>
<td>Cell &amp; Molecular Biology</td>
<td>Universidade de Coimbra, Portugal</td>
</tr>
<tr>
<td>Joel Amaque Indi</td>
<td>Guinea- Bissau</td>
<td>Development &amp; Environment</td>
<td>Universidade Federal do Ceará, Brazil</td>
</tr>
<tr>
<td>Nuno Pais dos Santos</td>
<td>Cabo Verde</td>
<td>Biotechnology</td>
<td>Faculdade de Ciências da Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Valdir Rocha Semedo</td>
<td>Cabo Verde</td>
<td>Biochemistry</td>
<td>Faculdade de Ciências da Universidade de Lisboa, Portugal</td>
</tr>
<tr>
<td>Valéria dos Santos Custódio</td>
<td>Cabo Verde</td>
<td>Biology</td>
<td>Universidade de Coimbra, Portugal</td>
</tr>
</tbody>
</table>

MODULES | COURSES RUN IN 2016

JANUARY 18-22
FROM DNA TO PROTEINS – HISTORY AND STATE OF THE ART
Organiser: Miguel Godinho Ferreira (IGC, Portugal)
Faculty: Lars Janassen (IGC, Portugal), Rui Martinsinho (Universidade do Algarve, Portugal).

JANUARY 25-29
MOLECULAR BIOLOGY AND TECHNIQUES
Organiser: Maria João Amarim (IGC, Portugal)
Faculty: Susana Deusia (IGC, Portugal), Rita Teodoro (FCUL, Portugal).

FEBRUARY 01-05
THEORETICAL BIOLOGY AND EPIDEMIOLOGY
Organiser: Jorge Carneiro (IGC, Portugal)
Faculty: Nuno Sepúlveda (LSHTM, UK), Gabriela Gomes (LSHTM, UK).

FEBRUARY 08-12
EVOLUTION
Organisers: Filipa Vala (FCUL, Portugal), Tiago Paixão (IST, Austria)
Faculty: Rui Castanhinhas (IGC, Portugal), Sara Magalhães (FCUL, Portugal).
MODULES | COURSES RUN IN 2016 (cont.)

FEBRUARY 15-19
TRAFFICKING AND SIGNALLING
Organisers: Pedro Carvalho (CRG, Spain), Colin Adrain (IGC, Portugal)
Faculty: Cláudia Almeida (CEDOC, Portugal).

FEBRUARY 22-26
BIOINFOMATICS
Organiser: Nuno Morais (IMM, Portugal)
Faculty: Benilton Carvalho (UniCamp, Brazil), Inês Santiago (CIUHK, UK).

FEBRUARY 29 - MARCH 04
CELL CYCLE
Organisers: Raquel Oliveira (IGC, Portugal)
Faculty: Florence Janody (IGC, Portugal), Susana Godinho (UCL, UK).

MARCH 07-11
DEVELOPMENT
Organisers: António Jacinto (CEDOC, Portugal), Leonor Saúde (IMM, Portugal)
Faculty: Rita Flor (IGC, Portugal), Sérgio Dias (FMUL, Portugal).

MARCH 14-18
BIOINFORMATICS
Organiser: Nuno Morais (IMM, Portugal)
Faculty: Benilton Carvalho (UniCamp, Brazil), Inês Santiago (CRUK, UK).

MARCH 28 - APRIL 01
INTRODUCTION TO MARINE BIOLOGY
Organiser: Manuel Santos (ISPA, Portugal)
Faculty: Carlos Assis (FCUL, Portugal).

APRIL 04-08
MARINE ECOLOGY
Organiser: Miguel Barbosa (St. Andrews, UK)
Faculty: Roberta Bonaldo (Universidade de São Paulo, Brazil).

APRIL 11-15
MARINE POPULATION PHYLOGENIES, GENETICS AND GENOMICS
Organiser: Ricardo Beldade (CNRS, France)
Faculty: Rui Faria (Universidade do Porto, Portugal), André Vale (IBCCF, Brazil).

APRIL 18-22
AQUACULTURE AND FISHERIES
Organiser: Jorge Gonçalves (Universidade do Algarve, Portugal)
Faculty: Cláudia Aragão (Universidade do Algarve, Portugal).

JUNE 27 - JULY 01
TROPICAL MEDICINE AND CLINICAL MICROBIOLOGY
Organiser: Thomas Hanscheid (IMM, Portugal)
Faculty: Robert Badura, Carla Santos, Elisabette Martins (IMM, Portugal).

APRIL 25-29
AQUATIC PLANTS AND ALGAE
Organisers: Ester Serrão (Universidade do Algarve, Portugal), Salomón Bandeira (UEM, Mozambique)
Faculty: Joel Creed (UERJ, Brazil), Peter Witz (Universidade da Madeira, Portugal), Joanna Bravida (Universidade do Algarve, Portugal).

MAY 08-13
PLANT BIOLOGY AND BIOCHEMISTRY
Organiser: Paula Duque (IGC, Portugal)
Faculty: Jorge Marques da Silva (FCUL, Portugal), José Feció (University of Maryland, USA), Alessandro Ramos (UENF, Brazil).

MAY 18-20
PLANT STRESS AND NUTRITION
Organiser: Elena Baena (IGC, Portugal)
Faculty: Alessandro Ramos (UENF, Brazil), Nelson Saibo (ITQB-UNL, Portugal).

MAY 23-27
BIOTECHNOLOGY TECHNIQUES
Organisers: Fatima Gross de Sá (Universidade de Brasília, Brazil)
Faculty: Patrícia Pelegrini (Embrapa, Brazil).

JUNE 06-10
IMMUNOLOGY
Organiser: Vasco Barreto (CEDOC, Portugal)
Faculty: José Alexandre (Universidade de Évora, Portugal), Manfred Madeira, João Neves Martins (ISPA, Portugal).

JUNE 13-17
IMMUNITY OF HOST–PATHOGEN INTERACTIONS
Organiser: Helena Soares (CEDOC, Portugal)
Faculty: Rafaela Gozelnio (CEDOC, Portugal), Ana Mena, Teresa Costa (IGC, Portugal).
DESCRIPTION OF THE PROGRAMME

The GTPB runs face-to-face Bioinformatics Training Courses regularly at the Instituto Gulbenkian de Ciência since 1999. Up to now, more than 5000 course participants have acquired practical skills that they can use with high degree of independence.

The Programme consists in a series of short, intensive hands-on courses delivered and fully documented in English. The design of the courses is based on sets of carefully chosen exercises, flanked by short lectures and participative interaction sessions. The training methodology is based on active learning principles. A set of courses addresses recognised needs in a stable manner, whereas new themes are introduced each year to allow for novel areas where Bioinformatics is making new impacts.

The courses are held in a fully equipped training room, enabling intensive interactions between instructors and participants. In 2016, the GTPB has provided 13 training courses to a grand total of 167 participants from 19 nationalities. Of these, 113 participants were from Portuguese institutions, 60 from the IGC and 54 from foreign institutions.

MODULES | COURSES RUN IN 2016

Organiser: Pedro L. Fernandes

MARCH 28 - APRIL 1
NDARC16 - NGS DATA ANALYSIS, RNAseq, ChIPseq
Faculty: Mark Dunning (Cancer Research UK, University of Cambridge, UK), Tom Carroll (MBI Clinical Sciences Centre, UK), Nuno Barbosa-Morais (IMM, Portugal).

APRIL 1-15
PDA16 - PROTEOMICS DATA ANALYSIS
Faculty: Lennart Martens (Ghent University and VIB, Belgium), Harald Barsnes, Marc Vaudel (University of Bergen, Norway).

APRIL 18-22
IBISF - INTRODUCTORY BIOINFORMATICS: Our entry level course with a soft introduction to NGS data analysis
Faculty: David P. Judge (Freelancer Bioinformatics instructor), Pedro Fernandes, Daniel Sobral (IGC, Portugal).

MAY 9-13
ARANGS16 - AUTOMATED AND REPRODUCIBLE ANALYSIS OF NGS DATA
Faculty: Rutger Vos, Hannes Hettling (Naturalis, The Netherlands), Darin London (Duke University Medical Center, USA).

MAY 18-20
GTDA16 - GENOMIC AND TRANSCRIPTOMIC DATA ANALYSIS
Faculty: Francisco García and Alejandro Alemán (Centro de Investigación Príncipe Felipe, Spain).

JULY 11-15
BPPR16 - BIOINFORMATICS USING PYTHON FOR BIOMEDICAL RESEARCHERS
Faculty: Allegra Via (IBBE, CNR, Italy) and Vincenzo Colonna (IGB, CNR, Italy).

SEPTEMBER 27-30
PM16 - PRECISION MEDICINE: NGS variant analysis and interpretation for translational research
Faculty: Fatima Al-Shahrour, Elena Piñeiro, Javier Perales (CNIO, Spain).

OCTOBER 10-14
3DAROC16 - 3C-BASED DATA ANALYSIS AND 3D RECONSTRUCTION OF CHROMATIN FOLDING
Faculty: Marc Martí-Renom, François Serra, Marco di Stefano (Centro Nacional de Análisis Genómico and CRG-Barcelona, Spain).
POSTDOCTORAL TRAINING

SCIENTIFIC COORDINATOR
XAVIER, KARINA B.

DESCRIPTION OF THE PROGRAMME

The Postdoc Committee, a group of volunteer postdoctoral fellows, is responsible for organising activities to promote professional development of the postdoc community at the IGC. In 2016, the Committee established a successful new format of the weekly seminar series (20 minutes with...), where IGC Postdocs and senior PhD students presented short talks. Scientific seminars by Daniel Van Damme (VIB, Belgium), Leonie Ringrose (Humboldt University, Germany), and Anna Akhmanova (Utrecht University, The Netherlands) were hosted. To find inspiration, three Career Path seminars by Maria Leptin (EMBO director), Peter Murray and Lucia Prieto Godino (TReND) were organised. To improve professional skills, four workshops were held: Improving skills to better communicate with lay audiences by the Science Communication Unit, Advice and tips to improve your CV by the RFA unit, Surviving in Science by Leonie Ringrose, and Training on peer-reviewing supported by eLIFE. The Committee also co-organised the Annual Postdoc Retreat that brought together 116 researchers from IGC, iBET, ITQB, iMM, and CCU that participated on a three-day meeting focused on scientific interactions and career development. Portuguese and English language classes form part of the available training, coordinated by the committee. A document proposing future changes for continued professional development of IGC postdocs via a formal programme was drafted and submitted by the Postdoc Committee.

E-MAIL: postdoccommittee@igc.gulbenkian.pt
IGC WEBPAGE: http://www.igc.gulbenkian.pt/education/pdtraining
EXTERNAL WEBSITE: https://www.facebook.com/igcpostdocs/

SUMMER INTERNSHIP PROGRAMME

COORDINATOR
AMORIM, MARIA JOÃO

DESCRIPTION OF THE PROGRAMME

In 2014, the IGC and University of Oxford established a partnership aiming to bring young science undergraduates to the IGC for an 8-week lab experience under the Oxford University Internship Programme. This programme has since then expanded to accommodate several undergraduates studying at universities from the Lisbon area, including Instituto Superior Técnico, Universidade de Lisboa and Universidade Nova de Lisboa. In 2016, the IGC hosted 18 talented summer students that enjoyed the atmosphere of the IGC, experienced the life of a researcher and presented their work in a symposium for the IGC community.

Funding: University of Oxford and Calouste Gulbenkian Foundation

HOSTING GROUPS IN 2016

- Chromosome Dynamics
- Cell Cycle Regulation
- Epigenetic Mechanisms
- Evolutionary Dynamics
- Evolutionary Biology
- Network modeling
- Cellular and Systems Neurobiology
- Innate Immunity & Inflammation
- Molecular Neurobiology
- Host-Microorganism Interactions
- Plant Stress Signalling
- Quantitative Organism Biology
- Lymphocyte Physiology
THESES 2016

BSc THESES

CRUZ, JOSIMAR
Generation of Physcomitrella patens mutants
Escola Superior de Tecnologia de Barreiro, Instituto Politécnico de Setúbal, Portugal - December

ALMEIDA, ANA
How different host genotypes alter the virulence transmission trade-off in Drosophila melanogaster - Pseudomonas entomophila complex?
Universidade de Lisboa, Portugal - December

CARVALHO, JOANA
A role for microRNAs in haematopoiesis and immunology of Drosophila melanogaster
Universidade de Lisboa, Portugal - October

DIAS, ANDRÉ
Retinoic acid: a key regulator of vertebrate embryonic development
Universidade de Lisboa, Portugal - October

LARANJEIRA, ANA
Can evolution of gut microbiota alter C. elegans longevity?
Universidade de Lisboa, Portugal - November

LINDEZA, ANA SOFIA
How does developmental plasticity differ between diverse types of nutrition regimes?
Universidade de Lisboa, Portugal - March

LOPES, FILIPA
Alternative splicing and SR proteins in ABA-mediated stress responses
Universidade de Lisboa, Portugal - October

LOURO, MARCO
A stochastic model of centriole assembly
Universidade de Lisboa, Portugal - December

MARTINS, NUNO
How different host genotypes alter the virulence transmission trade-off in Drosophila melanogaster - Pseudomonas entomophila complex?
Universidade de Lisboa, Portugal - December

PEDRO, MIGUEL
Metabolic-derived functions during adaptation of E. coli to the mammalian gut
Universidade de Lisboa, Portugal - December

RAMOS, CAMILA V.
A discrete logical modelling framework to study tissue patterning and morphogenesis
Universidade de Lisboa, Portugal - July

RIBEIRO, DIOGO
Indirect genetic effects of oxytocin in the development of social behaviour in zebrafish
Universidade de Lisboa, Portugal - December

TOMAZ, DIOGO
Insight on the function of MyT1L in Ascl1 mediated neuronal reprogramming
Universidade de Lisboa, Portugal - January

VERISSIMO, MARIA INÉS
The role of ARL17 in influenza A virus infection
Universidade de Coimbra, Portugal - September

VIEGAS, FILIPE
Role of Tropomysin 2 in cell proliferation and survival of Drosophila melanogaster
Universidade de Lisboa, Portugal - December

YOKOTA, AYA
Role of conserved RNA regulatory elements in posttranscriptional regulation by zinc
Université Pierre et Marie Curie, France - June

PhD THESES

AIRES, ANA RITA
Gdf11 signalling, Oct4 and the control of vertebrate trunk length
Universidade Nova de Lisboa, Portugal - July

ALMEIDA, ANA INÉS
An approach to molecular genetics of thyroid cancer: from novel mutations to a zebrafish model
Universidade do Porto, Portugal - February

AREAL, RÔMULO
Reciprocal interactions between Helicobacter hepaticus and the mouse immune system
Universidade Nova de Lisboa, Portugal - December

BARROSO-BATISTA, JOÃO
Adaptation of Escherichia coli to the mouse gut
Universidade Nova de Lisboa, Portugal - December

FAUSTINO, ANA
Social buffering of fear in zebrafish
Instituto Superior de Psicologia Aplicada, Portugal - May

FAVARETTO, GIACOMO
The role of clonal interference across genetic backgrounds and environments
Universidade Nova de Lisboa, Portugal - May

SURKONT, JAROSLAW
Tracing protein evolutionary trajectory: Homology inference with specific molecular constraints
Universidade Nova de Lisboa, Portugal - June

TAVARÉS, SANDRA
The role of actin cytoskeleton downstream of the Src oncogene in the earlier events of breast tumour progression
Universidade Nova de Lisboa, Portugal - November

MATEUS, ANA RITA
Temperature effects on genetic and physiological regulation of adaptive plasticity
University of Liége, The Netherlands - July

RODRIGUEZ, WILLY
Patterns of genetic diversity in socially structured populations: an individual based approach
Universidade Nova de Lisboa, Portugal - April

ROSMAINHO, PEDRO
Gene regulation by the transcription factor ZEB1 in glioblastoma multiforme
Universidade Nova de Lisboa, Portugal - November

SOUSA, JORGE
The role of clonal interference across genetic backgrounds and environments
Universidade Nova de Lisboa, Portugal - May
TEACHING AT OTHER PhD PROGRAMMES 2016

AMORIM, MARIA JOÃO
Myosin and actin steer plant cell division
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - March
Viruses and the recycling endosome
7th Advanced Course in Cell Biology, Hong Kong University-Institute Pasteur, Hong Kong - March
Viruses and the recycling endosome
Faculdade de Medicina, Universidade de Coimbra, Portugal - November

BECKER, JÖRG
Microarrays as tools to decipher biological processes
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - February
(Epi)genetic basis of sexual reproduction in land plants: A focus on the male gametes
ITQB Plants for Life PhD Programme, Universidade Nova de Lisboa, Portugal - April
Microarrays and deep sequencing as tools to decipher biological processes
BioFIG BioSYS PhD Programme, Faculdade de Ciências da Universidade de Lisboa, Portugal - June

BISPO, CLAUDIA
Flow Cytometry in plant sciences
ITQB Plants for Life PhD Programme, Universidade Nova de Lisboa, Portugal - April

BORGES, ANA CRISTINA
11th edition of the Laboratory Animal Science Course – Zebrafish module, Training in Biomedical Sciences and Other Areas, Universidade do Minho, Portugal - February

CASTRO, DIOGO
GABBA Graduate Program in Areas of Basic and Applied Biology, Universidade do Porto, Portugal - April
Brain Development Course, Karolinska Institute, Sweden - August

CHAOUYA, CLAUDINE
Logical modelling of multi-cellular systems
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - February

JANSEN, LARS
Principals of epigenetic inheritance
PhD course “Epigenetics from mechanisms to disease”, Universidade do Minho, Portugal - April

MALLO, MOISÉS
Development of the spinal cord
“Axonal regeneration” module, GABBA Graduate Program in Areas of Basic and Applied Biology, Universidade do Porto, Portugal - June

MARTINS, GABRIEL
Light microscopy
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - January

METHIE, CHRISTEN
Mesoscopic imaging
BioFIG BioSYS PhD Programme, Faculdade de Ciências da Universidade de Lisboa, Portugal - June

MIRTH, CHRISTEN
Mesoscopic imaging
BioFIG BioSYS PhD Programme, Faculdade de Ciências da Universidade de Lisboa, Portugal - July

DOMINGOS, ANA
NutmNeuro PhD Course on Neurobiology and Nutrition, Bordeaux University, France

MORGAN, PAULA
Alternative splicing controls translation efficiency of a membrane transporter to promote plant tolerance to zinc
BioFIG BioSYS PhD Programme, Universidade Nova de Lisboa, Portugal - March

WRIGHT, CHRISTEN
Alternative splicing controls translational efficiency of a membrane transporter to promote plant tolerance to zinc
ITQB Plants for Life PhD Programme, Universidade Nova de Lisboa, Portugal - March

MOITA, LUIS FERREIRA
Disease tolerance in immunity
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - March
Disease tolerance in immunity
GABBA Graduate Program in Areas of Basic and Applied Biology, Universidade do Porto, Portugal - January

OLIVEIRA, RUI
Social cognition in zebrafish
Conférence Universitaire de Suisse Occidentale Inter-University Doctoral Programme in Ecology and Evolution Workshop “The role of sensory ecology and cognition in social decision, Switzerland - July

REBELLO, MANUEL
Animal house facilities and regulations for animal experimentation
PhD Programme in Health Sciences, Universidade de Coimbra, Portugal - October

ROCHA, LUIS
Tissue Damage Control in Immune Mediated Inflammatory Diseases
BRIDGE GAPS – CROSS ROADS Joint Symposium of 4 PhD Programmes CCHD, IAI, ICA, MCCA/Medical University of Vienna - February
Tissue damage control & disease susceptibility
GABBA Graduate Program in Areas of Basic and Applied Biology, Universidade do Porto, Portugal - June

SOARES, MIGUEL
Macrophage, iron metabolism & homeostasis
EFIS-EJI Ruggero Ceppellini Advanced School of Immunology, Vienna - February

TRANFIELD, ERIN
Introduction to electron microscopy
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - January

XAVIER, KARINA
Bacterial quorum sensing in the mammalian gut microbiota
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - April

Bacterial communities inside our bodies
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - April

SOBRAL, DANIEL
NGS Data Analysis
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - April

SOMBRA, DANIEL
Introduction to Bioinformatics
Workshop in Marine Genomics - September

TEIXEIRA, LUIS
Symbiotic modulation of host-pathogen interactions
ITQB MolBioS PhD Programme, Universidade Nova de Lisboa, Portugal - October
6 SEMINARS & MEETINGS

77 INTERNAL SPEAKERS

106 EXTERNAL SPEAKERS

92 PRESENTATIONS AT NATIONAL MEETINGS

182 AT INTERNATIONAL MEETINGS

29 MEETINGS, CONFERENCES AND WORKSHOPS ORGANISED BY IGC RESEARCHERS
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>05.01</td>
<td>Title Chromosome architecture and the fidelity of mitosis during development</td>
<td>Speaker Raquel Oliveira</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Unravelling hidden roles of microRNAs in bacterial pathogen host interaction</td>
<td>Speaker Ana Eulalio</td>
<td>Affiliation Institute for Molecular Infection Biology, University of Würzburg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Epigenetic barriers in stem cell states during development and cancer</td>
<td>Speaker Alexandre Maia</td>
<td>Affiliation ICG</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Cell shape and morphogenesis: sub cellular and supracellular mechanisms</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>12.01</td>
<td>Title The iron age of host microbe interactions</td>
<td>Speaker Wacław Siewok</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>13.01</td>
<td>Title “What did you say?” - When we loose our senses</td>
<td>Speaker Sascha Werner</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>14.01</td>
<td>Title Changing peer review in life sciences research – eLife journal</td>
<td>Speaker Mark Patterson</td>
<td>Affiliation eLife, Cambridge, UK</td>
</tr>
<tr>
<td>15.01</td>
<td>Title Johannes Holtfreter and the politics of gastrulation</td>
<td>Speaker Michael R. Distech</td>
<td>Affiliation Department of Biological Sciences, Dartmouth College, USA</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Central sensing of peripheral growth perturbations</td>
<td>Speaker Alisson Gontijo</td>
<td>Affiliation CEDOC, Portugal</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Cellular memory of transcription - initial observations</td>
<td>Speaker Catarina Nabais/Maria Francia</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>20.01</td>
<td>Title Trypanosoma parasites: a new life beyond the bloodstream</td>
<td>Speaker Luísa Figueiredo</td>
<td>Affiliation Instituto de Medicina Molecular, Portugal</td>
</tr>
<tr>
<td>22.01</td>
<td>Title Getting in Shape: in vivo and in silico studies of tissue mechanics in growth control</td>
<td>Speaker Yanlan Mao</td>
<td>Affiliation MRC Laboratory for Molecular Cell Biology, University College London, UK</td>
</tr>
<tr>
<td>26.01</td>
<td>Title Bridging theoretical and experimental evolution - predicting the future using models from the past?</td>
<td>Speaker Lars Jansen</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>27.01</td>
<td>Title Taking advantage of CRISPR technology to address centrole biogenesis questions in different organisms</td>
<td>Speaker Delphine Pessos</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>29.01</td>
<td>Title Toward a molecular and clinical mutagenesis of APOBEC in cancer</td>
<td>Speaker Reuben Harris</td>
<td>Affiliation Howard Hughes Medical Research Institute, University of Minnesota, USA</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Unravelling hidden roles of microRNAs in bacterial pathogen host interaction</td>
<td>Speaker Ana Eulalio</td>
<td>Affiliation Institute for Molecular Infection Biology, University of Würzburg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Epigenetic barriers in stem cell states during development and cancer</td>
<td>Speaker Alexandre Maia</td>
<td>Affiliation ICG</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Cell shape and morphogenesis: sub cellular and supracellular mechanisms</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>12.01</td>
<td>Title The iron age of host microbe interactions</td>
<td>Speaker Wacław Siewok</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>13.01</td>
<td>Title “What did you say?” - When we loose our senses</td>
<td>Speaker Sascha Werner</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>14.01</td>
<td>Title Changing peer review in life sciences research – eLife journal</td>
<td>Speaker Mark Patterson</td>
<td>Affiliation eLife, Cambridge, UK</td>
</tr>
<tr>
<td>15.01</td>
<td>Title Johannes Holtfreter and the politics of gastrulation</td>
<td>Speaker Michael R. Distech</td>
<td>Affiliation Department of Biological Sciences, Dartmouth College, USA</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Central sensing of peripheral growth perturbations</td>
<td>Speaker Alisson Gontijo</td>
<td>Affiliation CEDOC, Portugal</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Cellular memory of transcription - initial observations</td>
<td>Speaker Catarina Nabais/Maria Francia</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>20.01</td>
<td>Title Trypanosoma parasites: a new life beyond the bloodstream</td>
<td>Speaker Luísa Figueiredo</td>
<td>Affiliation Instituto de Medicina Molecular, Portugal</td>
</tr>
<tr>
<td>22.01</td>
<td>Title Getting in Shape: in vivo and in silico studies of tissue mechanics in growth control</td>
<td>Speaker Yanlan Mao</td>
<td>Affiliation MRC Laboratory for Molecular Cell Biology, University College London, UK</td>
</tr>
<tr>
<td>26.01</td>
<td>Title Bridging theoretical and experimental evolution - predicting the future using models from the past?</td>
<td>Speaker Lars Jansen</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>27.01</td>
<td>Title Taking advantage of CRISPR technology to address centrole biogenesis questions in different organisms</td>
<td>Speaker Delphine Pessos</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>29.01</td>
<td>Title Toward a molecular and clinical mutagenesis of APOBEC in cancer</td>
<td>Speaker Reuben Harris</td>
<td>Affiliation Howard Hughes Medical Research Institute, University of Minnesota, USA</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Unravelling hidden roles of microRNAs in bacterial pathogen host interaction</td>
<td>Speaker Ana Eulalio</td>
<td>Affiliation Institute for Molecular Infection Biology, University of Würzburg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Epigenetic barriers in stem cell states during development and cancer</td>
<td>Speaker Alexandre Maia</td>
<td>Affiliation ICG</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Cell shape and morphogenesis: sub cellular and supracellular mechanisms</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>12.01</td>
<td>Title The iron age of host microbe interactions</td>
<td>Speaker Wacław Siewok</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>13.01</td>
<td>Title “What did you say?” - When we loose our senses</td>
<td>Speaker Sascha Werner</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>14.01</td>
<td>Title Changing peer review in life sciences research – eLife journal</td>
<td>Speaker Mark Patterson</td>
<td>Affiliation eLife, Cambridge, UK</td>
</tr>
<tr>
<td>15.01</td>
<td>Title Johannes Holtfreter and the politics of gastrulation</td>
<td>Speaker Michael R. Distech</td>
<td>Affiliation Department of Biological Sciences, Dartmouth College, USA</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Central sensing of peripheral growth perturbations</td>
<td>Speaker Alisson Gontijo</td>
<td>Affiliation CEDOC, Portugal</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Cellular memory of transcription - initial observations</td>
<td>Speaker Catarina Nabais/Maria Francia</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>20.01</td>
<td>Title Trypanosoma parasites: a new life beyond the bloodstream</td>
<td>Speaker Luísa Figueiredo</td>
<td>Affiliation Instituto de Medicina Molecular, Portugal</td>
</tr>
<tr>
<td>22.01</td>
<td>Title Getting in Shape: in vivo and in silico studies of tissue mechanics in growth control</td>
<td>Speaker Yanlan Mao</td>
<td>Affiliation MRC Laboratory for Molecular Cell Biology, University College London, UK</td>
</tr>
<tr>
<td>26.01</td>
<td>Title Bridging theoretical and experimental evolution - predicting the future using models from the past?</td>
<td>Speaker Lars Jansen</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>27.01</td>
<td>Title Taking advantage of CRISPR technology to address centrole biogenesis questions in different organisms</td>
<td>Speaker Delphine Pessos</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>29.01</td>
<td>Title Toward a molecular and clinical mutagenesis of APOBEC in cancer</td>
<td>Speaker Reuben Harris</td>
<td>Affiliation Howard Hughes Medical Research Institute, University of Minnesota, USA</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Unravelling hidden roles of microRNAs in bacterial pathogen host interaction</td>
<td>Speaker Ana Eulalio</td>
<td>Affiliation Institute for Molecular Infection Biology, University of Würzburg, Germany</td>
</tr>
<tr>
<td>07.01</td>
<td>Title Epigenetic barriers in stem cell states during development and cancer</td>
<td>Speaker Alexandre Maia</td>
<td>Affiliation ICG</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Cell shape and morphogenesis: sub cellular and supracellular mechanisms</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>08.01</td>
<td>Title Career Paths in Science</td>
<td>Speaker Maria Leptin</td>
<td>Affiliation EMBO, Heidelberg, Germany</td>
</tr>
<tr>
<td>12.01</td>
<td>Title The iron age of host microbe interactions</td>
<td>Speaker Wacław Siewok</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>13.01</td>
<td>Title “What did you say?” - When we loose our senses</td>
<td>Speaker Sascha Werner</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>14.01</td>
<td>Title Changing peer review in life sciences research – eLife journal</td>
<td>Speaker Mark Patterson</td>
<td>Affiliation eLife, Cambridge, UK</td>
</tr>
<tr>
<td>15.01</td>
<td>Title Johannes Holtfreter and the politics of gastrulation</td>
<td>Speaker Michael R. Distech</td>
<td>Affiliation Department of Biological Sciences, Dartmouth College, USA</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Central sensing of peripheral growth perturbations</td>
<td>Speaker Alisson Gontijo</td>
<td>Affiliation CEDOC, Portugal</td>
</tr>
<tr>
<td>19.01</td>
<td>Title Cellular memory of transcription - initial observations</td>
<td>Speaker Catarina Nabais/Maria Francia</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>20.01</td>
<td>Title Trypanosoma parasites: a new life beyond the bloodstream</td>
<td>Speaker Luísa Figueiredo</td>
<td>Affiliation Instituto de Medicina Molecular, Portugal</td>
</tr>
<tr>
<td>22.01</td>
<td>Title Getting in Shape: in vivo and in silico studies of tissue mechanics in growth control</td>
<td>Speaker Yanlan Mao</td>
<td>Affiliation MRC Laboratory for Molecular Cell Biology, University College London, UK</td>
</tr>
<tr>
<td>26.01</td>
<td>Title Bridging theoretical and experimental evolution - predicting the future using models from the past?</td>
<td>Speaker Lars Jansen</td>
<td>Affiliation IGC</td>
</tr>
<tr>
<td>27.01</td>
<td>Title Taking advantage of CRISPR technology to address centrole biogenesis questions in different organisms</td>
<td>Speaker Delphine Pessos</td>
<td>Affiliation IGC</td>
</tr>
</tbody>
</table>
MARCH

Date 01.03
Title Signal integration in quorum sensing enables bacteria to respond to different ecological contexts
Speaker Karina Xavier
Affiliation IGC

Date 01.03
Title CNS development and epigenetics: on oligodendrocytes and multiple sclerosis
Speaker Gonçalo Castelo-Branco
Affiliation Karolinska Institute, Sweden

Date 02.03
Title Actin' as a checkpoint?
Speaker Praachi Jain
Affiliation IGC

Date 03.03
Title Hox genes and the establishment of the kidney morphogenetic field: a new head on old shoulders
Speaker Ram Reshef
Affiliation Faculty of Natural Sciences, University of Haifa, Israel

Date 04.03
Title A dynamic unfolded protein response contributes to the control of cortical neuron genesis
Speaker Laurent Nguyen
Affiliation GIGA, Université de Liège, Belgium

Date 08.03
Title What is going on in the Network Modelling group? From theory to biological applications and... back!
Speaker Claude Chaouiya
Affiliation IGC

Date 09.03
Title Crosstalk between ABA and Snrk1 mediated energy signalling
Speaker Mattia Adamo
Affiliation Cold Spring Harbor Laboratory, USA

Date 11.03
Title Genetics of rapid and extreme size evolution in island mice
Speaker Bret Payeur
Affiliation Laboratory of Genetics, University of Wisconsin, USA

Date 14.03
Title Intravital imaging of fungalfilarial-innate immune dynamics and dissemination in vivo
Speaker Robert Wheeler
Affiliation University of Maine, USA

Date 15.03
Title Found in translation: from genomics to novel gene functions
Speaker Andrea Pauli
Affiliation Research Institute of Molecular Pathology, Austria

Date 15.03
Title Tetraspanin-associated signalling complexes as mediators of gamete interactions in plant fertilization
Speaker Jörg Becker/ Leonor Boavida
Affiliation IGC

Date 15.03
Title Transcriptional integration of synaptic and neuroendocrine signalling in the zebrafish nervous system
Speaker Vincent Cunliffe
Affiliation Department of Biomedical Science, University of Sheffield, UK

Date 16.03
Title Imaging and modifying tumor-immune cell interactions in tumor rejection
Speaker Ana S. Almeida
Affiliation IGC

Date 16.03
Title Plant experimental assay ontology
Speaker Inês Chaves
Affiliation Forest Biotech Lab, IBET/ITQB-UNL, Portugal

Date 16.03
Title Crosstalk between ABA and Snrk1 mediated energy signalling
Speaker Mattia Adamo
Affiliation IGC

Date 16.03
Title Controlled chaos: reigning in the TEV protease in order to study aneuploidy
Speaker Mihailo Mirkovic
Affiliation IGC

Date 19.03
Title Evolution of codon reassignment in yeast
Speaker Manuel A. S. Santos
Affiliation Department of Medical Sciences, iBIMED, Universidade de Aveiro, Portugal

Date 21.03
Title Linking genes, development and function of the zebrafish hypothalamus
Speaker Gil Levkowitz
Affiliation Weizmann Institute of Science, Israel

Date 23.03
Title Epithelial polarity and spindle orientation
Speaker Daniel Saint Johnston
Affiliation Garvan Institute, Cambridge, UK

Date 23.03
Title Anticipating the future: evolutionary explanations for risk sensitivity, contrast effects and winner and loser effects
Speaker Tim Fawcett
Affiliation University of Exeter, UK

Date 24.03
Title Does this look infected? Analyzing time course of viral load to assess impact of Wolbachia on dengue virus transmission
Speaker Caetano Mendes
Affiliation IGC

Date 24.03
Title Brain diversity in evolution: what changes, what doesn’t, and why does it matter?
Speaker Suzana Herculano-Houzel
Affiliation Federal University of Rio de Janeiro, Brazil

Date 24.03
Title Experimental population genomics in Drosophila
Speaker Christian Schlüterer
Affiliation Institut für Populationsgenetik Vetmeduni, Austria

Date 24.03
Title Between chemosensation and metabolism: how the nervous system integrates odors and tastes with internal state
Speaker Iona Groszland-Kadow
Affiliation Max Plank Institute for Neurobiology, Germany

Date 25.03
Title Transcriptional control of subcutaneous and visceral adipose tissue phenotype
Speaker Paul Cohen
Affiliation Rockefeller University, USA

Date 28.03
Title Making the invisible visible: structure and functions of the plant microbiota
Speaker Paul Schulze-Lefert
Affiliation Max Planck Institute for Plant Breeding Research, Germany

Date 29.03
Title Host immunity, pathogens and the microbiota at the intestinal barrier
Speaker Gabriel Nunez
Affiliation University of Michigan, USA

Date 29.03
Title Violation of Mendel’s first law: cell biological mechanisms of meiotic drive
Speaker Michael Lampson
Affiliation University of Pennsylvania, USA

Date 29.03
Title Career Path Seminar
Speaker Peter Murray
Affiliation St. Jude Children’s Research Hospital, USA

Date 30.03
Title Amino acid auxotrophy as a central immunoregulatory control point
Speaker Peter Murray
Affiliation St. Jude Children’s Research Hospital, USA

Date 30.03
Title Immune cells in the neuro-adipose connection
Speaker Roksana Pirzgalska
Affiliation IGC

APRIL

Date 01.04
Title Rab small GTPases into prokaryotes
Speaker José Pereira Leal
Affiliation IGC

Date 04.04
Title Microbiota and autoimmunity
Speaker Alexander Chernovasky
Affiliation University of Chicago, USA

Date 05.04
Title How cells count: control of centrosome number factor
Speaker Tatjana V. Golovkina
Affiliation University of Chicago, USA

Date 12.04
Title Mechanisms of influenza: A virus assembly
Speaker Maria João Amorim
Affiliation IGC

Date 13.04
Title Age as a carcinogen: is it all about telomere shortening?
Speaker Kirsten Lex
Affiliation IGC

Date 14.04
Title The strange lifestyle of multipartite viruses
Speaker Ioannis Michalakis
Affiliation Institut de Recherche pour le Développement, France

Date 15.04
Title Rapid adaptation and eco-evolutionary dynamics over seasonal timescales
Speaker Paul Schmidt
Affiliation University of Pennsylvania, USA

Date 19.04
Title Network approaches for human diseases
Speaker Anais Baudot
Affiliation Institute of Mathematics, Aix-Marseille University, France
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>20.04</td>
<td>How do zebrafish learn from others? - The social learning</td>
<td>Yulia Pinho</td>
<td></td>
<td>IGC</td>
</tr>
<tr>
<td>21.04</td>
<td>The role of microRNAs in controlling gene expression variability</td>
<td>Nila Blüthgen</td>
<td>Horizont Discovery, The Netherlands</td>
<td>IGC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Charite, Universitätsmedizin Berlin, Institut für Pathologie</td>
<td>Germany</td>
<td></td>
</tr>
<tr>
<td>22.04</td>
<td>Disentangling the regulatory network governing X-chromosome inactivation</td>
<td>Edda Schulz</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Max Planck Institute for Molecular Genetics</td>
<td>Germany</td>
<td></td>
</tr>
<tr>
<td>26.04</td>
<td>Behavioural differences underly frequency-dependent selection in <em>C. elegans</em></td>
<td>Ivo Chelo</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>27.04</td>
<td>Orangutan development and the evolution of intelligence</td>
<td>Mark Thomas</td>
<td>University College London, UK</td>
<td></td>
</tr>
<tr>
<td>27.04</td>
<td>New insights into the origins of farming</td>
<td>Ivo Chelo</td>
<td></td>
<td>IGC</td>
</tr>
<tr>
<td>27.04</td>
<td>Making new enhancers for new genes (…or not): cis-regulatory evolution at a duplicated locus</td>
<td>Kohtaro Tanaka</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30.05</td>
<td>The role of pH in sperm physiology</td>
<td>Alberto Darasaz</td>
<td>Instituto de Biotecnologia, UNAM, Mexico</td>
<td></td>
</tr>
<tr>
<td>13.05</td>
<td>Receptors for the export of bulky collagen and chylomicrons</td>
<td>Vivek Malhotra</td>
<td>Centre for Genomic Regulation - Barcelona, Spain</td>
<td></td>
</tr>
<tr>
<td>03.05</td>
<td>Innate immune responses to nucleic acids: the Zalpha domain family and its intriguing properties</td>
<td>Alexos Athanasiadis</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>04.05</td>
<td>Rampant reverse evolution of commensal bacteria colonizing the gut</td>
<td>Ana Margarida Sousa</td>
<td></td>
<td>IGC</td>
</tr>
<tr>
<td>06.05</td>
<td>Cellular senescence: when multitasking can be dangerous</td>
<td>Maro Demaria</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>University Medical Center Groningen, The Netherlands</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.05</td>
<td>Bringing mice and snakes together to shed light into the evolution of the vertebrate body plan</td>
<td>Moisés Mallo</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>25.05</td>
<td>Tracing endosporulation evolution: the conserved gene core and lineage specific novelties</td>
<td>Paula Ramos Silva</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>27.05</td>
<td>Motile cilia define left and right</td>
<td>Susana Lopes</td>
<td>CEDOC, Portugal</td>
<td></td>
</tr>
<tr>
<td>30.05</td>
<td>Modular transcriptional repertoire and microRNA target analyses characterize genomic dysregulation in the thymus of Down syndrome infants</td>
<td>Carlos Alberto Moreira-Filho</td>
<td>Universidade de São Paulo, Brazil</td>
<td></td>
</tr>
<tr>
<td>31.05</td>
<td>Disease Genetics</td>
<td>Carlos Fenhon Goulaczes</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>08.06</td>
<td>Membrane regulators of complement activation impact on influenza A virus infection (the many ways flu outsmarts the immune system)</td>
<td>Zé Silva</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>15.06</td>
<td>“Should I stay or should I go?” Cyclic di-GMP signalling, motility and Echerichia coli gut colonisation</td>
<td>Jessica Thompson</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>16.06</td>
<td>Genetic ancestry and natural selection drive population differences in immune responses to pathogens in humans</td>
<td>Luis Barreiro</td>
<td>University of Montreal, Canada</td>
<td></td>
</tr>
<tr>
<td>22.06</td>
<td>Double antibiotic resistance enhances survival in macrophages</td>
<td>Paulo Durão</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>24.06</td>
<td>Tales of the sensory immune system and the second brain</td>
<td>Henrique Veiga-Fernandes</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>28.06</td>
<td>Mother to pup transmisson favours mouse- Helicobacter hepaticus symbiosis</td>
<td>Jocelyne Demengeot</td>
<td>IGC</td>
<td></td>
</tr>
</tbody>
</table>

JUNE

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.06</td>
<td>Drug discovery opportunities for Portuguese academies</td>
<td>Sílvia Gomes</td>
<td>University of Leiri, Portugal</td>
<td></td>
</tr>
<tr>
<td>24.05</td>
<td>Bacteria-host symbioses in <em>Drosophila melanogaster</em></td>
<td>Luis Teixeira</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>25.05</td>
<td>Genome editing in haploid human cells using CRISPR/CA9</td>
<td>Daniel Lackner</td>
<td>Horizon Discovery, Austria</td>
<td></td>
</tr>
<tr>
<td>03.06</td>
<td>The story of an intracellular pathogen that thrives on reactive oxygen species</td>
<td>Marcelo Torres Bozza</td>
<td>Universidade Federal do Rio de Janeiro, Brazil</td>
<td></td>
</tr>
<tr>
<td>07.06</td>
<td>Regulation of tryptophan-kynurenine metabolism</td>
<td>Vivek Malhotra</td>
<td>Dunn School of Pathology, University of Oxford, UK</td>
<td></td>
</tr>
</tbody>
</table>

JUNE

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.05</td>
<td>Huntington’s disease - pathogenic mechanisms and potential therapeutic targets</td>
<td>Flaviano Giorgini</td>
<td>University of Leicester, UK</td>
<td></td>
</tr>
<tr>
<td>03.06</td>
<td>Fundamental physical cellular constraints drive self-organization of tissues</td>
<td>Luis Maria Escudero</td>
<td>Universidad de Sevilla, Spain</td>
<td></td>
</tr>
<tr>
<td>07.06</td>
<td>Can (big) data help us make better-informed decisions?</td>
<td>Joana Gonçalves Sá</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>08.06</td>
<td>Membrane regulators of complement activation impact on influenza A virus infection (the many ways flu outsmarts the immune system)</td>
<td>Zé Silva</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>15.06</td>
<td>Genetic ancestry and natural selection drive population differences in immune responses to pathogens in humans</td>
<td>Luis Barreiro</td>
<td>University of Montreal, Canada</td>
<td></td>
</tr>
<tr>
<td>16.06</td>
<td>Genetic ancestry and natural selection drive population differences in immune responses to pathogens in humans</td>
<td>Luis Barreiro</td>
<td>University of Montreal, Canada</td>
<td></td>
</tr>
<tr>
<td>22.06</td>
<td>Double antibiotic resistance enhances survival in macrophages</td>
<td>Paulo Durão</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>24.06</td>
<td>Tales of the sensory immune system and the second brain</td>
<td>Henrique Veiga-Fernandes</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>28.06</td>
<td>Mother to pup transmission favours mouse- Helicobacter hepaticus symbiosis</td>
<td>Jocelyne Demengeot</td>
<td>IGC</td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Title</td>
<td>Speaker</td>
<td>Affiliation</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>29.06</td>
<td>Control of early steps of the legume-rhizobia symbiosis by plant NF-Y transcription factors</td>
<td>Tom Laloun</td>
<td>IGC</td>
<td></td>
</tr>
</tbody>
</table>

**JULY**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.07</td>
<td>The concept of tolerance in host-microbiota interactions</td>
<td>Janelle S. Ayres</td>
<td>Salk Institute for Biological Studies, USA</td>
</tr>
<tr>
<td>01.07</td>
<td>Regulation of microtubule organization and dynamics by minus-end binding proteins</td>
<td>Ana Akhmamova</td>
<td>Utrecht University, The Netherlands</td>
</tr>
<tr>
<td>05.07</td>
<td>Host-pathogen interaction and the control of infectious and non-infectious diseases</td>
<td>Michael Parkhouse</td>
<td>IGC</td>
</tr>
<tr>
<td>06.07</td>
<td>Tissue targeting in autoimmune disease: does the history of an organ have a word to say?</td>
<td>Vânia Silva</td>
<td>IGC</td>
</tr>
<tr>
<td>07.07</td>
<td>Canonical and non-canonical roles of telomerase modulate human stem cell self-renewal and differentiation</td>
<td>Luis Batista</td>
<td>Washington University in St. Louis, USA</td>
</tr>
<tr>
<td>11.07</td>
<td>Deciphering the role of glycosylation of ovarian cancer biomarker CA125</td>
<td>Lara Marcos da Silva</td>
<td>IPATIMUP, Portugal</td>
</tr>
<tr>
<td>12.07</td>
<td>Faraday and the Tree of Knowledge</td>
<td>Jorge Carneiro</td>
<td>IGC</td>
</tr>
<tr>
<td>13.07</td>
<td>Evolution of stem cell pluripotency regulation: RNA binding proteins and alternative splicing control in planarian stem cells</td>
<td>Jordi Solana</td>
<td>Max Delbrück Center for Molecular Medicine, Germany</td>
</tr>
<tr>
<td>15.07</td>
<td>The TPLATE adaptor complex drives clathrin-mediated endocytosis in plants</td>
<td>Daniël Van Damme</td>
<td>Department of Plant Systems Biology, VIB/UGent, Belgium</td>
</tr>
<tr>
<td>19.07</td>
<td>Understanding complex biological systems with mathematics: from cells to ecosystems</td>
<td>Ezida Gini</td>
<td>IGC</td>
</tr>
<tr>
<td>20.07</td>
<td>Public health monitoring and surveillance: from social media &amp; electronic medical records</td>
<td>Ronn Brattig Correia</td>
<td>IGC</td>
</tr>
<tr>
<td>22.07</td>
<td>The innate immune response as mediator of hematopoietic stem cell failure in a mouse mutant with defective DNA repair: unraveling the IFN-1 &gt; BID &gt; ROS connection in mlf-deficient mice</td>
<td>Hans-Jörg Fohling</td>
<td>IGC</td>
</tr>
</tbody>
</table>

**SEPTEMBER**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>06.09</td>
<td>Why shuffle genes? The evolution of natural transformation and integrins in bacteria</td>
<td>Jan Engelsdenter</td>
<td>University of Queensland, Australia</td>
</tr>
<tr>
<td>09.09</td>
<td>Hypothalamus and thermogenic heating the bat, browning the fat</td>
<td>Miguel López</td>
<td>CIMUS- Center for Research in Molecular Medicine and Chronic Diseases, Universidade de Santiago de Compostela, Spain</td>
</tr>
<tr>
<td>20.07</td>
<td>Public health monitoring and surveillance: from social media &amp; electronic medical records</td>
<td>Timothy Kowalik</td>
<td>University of Massachusetts Medical School, USA</td>
</tr>
<tr>
<td>22.07</td>
<td>The innate immune response as mediator of hematopoietic stem cell failure in a mouse mutant with defective DNA repair: unraveling the IFN-1 &gt; BID &gt; ROS connection in mlf-deficient mice</td>
<td>Hans-Jörg Fohling</td>
<td>IGC</td>
</tr>
</tbody>
</table>

**OCTOBER**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>04.10</td>
<td>Synaptic cooperation and competition in the amygdala: role in discriminative learning</td>
<td>Isabel Gordo</td>
<td>IGC</td>
</tr>
<tr>
<td>06.10</td>
<td>Unravelling the molecular mechanisms of a successful graft in grapevine</td>
<td>Maria Assunção</td>
<td>ITQB-UL, Portugal</td>
</tr>
<tr>
<td>09.09</td>
<td>Starch metabolism – a regulatory role for SARK1?</td>
<td>Bruno Faizato</td>
<td>IGC</td>
</tr>
<tr>
<td>21.09</td>
<td>Surviving aneuploidy: Tolerate the unbalance</td>
<td>Leonardo Guilger</td>
<td>IGC</td>
</tr>
<tr>
<td>21.09</td>
<td>Adapting to temporal fluctuating environments by the evolution of maternal effects</td>
<td>Zachary Knight</td>
<td>University of California San Francisco, USA</td>
</tr>
</tbody>
</table>

**NOVEMBER**

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Speaker</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.10</td>
<td>Trafficking, signalling and quality control</td>
<td>Colin Aird</td>
<td>IGC</td>
</tr>
<tr>
<td>28.09</td>
<td>Haith... or not: how telomeres prevent checkpoint activation</td>
<td>Akila Srihar</td>
<td>IGC</td>
</tr>
<tr>
<td>30.09</td>
<td>The locus of sexual selection</td>
<td>Judith Mank</td>
<td>University College London, UK</td>
</tr>
<tr>
<td>07.10</td>
<td>Variants of histone H2A shape genome organisation and control transcription</td>
<td>Gregor Mendel Institute</td>
<td>Switzerland</td>
</tr>
<tr>
<td>11.10</td>
<td>Early T lymphocyte development and leukemogenesis</td>
<td>Vera Martins</td>
<td>IGC</td>
</tr>
<tr>
<td>12.10</td>
<td>Animal research: Time to talk</td>
<td>Kirk Leech</td>
<td>European Animal Research Association</td>
</tr>
<tr>
<td>12.10</td>
<td>Sounds of silence: exploring the effect of synonymous mutations using fitness landscapes</td>
<td>Inês Fragata</td>
<td>IGC</td>
</tr>
<tr>
<td>14.10</td>
<td>Programming the Notch response</td>
<td>Sarah Bray</td>
<td>Department of Physiology Development and Neuroscience, University of Cambridge, UK</td>
</tr>
<tr>
<td>18.10</td>
<td>Social and affective neurosciences: lessons from fly</td>
<td>Rui Oliveira</td>
<td>IGC</td>
</tr>
</tbody>
</table>
Speaker Ann-Cathrin Lindner
Affiliation IGC

Date 03.11
Title Insulin signalling and proteostasis are coordinated by the ubiquitin ligase chip to promote longevity
Speaker Thorsten Hoppe
Affiliation University of Cologne, Germany

Date 04.11
Title When genomes meet – RNA, epigenetics and phenotypes of hybrid plants
Speaker David Baulcombe
Affiliation Department of Plant Sciences, University of Cambridge, UK

Date 09.11
Title The actin cytoskeleton in pre-malignant breast cancer expansion: when cells are overactin
Speaker Sandra Tavares
Affiliation IGC

Date 11.11
Title Sepsis and glucocorticoids, an impossible marriage?
Speaker Claude Libert
Affiliation VIB Inflammation Research Center UGent, Belgium

Date 15.11
Title Mechanisms of chromatin inheritance
Speaker Lars Jansen
Affiliation IGC

Date 16.11
Title Neocentromeres: from de novo formation to epigenetic inactivation
Speaker Marina Murillo Pineda
Affiliation IGC

Date 17.11
Title Cell-free reconstitution of cytoskeletal form and function
Speaker Gijsje Koenderink
Affiliation FOM Institute AMOLF, The Netherlands

Date 18.11
Title Orchestrating aging across a troubled soma
Speaker Andrew Dillin
Affiliation Molecular and Cell Biology Department, UC Berkeley, USA

Date 19.11
Title Chromatin dynamics and epigenetic inheritance at the onset of life
Speaker Antoine Peters
Affiliation Friedrich Miescher Institute for Biomedical Research, University of Basel, Switzerland

Date 21.11
Title Programming and reprogramming brain tumour stem cells
Speaker Steve Pollard
Affiliation MRC Centre for Regenerative Medicine, UK

Date 22.11
Title Adaptive developmental plasticity: E\(^{+}\)E and G\(^{+}\)E effects
Speaker Patricia Beldade
Affiliation IGC

Date 23.11
Title Becoming a male in the blenniid fish Salaria pavo: a neurogenomic perspective
Speaker Sara Cardoso
Affiliation IGC

Date 25.11
Title Endomembrane signalling in metabolism and inflammation
Speaker Romeo Rieci
Affiliation Institute of Genetics and Molecular and Cellular Biology, France

Date 29.11
Title How to distribute a dividing organelle in (large) space and (short) time
Speaker Ivo Telley
Affiliation IGC

Date 30.11
Title An evolutionary biology approach to human male fertility
Speaker Paulo Navarros Costa
Affiliation IGC

Date DECEMBER

Date 02.12
Title The pathophysiology of platelet-derived interleukin-1
Speaker Bernardo Franklin
Affiliation Institute of Innate Immunity, University of Bonn, Germany

Date 06.12
Title Gene regulation by the zinc-finger factor ZEB1 in development and disease
Speaker Diogo Castro
Affiliation IGC

Date 07.12
Title A role for energy signalling in plant shoot architecture
Speaker Ana Confraria
Affiliation IGC

Date 09.12
Title The revision of the genome by RNA editing: in sickness and in health
Speaker Robert Reenan
Affiliation Department of Molecular Biology, Cellular Biology and Biochemistry, Brown University, USA
FLOW CYTOMETRY: FUNDAMENTALS AND APPLICATIONS
JANUARY 18-22
The course covered the fundamentals of Flow Cytometry, focusing mostly on the main applications run at the IGC, and was directed to both experienced and inexperienced researchers. Topics included planning a flow experiment, cell dynamics (cell death, cell cycle, proliferation), multicolor flow, small particle analysis, high throughput flow, cell sorting, as well as data analysis and publishing.
Organisers: Flow Cytometry Unit
Sponsors: Enzifarma
IGC, Oeiras, Portugal

WORKSHOP: IMPROVING SKILLS TO BETTER COMMUNICATE WITH LAY AUDIENCES
MARCH 11 & 14
Included in the “Postdoctoral Workshop Series: Skills and tools to improve your career”, this workshop aimed at providing some strategies and tips to help the postdoctoral community at the IGC to improve their communication skills when addressing to lay audiences, such as the general public, the media, or during a job interview. Twelve postdocs attended this workshop.
Organisers: Postdoctoral Committee & Science Communication Unit
IGC, Oeiras, Portugal

4TH EUROPEAN ZEBRAFISH PI MEETING
MARCH 15-19
Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental Biannual meeting that gathered most European PIs using zebrafish as a model organism in experimental
Research), Rui Oliveira (IGC)
António Jacinto (CEDOC), Mike Orger (Champalimaud
Leonor Saúde (IMM), Susana Lopes and
using zebrafish as a model organism in experimental

BEHAVIOURAL AND NEURAL GENOMICS OF SOCIALITY SYMPOSIUM AT THE INTERNATIONAL CONGRESS FOR NEUROTHEOLOGY 2016
MARCH 30 – APRIL 3
Thematic symposia at a regular meeting of the International Neurotheology Society (ca. 500 attendees).
Organiser: Rui Oliveira
Montevideo, Uruguay

ROUND TABLE ON BIODIVERSITY AND SUSTAINABILITY
MARCH
Organiser: Joana Sá
Universidade de Cabo Verde

WORKSHOP: ADVICE AND TIPS TO IMPROVE YOUR CV
APRIL 6 & 22
Included in the “Postdoctoral Workshop Series: Skills and tools to improve your career”, this workshop aimed at providing advice and tips in a practical setting to help young researchers to compose a more effective and tailored scientific CV. A scientific curriculum vitae is the most common communication tool used to self-marketing expertise when applying for academic; research jobs, fellowships or grants. A total of 12 postdoctoral attended this workshop.
Organisers: Postdoctoral Committee & RFA Unit
IGC, Oeiras, Portugal

EMBO WORKSHOP ON NEURAL CONTROL OF METABOLISM AND EATING BEHAVIOUR
MAY 5-7
The main goal of this EMBO Workshop was to bring together expertise from these different disciplines to discuss recent developments and landmark discoveries.
Organiser: Ana Domingos
Sponsors: EMBO, IGC, IMP, Boehringer Ingelheim Pestana Cidadela Cascais, Cascais

AMEEGUS – THE 10TH ANNUAL MEETING OF GULBENKIAN STUDENTS
MAY 15-18
To celebrate the 10th anniversary of the internal annual meeting of IGC PhD students, this year AMeeGus was an international joint retreat with PhD students from the CRG (Barcelona, Spain). To inspire students as well as give them feedback, four keynote speakers and some scientists from the IGC were present at the retreat.
Organiser: PhD students IBB 2015
Hotel do Sado, Setubal

COMMUNICATION AMONG COMPLEX MICROBIAL POPULATIONS AND THEIR HOST
MAY 30-31
International Symposium at the College France opened to the public with more than 100 participants.
Organisers: Brett Finlay, Jean-Marc Ghigo, Philippe Sansonetti and Karina Xavier (IGC)
Paris, France

XLII ANNUAL MEETING OF THE PORTUGUESE SOCIETY OF IMMUNOLOGY
JUNE 1-3
The scientific programme reflected different aspects of immune cell activity. Creative and innovative foreigners were invited as well as new actors in the Portuguese Immunology community and clinicians to provide broad insights into the recent developments. In addition, younger immunologists were encouraged to present and discuss their latest results within allocated short talks and extensive poster sessions. The number of attendants reached 150.
Organisers: Iris Caramalho, Carlos Penha Gonçalves, Teresa Pais, Natacha Gonçalves (IMM) and Jocelyne Demengeot
Sponsors: Actimel, Celgene, Labclinics, Peprotech, Taper, Stemcell, Sarstedt, MACS miltenyi biotech, Tebu-bio, Izasa, Enzifarma, Amgen, FCT, Roche Diagnostics.
IGC, Oeiras, Portugal

WORKSHOP FOR CANDIDATES: HOW TO PREPARE AN APPLICATION TO THE 2016 MARIE S. CURIE INDIVIDUAL FELLOWSHIPS
JUNE 2
The aim of this informative session was to guide potential candidates through the general conditions and rules of this call. Special attention was given to the eligibility rules, typical activities expected to be developed during the postdoctoral training and the evaluation criteria. A total of 6 applicants attended this session.
Organiser: RFA Unit
IGC, Oeiras, Portugal

5TH EMBO COURSE ON “3D DEVELOPMENTAL IMAGING”
JULY 1-9
This EMBO Practical Course targeted researchers in developmental biology, interested in specific questions that require observation of cell movement and tissue morphogenesis, or understanding complex 3D spatial relationships between tissues. Multiphoton, SPIM/DSLIM and OPT are a major feature of the course, as well as both open source and commercial solutions for equipment development and image analysis.
Organisers: Gabriel G. Martins, Nuno Moreno, José Joëfi, Brett Finlay, Jean-Marc Ghigo, Philippe Sansonetti and Karina Xavier (IGC)
Paris, France

INTERDISCIPLINARITY, NETWORKS, DATA AND COMPLEX SYSTEMS: PROMISE AND CHALLENGES
JULY 4-6
This EMBO Practical Course targeted researchers in developmental biology, interested in specific questions that require observation of cell movement and tissue morphogenesis, or understanding complex 3D spatial relationships between tissues. Multiphoton, SPIM/DSLIM and OPT are a major feature of the course, as well as both open source and commercial solutions for equipment development and image analysis.
Organisers: Gabriel G. Martins, Nuno Moreno, José Joëfi, Brett Finlay, Jean-Marc Ghigo, Philippe Sansonetti and Karina Xavier (IGC)
Paris, France

LOGICAL MODELLING OF CELLULAR NETWORK POPULATIONS AND THEIR HOST
JULY 11-15
This mini-symposium at ECMTB 2016 (European Conference on Mathematical and Theoretical Biology) was organised in connection with the Consortium for Logical Modelling and Tools (CoLoTo, colomo.org), which has been recently launched to promote the logical modelling framework and provide scientists with
TELEOST FISH AS MODELS IN COMPARATIVE COGNITION SYMPOSIUM
JULY 12-15

Thematic symposium at the 8th European Conference of Behavioral Biology, a regular EU meeting with around 400 attendees.

Organisers: Theresa Burt de Perera (Univ. Oxford), Rui Oliveira (IGC)
University of Vienna, Austria

EMBO YOUNG SCIENTIST FORUM 2016
SEPTEMBER 1-2

The EMBO Young Scientists Forum (EYSF) is an annual EMBO initiative that aims to bring young European researchers together in an informal atmosphere in order to inspire students and postdocs to pursue a career in the life sciences.

Organisers: Raquel Oliveira, Mónica Bettencourt Dias, Lars Jansen, Ana Domingos and Elena Bearn-González
Sponsors: EMBO, IGC, FCG, Tebu-bio
Fundação Calouste Gulbenkian, Lisbon, Portugal

DROSTUGA
SEPTEMBER 9-10

This meeting brought together 81 leading investigators and experts from Portugal and abroad, who use Drosophila melanogaster as a model system to decipher fundamental questions in biology. This meeting aimed at promoting dissemination of the latest research findings, communication between researchers in different fields and foster and strengthen networks.

Organisers: Florence Janody (IGC), Carla Lopes (i3S); Alison M. Gontijo (CEDOC), Marta Moita (Champalimaud Research)

Hotel dos Templários, Tomar

AUSTRALIAN FLY MEETING
SEPTEMBER 15-17

Organisers: Mike Murray and Christen Mirth
Wharburton Victoria

JEDI MEETING
SEPTEMBER 18-21

This meeting brought together 20 young European Principal Investigators using Drosophila melanogaster as a model system.

Organisers: Raquel Oliveira
Viseu, Portugal

IGC’S PRACTICAL COURSE ON ANIMAL HANDLING AND EXPERIMENTATION IN MICE AND ZEBRAFISH
SEPTEMBER 26-29

Under the scope of Laboratory Animal Science courses, this is the 20 hours practical module that allows IGC and external researchers to obtain a personal license to work with animals, issued by the Direção Geral de Alimentação e Veterinária (DGAV). The theoretical part of the course (20 hours) was done through an e-learning system, provided by the Sociedade Portuguesa de Ciências de Animais de Laboratório (SPCAL). The number of attendants was 29.

Organiser: Animal House Facility
Sponsors: IGC, Ultragene, Grupo Taper
IGC, Oeiras, Portugal

SPAOM: SPANISH-PORTUGUESE ADVANCED OPTICAL MICROSCOPY WORKSHOP
OCTOBER 5-7

SPAOM 2016 aimed at promoting the Spanish and Portuguese bioscimaging scientific community and fostering communication between scientists and industry. The conference had an international scope: focused on the national Spanish and Portuguese microscopic panorama but also hosted invited talks by relevant European researchers and accepts contributions from abroad.

Organisers: Gabriel Martina and TSS Unit
Sponsors: Leica, Zeiss, Iasa, Olympus, Chroma, Cirklo, Agilent, Laser 2000, Innova, CSC, IGC, IBMC
Bilbao, Spain

WORKSHOP: SOCIAL MEDIA TRAINING FOR SCIENCE COMMUNICATORS
OCTOBER 18 & 31; NOVEMBER 14

Under the scope of a EU-LIFE training series for professional science communicators, a remotely-delivered workshop was organised with the aim of providing training on Twitter, Facebook and LinkedIn for the communication officers of the EU-LIFE alliance. Lecturers from the University of the West of England (UWE) were invited to share their expertise in these social media channels. About 30 science communicators from the 13 EU-LIFE partner institutes participated in this workshop.

Organisers: Ana Mena, Inês Domingues (IGC), and Louisa Wood (Babraham Institute)
Sponsors: EU-LIFE

3rd CROSS-INSTITUTIONAL MEETING OF YOUNG RESEARCHERS
OCTOBER 19-21

The Joint Meeting of Young Researchers brought together postdoctoral fellows of four leading biosciences research institutes in Portugal: IGC, IMM, ITQB and Champalimaud Research. This initiative intended to go beyond fostering a common dialogue between these communities of young researchers, and established a starting point for strategic cooperation between these four hubs of scientific excellence. Additionally, the goal was also to draw attention to, and constructively discuss challenges and policy making that influence professional lives of postdoctoral fellows.

Organisers: IGC, Champalimaud Research, IMM and ITQB
Tróia, Portugal

1st PORTUGUESE ELECTRON MICROSCOPY TECHNICAL MEETING
OCTOBER 28

This was the first of hopefully an annual Portuguese technical skill development meeting series with the goal of bringing together the Portuguese EM Community, helping experienced laboratories improve their skills, and developing laboratories expand their skills.

Organisers: EMF Unit, supported by IMM and IGC scientists
Sponsors: FEI and Agar Scientific
IGC, Oeiras, Portugal

ASYNCHRONOUS DYNAMICS OF LOGICAL MODELS: ASSIGNED FUNCTIONALLY RELEVANT PROPERTIES
NOVEMBER 3-4

Organisers: Elísia Remy (Aix Marseille Universités) and Claudine Chaouiya (IGC)
Sponsors: Institut de Mathématiques de Marseille
Marseille, France

EXPERIMENTAL EVOLUTION: THEORY AND CURRENT PRACTICES
NOVEMBER 7-11

International Graduate Programme in Life Sciences and the Interdisciplinary Master in Life Sciences (MaLa) at the Institute of Biology of the École Normale Supérieure (IHENS). The course introduced Master and PhD students in Evolutionary Biology to the experimental approaches employed to test evolutionary theory, bringing together world-renowned researchers to lecture on topics including the historical development of experimental evolution approaches, experimental design, the evolution of sexuality, origin of multicellularity and sociality, and the genetic basis of adaptation to changing environments. Lectures were complemented with computer tutorials on the analysis of experimental population genomics data.

Organiser: Ivo Chelo
Paris, France

DROSEU
NOVEMBER 14-15

Around 30 European population geneticists working in Drosophila came together to collect, sequence and analyse Drosophila populations across the whole continent.

Organiser: Elío Suárez
Sponsor: European Society for Evolutionary Biology
IGC, Oeiras, Portugal

PERSPECTIVES FOR RESEARCH MANAGERS IN PORTUGAL - “DO DESAFIO À OPORTUNIDADE - PERSPECTIVAS PARA OS GESTORES DE CIÊNCIA EM PORTUGAL”
NOVEMBER 28

The event aimed to bring together the stakeholders of the Portuguese research and innovation system to reflect on Science and Technology Management at national and international level. There was a focus on the skills and profiles of the science and technology managers, career paths, areas of action, and the added value of their action as an interface with the various stakeholders of the science and technology system.

The programme included two round tables open to the public, followed by a third session dedicated to science and technology managers. A total of 330 participants attended this event.

Organisers: Sheila Vidal (IGC), Margarida Trindade (ITQB), João Cortez (i3S), Júlio Borlido Santos (i3S) and Filipa Borrego (freelance consultant)
Sponsor: Secretariado de Estado da Ciência, Tecnologia e Ensino Superior.
Teatro Thalia, Lisboa
PRESENTATIONS
BY IGC RESEARCHERS 2016

AT INTERNATIONAL MEETINGS AND SEMINARS

ADRAIN, COLIN
Physiological and cellular roles of iHoms in cytokine and growth factor signalling
COST Meeting BM1406, Ruder Bošković Institute, Zagreb, Croatia - October

ALVES, FILIPA
Dorsos are green, eyespots are blue, does natural selection shape you?
Biology’16: The Annual Swiss Science and Technology, Dübenberg, Germany - April

ATHANASIADES, ALEXOS
Innate immune responses to nucleic acids: Zalapha domains and their intriguing properties
CECAD, University of Cologne, Cologne, Germany - December

BAENA-GONZÁLEZ, ELENA
SnRK1 signaling pathway – A link between environmental signals and plant growth
Universidade Politécnica de Madrid, Madrid, Spain - February

BANK, CLAUDIA
Epistasis and the predictability of evolution
University of Massachusetts Medical School, Massachusetts, USA - May

BECKER, JÖRG
A transcriptome atlas of Physcomitrella patens provides insights into the evolution and development of land plants
Max Planck Institute for Plant Breeding Research, Cologne, Germany - April

BORGES, ANA CRISTINA
Zebrafish health programme: Implementation and results
FEALSA Congress, Brussels, Belgium - June

BELDADE, PATRICIA
Eco-ervo-devo in Bicyclus anynana color patterns: novelty, plasticity, and immunity
Chubu University International Meeting on Integrative Approach to Understanding the Diversity of Butterfly Wing Patterns, Nagoya, Japan - August

BARROSO-BATISTA, JOÃO
Adaptive immunity increases the pace and predictability of evolutionary change in commensal gut bacteria
EU-LIFE Scientific Workshop "Inflammation & Immunity in Health and Disease", Vienna, Austria - May

BOM, JOANA
Implementation of a Gnoto/Axenic Facility: a case report from the Instituto Gulbenkian de Ciência
FEALSA Congress, Brussels, Belgium - June

CASTRO, DOGO
Transcriptional control of vertebrate neurogenesis by the proneural factor Ascl1
Department of Medical Biochemistry and Biophysics, Karolinska Institutet, Stockholm, Sweden - August

CHIKHI, LOUNÈS
On the importance of being structured: from habitat fragmentation in Madagascar to recent human evolution
TULIP International Conference, Université Paul Sabatier, Toulouse, France - April

CHELO, IVO
Pervasive frequency-dependency selection in Caenorhabditis elegans competitions
Evolution meeting, Austin, USA - June

CHELLA, SANGITAM
Reversing Boolean models: Workshop “Asynchronous dynamics of logical models: assessing biologically relevant properties” 12M, Marseille, France - November

CHIKHI, LOUNÈS
On the importance of being structured: should we trust population size changes inferred from genomic data?
Université Savoie, France - January

CHIKHI, LOUNÈS
On the importance of being structured: from habitat fragmentation in Madagascar to recent human evolution
TULIP International Conference, Université Paul Sabatier, Toulouse, France - April

CNetwines Meeting 2016, CIIBIO, Porto, Portugal - May

Effe de la structure spatiale et familiale de la population sur la taille efficace Ou plutôt Quelques conséquences de la structure des populations sur la notion de taille efficace
Séminaire Taille Efficace, INRA Agroparistech, Paris, France - May
**Correia, Rion**  
Legislative polarization and social activism: a data-driven analysis of political communication  
The Conference on Complex Systems, Amsterdam, The Netherlands - September

**Costa, Teresa**  
Presentation of the Instituto Gulbenkian de Ciência: facts & figures  
BiBESTPAC group short-term mission (STSM) to three universities in Flanders, UKRO, Brussels, Belgium - January

**Domingos, Ana**  
Keystone Symposia on New Therapeutics for Diabetes and Obesity, La Jolla, USA  
Keystone Symposia on Obesity and Adipose Tissue Biology, Banff, Canada  
Gordon Meeting, “Optogenetic approaches to understanding neural circuits and behavior”, Newry, USA  
International Conference of Endocrinology and Metabolism, Seoul, South Korea  
University of Seoul School of Medicine, Seoul, South Korea  
Diabetes Center of Asan Medical Center, University of Ulsan College of Medicine, Ulsan, South Korea  
EMBO Workshop: Neural Control of Metabolism and Eating Behaviour, Cascais, Portugal  
EASO, Gothenburg, Sweden  
IGBMC, Strasbourg, France  
University of Bonn, Bonn, Germany  
Babraham Institute, University of Cambridge, Cambridge, UK  
Imperial College, London, UK

**Domingues, Inês**  
Research institutions and social media: Channels for engaging the public and scientists  
14th Public Communication of Science and Technology 2016, Istanbul, Turkey - April

**Duque, Paula**  
A plant-specific splicing regulator conferring tolerance to drought and salt stress during seed germination  
Rothamsted Research, Harpenden, UK - March  
An Arabidopsis RNA-binding protein regulating ABA-dependent stress responses during seed germination  
University of Cologne, Cologne, Germany - April

**Ferreira, Miguel Godinho**  
The role of telomeres in cancer and ageing  
4th European Zebrafish Principal Investigator Meeting, Portugal - March  
The role of telomeres in cancer and ageing  
FLI Colloquium: Beutenberg Campus Jena e.V., Germany - April

**Feisel, Constantin**  
Features of SLE and their possible relation to infection and microbiota  
SIGID steering committee meeting, Nimes, France - May

**Fragata, Inês**  
Predictability of long-term, but not short-term, evolution in Drosophila  
Mathematical and Computational Evolutionary Biology, France - April

**Gardner, Rui**  
Workshop: Systems for Simplifying Core Management  
XXII Congress of the International Society for Advancement of Cytometry 2016, Seattle, USA - June  
A role for telomere shortening in cancer and ageing in zebrafish  
MBI talk/TIB, Germany - April

**Gjini, Erida**  
Understanding drug-immunity interplay during antibiotic treatment of infection  
Workshop on Microbes and Ecosystems in Health, Liverpool School of Tropical Medicine, Liverpool, UK - April  
A role for telomere shortening in cancer and ageing in zebrafish  
The FIRC Institute of Molecular Oncology Foundation, Italy - July

**González-Sá, Joana**  
Early detection of the flu season  
Conference for Complex System, The Netherlands - October

**Janssen, Lars**  
TimeChIP identifies long-lived nucleosomes at active genes  
Gordon Conference on Chromatin Structure & Function, Les Diablerets, Switzerland - May

**Jensen, Marielle**  
Centromeric chromatin inheritance along the cell cycle  
EMBO Workshop: Chromosome Segregation & aneuploidy  
Galway, Ireland - June 2016

**Jensen, Peter**  
Histone variant inheritance and assembly at the centromere and beyond  
Gordon Conference on Genomic Instability, Hong Kong, China - July

**Mallo, Moïses**  
A second life for Oct4 during embryonic development
Ulm’s University Hospital, Ulm, Germany - November

WALTZ, LIAD

10th International Conference on Biomedical Imaging and the Field between Bio & Medical Imaging, Jerusalem, Israel - July

The Conference on Complex Systems, Satellite Workshop at The Conference on Complex Systems, Amsterdam, The Netherlands - September

PEREIRA, HUGO

Opens in and Open Meso-scopic imaging for cell & developmental biology Bioimaging 2016 - Disease in Fo-cus, iS8, Porto, Portugal - October

RAMOS, SUSANA

Kidney proximal tubular epithelial cells control disease tolerance to malaria by main-taining heme/iron homeostasis 9th International Conference on Heme Oxygenase, Prague, Czech Republic - September

ROCHA, LUIS

Monitoring potential drug interactions and reactions via network analysis of Instagram user timelines Pacific Symposium on Biocomputing 2016, Hawaii, USA - January

Redundancy and control in complex networks Workshop, Control and Observ-ability of Network Dynamics, National Science Foundation, Mathematical Biosciences Institu-tute, Columbus, USA - August

Redundancy and control in complex networks 2016 Summer Solstice: 8th Inter-national Conference on Discrete Models of Complex Systems, University of Aveiro, Aveiro, Portugal - September

SOCIAL NETWORKS AND THEIR APPLICATIONS - 7th Inter-Science and Interchange, Turin, Italy - November

Social media mining for public health monitoring in precision medicine ISI Foundation, Institute for Sci-entific Interchange, Turin, Italy - November

Structure and dynamics of complex systems: from social media mining to control of biochemical networks Mathematics of Complex Systems: from precision medicine to smart cities, Coimbra, Portugal - De-cember

SALMONA, JORDI

Comparative genomic diver-sity of two northern Mad-agascar lemur genera in a fragmented landscape ConGenomics Meeting, CIBIO, Porto, Portugal - May

Comparative demographic history of two northern Madagascan lemur genera from site frequency spectrum ConGenomics Meeting, CIHIO, Porto, Portugal - May

SOARES, MIGUEL

Tissue damage control at the “Iron Age” of host microbe interactions Jagiellonian University, Kraków, Poland - February

Gut microbiota confers...
immune protection against malaria transmission
27th Annual Meeting of the German Society for Parasitology, Göttingen, Germany - March

Disease tolerance as a defense strategy against infection
COST Action 1307: Chemotherapy towards Diseases Caused by Endoparasites Meeting, Porto, Portugal - May

Disease tolerance as a defense strategy against infection
EU-LIFE Scientific Workshop 2016: Inflammation & Immunity in Health and Disease, Vienna, Austria - May

Targeting iron/heme in immune-mediated inflammatory diseases
3rd Jena Symposium on Heme and Heme Degradation Products, Freie-Dr.-Schiller-Universität Jena, Thuringia, Germany - May

Disease tolerance as a defense strategy against infection
Host-pathogen interactions: from bench to bedside, ARMINA, Nantes, France - June

The pathobiology of heme: tetrapyrroles and host microbe interactions
Gordon Research Conference on Chemistry and Biology of Tetrapyrroles, Salve Regina University, Newport, USA - July

A central stage for heme catabolism in disease tolerance to infection
9th International Conference on Heme Oxyngease, Prague, Czech Republic - September

Macrophage control of iron metabolism & homeostasis
Cell Symposium: 100 years of Phagocytes, Sicily, Italy - September

STANKOVIC, ANA
Cell cycle control mechanisms of mammalian centromere assembly
Gordon Conference on Structural and Functional Dynamics of the Centromere in Mitosis and Meiosis, Mount Snow, USA - July

SUCENA, ÉLIO
Using evolution for the study of development and physiology
Vienna Graduate School of Population Genetics, Vienna, Austria - May

Using experimental evolution to learn about ultimate and proximate mechanisms of Drosophila immunity
Institute of Functional Genomics of Lyon, Lyon, France - June

Re-visiting crystal cell differentiation in the lymph gland
New Directions in Drosophila Blood Cell Biology, Woods Hole, USA - October

TAVARES, SANDRA
The actin cytoskeleton: A key mediator of pre-malignant breast cancer expansion
Mechanobiology - Mechanisms of force sensation and transduction that control cell behaviour in health and disease, Amsterdam, The Netherlands - March

TEIXEIRA, LIÚS
Natural host-microbe interactions in Drosophila: from defensive endosymbionts to gut microbiota
Grisonal Annual Speaker at Department of Entomology, Cornell University, New York, USA - April

Toll and Wolbachia: two antiviral factors in Drosophila
MRC Centre for Virus Research, University of Glasgow, Glasgow, UK - May

Natural host-microbe interactions in Drosophila: from defensive endosymbionts to gut microbiota
Zoological Institute, University of Basel, Basel, Switzerland - June

Wolbachia genetic diversity and antiviral protection in insects
FAPESP/LIFE Symposium on Carson Granoff, Immunization & Immunity, São Paulo, Brazil - June

Toll and Wolbachia: two antiviral factors in Drosophila
Instituto de Ciências Biológicas, Universidade Federal de Minas Gerais, Minas Gerais, Brazil - June

TELLEY, IVO
Drosophila embryogenesis under a new light
IFR for Life Sciences-Humboldt University, Berlin, Germany - February

THOMPSON, JESSICA
Autoinducer-2 influences gut microbiota composition
1st Young Scientists Symposium in Mucool Biology, University of Bern, Bern, Switzerland - June

TRANFIELD, ERIN
Three-dimensional imaging in electron microscopy
EMBO Practical Course on 3D Developmental Imaging, Oeiras, Portugal - July

Using correlative light and electron microscopy to understand influenza A virus assembly
ULTRAPATH XVIII, Annual Meeting of the International Society for Ultrastructural Pathology, Lisbon, Portugal - July

VARELA, PEDRO
SAT-based identification of stable states in composed Boolean regulatory networks
7th International Workshop on Static Analysis and Systems Biology, Edinburgh, UK - September

VASCONCELOS, FRANCISCA
MyTi counteracts the neural progenitor program to promote vertebrate neurogenesis
Joint meeting of the Spanish and Português Societies for Developmental Biology, Girona, Spain - October

VIDAL, SHEILA
Funding opportunities for European researchers
European COST Action BM1203 Working Groups meeting, Lisbon, Portugal - April

The challenging path towards widening participation
22nd Annual Conference EARMIA 2016, Lulea, Sweden - June

EARMIA addresses cultural and diversity issues: A new working group for EARMIA 22nd Annual Conference EARMIA 2016, Lulea, Sweden - June

XAVIER, KARINA
AI-2 and homeostasis of gut microbiota
International Symposium at the College France on “Communication among Complex Microbial Populations and Their Host”, Paris, France - May

Manipulation of the quorum sensing signal AI-2 affects the antibiotic-treated gut microbiota
Garden Research Conference on Bacterial Cell Surfaces, Mount Snow, USA - June

Quorum sensing signal AI-2 affects the antibiotic-treated gut microbiota
Garden Research Conference on Microbial Stress Response, Massachusetts, USA - July

ADAMO, MATTIA
Interplay between energy and ABA signalling in plant growth and stress responses
ITQB-IGC Plant Interaction Meeting, Oeiras - March

Interplay between energy and ABA signalling in plant growth and stress responses
Green-IT Research Unit Annual Meeting, Oeiras - July

ADRAIN, COLIN
Trafficking control and signalling
Chronic Diseases Research Centre, Universidade Nova de Lisboa, Lisbon - July

AMORIM, MARIA JÁO
Influencia A virus and the recycling endosome
Chronic Diseases Research Centre, Universidade Nova de Lisboa, Lisbon - April

BAENA-GONZÁLEZ, ELENA
SnRK1 signalling pathway – A link between environmental signals and plant growth
NEBFCUL’s BioSAM – Biological Sciences Annual Meeting/FCUL, Lisbon - April

BANK, CLAUDIA
On the (un-)predictability of a large intragenic fitness landscape
NEBFCUL’s BioSAM – Biological Sciences Annual Meeting/FCUL, Lisbon - April

BECKER, JÖRG
Land plant evolution from the perspective of a tiny moss
XL Jornadas Portuguesas de Genética, Coimbra - June

NGS services at ICG
3rd Reunião de Utilizadores de Plataformas NGS, INSA, Lisboa - November

Quorum sensing signal AI-2 affects the antibiotic-treated gut microbiota
Garden Research Conference on Microbial Stress Response, Massachusetts, USA - July

BLANKCAERT, ALEXANDRE
Local adaptation: a limit during early divergence?
XI Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro, Aveiro - December

CARNEIRO, TIAGO
Workshop in “Biossegurança em experimentação animal”
INSA, Lisboa - September

CARVALHO, INÉS
A importância da genética na conservação da biodiversidade – o caso específico dos cetáceos
IV Jornadas da Investigação em Biologia, Faculdade de Ciências da Universidade de Lisboa, Lisboa - February

CAVADAS, MIGUEL
Beyond the ER: IL1hom2-phosphorylation controls TACE activity at the cell surface
COST Publications meeting, Universidade Nova de Lisboa, Lisboa - November

CHEILO, IVO
Pervasive frequency-dependent selection in Caenorhabditis elegans competitions
XII Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro, Aveiro - December

CIKHIL, LOUÈN
On the importance of being structured: should we revisit the demographic history of species? (and how it could apply to humans) or Should we trust population size changes inferred from genomic data?
Portuguese Genetics, Porto - February

On Madagascar, social groups and population structure
NEBFCUL’s BioSAM – Biological Sciences Annual Meeting/FCUL, Lisbon - April

On the importance of being structured: from habitat frag-
mentation in Madagascar to recent human evolution
Instituto de Medicina Molecular, Lisbon - October

COELHO, INÉS
TREM-2 controls population repressors of macrofagos over the reversão da fibrose hepática
12th Congresso da Sociedade Portuguesa de Diabetologia - March

CONFARIA, ANA
Interplay between microRNA and energy in Arabidopsis
Green IT Research Unit Annual Meeting, Oeiras - July

COSTA, TERESA
Overview of the BESTPRAC group short-term mission (STSM)
“Finca-P” Meeting, Oeiras - March

DOMINGOS, ANA
Chronic Diseases Research Centre
Domingos, ANA (STSM)
Meeting, Oeiras - July

DOMINGOS, ANA
Chronic Diseases Research Center
Domingos, ANA (STSM)
Meeting, Oeiras - December

FERREIRA, MIGUEL GODINHO
The role of telomeres in cancer and ageing
CNC-IHIL Seminars/Universidade de Coimbra, Coimbra - January

FERREIRA, MIGUEL GODINHO
The role of telomeres in cancer and ageing
Jornada Pedagógica, Faculdade de Medicina da Universidade de Lisboa, Lisbon - November

FERREIRA, MIGUEL GODINHO
The role of telomeres in cancer and ageing
Escola Superior de Educação - April

FERREIRA, MIGUEL GODINHO
A role for telomere shortening in cancer and ageing in zebrafish
Aging and Aging related diseases Workshop/CNC, Coimbra - October

FERREIRA, MIGUEL GODINHO
The role of telomeres in cancer and ageing
XIX National Congress of Biochemistry/SPBR2016 - December

FESEL, CONSTANTIN
Pathological autoimmunity: Tregs, lymphopenia and the example of SLE
Porto Autoimmune Meeting PAM, Universidade do Porto, Porto - April

FESEL, CONSTANTIN
Pathological autoimmunity
Tregs, lymphopenia and the example of SLE
Porto Autoimmune Meeting PAM, Universidade do Porto, Porto - April

GONÇALVES SÁ, JOANA
Data mining for decision-making
Pribaram Seminars, INESC-ID, Lisbon - April 2016

GONÇALVES SÁ, JOANA
Data mining for decision-making
Department of Electronic Engineering, Instituto Superior Técnico, Lisbon - September

GORDO, ISABEL
Escherichia coli adaptation in the mammalian gut
Portuguesa Genetica, Porto - March

GORDON, ISABEL
Escherichia coli adaptation in the mammalian gut
Portuguesa Genetica, Porto - March

Evolução de bactérias comensais no intestino
Illumina Users Group Meeting, INSA, Lisbon - November

Compensation of multiple antibiotic resistance
XII Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro - December

LESSONS FROM ESCHERICHIA COLI ABOUT EVOLUTION IN THE MAMMALIAN GUT
IMM Computational Biology and Bioinformatics Seminars, Lisbon - December

LESSONS FROM ESCHERICHIA COLI ABOUT EVOLUTION IN THE MAMMALIAN GUT
IMM Computational Biology and Bioinformatics Seminars, Lisbon - December

Lopes, Filipa
Alternative splicing and SR proteins in ABA-mediated stress responses
IUCR-ITQB Plant Interaction Meeting, Oeiras - November

MALLO, MAÍRIS
The control of body length in the nematode Caenorhabditis elegans
Doutor Ricardo Jorge, Lisbon - September

MARTINS, GABRIEL
Mesoscopic imaging
8th Course on Optical Microscopy Imaging for Biosciences I3S, Porto - April

MARTINS, VERA
Leukemia and cell competition
XLII Annual Meeting of the Portuguese Society of Immunology, Oeiras - June

MEN, ANA
Comunicação de ciência para cidadãos: dois cursos, duas abordagens
SciComp2016, Lisbon - May

MOITA, LUIS FERREIRA
The importance of being tolerant
Ciclo de conferências sobre doenças infecciosas, Hospital de Santa Maria, Lisbon - January

TARGETING ANTIGEN CROSSPRESENTATION FOR CANCER IMMUNOTHERAPY
Fundação Champalimaud, Lisbon - March

The importance of being tolerant
AIMS meeting, Lisbon - March

IPTRODUCTION; ERC/IE Information Session for Principle Investigators of ERC projects
Fundação Champalimaud, Lisbon - July

NÍÑO-GONZÁLEZ, MARÍA
Analysis of Arabidopsis MFS membrane transporters unveils biological relevance of alternative splicing in plants
Symposium David Drubin Visit, Lisbon - May

OLIVEIRA, RAQUEL
Chromosome architecture and the fidelity of mitosis during development
Symposium David Drubin Visit, Lisbon - May

OLIVEIRA, RUI
Zebrafish as a model organism in social neuroscience
Liase Social Neuroscience Club, RPA, Lisbon - April

O Cérebro Social: como a vida social influencia o cérebro e o comportamento
Culturgest, Ciclo de Conferências “Discursos do Cérebro”, Lisbon - September

Social and affective neuroscience: lessons from fish
Institute for Public Health, Universidade do Porto, Porto - November

PAIS, INÉS
Drosophila melanogaster has a stable, beneficial and host-specific gut microbiota
DrosTuga, Tomar - September

PEIXOTO, BRUNO
Starch Metabolism - A regulatory role for SARK1?
ITQB-IGC Plant Interaction Meeting, Oeiras - September

PENHA-GONÇALVES, CARLOS
Foetal factors in pathogenesis of malaria in pregnancy
NEBFCUL’s BioSAM – Biological Sciences Annual Meeting/FCUL, Lisbon - April

PEREIRA, LÍLIA
Evolution and cancer
Faculdade de Ciências da Universidade de Lisboa, Lisbon - March

PEREIRA, LÍLIA
Evolution and cancer
Faculdade de Ciências da Universidade de Lisboa, Lisbon - March

PEREIRA, LÍLIA
Evolution and cancer
Faculdade de Ciências da Universidade de Lisboa, Lisbon - March

REBELO, MANUEL
VI Workshop “Biosegurança em experimentação animal”
Instituto Nacional de Saúde Doutor Ricardo Jorge, Lisbon - September

RICHARDSON, DALE
The plant-specific SR protein SCL30a confers ABA-depend-
ent salt and osmotic stress tolerance during seed germination in Arabidopsis

ROCHA, LUIS
Social media mining for precision medicine
Clinical Seminar Series, Fundação Champalimaud, Lisbon - March

The challenge and promise of a two-dimensional science
Ciência 2016: Encontro com a Ciência e Tecnologia em Portugal, Lisbon - July

RODRIGUES, YARA
Integrating complex environmental information in developmental plasticity
XII Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro, Aveiro - December

ROSMANINHO, PEDRO
Zeb1 potentiates gene transcription genome-wide in Glioblastoma Multiforme cancer stem cells via a novel LEF1/TCF dependent mechanism
Portuguese Society for Developmental Biology, Lisbon - April

SANTOS, DIOGO
The relativity of time in evolution
XII Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro, Aveiro - December

SILVA, CAROLINA
Genetics of diversification: characterization of a hot-spot locus for pigmentation evolution
XII Encontro Nacional de Biologia Evolutiva, Universidade de Aveiro, Aveiro - December

SOARES, MIGUEL
Metabolic adaptation at the “iron age” of host microbe interactions
Chronic Diseases Research Center at Universidade Nova de Lisboa, Lisbon - February

Inflammation: a fine balance between immunity and disease
Faculdade de Medicina da Universidade de Lisboa, Lisbon - October

TAVARES, SANDRA
The actin cytoskeleton in pre-malignant breast cancer expansion: when cells are overactin
SPBD 10th Anniversary Symposium, Lisbon - September

TEIXEIRA, LUIS
Natural host-microbe interactions in Drosophila: from defensive endosymbionts to gut microbiota
iiSIBMC, Universidade do Porto, Porto, Portugal - January

Wolbachia and vector-borne diseases
Instituto de Higiene e Medicina Tropical, Lisbon - May

The bacterial endosymbiont Wolbachia protects against viruses
XLII Annual Meeting of the Portuguese Society for Immunology, Oeiras - June

VAZ DA SILVA, ZOE
Membrane regulators of complement activation impact in influenza A virus pathogenicity
XLII Annual Meeting of the Portuguese Society for Immunology, Oeiras - June

XAVIER, KARINA
A linguagem das bactérias que vivem no nosso corpo
VIII Jornadas de Genética e Biotecnologia, Universidade de Trás os Montes e Alto Douro, Vila Real - March
PUBLIC ENGAGEMENT IN SCIENCE

>5500 VISITORS IN PUBLIC EVENTS

432 STUDENTS VISITED THE IGC

~207 RESEARCHERS & TECHNICIANS ENGAGED IN OUTREACH ACTIVITIES

5 NEW MULTIMEDIA RESOURCES

1 INTERNATIONAL EDUCATION PROJECT

8 PARTICIPATIONS IN PUBLIC EVENTS

2 ARTISTS IN RESIDENCE
PRODUCTION OF MULTIMEDIA RESOURCES
Four episodes of a new series of videos entitled "PhD in a minute" were produced in 2016, aiming at introducing the thesis work developed by IGC PhD candidates. A new video from the "IGC paper video" series - "Using statistics to prepare better experiments!" - was released, covering the scientific article published in Genetics by Claudia Bank’s laboratory.

"LAB IN A BOX" – SCIENCE EXPERIMENTS FOR STUDENTS IN AFRICA
This new project is based on the concept of a mini-lab provided in a box, containing very simple and inexpensive materials that can support the development of experiments in Biology, Ecology, Geology, Chemistry and Physics. Established by the Graduate Programme Science for Development and by the Science Communication Unit, Lab in a Box aims at improving scientific literacy and stimulating experimental work as part of the science education curricula in African schools. In 2016, 34 IGC scientists and technicians volunteered to improve and further developed 43 experimental protocols in biology, ecology and chemistry; 500 boxes with reagents and material to run about those experiments were prepared and sent to every secondary school in Cabo Verde; and 24 Cabo-Verdean high-school teachers received specific training by IGC scientists and science communicators, in Praia, to implement these activities in the classroom. The Instituto Camões, the UNESCO National Commission, and the Ministry of Education of Cabo Verde support Lab in a Box.

SCHOOLS’ OUTREACH
In 2016, 188 students from 9 high schools (from Lisboa, Portimão, Silves, Coimbra, Almada, Sintra, Caparica and Oeiras) and 144 students from 4 universities (Universidade de Lisboa, Universidade Nova de Lisboa, Instituto Politécnico de Leiria and Instituto Superior Técnico) visited the IGC. One of our scientists was invited to participate in the “Encontro com o Cientista”, an initiative from “Escola Ciência Viva”, receiving a total of 49 students from 2 primary schools (in Lisbon). Two of our scientists went to 2 high schools to lecture on evolution (in Algés) and in science in general (in Barcelona), reaching 123 students. In total, we received 27 requests either to visit the IGC, also in specific events, or to provide material or assistance in the development of science projects.

ONLINE EDUCATION RESOURCES
“Ciência em Três” - The IGC website for teachers
A new website was launched in the beginning of April to substitute the obsolete “Genes et al.” website. This website offers resources developed at the IGC for the teaching and learning of the life sciences. The resources available include experimental activities suitable for the classroom and divided by school years, videos illustrating biological processes and articles focusing areas of cutting-edge research. During 2016, the website received 14,031 total views corresponding to 4,075 users. A total of 555 downloads were done.

PUBLIC ENGAGEMENT IN SCIENCE 2016

MEDIA OFFICE

NEWS CLIPPINGS mentioning the IGC were registered (values are underestimates)

35,755 FANS ON FACEBOOK
2,926 FOLLOWERS ON TWITTER
236,905 VIEWS ON THE YOUTUBE CHANNEL
419,223 IGC WEBSITE VISITS

INSTITUTIONAL COMMUNICATION

18 PRESS RELEASES were sent out announcing research developments and awards accomplished by IGC scientists

42% INTERNATIONAL MEDIA OUTLETS

58% PORTUGUESE MEDIA OUTLETS

663 NEWS CLIPPINGS

PUBLISHED IN THE INTERNET

NEW MEDIA

HIGH SCHOOL STUDENTS VISITING A FACILITY IN THE IGC

A new educational platform developed by the IGC was launched.
PUBLIC EVENTS

IGC AT FUTURÁLIA | 16-19 MARCH
Upon invitation by FCT, 4 IGC researchers participated in Futurália, the largest education, training and employability fair in Portugal. The researchers talked with high school students about their career path as scientists and informed students about the IGC PhD Programmes.

INTERNATIONAL IMMUNOLOGY DAY | 29 APRIL
To celebrate the International Immunology Day, the IGC prepared a full programme of activities that aimed to guide the visitors in a great journey through the science behind immunology. A total of 51 students from 5 high schools (from Castelo Branco, Portalegre, Sintra, Cascais and Oeiras) attended lectures given by IGC scientists, learned concepts through laboratory activities and interacted with the science & art installation “Musical Morphogenesis”.

IGC AT BELEM ART FEST | 6-7 MAY
For the second consecutive year, the IGC was invited to participate in Belém Art Fest, a festival of Portuguese culture that takes place in Belém (Lisbon). 580 visitors talked to our scientists to unravel the complex world of the genetic networks and Plant Biology, and interacted with the science & art installation “Musical Morphogenesis”.

IGC AT MAKER FAIRE LISBON | 25-26 JUNE
The IGC participated at the Maker Faire Lisbon, an event with a “Do It Yourself” mindset that embraces all kinds of innovative science and engineering projects, with “Musical Morphogenesis”. About 700 visitors had the opportunity to interact and learn about this science & art installation.

IGC AT NOS ALIVE'16 | 17-9 JULY
Science and music came together for the 9th year running at the NOS Alive’16 music festival. The main activities at the IGC corner were speed-dating, a photo exhibition of the NOS Alive fellows and four different science activities: a biodiversity quiz, a game testing the evolution of hosts and parasites, a fitness-land-scape climbing board game and a game/quiz to explain malaria. This year, we also had a Plinko indicating which activity visitors should take and a “If you were a scientist what would you like do discover?” board, where visitors could write their ideas. Fifty IGC volunteers made these activities possible for about 1500 young people who visited the IGC corner.

IGC AT “AO LEME COM A CIÊNCIA VIVA” FESTIVAL | 4 AUGUST
IGC was invited by the national agency Ciência Viva to participate at the Science Festival “Ao Leme com a Ciência Viva” in Belém (Lisbon), an event that had the participation of over 50 institutions. About 200 visitors engaged in two activities that were run by 7 IGC researchers: a biodiversity quiz and a hands-on activity where visitors could learn and experiment some of the steps involved in biodiversity research, from the field to the laboratory.

IGC AT THE SCIENCE & TECHNOLOGY WEEK | 21-27 NOVEMBER
IGC participated in the Science & Technology Week 2016 with 2 different activities. “Musical Morphogenesis”, the science & art installation, was exhibited at the Electricity Museum in Belém (Lisbon) during the entire week. Around 750 visitors interacted with the installation. The IGC also created an online challenge: solving and deciphering 4 biology-related puzzles. The goal was to show some of the research developed at the IGC and test biology knowledge in a playful and fun way. 750 new sessions with 6.300 page visualisations, from 10 different countries were registered; 54 visitors managed to solve all puzzles.

IGC AT BELÉM ART FEST | 6-7 MAY

An IGC PhD candidate talks to high school students at Futurália.

Visitors learning the science behind “Musical Morphogenesis” at the Maker Faire Lisbon.

Visitors interacting with the installation “Musical Morphogenesis” at Belém Art Fest.

The Portuguese Minister for Science, Technology and Higher Education, and the President of Ciência Viva at the IGC stand at “Ao leme com a Ciência Viva” festival.

The IGC stand at the NOS Alive'16 Festival.

A hands-on activity developed during the IGC Open Day.

The IGC participated in the Science & Technology week with online biology-related puzzles, and a science & art installation.

The 8th edition of the IGC Open Day brought 1800 visitors to the IGC. 170 IGC volunteers (including 29 non-Portuguese) participated in the event, showing the science we do in many different activities: hands-on experiments, laboratory tours, talks with scientists, a Top Model room showing the model organisms used at the IGC, a fluorescent room with GFP-organisms, a science corner for kids and a group of sketchers to draw some of our science. This year we also had science & art projects, with the pre-promiere of “Quatuor pour l’aurore des temps”, a musical project of the artist in residence Camille van Lumen, in collaboration with in-house scientists, and played by a quartet of the Gulbenkian Music. Visitors also had the opportunity to interact with the installation “Musical Morphogenesis”.

The 8th edition of the IGC Open Day brought 1800 visitors to the IGC. 170 IGC volunteers (including 29 non-Portuguese) participated in the event, showing the science we do in many different activities: hands-on experiments, laboratory tours, talks with scientists, a Top Model room showing the model organisms used at the IGC, a fluorescent room with GFP-organisms, a science corner for kids and a group of sketchers to draw some of our science. This year we also had science & art projects, with the pre-promiere of “Quatuor pour l’aurore des temps”, a musical project of the artist in residence Camille van Lumen, in collaboration with in-house scientists, and played by a quartet of the Gulbenkian Music. Visitors also had the opportunity to interact with the installation “Musical Morphogenesis”.

The 8th edition of the IGC Open Day brought 1800 visitors to the IGC. 170 IGC volunteers (including 29 non-Portuguese) participated in the event, showing the science we do in many different activities: hands-on experiments, laboratory tours, talks with scientists, a Top Model room showing the model organisms used at the IGC, a fluorescent room with GFP-organisms, a science corner for kids and a group of sketchers to draw some of our science. This year we also had science & art projects, with the pre-promiere of “Quatuor pour l’aurore des temps”, a musical project of the artist in residence Camille van Lumen, in collaboration with in-house scientists, and played by a quartet of the Gulbenkian Music. Visitors also had the opportunity to interact with the installation “Musical Morphogenesis”. 
**ART & SCIENCE PROJECTS**

**‘MUSICAL MORPHOGENESIS’**
Musical Morphogenesis is an interactive installation that traduces in sound, light and movement the development of a flower, unveiling the role of genetic networks during that process. This installation was developed by scientists, architects, engineers and a musician, in a collaborative project between the IGC, Gulbenkian Descobrir and Vitruvius-FabLab, ISCTE-IUL. During 2016 this installation was exhibited in 5 different venues (see public events for more information).

**ARTIST IN RESIDENCE: SIMON BILL**
The British visual artist and novelist Simon Bill became the new artist in residence at the IGC in November 2016, and for a period of 6 months. During his residence, Simon will interact with the IGC community.

**COMPOSER IN RESIDENCE: CAMILLE VAN LUNEN**
From October 2015 to May 2016, the IGC hosted as Artist in Residence the French-Dutch composer and singer Camille van Lunen. During her residence, Camille promoted several musical activities with the IGC scientific community, and composed the piece “Quatuor por l’aurore des temps”, based on biological themes. The pre-premiere of the piece occurred during the IGC Open Day, and its first public performance a month later, in November, in the Gulbenkian Foundation’s main auditorium, played by 4 brilliant members of the Gulbenkian Orchestra.

**OTHER PARTICIPATIONS**
The IGC community collaborated in other projects promoted by different entities. These included a Science Café on “Genetic Improvement”, organised by high school students from Escola Secundária da Cidadela (Cascais) and held at Café do Centro Cultural de Cascais, in May, with the goal of discussing potential benefits, negative impacts and bioethics concerns of genetic modification, with the broader community; and the Portuguese participation in London Design Bienale 2016, where the artist Marta de Menezes collaborated with IGC scientists to merge design and science, using bacteria and plants for data visualization (http://www.londondesignbiennale.com/participants).

**FUNDRAISING 2016**

The IGC runs fundraising initiatives with private companies, charities and the general public to raise private funds for science. The IGC is under the Scientific Sponsorship Law. This law provides tax benefits for science-related donations by either individuals or companies.

**NOS ALIVE – IGC RESEARCH FELLOWSHIPS**
Established in 2007, the partnership between the Instituto Gulbenkian de Ciência (IGC) and Everything is New, promoter of the NOS Alive music festival, results in the IGC participation in this music festival and in two research fellowships per year that allow Portuguese young graduates to start their scientific careers. In 2016, Ana Eugénio and Tiago de Zoeten received a fellowship to develop one-year research projects at the Evolution and Development, and the Population and Conservation Genetics research groups, respectively. The practical works of these projects are to be carried out at the IGC, and in France and Madagascar. Since 2008, over 450 young graduates around the country have applied to these fellowships, and 14 received a fellowship. In 2016, 3 NOS Alive-IGC alumni were conducting a postdoc abroad, 6 were doing a PhD, and the other 3 were developing projects in different research groups.

**COLEÇÃO CIÊNCIA – A PARTNERSHIP BETWEEN THE IGC AND VISTA ALEGRE**
A collection of porcelain products, Coleção Ciência, results from a partnership between the IGC and Vista Alegre, a prestigious and market leader Portuguese porcelain manufacturer. In 2016, the porcelain Coleção Ciência was available at the IGC and at the Calouste Gulbenkian Foundation.

**FUNDRAISING ACTIVITIES ORGANISED BY THE IGC PHD DELEGATES AND POSTDOCTORAL COMMITTEE**
Several fundraising activities (beer hours, wine hours, thematic parties, etc.) were organised in 2016 to raise funds for the 10th PhD AMeeGuS meeting and for the postdoctoral retreat, via donations from attendees at the events, both from IGC staff and the general public.
ACKNOWLEDGMENTS

We are grateful to everyone at the IGC - researchers, students and staff - who supplied information, text and images used in this report.

COORDINATOR
Ana Mena

EDITORS
Vanessa Borges
Inês Domingues

LAYOUT AND DESIGN
Formas do Possível . Creative Studio

PHOTOGRAPHY
Catarina Júlio
Sandra Ribeiro

The Instituto Gulbenkian de Ciência (IGC) Annual Report is also available for download from the IGC website at:
www.igc.gulbenkian.pt/annualreport

If you would like to receive a copy of this report, on a USB memory stick, please contact:

Science Communication and Outreach
Instituto Gulbenkian de Ciência
Tel: +351 440 7959
Fax: +351 440 7970
E-mail: info@igc.gulbenkian.pt

This is an open access publication, and with the exception of images and illustrations, the content may, unless otherwise stated, be reproduced free of charge in any format or medium, subject to the following conditions: content must not be used in a misleading context, the IGC must be credited as the original author and the title of the document specified in the attribution.

First published by the Instituto Gulbenkian de Ciência, 2017

© Copyright Fundação Calouste Gulbenkian 2017