

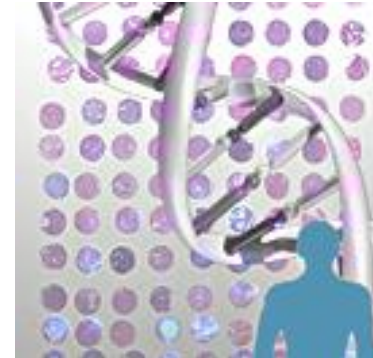
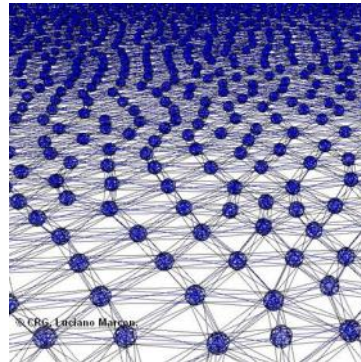
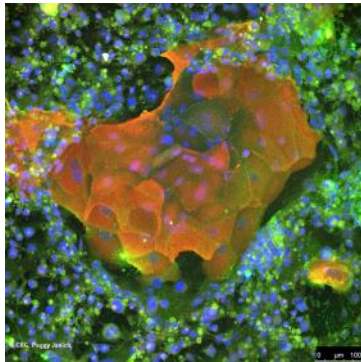
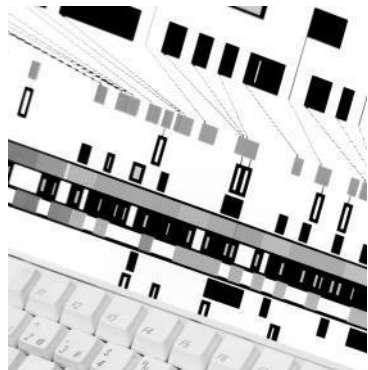


THE CRG IN A NUTSHELL



- Founded in 2000
- 30 groups + 6 core facilities
- 425 staff
- 70% foreign researchers
- 197 publications, IF=8.8
- Budget: 27M€ (47% core – National and local government; 53% external)
- Position 9 worldwide Q1, Health - Scimago Reports (2007-2011)
- Severo Ochoa center of Excellence

Understanding the complexity of life from the genome to the cell to a whole organism and its interaction with the environment, offering an integrated view of genetic diseases.




THE MEDICINE OF THE FUTURE DEPENDS ON THE GROUNDBREAKING SCIENCE OF TODAY

***INTERNATIONAL
COLLABORATION***

***ADVANCED
TRAINING***

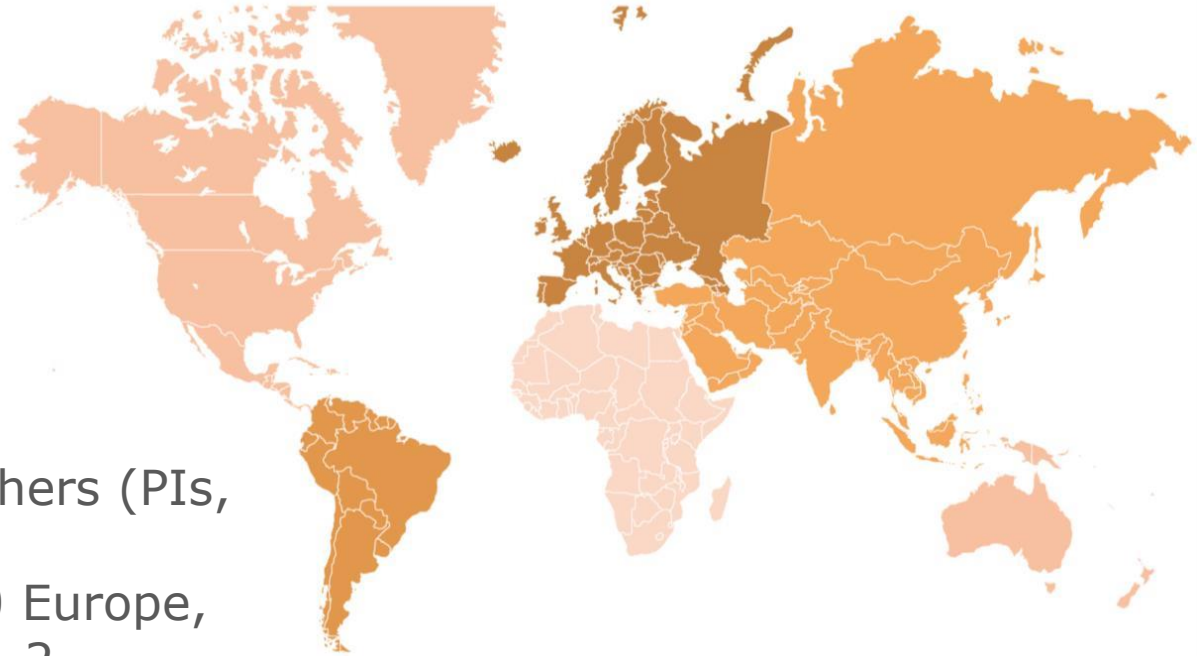
***FOREFRONT
TECHNOLOGY***

A close-up photograph of a hand wearing a white nitrile glove, holding a clear glass test tube. The hand is positioned above a white plastic test tube rack that contains several other test tubes. The background is a blurred laboratory setting.

**EXCELLENCE
IN SCIENCE**

***TECHNOLOGY
TRANSFER***

***SCIENCE &
SOCIETY***



- 70% foreign researchers (PIs, Postdocs, PhDs)
- 41 nationalities (380 Europe, 15 America, 28 Asia, 2 Oceania)
- > 100 PhD students
- > 100 postdocs

THE FACES OF OUR SCIENCE



- 13 European Research Council (ERC) PIs
- 2 Howard Hughes Early Career Scientists (HHMI)
- 8 EMBO members
- 3 EMBO Young Investigators
- 2013 Eppendorf Young European Investigator
- 1 Merck Award ASBMB

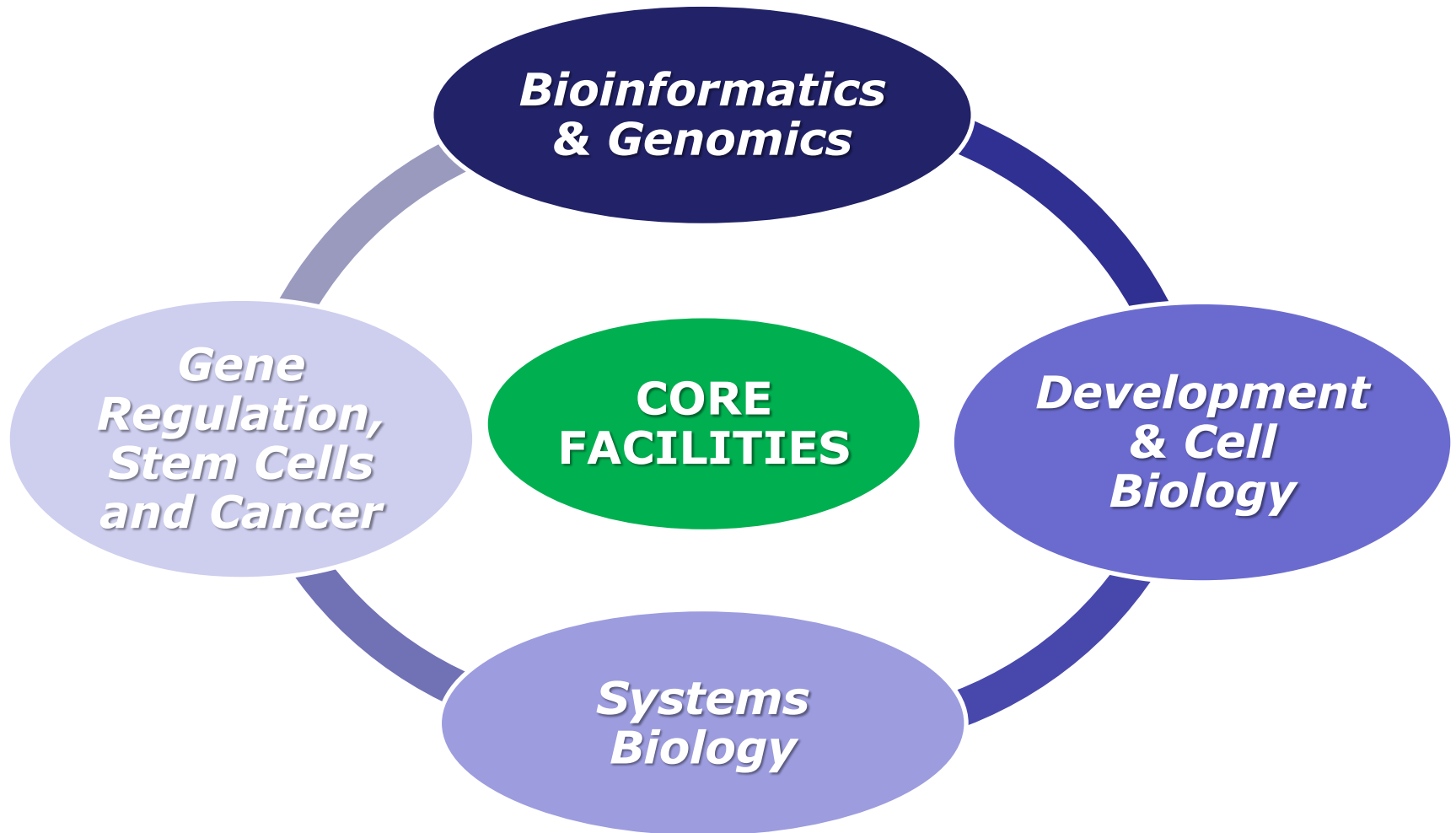


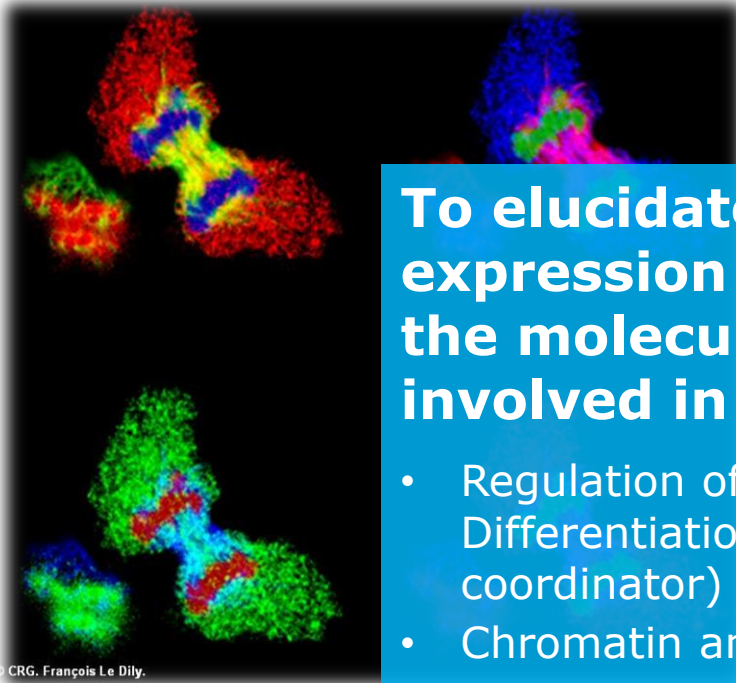
Senior PIs with open-ended contracts

Junior PIs with 5 +4 contracts

Evaluation by SAB and *ad hoc* panel every 4 years
according to high international standards

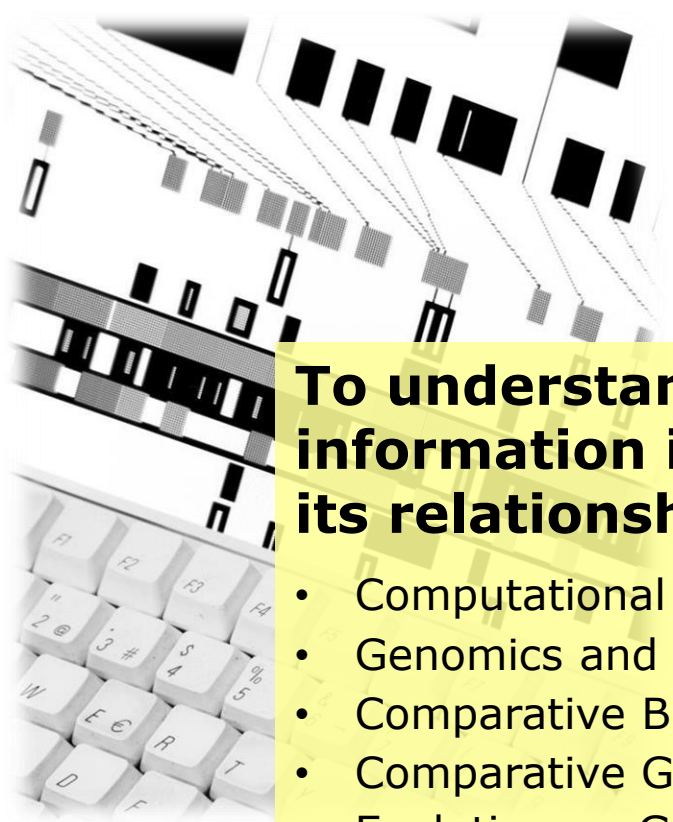






To elucidate mechanisms of gene expression and epigenetic regulation, and the molecular basis of cellular decisions involved in tissue homeostasis and cancer

- Regulation of Alternative pre-mRNA Splicing during Cell Differentiation, Development and Disease (Valcárcel, coordinator)
- Chromatin and Gene Expression (Beato)
- Reprogramming and Regeneration (Cosma)
- Gene Function (De La Luna)
- Epigenetic Events in Cancer (Di Croce)
- Genome Architecture (Filion)
- Regulation of Protein Synthesis in Eukaryotes (Gebauer)
- Hematopoietic stem cell biology and differentiation (Graf)
- Mechanisms of cancer and aging (B. Keyes)
- Structural Genomics (Martí-Renom)

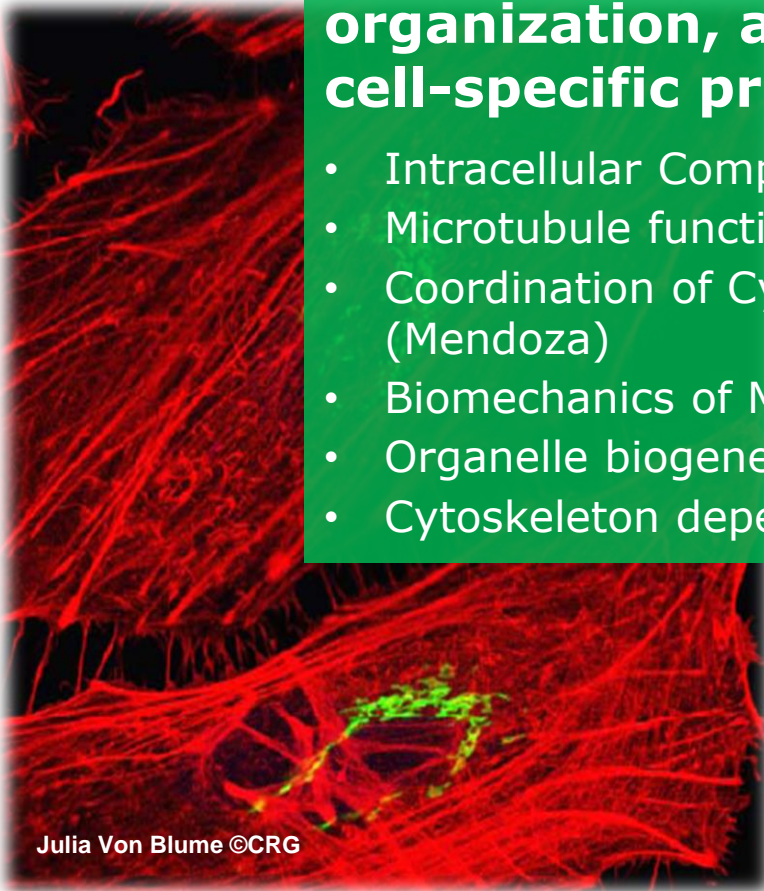


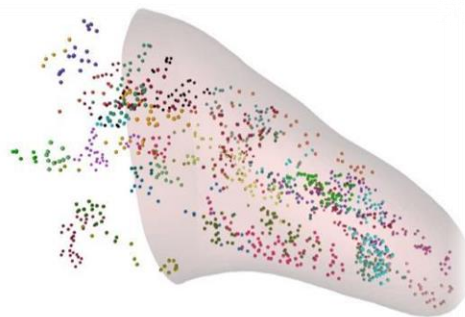
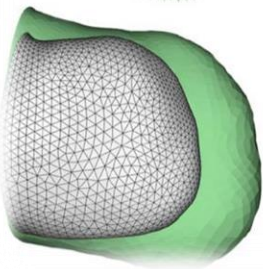
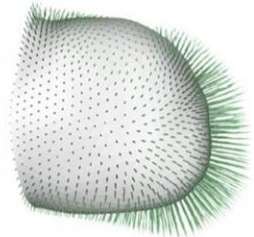
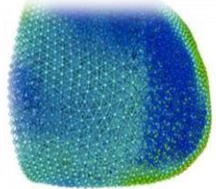
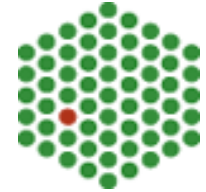
To understand the coding of biological information in the sequence of genomes and its relationship to human health

- Computational Biology of RNA Processing (Guigó, coordinator)
- Genomics and Disease (Estivill)
- Comparative Bioinformatics (Notredame)
- Comparative Genomics (Gabaldón)
- Evolutionary Genomics (Kondrashov)
- Gene Function and Evolution (Tartaglia)
- Genomic and Epigenomic Variation in Disease (Ossowski)

To understand the mechanisms of cell compartmentalization, division and tissue organization, and their roles in determining cell-specific properties

- Intracellular Compartmentation (Malhotra, coordinator)
- Microtubule function and cell division (Vernos)
- Coordination of Cytokinesis with Chromosome Segregation (Mendoza)
- Biomechanics of Morphogenesis (Solon)
- Organelle biogenesis and homeostasis (Carvalho)
- Cytoskeleton dependent RNA distribution mechanisms (Maurer)





To achieve a global quantitative understanding of biological systems, developing models that capture biological complexity and have predictive value

- Multicellular Systems Biology (Sharpe, coordinator)
- Design of Biological Systems (Serrano)
- Genetic Systems (Lehner)
- Sensory Systems and Behaviour (Louis)
- Comparative Analysis of Developmental Systems (Jaeger)
- Cellular & Systems Neurobiology (Dierssen)
- Transcriptomics of vertebrate development and evolution (Irimia)

Cell

Senescence Is a Developmental Mechanism that Contributes to Embryonic Growth and Patterning

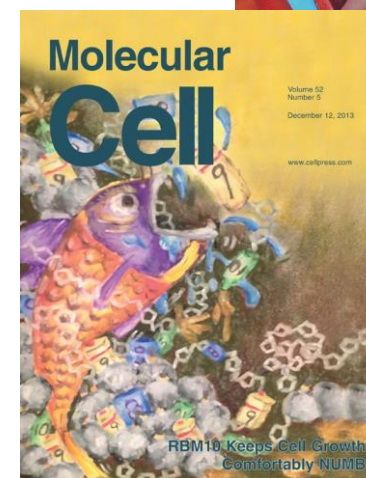
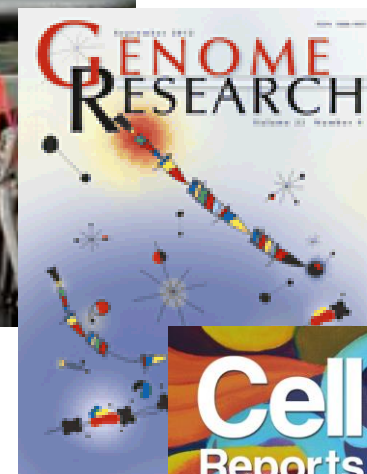
Mekayla Storer,¹ Alba Mas,¹ Alexandre Robert-Moreno,¹ Matteo Pecoraro,¹ M. Carmen Ortells,¹ Valeria Di Giacomo,¹ Reut Yosef,² Noam Pilpel,² Valery Krizhanovsky,² James Sharpe,¹ and William M. Keyes^{1,2}

NATURE | LETTER



The effects of genetic variation on gene expression dynamics during development

Mirko Francesconi & Ben Lehner



LETTER

doi:10.1038/nature11510

Epistasis as the primary factor in molecular evolution

Michael S. Breen¹, Carsten Kemena¹, Peter K. Vlasov¹, Cedric Notredame¹ & Fyodor A. Kondrashov^{1,2}



eLIFE Research article Cell biology

Article Figures & data Metrics Article & author info

TRPM5-mediated calcium uptake regulates mucin secretion from human colon goblet cells

Sandra Mitrovic, Cristina Nogueira, Gerard Cantero-Recasens, Kerstin Kiefer, José M Fernández-Fernández, Jean-François Popoff, Laetitia Casano, Frederic A Bard, Raul Gomez, Miguel A Valverde, Vivek Malhotra

Molecular Systems Biology 9; Article number 653; doi:10.1038/msb.2013.6
Citation: *Molecular Systems Biology* 9:653
www.molecularsystemsbiology.com



molecular
systems
biology

Dissecting the energy metabolism in *Mycoplasma pneumoniae* through genome-scale metabolic modeling

Judith AH Wodke^{1,2,3}, Jacek Puchatka^{4,11}, Maria Lluch-Senar^{1,2}, Josep Marcos^{5,6}, Eva Yus^{1,2}, Miguel Godinho^{4,7}, Ricardo Gutiérrez-Gallego^{5,6}, Vitor AP Martins dos Santos^{1,8,9}, Luis Serrano^{1,2,10,*}, Edda Klipp^{3,*} and Tobias Maier^{1,2,*}

FOREFRONT TECHNOLOGIES



Advanced Light Microscopy

- Super-resolution (STED)
- Two-photon
- Confocal

Proteomics

- Orbitrap mass spec

Genomics

- Microarray
- NGS (Illumina and 454 platforms)

Histology

Bioinformatics

- NGS data analysis
- Data integration

FACS

- Becton Dickinson site
- 5 analyzers and 2 sorters

Screening / protein tech.

- High content screening
- LabChip, AKTA

TOWARDS TRANSLATIONAL RESEARCH

COLLABORATION

- HOSPITALS
- HEALTH INDUSTRY
- TRAINING FOR MD
- INSTITUTIONAL SEED FUNDS

CRG
*Fundamental
Knowledge*

MODELS

TISSUES, ORGANS

GENOMES

**TRANSLATION TOWARDS
PERSONALIZED MEDICINE**

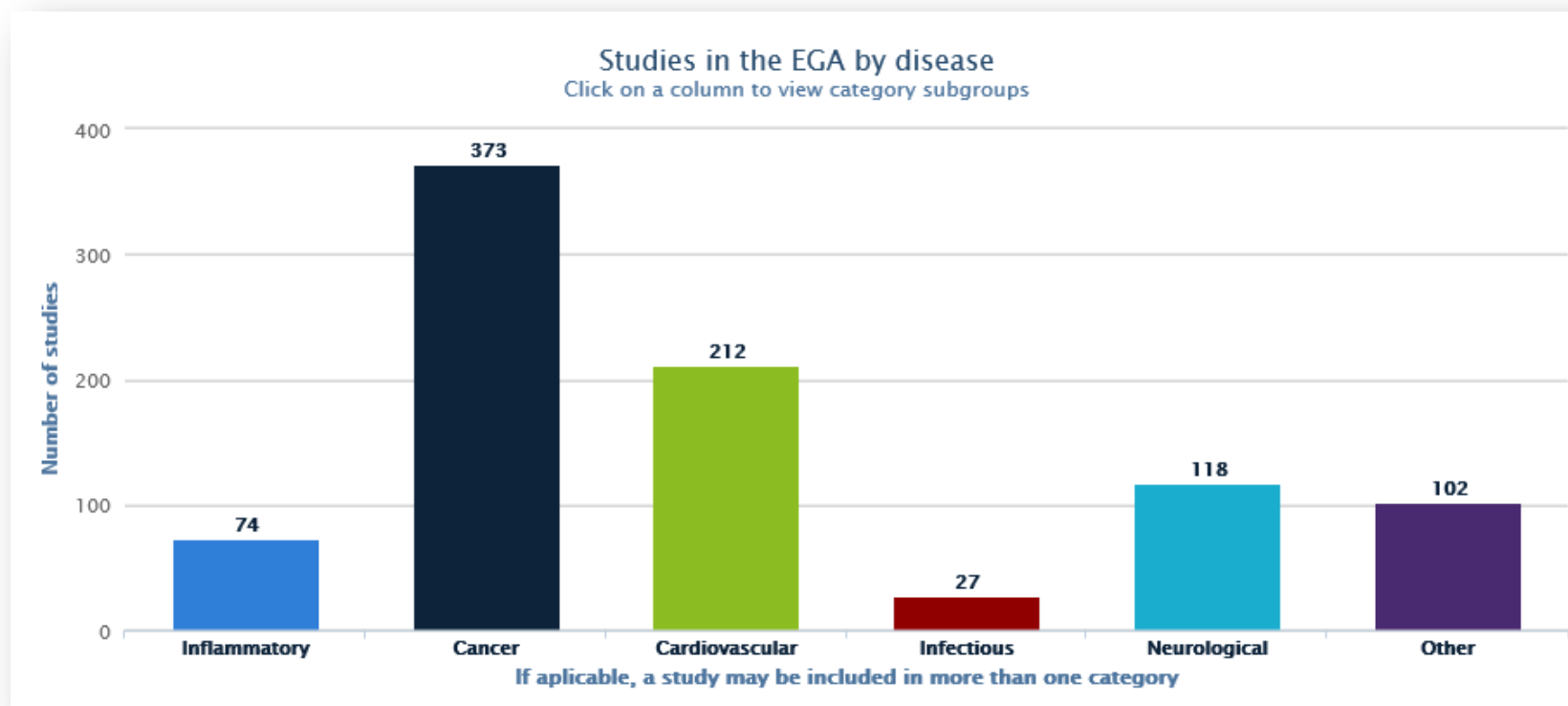
Individual
patient



RESOURCES

- EUROPEAN GENOME PHENOME ARCHIVE (**EGA**)
- MERGING WITH SPANISH NATIONAL SEQUENCING CENTER (**CNAG**)

- A service for **permanent archiving** and **secure sharing** of personally identifiable genetic and phenotypic data from biomedical research projects.
- A key resource for personalized systems medicine.
- **EBI-BSC-CRG** partnership to host, manage and improve the EGA.





eulife



CORE FOR LIFE

EU-LIFE

European Life Sciences Institutes for Excellence, www.eu-life.eu

13 partners across Europe

- Promoting excellence
- Integration
- Attract talent, support mobility
- Sharing best practise in research and management

PARTNERS: CRG, VIB, Curie, MDC, Babraham, IGC, FMI, NKI, CEITEC, CeMM, IEO, BRIC, FIMM

CORE FOR LIFE

Excellence Alliance of Life Sciences Core Facilities in Europe, www.coreforlife.eu

7 partners across Europe

- Sharing best practice
- Training
- Scouting new technologies
- Capacity sharing
- Funding

PARTNERS: CRG, VIB, EMBL, MPI-CBG, CSF - Vienna Biocente, FGCZ



Collaboration agreement; exchange programme



MIT International Science & Technology Initiatives

MIT-Spain:
Hosting MIT students in CRG research labs



2013-2014 programme

3 PhD students for 6 months on collaborative projects

A faint, light purple world map is visible in the background of the slide, showing the outlines of continents.

2014-2015 programme

- 3 fellowships for PhD students or postdocs for 6 months on collaborative projects (January – July 2015)
- Open up to other SA Universities and research centres

EUROPEAN COORDINATED PROJECTS

4DCellFate

Global understanding of the PRC and NuRD complexes in stem cells and disease.



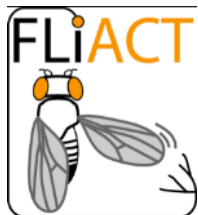
SystemTb

Systems Biology of *M. tuberculosis* and its interaction with the host.



FLiACT

Systems neuroscience in *Drosophila* (training network).



SWARMORGAN

Theoretical framework for swarms of GRN-controlled agents in morphogenesis and robotics.



BioPreDyn

New systems biology and bioinformatics tools for biotechnology applications.



IHEC

A BLUEPRINT of
Haematopoietic
Epigenomes (FP7)



GTEx

Genotype-tissue
Expression Portal
(NIH funded)



ICGC

Genome sequencing
of chronic
lymphocytic
leukemia (CLL)



ENCODE

The Encyclopedia Of
DNA Elements (NIH-
funded)





Training the next generation of scientists

- International PhD Programme
- International Postdoctoral Programme
- Programme for visiting scientists
- Courses@CRG
- Teaching and Training LAB
- Training Unit
- Seminars, data clubs, retreats, courses

- Personalized mentoring
- Advanced training and courses
- Weekly journal clubs, data seminars, Courses @ CRG
- Career development and transferable skills
- PhD symposia and retreats
- Social activities



- Training through research
- Advanced courses
- Teaching and mentoring activities
- Weekly journal clubs, data seminars, Courses @ CRG
- Career development and transferable skills
- Postdoc symposia and retreats
- Collaboration and mobility opportunities
- Social activities
- ***New calls open now (ImPULSE)***



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For further information: interpodcrg@crg.eu

Co-funded by:  

07/07/2014 - 11/07/2014 **Advanced proteomics course for molecular biologists and clinicians**

15/09/2014 - 20/09/2014 **Genome wide approaches to study functional protein/RNA interactions**

28/09/2014 - 03/10/2014 **EMBO Practical course on targeted proteomics: experimental design and data analysis**

06/10/2014 - 10/10/2014 **Next Generation Sequencing: lab methods and computational challenges**

27/10/2014 - 05/11/2014 **Stem Cells and induced Pluripotent Stem Cells**

Advanced proteomics course for molecular biologists and clinicians

7-11 July 2014

Teachers
Eduardo COBAS, CIBER Proteómica, Barcelona, Spain

Barcelona, Spain
Barcelona, Spain
Barcelona, Spain
Barcelona, Spain
Barcelona, Spain

Genome wide approaches to study functional protein/RNA interactions

15-20 September 2014

Speakers

Fatima GEBAUER, CRG, Spain
Nicholas T. INGOLIA, UC Berkeley, USA
Julian KÖNIG, IMB, Germany
Reinhard LÜHRMANN, MPI, Germany
Maria Paola PARONETTO, CERC Fondazione Santa Lucia, Italy
Michael SATTLER, STB, Germany

Trainers

Elias BECHARA, CRG, Spain
Julian KÖNIG, IMB, Germany
Maria Paola PARONETTO, CERC Fondazione Santa Lucia, Italy
Laurence WURTH, CRG, Spain

Organizers

Elias BECHARA,
Centre for Genomic Regulation (CRG)
Juan VALCÁRCEL,
ICREA and Center for Genomic Regulation (CRG)

More information and online registration at:
www.crg.eu/RNACourse14



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@Courses
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Dedicated Technology
Transfer Office

A green rectangular street sign with white, bold, sans-serif capital letters spelling 'INNOVATION'. The sign is mounted on a black metal pole and is angled upwards against a clear blue sky. In the background, a modern building with a grid of windows is visible.

INNOVATION

Translating new scientific
knowledge into benefits for
health and value for society

- Licensing and patent portfolio in cancer, CNS, dermatology, HIV/AIDS, methods
- Contract research agreements with pharmaceutical and biotech companies
- Strategic research agreement with **Sanofi**
- Q-Genomics



Encouraging critical thinking and offering new educational resources

- Science & Art: scientific artistic contest
- Workshops for primary & high schools
- Scientific cafes
- "Easy Science" conferences
- Molecular biology summer campus
- Summer internships



THANKS!

Contacts:

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