Activity Report 2016

CIC CONTRACTOR Biozientzietako Ikerkuntza Kooperatiboko Zentroa Centro de Investigación Cooperativa en Biociencias



About Us

Vision:

CIC bioGUNE (Centre for Cooperative Research in Biosciences) is a non-profit research organisation focused on performing research of excellence in Life Sciences. Founded in 2002 through an initiative of the Department of Industry of the Basque Government (currently Department of Economic Development and Infrastructures), it has become a pillar of the Basque Country's growing bioscience sector and a model for efficient cooperation between the different agents of the Basque Innovation System.

Mission:

CIC bioGUNE's mission is to perform basic research that excels at the international level, focused on strategic aims: to play a major role in the advancement of biomedical research and technological innovation and to support the development of the biotechnology and bioscience industry in the Basque Country.

Values:

CIC bioGUNE prioritises scientific opportunities with the strongest service potential and the highest capacity to improve the quality of life of society. CIC bioGUNE adheres to the following values:

Our projects and activities will be conducted in the firm belief that scientific excellence may only be fostered in a free and tolerant environment.

Our projects and activities will seek to promote the human and professional development of those involved in achieving our goals.

Our resources and projects will be administered, directed and assessed in order to reaffirm the trust placed in us by the Basque Administration.

Funding 2016

Total 2016 R&D Budget: **11.459** million € N. R&D Projects: **57**

Public Funding

Private Funding

87% Public Funding 52,76% competitive + 47,24% non-competitive

13% Private Funding





56% Basque Gorvernment Departments
6.399 K€
20% MINECO & MEDC (Spanish Government)
2.286 K€
13% R&D Contracts, Research Services & Others
1.498 K€
8% EU & International Projects
871 K€
3% Bizkaia County Council & Others
405 K€

Staff 2016

Staff 2016.12.31:**164** Average Age: **37.2** years Permanent staff: **52%**





83.5% Research16.5% Administration and services13727

Research distribution by Proffesional Category	n٥	%	Ŷ	Ŵ	
Researches	95	69.3	41	54	
Principal Investigators / Platform Managers	25	18.2	7	18	
Postdoctoral Researches / Research Assistant / Specialist	36	26.3	15	21	
• PhD Student	34	24.8	19	15	
Technicians	42	30.7	33	9	



76.8% Spanish 73 researchers
14.8% Rest of Europe 14 researchers
6.3% America6 researchers
2.1% Asia 2 researchers

Scientific Output 2016



Technology transfer and innovation 2016

New Patent Applications: New Collaboration Agreements: New Research Contracts: Economic Activity: **1.107.328 €**

3 Licensed Patents
1 new US Patent: US 9.437.765
1 new EPO Patent: EP 2.384.702 (B1)

Customer Base: 57

Basque Country: **34.3 %** National: **19.3 %** International: **46.4 %**

11 New Patent Applications



4	European Patent Application
3	PCT Patent Application
2	Spanish Patent Application
2	USPTO Patent Application

Research Programmes



Personalized medicine Prostate Cancer Breast Cancer Colorectal Cancer Liver Diseases Rare Diseases Biomarkers for Diagnosis Biomarkers for Prognosis Drug Design and Discovery



Rare Diseases Homeostasis Viral Infections Bacterial Infections Prion Disease Tick-Borne Disease Immune Response Drug Design and Discovery



NMR Spectroscopy Macromolecular Crystallography Electron Microscopy Genome Analysis Proteomics Metabolomics Animal Facility

Organization

New recruitments

Research lines:

- **1. Carbohydrate modifying enzymes** Glycosyltransferases, Glycoside hydrolases, Esterases, Auxiliary activities, CBMs...
- 2. Bacterial pathogenesis

Mycobacterium tuberculosis









Marcelo Guerin Group Leader

Comes from Leloir Institute, Argentina

His interest in glycobiology began as an undergraduate student, while working with glycosyl hydrolases in the Leloir Institute at Buenos Aires, Argentina (1991-1996). This research center was named in honor to Luis F. Leloir, who discovered the first sugar nucleotide and was awarded the Nobel Prize in Chemistry in 1970.

He then completed his doctoral studies in biochemistry and molecular biology studying mechanistic aspects of glycosyltransferases in the Leloir Institute (1997-2002). To further advance toward the understanding of the molecular mechanism that governs glycosyl transfer reactions, he moved to the Structural Biochemistry Unit at the Institut Pasteur in Paris, France, where he was first introduced to macromolecular crystallography (2003-2007). After this postdoctoral training, he continued his work on the mycobacterial cell envelope when he transferred as a postdoctoral fellow to the Mycobacteria Research Laboratories in the Department of Microbiology, at Colorado State University in the United States (2008-2009). In 2009, he was awarded an Ikerbasque Research Professor position as the Head of the Structural Glycobiology Group (SGP).

He started his work at the Unit of Biophysics (CSIC-UPV), the Basque Country, Spain. More recently, he moved to the Structural Biology Unit, CIC bioGUNE as the Head of the Structural Glycobiology Lab. He is particularly interested in investigating the structural and mechanistic properties of carbohydrate modifying enzymes. To this end, the group is using a multidisciplinary approach including protein biochemistry, protein biophysics and structural biology.



David Albesa-Jové Senior Scientist

Comes from Imperial College London, United Kingdom

His interest in structural biology and bacterial pathogenicity began at Imperial College London, where he developed his research in the Centre for Molecular Bacteriology and Infection of the Medical Research Council, London, UK (2006-2011). This research center is an international reference point in molecular, cellular and structural aspects of bacterial pathogenesis.

Previous to this, he completed his doctoral studies in chemistry at the University of Birmingham, Birmingham, UK (2000-2004), followed by a first postdoctoral training in the Department of Chemistry at the University of Durham, Durham, UK (2004-2006).

To further advance towards the understanding of the molecular mechanism that underline bacterial pathogenesis, he moved to the Structural Glycobiology Laboratory (2011 to present), where he focuses on the structural bases of glycolipid biosynthesis in bacteria.

In 2014, he was awarded an Ikerbasque Research Fellowship, a highly competitive program that provides a path towards an independent research career. To this end, he is using a multidisciplinary approach including protein biochemistry, protein biophysics and structural biology to study the involvement of the Type 6 Secretion System in bacterial competition and human pathogenicity.

Scientific Output



Structural Mechanism for Cargo Recognition by the Retromer Complex Lucas M, Gershlick DC, Vidaurrazaga A, Rojas AL, Bonifacino JS, Hierro A.

Cell. 2016 Dec 1;167(6):1623-1635.e14. doi: 10.1016/j.cell.2016.10.056



Fine Tuning of CD8 (+) T Cell Mitochondrial Metabolism by the Respiratory Chain Reporter MCJ Dictates Protection to Influenza Virus

Champagne DP, Hatle KM, Fortner KA, D'Alessandro A, Thornton TM, Yang R, Torralba D, Tomás-Cortázar J, Jun YW, Ahn KH, Hansen KC, Haynes L, Anguita J, Rincon M. nature chemistry Catching elusive glycosyl cations in a condensed phase with HF/SbFD superacid

Martin A, Arda A, Désiré J, Martin-Mingot A, Probst N, Sinaÿ P, Jiménez-Barbero J, Thibaudeau S, Blériot Y

Nat Chem. 2016 Feb;8(2):186-91. doi: 10.1038/nchem.2399



The metabolic co-regulator PGC1a suppresses prostate cancer metastasis

Torrano V, Valcarcel-Jimenez L, Cortazar AR, Liu X, Urosevic J, Castillo-Martín M, Fernández-Ruiz S, Morciano G, Caro-Maldonado A, Guiu M, Zúñiga-García P, Graupera M, Bellmunt A, Pandya P, Lorente M, Martín-Martín N, David Sutherland J, Sanchez-Mosquera P, Bozal-Basterra L, Zabala-Letona A, Arruabarrena-Aristorena A, Berenguer A, Embade N, Ugalde-Olano A, Lacasa-Viscasillas I, Loizaga-Iriarte A, Unda-Urzaiz M, Schultz N, Aransay AM, Sanz-Moreno V, Barrio R, Velasco G, Pinton P, Cordon-Cardo C, Locasale JW, Gomis RR, Carracedo A. Tomás-Cortázar J, Jun YW, Ahn KH, Hansen KC, Haynes L, Anguita J, Rincon M.

Nat Cell Biol. 2016 Jun;18(6):645-56. doi: 10.1038/ncb3357



The democratization of cryo-EM Stuart DI, Subramaniam S, Abrescia NG.

Mat Methods. 2016 Jul 28;13(8):607-8. doi: 10.1038/nmeth.3946



Neoangiogenesis-related genes are hallmarks or fast-growing hepatocellular carcinomas and worst survival. Results from a prospective study

Villa E, Critelli R, Lei B, Marzocchi G, Cammà C, Giannelli G, Pontisso P, Cabibbo G, Enea M, Colopi S, Caporali C, Pollicino T, Milosa F, Karampatou A, Todesca P, Bertolini E, Maccio L, Martinez-Chantar ML, Turola E, Del Buono M, De Maria N, Ballestri S, Schepis F, Loria P, Enrico Gerunda G, Losi L, Cillo U.

Gut. 2016 May;65(5):861-9. doi: 10.1136/ gutjnl-2014-308483



Cross-Species Interferon Signaling Boosts Microbicidal Activity within the Tick Vector Smith AA, Navasa N, Yang X, Wilder CN, Buyuktanir O, Marques A, Anguita J, Pal U.

Cell Host Microbe. 2016 Jul 13;20(1):91-8. doi: 10.1016/j.chom.2016.06.001



Evolution of SUMO Function and Chain Formation in Insects

Ureña E, Pirone L, Chafino S, Pérez C, Sutherland JD, Lang V, Rodriguez MS, Lopitz-Otsoa F, Blanco FJ, Barrio R, Martín D.

Mol Biol Evol. 2016 Feb;33(2):568-84. doi: 10.1093/molbev/msv242.



Novel vaccines targeting dendritic cells by coupling allergoids to nonoxidized mannan enhance allergen uptake and inducefunctional regulatory T cell through programmed death ligand1

Sirvent S, Soria I, Cirauqui C, Cases B, Manzano AI, Diez-Rivero CM, Reche PA, López-Relaño J, Martínez-Naves E, Cañada FJ, Jiménez-Barbero J, Subiza J, Casanovas M, Fernández-Caldas E, Subiza JL, Palomares O.

J Allergy Clin Immunol. 2016 Aug;138(2):558-567.e11. doi: 10.1016/j.jaci.2016.02.029

Scientific Output



Finding the Right Candidate for the Right Position: A Solid NMR-Assisted Combinatorial Method for Optimizing Nucleic AcidsBinders.

Jiménez-Moreno E, Montalvillo-Jiménez L, Santana AG, Gómez AM, Jiménez-Osés G, Corzana F, Bastida A, Jiménez-Barbero J, Cañada FJ, Gómez-Pinto I, González C, Asensio JL.

J Am Chem Soc. 2016 May 25;138(20):6463-74. doi: 10.1021/jacs.6b00328



Pharmacological inhibition of fatty-acid oxidation synergistically enhances the effect of I-asparaginase in childhood ALL cells.

Hermanova I, Arruabarrena-Aristorena A, Valis K, Nuskova H, Alberich-Jorda M, Fiser K, Fernandez-Ruiz S, Kavan D, Pecinova A, Niso-Santano M, Zaliova M, Novak P, Houstek J, Mracek T, Kroemer G, Carracedo A, Trka J, Starkova J.

Leukemia. 2016 Jan;30(1):209-1

Deregulated methionine adenosyltransferase α1, c-Myc, and Maf proteins together promote cholangiocarcinoma growth in mice and humans (‡)

Yang H, Liu T, Wang J, Li TW, Fan W, Peng H, Krishnan A, Gores GJ, Mato JM, Lu SC.

Hepatology. 2016 Aug;64(2):439-55. doi: 10.1002/hep.28541.



Structural basis for selective recognition of acyl chains by the membraneassociated acyltransferase PatA.

Albesa-Jové D, Svetlíková Z, Tersa M, Sancho-Vaello E, Carreras-González A, Bonnet P, Arrasate P, Eguskiza A, Angala SK, Cifuente JO, Korduláková J, Jackson M, Mikušová K, Guerin ME.

Nat Commun. 2016 Mar 11;7:10906. doi: 10.1038/ncomms10906.



Liver receptor homolog 1 and transmethylation fluxes in nonalcoholic steatohepatitis Mato JM, Lu SC.

Hepatology. 2016 Jan;63(1):17-9. doi: 10.1002/ hep.28146



Methionine and S-adenosylmethionine levels are critical regulators of PP2A activity modulating lipophagy during steatosis

Zubiete-Franco I, García-Rodríguez JL, Martínez-Uña M, Martínez-Lopez N, Woodhoo A, Juan VG, Beraza N, Lage-Medina S, Andrade F, Fernandez ML, Aldámiz-Echevarría L, Fernández-Ramos D, Falcon-Perez JM, Lopitz-Otsoa F, Fernandez-Tussy P, Barbier-Torres L, Luka Z, Wagner C, García-Monzón C, Lu SC, Aspichueta P, Mato JM, Martínez-Chantar ML, Varela-Rey M.



Stratification and therapeutic potential of PML in metastatic breast cancer

Martín-Martín N, Piva M, Urosevic J, Aldaz P, Sutherland JD, Fernández-Ruiz S, Arreal L, Torrano V, Cortazar AR, Planet E, Guiu M, Radosevic-Robin N, Garcia S, Macías I, Salvador F, Domenici G, Rueda OM, Zabala-Letona A, Arruabarrena-Aristorena A, Zúñiga-García P, Caro-Maldonado A, Valcárcel-Jiménez L, Sánchez-Mosquera P, Varela-Rey M, Martínez-Chantar ML, Anguita J, Ibrahim YH, Scaltriti M, Lawrie CH, Aransay AM, Iovanna JL, Baselga J, Caldas C, Barrio R, Serra V, Vivanco Md, Matheu A, Gomis RR, Carracedo A.

Nat Commun. 2016 Aug 24;7:12595. doi:

Scientific Output Editorial Activity



Scientific Output Highlights

CIC bioGUNE researchers publish again more than 100 publications. They include 20 publications with Impact Factor above 10. The average IF in 2016 reaches 6.5. Competitive funding in CIC bioGUNE reaches 58% of total funding.

A new 600 MHz Bruker IVDr NMR instrument exclusively dedicated to metabolomics studies is installed at CIC bioGUNE.

A new research group (Structural Glycobiology) joins CIC bioGUNE.

CIC bioGUNE researchers obtain three new International projects in 2016.

This instrument will be essential for the development of a new Project on metabolic health of the Basque Country populations.

Atlas Molecular Pharma, a spinoff company from CIC bioGUNE, consolidates its Seed II Phase. CIC bioGUNE joins the RIS3 Specialization Strategy at Euskadi in the area of Health.





11th anniversary-lecture Prof. Avelino Corma



He is also member of the SAB of CIC bioGUNE

Synthetic Biology: Fundaments and Current Developments Prof. Andrew Hessel



Christmas Lecture Prof. Maurizio Prato



Conferences

INTERNATIONAL SOCIETY FOR EXTRACELLULAR VESICLES

> Annual Meeting – ISEV2016 Rotterdam, The Netherlands

Co-organized by Juan M Falcón Pérez 4-7 May 2016 EMBO conference 4 – 6 October 2016 I Bilbao, Spain

Organized by Arkaitz Carracedo 4-6 Oct 2016



Co-organized by Juan M Falcón Pérez 29-30 Sept 2016



Co-organized by Rosa Barrio 2-5 Nov 2016



Workshop



Joint Meeting CIC biomaGUNE- CIC bioGUNE: January 27, 2016



Joint Meeting UPV/EHU (Biofisika)- CIC bioGUNE: June 30, 2016



Rediex Workshop on exosome imaging by REDiEX at @CNIO_cancer Co-organized by Juan M Falcón Pérez July 26-28, 2016

Some Activities



11th anniversary-lecture Avelino Corma, Premio Príncipe de Asturias 2014



New MNR Equipment



5th anniversary



2º Encuentro Industrias Bio-Salud Aquitania / Euskadi



Biospain (28-30 September) & Meeting Biobasque - USA Delegation Biospain 2016. September at CIC bioGUNE



CIC bioGUNE has joined the Agreement on Openness on Animal Research promoted by the Federation osf Scientific Societies in Spain (COSCE)

We have also participated in...







EGITARAUA / PROGRAMA

- Jardunaldiaren aurkezpena / Presentación de la Jornada: pña. Juncal exoberria and.
- La fibromiaigia y sus límites nosológicos desde una perspectiva clínica Dra. Ogo Maiz dk. Diúble Freumatologisko Zechizua Z Seculto de Reumatología del HUD.
- La fibromisigia desde la perspectiva psicológica: ¿causa o consecuencia? Dra. Leyia Govilard dic. Desutivo Unitartificata / Universidad da Desuto.
- El proyecto de investigación ómica en fibromialgía; base conceptua pr. Jaan Manual Falcón de. OC BIOGUNE, Zernadio, Bizkala

El papel de los institutos de investigación y el Biobanco en la investigación sobre las E Dr. Adolfo tóper de Munein de.

n padro los maneses en la consecta e

OPCANIZA: OSI Dopostialda

NOR: Donostia Unibertitate Ospitales. Exitatită aretoa (Arantzatu erokina, 1. solairua) NOR: 2016ko maiatzaren 16an (19:00 – 21:00) ANTOLATZAREA: Donostialdea ESI LUGAR: Hospital Universitario Donostia. Salón de Actos (Edificio Arantza TECHA: 16 de muno de 2016 (19:00 – 21:00) Accademia de ciencias Medicas de Billibao Médicas de Billibao Accademia de ciencias Medicas de Billibao Médicas de Billibao Médicas de Billibao

Definition

Servicio de Dermatolo

BILBOKO MEDIKU ZIENTZIEN AKADEMIA ACADEMIA DE CIENCIAS MEDICAS DE BILBAO



Almirall







-





CIC bioGUNE inaugura un espectrómetro de Resonancia Magnética Nuclear

deia

Un estudio de CIC bioGUNE avanza en la lucha contra el cáncer de hígado y colon

estrategia a Firma | eNet | |

Expertos internacionales se reúnen en Bilbao para discutir sobre cáncer

19,950

noticias de Gipuzkoa

ON ESOCIEDAD EPOLITICA EBERTAN EECONOMIA ELA REAL EDEPORT

de Bilbao ha nombrado a Óscar Mil dente de su sección de investigación. Óscar Mill

