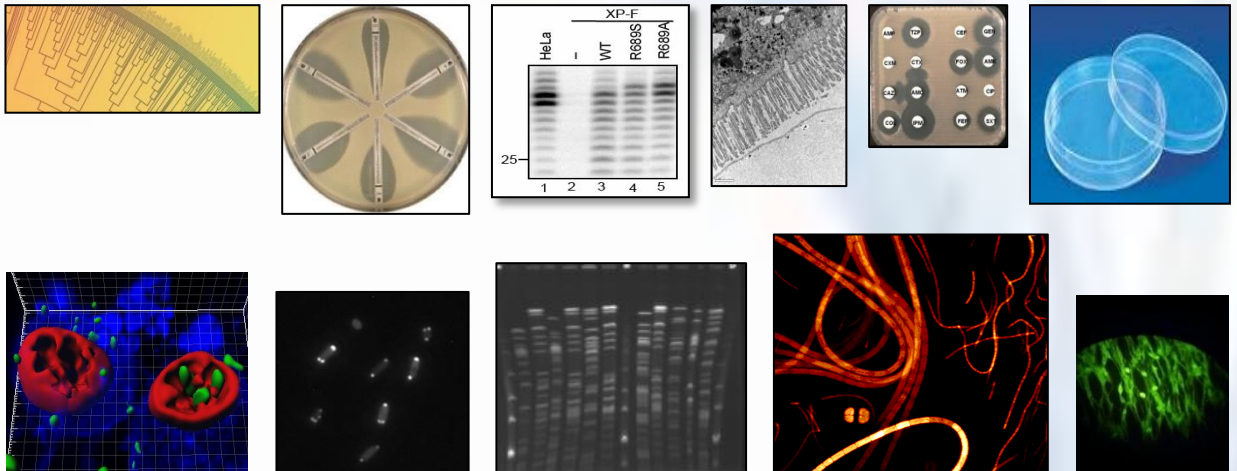

Department of Genetics and Microbiology Universitat Autònoma de Barcelona



2017 ANNUAL SCIENTIFIC REPORT



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Introducció / Introduction



Un cop més presentem la memòria de recerca del Departament. En aquest cas la corresponent a l'any 2017.

Malgrat mantenir un pressupost baix i una contínua reducció en la contractació de professorat no permanent, que fa que la càrrega docent del professorat augmenti, seguim mantenint en el Departament un alt nivell d'excel·lència científica. Continuem amb un nombre elevat de publicacions indexades, que des de l'any 2015 es mou per sobre de 180 articles. El factor d'impacte mitjà d'aquestes publicacions segueix una clara progressió sent el d'aquest any el major aconseguit, 4,76.

Això sí, el valor que ha disminuït de manera significativa és el dels diners aconseguits en projectes i convenis. Com es pot comprovar el valor dels ingressos per projectes fluctua entre els anys parells i els senars. Això és degut a que únicament es compten els ingressos dels projectes concedits aquell any i, per tant, depèn de quins grups de recerca poden sol·licitar nous projectes cada any.

Únicament, doncs, resta donar les gràcies a tots els membres del Departament que han fet possible aquest manteniment del nivell d'excel·lència del nostre Departament.

Once again we present the Annual Scientific Report of the Department. In this case the one corresponding to the year 2017.

Despite the low budget and a continuous reduction in the hiring of non-permanent teaching staff, which increases the teaching load of the permanent staff, we continue maintaining a high level of scientific excellence in the Department. We continue with a high number of indexed publications that since 2015 it moves over 180 papers. The average impact factor of these publications follows a clear progression being this year the highest achieved, 4.76.

The above achievements, has been done in spite of the decreased amount of money obtained from competitive projects and agreements. As you can see, the income from projects fluctuates between even and odd years. This is because only the incomes from the projects awarded that year are counted and, therefore, it depends on how many research groups can request new projects each year.

I wish thank to all the members of the Department who have make possible the high level of excellence of our Department.

Prof. Noel Xamena

Director del Departament

The Department

The Department of Genetics and Microbiology (DGM) is in charge of organizing and developing research and teaching in the disciplines included in the areas of Genetics and Microbiology. It is an Interfaculty Department, formed by three Units, two located in the Campus at the Faculty of BioSciences (Genetics Unit and Microbiology Unit Campus) and the third (Medical Microbiology Unit) for integrated teaching and research in the area Clinical Microbiology at the five UAB Hospitals (Sant Pau, Vall d'Hebron, Hospital del Mar, Germans Trias i Pujol and Parc Tauli).

The activity of DGM is fully committed to participate in the unprecedented intellectual adventure of Biology in the XXI century. We work hard to (i) contribute with our ability and commitment to scientific excellence in the research areas of Genetics and Microbiology; (ii) provide quality teaching and education to our students, future researchers, teachers and professionals in these areas; and (iii) contribute to increase the wellbeing of our society through the practical application of our expertise in biomedicine and other industrial sectors such as biotechnology, food, pharmacy and environment, among others

Further info at:

<http://www.uab.cat/departament/genetica-microbiologia/>

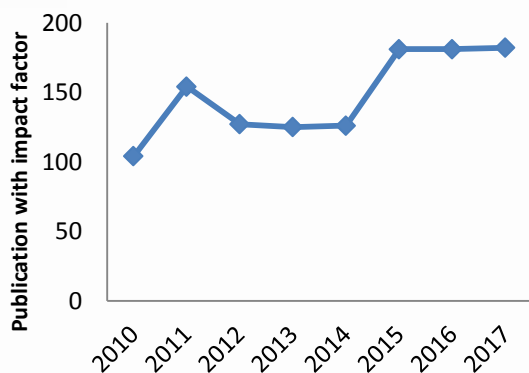
The screenshot shows the website of the UAB Department of Genetics and Microbiology. The header includes the UAB logo, the text 'UABCE CAMPUS D'EXCEL·LÈNCIA INTERNACIONAL', and the department name 'DEPARTAMENT DE GENÈTICA I MICROBIOLOGIA'. A search bar is located in the top right corner. Below the header, there are navigation tabs for 'El departament', 'La docència', and 'La recerca'. The main content area features a large image of red, spherical microorganisms. Below this, there are three columns: 'NOTÍCIES' with a news item about measuring evolutionary advantage, 'DESTACATS' with a section for the 'ANNUAL SCIENTIFIC REPORT - 2014', and 'ENLLAÇOS DIRECTES' with a list of links including 'UABDivulga', 'Ajuts, Beques i Convocatòries', 'UABCercador', 'Publicacions científiques', 'Parc de la Recerca', 'Tesis en xarxa', 'Grups de recerca', and 'Mobilitat i intercanvi'. At the bottom, there is a section for '30a. Edició Aspectes Generals i d'investigació' and a logo for 'Parc de Recerca UAB'.

Analysis of Scientific Production (2017)

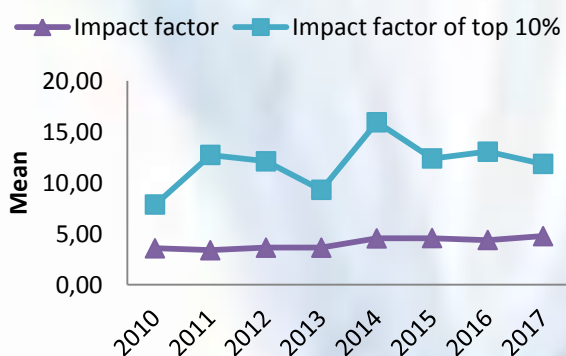


	2010	2011	2012	2013	2014	2015	2016	2017
Number of publication with impact factor	104	154	127	125	126	181	181	182
Total impact factor	372,43	521,38	460,76	454,33	569,71	826,80	793,69	866,43
Mean impact factor	3,58	3,39	3,63	3,63	4,55	4,57	4,38	4,76
Mean impact factor of top 10%	7,86	12,73	12,11	9,31	15,94	12,39	13,06	11,84
PhD thesis defended	21	20	17	17	12	24	24	15
Competitive income (grants) in euros	940.412	781.163	962.260	382.874	931.469	133.100	1.054.491	33.960
Non-competitive income in euros	82.912	184.065	247.820	84.358	80.198	357.958	199.611	27.788
Total income in euros	1.023.324	965.229	1.210.081	467.232	1.011.667	491.058	1.254.102	61.748

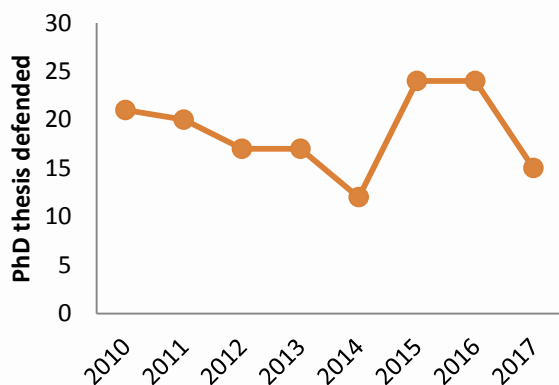
Number of indexed publications



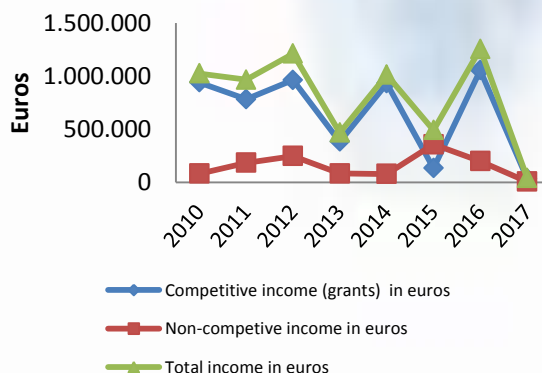
Impact Factors (SCI)



Number of PhD Thesis



Financial research incomes



Research Groups Performance

2017



Members

Basic and Applied Microbiology Group

Dr. Antonio Villaverde (PI)

Dr. Marina Luquín
Dr. Neus Ferrer-Miralles
Dr. Esther Julián
Dr. José Luis Corchero
Dr. Esther Vázquez
Dr. Paolo Saccardo
Dr. Olivia Cano
Dr. Julieta M. Sánchez
Rosa Mendoza
Mercedes Márquez
Cristina Sosa
Mireia Pesarrodona
Marta Llorens
José Vicente Carratalá
Naroa Serna
Laura Sánchez
Sandra Guallar
Marc Bach
Paula Herrero
Victor Campo
Raquel Díaz
Hèctor López
Esther Martínez
Eric Voltà
Andrés Cisneros
Amanda Muñoz
Aida Carreño



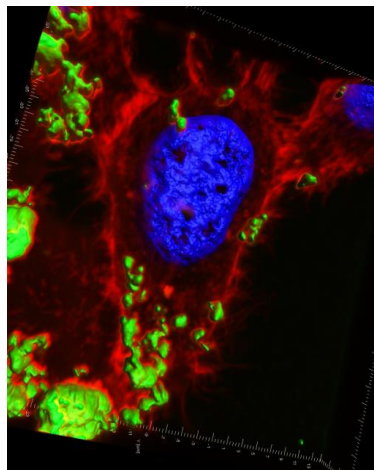
Web:

<http://ibb.uab.cat/?lang=spanish>

<https://sites.google.com/site/mycobacteriaresearchlabuab/publications>

Research

We generate nanostructured protein materials for biomedical applications, namely drug delivery, gene therapy, protein replacement and tissue engineering. In this context, we exploit diverse prokaryotic and eukaryotic cell factories for the design and bioproduction of self-assembling proteins. These engineered polypeptides are the basis for the design of smart functional materials displaying mechanical stability, regular geometry and refined properties such as specific cell binding, receptor-mediated internalization, intracellular trafficking and drug delivery. Most of our current collaborative projects are devoted to new nanosized drugs for the treatment of colorectal cancer. In another research line we focus on the study of environmental mycobacteria species as immunostimulatory and immunotherapeutic agents for the treatment of tuberculosis and cancer.



Publications 2017

2016 Impact factors are indicated in all cases.

- ✓ Ugutz Unzueta, Joaquín Seras-Franzoso, María Virtudes Céspedes, Paolo Saccardo, Francisco Cortes, Fabian Rueda, Elena García-Fruitós, Neus Ferrer-Miralles, Ramon Mangues, Esther Vazquez, Antonio Villaverde. 2017. Engineering tumor cell-targeting in nanoscale amyloid materials. *Nanotechnology*, 28: 015102. **3.44**
- ✓ Rinas U, García-Fruitós E, Corchero JL, Vázquez E, Seras-Franzoso J, Villaverde A. 2017. Bacterial inclusion bodies: discovering their better half. *Trends in Biochemical Sciences* 42; 726-737. **16.630**
- ✓ Laura Sánchez-García, Naroa Serna, Matthias Mattanovich, Petra Cazzanelli, Alejandro Sanchez-Chardi, Oscar Conchillo-Solé, Francisco Cortés, Xavier Daura, Ugutz Unzueta, Ramón Mangues, Antonio Villaverde and Esther Vazquez. 2017. The fusogenic peptide HA2 from influenza virus hemagglutinin-2 impairs selectivity of CXCR4-targeted protein nanoparticles. *Chem. Commun.* 53, 4565-4568. **6.319**
- ✓ Mireia Pesarrodona, Eva Crosas, Rafael Cubarsi, Alejandro Sánchez-Chardi, Paolo Saccardo, Ugutz Unzueta, Fabian Rueda, Laura Sanchez-García, Naroa Serna, Ramón Mangues, Neus Ferrer-Miralles, Esther Vázquez, Antonio Villaverde. 2017. Intrinsic functional and architectonic heterogeneity of tumor-targeted protein nanoparticles. *Nanoscale*, 9, 6427-6435. **7.367**

Publications 2017 (cont)

- ✓ Llorens-Fons M, Julián E, Luquin M, Pérez-Trujillo M. .Molecule confirmation and structure characterization of pentatriacontatrienyl mycolate in *Mycobacterium smegmatis*. *Chemistry and Physics of Lipids*. 2017 pii: S0009-3084(17)30297-9. **3.361**
- ✓ Crespo A, Gavalda J, Julián E, Torrents E. A single point mutation in class III ribonucleotide reductase promoter renders *Pseudomonas aeruginosa* PAO1 inefficient for anaerobic growth and infection. *Scientific Reports*. 2017 Oct 17;7(1):13350. **4.259**
- ✓ Llorens-Fons M, Pérez-Trujillo M., Julián E, Brambilla C., Alcaide F., Byrd TF., and Luquin M. (2017) Trehalose Polyphleates, External Cell Wall Lipids in *Mycobacterium abscessus*, Are Associated with the Formation of Clumps with Cording Morphology, Which Have Been Associated with Virulence. *Front. Microbiol.* 8:1402. **4.076**
- ✓ Naroa Serna, María Virtudes Céspedes, Ugutz Unzueta, Rita Sala, Alejandro Sánchez-Chardi, Laura Sánchez-García, Francisco Cortés, Neus Ferrer-Miralles, Ramón Mangues, Esther Vázquez, Antonio Villaverde. Peptide-Based Nanostructured Materials with Intrinsic Proapoptotic Activities in CXCR4+ Solid Tumors. *Advanced Functional Materials*, 27, 1700919. **12.124**
- ✓ Serna N, Sánchez-García L, Sánchez-Chardi A, Unzueta U, Roldán M, Mangues R, Vázquez E, Villaverde A. 2017. Protein-only, antimicrobial peptide-containing recombinant nanoparticles with inherent built-in antibacterial activity. *Acta Biomaterialia* 60 256–263. **6.319**
- ✓ Unzueta, Ugutz; Serna, Naroa; Sánchez-García, Laura; Roldan, Mónica; Sánchez-Chardi, Alejandro; Mangues, Ramon; Villaverde, Antonio; Vázquez, Esther. 2017. Engineering multifunctional protein nanoparticles by in vitro disassembling and reassembling of heterologous building blocks. *Nanotechnology* 28: 505102. **3.44**

Environmental Microbiology Group

Members

Dr. Olga Sánchez (PI)

Dr. Isabel Esteve

Dr. Núria Gaju

Dr. Marc Llíros

Dr. Maira Martínez

Dr. Jordi Mas

Dr. Antoni Solé

Laia Millach

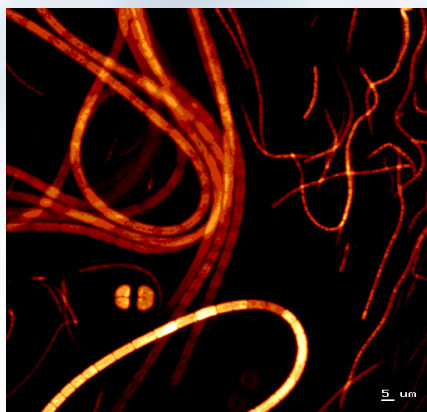
Eloi Parladé

Ferran Pujol

Cristina Sosa

Núria Tomás

Núria Vigués



Research

The scientific activity of the group relates to applied areas in the field of Environmental Microbiology, which have in common the impact of human activities on ecosystems, such as the study of the response of microbial communities to contaminants, as well as the development of electrochemical sensors for the measurement of toxicity in waters. The group is also specialized in the application of high throughput methodologies to understand the functional potential of microbial communities and the factors that regulate them in natural environments.

Publications 2017

- ✓ Ferrera I, Sánchez O, Kolárová E, Koblížek M, Gasol JM. Light enhances the growth rates of natural populations of aerobic anoxygenic phototrophic bacteria. *Isme Journal* 2017, 11:2391-2393.
- ✓ Llorens-Blanch G, Parladé E, Martínez-Alonso M, Gaju N, Caminal G, Blánquez P.A. Comparison between biostimulation and bioaugmentation in a solid treatment of anaerobic sludge: Drug content and microbial evaluation. *Waste Management* 2017, 17:30793-30796.
- ✓ Millach L, Obiol A, Solé, A, Esteve I. A novel method to analyse in vivo the physiological state and cell viability of phototrophic microorganisms by confocal laser scanning microscopy using a dual laser. *Journal of Microscopy* 2017, 268:53-65.
- ✓ Mir-Tutusa JA, Parladé E, Llorca M, Villagrasa M, Barceló D, Rodríguez-Mozaz S, Martínez-Alonso M, Gaju N, Caminal G, Sarrà M. Pharmaceuticals removal and microbial community assessment in a continuous fungal treatment of non-sterile real hospital wastewater after a coagulation-flocculation pretreatment. *Water Research* 2017, 116: 65-75.
- ✓ Puyen ZM, Villagrasa E, Millach L, Esteve I, Maldonado J, Solé A. Multi-approach microscopy techniques to evaluate the cytotoxic effect of chromium (III) on the cyanobacterium *Chroococcus* sp. PCC 9106. In: *Microscopy and imaging science: Practical approaches to applied research and education* 2017, 1:602-609. Formatex Research Center. Ed: Mendez-Vilas, A. Badajoz, España. ISBN-13: 978-84-942134-9-6
- ✓ Sánchez O. Constructed wetlands revisited: Microbial diversity in the -omics era. *Microbial Ecology* 2017, 73:722-733.
- ✓ Sánchez O, Koblížek M, Gasol JM, Ferrera I. Effects of grazing, phosphorus and light on the growth rates of major bacterioplankton taxa in the coastal NW Mediterranean. *Environmental Microbiology Reports* 2017, 9:300-309.

- ✓ Trueba-Santiso A, Parladé E, Rosell M, Llíros M, Mortan SH, Martínez-Alonso M, Gaju N, Martín-González L, Vicent T, Marco –Urrea E. Molecular and carbon isotopic characterization of an anaerobic stable enrichment culture containing *Dehalobacterium* sp. during dichloromethane fermentation. *Science of the Total Environment* 2017, 581-582:641-648.
- ✓ Uria-Moltó N, Ferrera I, Mas J. Electrochemical performance and microbial community profiles in microbial fuel cells in relation to electron transfer mechanisms. *BMC Microbiology* 2017, 17:208.

Molecular Microbiology Group

Members

Dr. Jordi Barbé (PI)

Dr. Montserrat Llagostera

Dr. Susana Campoy

Dr. Jesús Aranda

Dr. M. Pilar Cortés

Oihane Irazoki

Jennifer Otero

María Pérez Varela

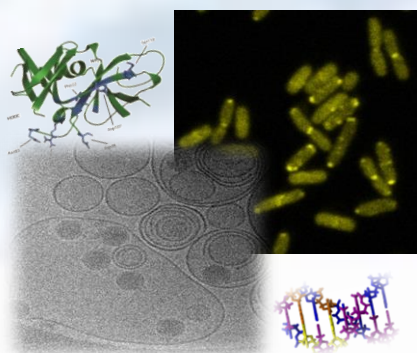
Miquel Sánchez Osuna

Jordi Corral

Elisabeth Frutos

Joan Ruiz

Susana Escribano



Research

Research is focused in the following three topics: i) DNA repair (SOS system) and mechanisms of bacterial pathogenesis; ii) Design of vaccine for animal pathogens; iii) Mechanisms of antibiotic resistance and bacteriophage therapy.

Publications 2017

- ✓ Ben Aissa A, Jara JJ, Sebastián RM, Vallribera A, Campoy S, Pividori MI. 2017. Comparing nucleic acid lateral flow and electrochemical genosensing for the simultaneous detection of foodborne pathogens. *Biosens Bioelectron.* 88:265-272.
- ✓ Campoy S, Cortés P, Aranda J, Sánchez-Osuna M, Barbé J, Llagostera M. 2017. A laboratory activity using bacteriophages, the forgotten weapon against bacteria. In Méndes-Vilas A (ed.) *Antimicrobial research: Novel bioknowledge and educational programs*. Formatex Research Center pp 231-241. ISBN (13): 978-84-947512-0-2
- ✓ Colom J, Cano-Sarabia M, Otero J, Aríñez-Soriano J, Cortés P, Maspoch D, Llagostera M. 2017. Microencapsulation with alginate/CaCO₃: A strategy for improved phage therapy. *Sci Rep.* 25(7):41441.
- ✓ Cortés P, Llagostera M. 2017. Phage therapy in food hygiene. In JM Lorenzo Rodríguez and FJ Carballo García (eds). *Strategies for obtaining healthier foods*. Nova Science Publishers, New York, pp 47-88.
- ✓ Irazoki O, Campoy S, Barbé J. 2017. The Transient Multidrug Resistance Phenotype of *Salmonella enterica* Swarming Cells Is Abolished by Sub-inhibitory Concentrations of Antimicrobial Compounds. *Front Microbiol.* 8:1360.
- ✓ Pérez-Varela M, Corral J, Vallejo JA, Rumbo-Feal S, Bou G, Aranda J, Barbé J. 2017. Mutations in the β -Subunit of the RNA Polymerase Impair the Surface-Associated Motility and Virulence of *Acinetobacter baumannii*. *Infect Immun.* 85(8). pii: e00327-17.
- ✓ Sánchez-Osuna M, Barbé J, Erill I. 2017. Comparative genomics of the DNA damage-inducible network in the *Patescibacteria*. *Environ Microbiol.* 19(9):3465-3474.
- ✓ Chourabi K, Campoy S, Rodríguez JA, Kloula S, Landoulsi A, Chatti A. 2017. UV-C Adaptation of *Shigella*: Morphological, Outer Membrane Proteins, Secreted Proteins, and Lipopolysaccharides Effects. *Curr Microbiol.* 74(11):1261-1269.

VHIR Research Group of Microbiology

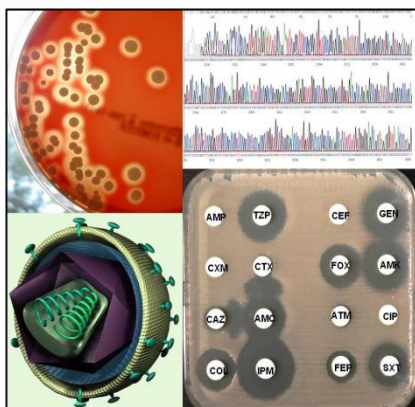
Members

Dr. Tomàs Pumarola Suñé (Group Leader)

Dra. Antònia Andreu Domingo
Dr. Andres Antón Pagarolas
Dra. Rosa M. Bartolomé Comas
Dra. Estrella Caballero Requero
Dra. Gema Codina Grau
Dra. Juliana Esperalba Esquerra
Dr. Juan José González López
Dra. M. Nieves Larrosa Escartín
Dra. M. Teresa Martín Gómez
Dra. Mayli Lung Suarez
Dra. Elena Sulleiro Igual
Dr. M. Teresa Tórtola Fernández
Dr. Mateu Espasa Soley
Dra. Virginia Rodríguez Garrido
Dra. Judit Serra Pladevall
Dra. Anna Fàbrega Santamaria
Laura Gimferrer Arriaga
Cristina Andrés Vergés
Maria Piñana Moro
Alba Mir Cros
Candela Fernandez Naval
Thais Cornejo Sánchez



Web: <http://www.vhir.org/larecerca/grupsrecerca>



Research

The Research Group of Microbiology at Vall d'Hebron Research Institute (VHIR) focuses on the study of the microbiology aspects, at basic, translational and clinical research, that could improve the outcomes of patients with infectious diseases. We work with special interest in studying the mechanisms involved in antimicrobial resistance, sexually transmitted infections, viral respiratory infections, international health infections, and viral and fungal infections in immunocompromised patients.

Publications 2017

- López Y, Parra E, Cepas V, Sanfeliú I, Juncosa T, Andreu A, Xercavins M, Pérez J, Sanz S, Vergara A, Bosch J, Soto SM. Serotype, virulence profile, antimicrobial resistance and macrolide-resistance determinants in *Streptococcus agalactiae* isolates in pregnant women and neonates in Catalonia, Spain. *Enferm Infecc Microbiol Clin*. 2017 Oct 10. pii: S0213-005X(17)30226-4. FI: 1,714
- Bosch-Nicolau P, Falcó V, Viñado B, Andreu A, Len O, Almirante B, Pigrau C. A Cohort Study of Risk Factors That Influence Empirical Treatment of Patients with Acute Pyelonephritis. *Antimicrob Agents Chemother*. 2017 Nov 22;61(12). pii:e01317-17. FI: 4.302
- Mendoza-Palomar N, Balasch-Carulla M, González-Di Lauro S, Céspedes MC, Andreu A, Frick MA, Linde MÁ, Soler-Palacin P. *Escherichia coli* early-onset sepsis: trends over two decades. *Eur J Pediatr*. 2017 Sep;176(9):1227-1234. FI: 1.921
- Barberá MJ, Fernández-Huerta M, Jensen JS, Caballero E, Andreu A. *Mycoplasma genitalium* Macrolide and Fluoroquinolone Resistance: Prevalence and Risk Factors Among a 2013-2014 Cohort of Patients in Barcelona, Spain. *Sex Transm Dis*. 2017 Aug;44(8):457-462. FI: 2.358

Publications 2017 (cont)

Serra-Pladevall J, Barberá MJ, Callarisa AE, Bartolomé-Comas R, Andreu A. Differences in *Neisseria gonorrhoeae* population structure and antimicrobial resistance pattern between men who have sex with men and heterosexuals. *Epidemiol Infect.* 2017 Jan;145(2):379-385. Epub 2016 Oct 19. FI: 2.075

de Mendoza C, Caballero E, Aguilera A, Requena S, de Lejarazu RO, Pirón M, González R, Jiménez A, Roc L, Treviño A, Benito R, Fernández-Alonso M, Aguinaga A, Rodríguez C, García-Costa J, Blanco L, Ramos JM, Calderón E, Eirós JM, Sauleda S, Barreiro P, Soriano V; Spanish HTLV Network. Human T-lymphotropic virus type 1 infection and disease in Spain. *AIDS.* 2017 Jul 31;31(12):1653-1663. FI: 5.003

Moreno M, Caballero E, Mateus RM, Samba F, Gil E, Falcó V. HIV drug resistance in Africa: an emerging problem that deserves urgent attention. *AIDS.* 2017 Jul 17;31(11):1637-1639. FI: 5.003

de Mendoza C, Cabezas T, Caballero E, Requena S, Amengual MJ, Peñaranda M, Sáez A, Tellez R, Lozano AB, Treviño A, Ramos JM, Pérez JL, Barreiro P, Soriano V; Spanish HIV-2 Network. HIV type 2 epidemic in Spain: challenges and missing opportunities. *AIDS.* 2017 Jun 19;31(10):1353-1364. FI: 5.003

Ramírez JC, Parrado R, Sulleiro E, de la Barra A, Rodríguez M, Villarroel S, Irazu L, Alonso-Vega C, Alves F, Curto MA, García L, Ortiz L, Torrico F, Gascón J, Flevaud L, Molina I, Ribeiro I, Schijman AG. First external quality assurance program for bloodstream Real-Time PCR monitoring of treatment response in clinical trials of Chagas disease. *PLoS One.* 2017 Nov 27;12(11):e0188550. FI: 2.806

Salvador F, Sulleiro E, Piron M, Sánchez-Montalvá A, Sauleda S, Molina I. Seroprevalence of *Strongyloides stercoralis* infection among HTLV-I infected blood donors in Barcelona, Spain: A cross-sectional study. *Acta Trop.* 2017 Dec;176:412-414. FI: 2.218

Salvador F, Sulleiro E, Piron M, Sánchez-Montalvá A, Sauleda S, Molina-Morant D, Moure Z, Molina I. *Strongyloides stercoralis* infection increases the likelihood to detect *Trypanosoma cruzi* DNA in peripheral blood in Chagas disease patients. *Trop Med Int Health.* 2017 Nov;22(11):1436-1441. FI: 2.85

de Alegría MLAR, Colmenares K, Espasa M, Amor A, Lopez I, Nindia A, Kanjala J, Guilherme D, Sulleiro E, Barriga B, Gil E, Salvador F, Bocanegra C, López T, Moreno M, Molina I. Prevalence of *Strongyloides stercoralis* and Other Intestinal Parasite Infections in School Children in a Rural Area of Angola: A Cross-Sectional Study. *Am J Trop Med Hyg.* 2017 Oct;97(4):1226-1231. FI: 2.549

Escolà-Vergé L, Arando M, Vall M, Rovira R, Espasa M, Sulleiro E, Armengol P, Zarzuela F, Barberá MJ. Outbreak of intestinal amoebiasis among men who have sex with men, Barcelona (Spain), October 2016 and January 2017. *Euro Surveill.* 2017 Jul 27;22(30). pii: 30581. FI: 7.202

Millet JP, Montalvo T, Bueno-Marí R, Romero-Tamarit A, Prats-Urbe A, Fernández L, Camprubí E, Del Baño L, Peracho V, Figuerola J, Sulleiro E, Martínez MJ, Caylà JA; Zika Working Group in Barcelona. Imported Zika Virus in a European City: How to Prevent Local Transmission? *Front Microbiol.* 2017 Jul 18;8:1319. FI: 4.076

Salvador F, Sánchez-Montalvá A, Sulleiro E, Berastegui C, Jauregui A, Pont T, Los-Arcos I, Len Ó, Gavalda J, Molina I. Case Report: Successful Lung Transplantation from a Donor Seropositive for *Trypanosoma cruzi* Infection (Chagas Disease) to a Seronegative Recipient. *Am J Trop Med Hyg.* 2017 Oct;97(4):1147-1150. FI: 2.549

Esteves TC, Tórtola T, Ferrer B, Aparicio G, Sulleiro E, González-López J, Moure Z, Romero D, Garcia-Patos V. Use of Molecular Biology Techniques in Sarcoidal Granulomatous Dermatitis: A Clinicopathological and Molecular Approach with Diagnostic Implications. *Acta Derm Venereol.* 2017 Nov 15;97(10):1241-1242. FI: 3.653

Ouaarab Essadek H, Claveria Guiu I, Caro Mendivelso J, Sulleiro E, Pastoret C, Navarro M, Barrabeig I, Gómez I Prat J. [On site-screening for Chagas disease supported by a community intervention: can it improve accessibility for diagnosis and treatment?]. *Gac Sanit.* 2017 Sep - Oct;31(5):439-440. FI: 1.768

Publications 2017 (cont)

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Infectious Diseases and Clinical Microbiology Group

Members

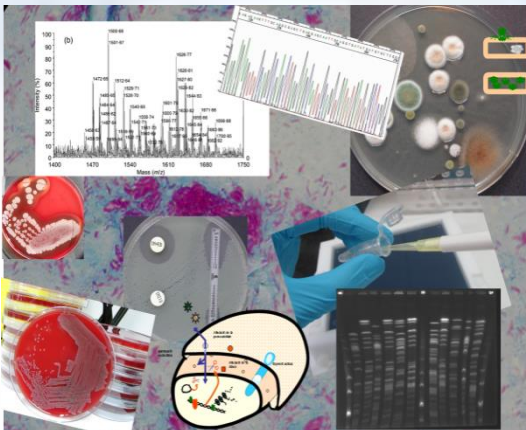
Dr. Pere Coll (PI)

Dra. Beatriz Mirelis
Dra. Núria Rabella
Dra. Carmen Muñoz
Dra. Núria Margall
Dr. Ferran Sánchez
Dr. Ferran Navarro
Dra. Elisenda Miró
Dra. Paula Espinal
Laura Gómez
Montserrat Español

Dra. Merce Gurguí
Dra. Natividad de Benito
Dr. Joaquín López Contreras
Dra. Virginia Pomar



Web: <http://www.santpau.es/santpau/activitats/inicioMicrobiologia.htm>



Research

This is a multi-disciplinary group of researchers from the Department of Microbiology and, the Infectious Diseases Unit at Hospital Santa Creu i Sant Pau. Our research lines focus on two main interrelated areas. The first of these is antimicrobial resistance. This area includes the study of molecular epidemiology (population and clonality studies in bacteria, mycobacteria, fungi and viruses), molecular bases of bacterial resistance to antibiotics, vectors that convey resistance genes (plasmids, transposons, integrons, phages), and the use of molecular techniques in diagnosis of infectious diseases. The second area emphasizes research related to bacteraemia and endocarditis, nosocomial infections, prosthetic joint infections, central nervous system infections, and tuberculosis.

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Clinical Microbiology and Experimental Infectious Pathology Group

Members

Lurdes Matas Andreu, MD PhD

Montserrat Giménez Pérez, MD PhD

Cristina Prat Aymerich, MD PhD

M^a Dolores Quesada Fernández, MD PhD

Sònia Molinos Abòs, MD PhD

Gema Fernández Rivas, MD PhD

Águeda Hernández Rodríguez, PhD

Melania Íñigo Pestaña, PhD

Casañ López, Cristina, MSc

José Antonio Domínguez Benítez, PhD

Alicia Lacoma de la Torre, PhD

Bárbara Molina Moya, PhD

Latorre Rueda, Irene, PhD

Raquel Villar Hernández, MSc

Meissiner Gomes Fernandes, MSc

Elisa Martró Català, PhD

Verónica Saludes Montoro, PhD

Cèlia Guardiola Llobet, MD

Pere Joan Cardona Iglesias, MD PhD

Cristina Vilaplana Massaguer, MD PhD

Arch Sisquella, Marta, MSc

Arias de la Cruz, Lilibeth, MSc

Cardona, Paula, BSc

Despuig Busquet, Albert, MSc

Victoria González Soler, PhD

Anabel Fernández Navarro, MD

Technical Support Members

Elisabet Bascuñana Prieto

Natalia Pagán Maldonado

Georgina Linares Llamas

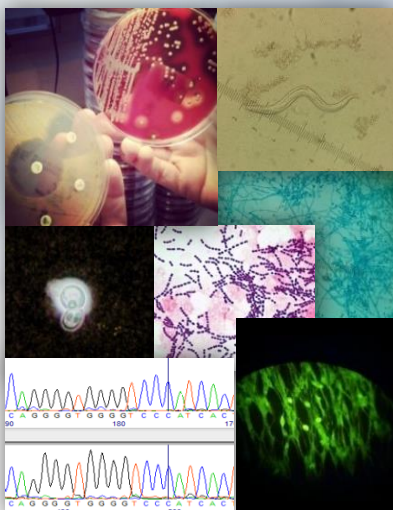
Esther García García

Jorge Díaz Pedroza

DYaiza Rosales Salgado



Research



Our Group, led by Prof. Lurdes Matas, MD, PhD, Head of the Microbiology Service at Hospital Unversitari Germans Trias i Pujol, is involved in several Spanish research networks including REIPI, RESITRA, CIBERES and CIBERESP and is focused in the development, standardization and clinical evaluation of microbiological, immunological and molecular techniques in the diagnosis of infectious diseases. Part of the Group is also devoted to the development of experimental models in infectious pathology, the study of the molecular mechanisms of antimicrobial resistance, and on the assessment of the antimicrobial activity of new drugs. Our historical focus is on respiratory pathogens, especially *Mycobacterium tuberculosis* and opportunistic mycobacteria. Additionally, other research lines led by different group members, such as molecular virology, pathogenesis of viral infection, immunology of inflammation and new bacterial anti-inflammatory molecules, as well as epidemiology and public health of communicable diseases, have acquired more relevance over the last decade.

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Community and Health-Care Related Infection Study Group

Members. Dr/es

O. Gasch (IP)

M. Navarro

MJ Amengual

I Pons

E Antón

S. Calzado

L Falgueras

S. Capilla

J. Oristrell

MM. Nogueras

I. Fernández

M. Píriz

F. Segura

D. Fontanals

M Vaqueiro

C Pontes

I Sanfeliu

B Font

M Cervantes

M Sala

J Castella

A Ortuño

A. Muijal



Parc Taulí. Hospital Universitari

Research

Community and Health-Care Related Infection Study Group¹ is headed by Dr Oriol Gasch since 2016. It is currently accredited as a Consolidated Investigation Group of the Generalitat de Catalunya (Agència de Gestió d'ajuts universitaris I de Recerca – AGAUR; SGR- 2017-677) and has obtained public financial support for years. The group is member of the Spanish network for research in infectious diseases (REIPI) Spanish Network for Research in Infectious Diseases (REIPI) (RD16/0016/0014) and the Network of AIDS research (RIS) (RD16/0025/0033), both funded by the Spanish ministry of economy and competitiveness (ISCIII). Our group has studied the pathogenic mechanisms of several infections since the 80s by a collaborative work between a multidisciplinary team, including physicians, research and clinical nurses, microbiologist, pharmacists, veterinarians, and epidemiologists who work around the Infectious Diseases Service of Parc Taulí Hospital. Most of them also have teaching responsibilities in the Universitat Autònoma de Barcelona. Our research team addresses different infections within a common framework, specifically, diseases related to healthcare, zoonoses, and HIV infection, from an epidemiological, clinical and therapeutic perspective. We summarize the orientation of all three research areas:

1.- Study of healthcare-related infections: Infections in the health field have a great individual and collective impact. The development of bacterial resistance, especially in the hospital environment, is a challenge in terms of handling and an increase in the risk of developing an unfavorable development. The lack of antibiotic treatments to face them make it known by the World Health Organization as one of the problems that will have the greatest impact in the coming years, specifically *Staphylococcus aureus* resistant to methicillin, *Klebsiella pneumoniae* and *Enterobacter* sp. Producers of extended spectrum betalactamases, *Enterococcus* sp. Resistant to vancomycin, *Pseudomonas aeruginosa* resistant to carbapenems, *Acinetobacter baumannii* resistant to carbapenems. Three main programmes guide our research in this area:

Programme 1: Management of multiresistance and difficult-to-treat infections

(1.1) Infections in critical patient

(1.2) Infective endocarditis and bloodstream infection

(1.3) Diagnostic of infectious diseases improving

Programme 2: Prevention of health-care related infections and antimicrobial resistance

(2.1) Education of sanitary staff and patients

(2.2) Epidemiology of HCR infections

(2.3) Innovative strategies for improving infection control

Programme 3: In vitro antimicrobial action and clinical efficacy

(3.1) PK/PD studies

(3.2) OPAT: Outpatient Parenteral Antimicrobial Therapy

(3.3) Appropriate use of antimicrobials

2.- Study of the main zoonoses with impact on health. The World Health Organization defines zoonoses as "any disease transmitted naturally from animals to humans or vice versa". As a consequence of the development of new molecular techniques, as well as changes in the pattern of behavior of the human population, new species have been described in the zoonoses or the re-emergence of ancient species. The research team started working on this line in 1980, coinciding with a remarkable increase in cases of Mediterranean Bontose Fever, (*Rickettsia conorii*). Currently the team's search encompasses all fields: veterinary, diagnostic, epidemiological, clinical, therapeutic ... In recent years, the priority lines are, on the one hand, identify new hosts and vectors and establish their role Epidemiologic in the transmission and maintenance of emerging zoonoses (*R. massiliae*-Bar29, new *Bartonella* species, other emerging zoonotic microorganisms) and confirm and describe their clinical practice in humans as well as in pets (clinical description Epidemiology and determination of risk factors). On the other hand, because the main diagnostic difficulty of these microorganisms is due to its intracellular nature, which does not allow the application of conventional cultivation techniques, one of the main objectives is the optimization of molecular techniques to improve diagnosis (PCR, arrays, ...).

3.- Study of the patient infected by the Human Immunodeficiency Virus (HIV). The HIV infection is one of the current great pandemics, of which there are still unresolved aspects. The group belongs to the RETICS network called RIS (AIDS Research Network) in which it carries out collaborative studies with other centers in the state. One of the objectives of the group is to continue participating in clinical trials that provide new knowledge about treatment with all that entails regarding improvement of quality of life, co-infections and increase in life expectancy. We also have a very high priority in our collaboration, very actively, in different HIV, national and international cohorts, contributing patient data as well as promoting specific studies led by the group (PISCIS, CORIS, COHERE, ART Cohort Collaboration). One of the main lines of the group is the study of the reconstitution of the immune system under HAART therapy and its possible age-dependent differences. Studying the dynamics of the immune system in elderly patients is of major importance. One of the translational objectives of this line is to find therapeutic targets and/or biomarkers that allow a more targeted treatment/monitoring based on the characteristics of the patient. Not only does this subpopulation of patients be studied from an immunological point of view but also from an epidemiological point of view: what risk factors, adherence to treatment, comorbidities, diagnostic retardation are age-dependent. Another of the problems posed at present is also an objective of this line: to address the comorbidities that appear and the co-infection by HCV.



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Genome Instability and DNA Repair Syndromes Group

Members

Dr. Jordi Surrallés (IP)

Dr. Massimo Bogliolo

Dra. M^a José Ramírez

Dra. Roser Pujol

Dr. Jordi Minguillón

Dr. Laia Roca

Dr. Gonzalo Hernández

Maria Marín (Doctoranda)

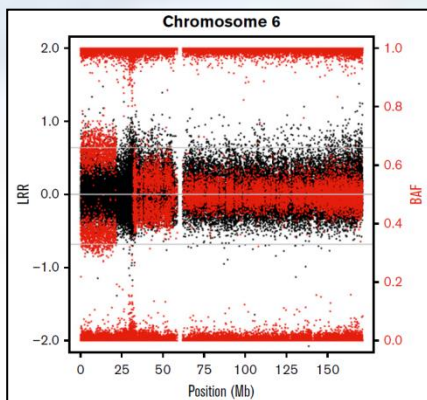
Helena Montanuy (Doctoranda)

Daniela Steigerwald (Doctoranda)

Cristina Camps (Doctoranda)

Montse Peiró (TSR)

Ana Molina (TSR)



Research

Our research interests are cancer-prone genetic syndromes with defective DNA repair with special focus in Fanconi anemia. We also investigate the genetics of familial cancer syndromes and perform therapeutic research including gene and cell therapy approaches and cell-based drug screening platforms. A long term goal is to understand the mechanisms that maintain genome stability and protect us from disease, cancer, and ageing.

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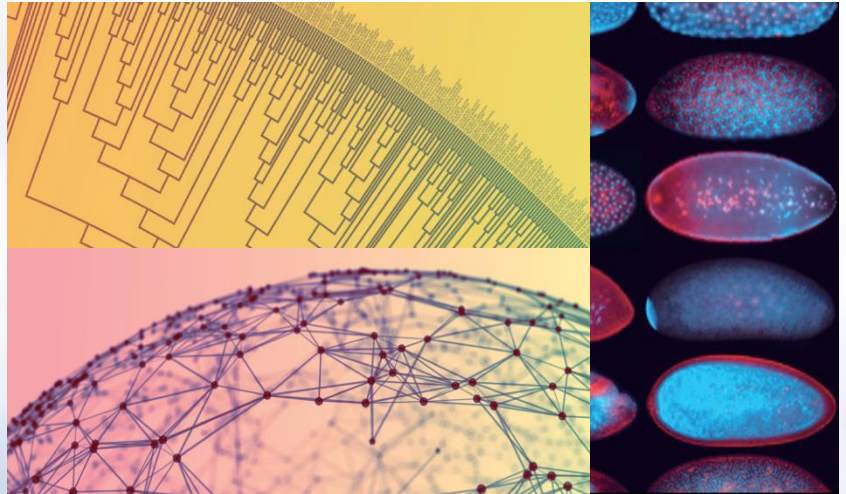
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Genomics, Bioinformatics and Evolutionary Biology Group (GBBE)

Members

Dr. Alfredo Ruiz (PI)

Dr. Mauro Santos
Dr. Antonio Barbadilla
Dr. Antonio Fontdevila
Dr. Mario Cáceres
Dr. Isaac Salazar-Ciudad
Dra. M. Pilar García Guerreiro
Dr. Francisco Rodríguez-Trelles
Dra. Rosa Tarrío
Dra. Alejandra Delprat
Dra. Raquel Egea
Dra. Sònia Casillas
Dra. Marta Puig
Dra. Marina Laplana
Dra. Barbara Negre
Marta Puig
Carla Giner
Sergi Hervás
Marta Coronado
Isaac Noguera
Victor Gámez
Ion Lerga
Alba Vilella
Jesus Murga
Esteve Sanz
Clio Karageorgiou



Research

Our research field is Evolutionary Biology, a complex historical process that accounts for the current Biodiversity on earth. We seek to understand the mechanisms that generate diversity patterns at several levels: geographical, phenotypical, chromosomal and nucleotide level. Our multidisciplinary team includes researchers with diverse expertise that use different but complementary approaches: from experimental and field work to bioinformatics and modelization. Besides, our experimental work makes use of two different species as model systems: *Drosophila* and humans. We are engaged in projects of comparative genomics in *Drosophila*, adaptation of *Drosophila* populations to global climate change, impact of interspecific hybridization on transposable element deregulation, genome-wide analyses of nucleotide and structural variability in a large set of *Drosophila* lines, modelization of the genotype-phenotype map, and functional and evolutionary impact of inversions in the human genome.

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Mutagenesis Group

Members

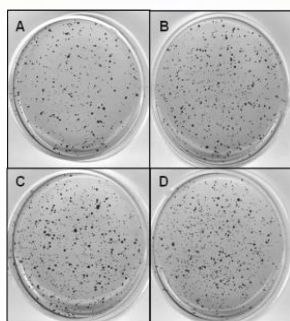
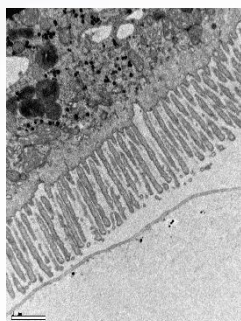
Dr. Ricard Marcos (IP)

Dr. Amadeu Creus
Dr. Noel Xamena
Dra. M^a Antonia Velázquez
Dra. Susana Pastor
Dra. Alba Hernández
Dra. Constanza Cortés
Alicia Marsa
Jana Peremarti
Laura Rubio
Alba García
Irene Barguilla
Josefa Domenech
Sandra Ballesteros



Web: <http://grupsderecerca.uab.cat/mutagenesi/>

Research



Our team works on the following topics: (i) molecular mechanisms involved in the genotoxicity/carcinogenicity of arsenic, using long-term exposures and environmental relevant doses; (ii) *In vitro* and *in vivo* models to determine the genotoxic/carcinogenic risk of nanomaterial exposures and their uptake through intestinal barriers; (iii) Genomic instability in patients suffering from chronic renal pathologies, and procedures to ameliorate the genotoxic risk

Publications 2017

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Department of Genetics and Microbiology

Universitat Autònoma de Barcelona

<http://www.uab.cat/departament/genetica-microbiologia/>
d.genetica.microbiologia@uab.cat

(int+34) 935813359

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