

Microbiology and Infectious Diseases

Group leader

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Researchers

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DESCRIPTION

This group includes physicians, microbiologists, nurses, technicians and students. Research focuses on Clinical Microbiology (CM), Infectious Diseases (ID) and Kidney Transplant (KT).

The CM projects focus on molecular epidemiology of drug resistance mechanisms, tuberculosis, Leishmaniasis, Chagas disease, immune responses to infections such as CMV and COVID-19, and microbiome studies.

The ID research covers antibiotic policies, multidrug-resistant bacteria, infections associated with foreign bodies, diabetic foot diseases, and tuberculosis.

The KT unit examines biomarkers and, microbiome in kidney transplant patients.

MAIN LINES OF RESEARCH

- Clinical Microbiology
 - Detection and characterisation of different antidrug mechanisms of resistance (Miro Cardona, Elisenda; Rivera Martínez, Maria Alba; Rubio Bueno, Marc; Navarro Risueño, Ferran).
 - Epidemiology of tuberculosis and mechanisms of anti-tuberculosis resistance. (Garrigó Fullola, Montserrat).
 - Molecular diagnosis in infectious diseases and taxonomy. (Navarro Risueño, Ferran; Miro Cardona, Elisenda).
 - Microbiome description in clinical samples (Navarro Risueño, Ferran; Miro Cardona, Elisenda; Rubio Bueno, Marc).

- Leishmaniosis (epidemiology, characterization and diagnosis) and Chagas (diagnosis and congenital infection) (Muñoz Batet, Carmen; Llovet Pellejero, Teresa).
- Medical care projects (Sánchez Reus, Fernando).
- Early bloodstream infection detection by NGS of cfDNA (Rivera Martínez, Maria Alba; Navarro Risueño, Ferran; Rubió Bueno, Marc).
- Infectious Diseases
 - Restricted-use policies for antimicrobial agents and suitable use of antimicrobial agents. (Navarro Risueño, Ferran).
 - Study of antimicrobial multiresistant microorganism infections requiring patient isolation. (Navarro Risueño, Ferran).
 - Study of foreign bodies infections as joint prostheses, catheters, cardiac prostheses and pacemakers. (De Benito Hernández, Maria Natividad; Grillo, Sara; Pomar Solchaga, Virginia).
 - Tuberculosis infectious diseases (Pomar Solchaga, Virginia).
 - Impact of New EUCAST Definitions for Antimicrobial Susceptibility Categories with a Bundle to Mitigate Adverse Effects (Escola Verge, Laura).
 - Impact of infective endocarditis on frailty and quality of life among the elderly population (Escola Verge, Laura).
- Kidney Transplant Unit
 - Description of the faecal microbiome in kidney transplant patients and recurrent urinary tract infections (Pérez Mir, Monica; Miro Cardona, Elisenda).
- Data Management and Analysis: With the incorporation of advanced techniques such as massive sequencing, we have the challenge of applying the most innovative tools in bioinformatics analysis, as well as organising and analysing big data. One of the objectives of various projects is to describe different pipelines.
- Sample Quality and Handling: Maintaining sample integrity and minimising contamination during collection, processing, and storage is vital across all research areas. Developing standardised protocols and ensuring reproducibility are key challenges.
- Interdisciplinary Collaboration: As research becomes increasingly multidisciplinary, fostering effective collaboration among experts from diverse fields poses a challenge. Overcoming communication barriers and integrating knowledge from different disciplines are essential for holistic research outcomes.
- Addressing Antimicrobial Resistance: Understanding and combating antimicrobial resistance remain critical challenges in Clinical Microbiology and Infectious Diseases research. Developing novel strategies to tackle resistant pathogens while preserving the efficacy of antibiotics is imperative.
- Integration into Healthcare Systems: Successfully integrating research findings and innovative technologies into existing healthcare systems presents logistical and structural challenges.

SCIENTIFIC CHALLENGES

- Technique Standardisation: Each research area, including Clinical Microbiology, Kidney Transplant, and Infectious Diseases, requires standardised techniques. Ensuring consistency in methodologies across diverse disciplines poses a significant challenge.

ACTIVE & AWARDED GRANTS

- Rivera Martínez, Maria Alba & Navarro Risueño, Ferran. Diagnóstico etiológico de la infección del torrente sanguíneo en pacientes adultos con sepsis mediante secuenciación masiva. PI22/00280. Instituto de Salud Carlos III (ISCIII). Duration: 2023-2025. 87.120,00 €

DOCTORAL THESES DEFENDED

- Berengua Pereira, Carla. Aportación del cultivo virológico en la interpretación de las pruebas

moleculares en dos modelos de infección respiratoria: Citomegalovirus y SARS-CoV-2. 26/02/2024. Universitat Autònoma de Barcelona. Supervisors: Marcos Maeso, Maria Àngeles; Martíno Bofarull, Rodrigo; Navarro Risueño, Ferran. <https://hdl.handle.net/10803/691629>

- Martín Arnau, Ana Belén. Utilidad y ventajas de los catéteres centrales de inserción periférica respecto al -catéter venoso central no tunelizado. 20/03/2024. Universitat Autònoma de Barcelona. Supervisors: González López, José Antonio; Pomar Solchaga, Virginia; Moral Duarte, Antonio. <https://hdl.handle.net/10803/691671>.

SCIENTIFIC PRODUCTION

- Abras A, Ballart C, Fernández A, Llovet T, Gállego M, Muñoz C. Assessment of Alinity s Chagas® as a Primary Diagnostic Test for Chronic Chagas Disease in a Non-Endemic Area of Europe (Barcelona, Spain). *Life-Basel*. 2024; 14(10):1278. DOI:10.3390/life14101278. PMID:39459578. IF:3,200 (Q1/3D). Document type: Article.
- Abril AG, Alexandre J, Mariscal A, Alserawan L, Rabella N, Roman E, López J, Navarro F, Serrano E, Nomdedeu JM, Vidal S. Titers of IgG and IgA against SARS-CoV-2 proteins and their association with symptoms in mild COVID-19 infection. *Scientific Reports*. 2024; 14(1):12725. DOI:10.1038/s41598-024-59634-y. PMID:38830902. IF:3,800 (Q1/2D). Document type: Article.
- Aceituno L, Núñez A, Serra J, Viñado B, Castella E, Escolà L, Pigrau C, Falcó V, Len YO. Oral quinolones versus intravenous β -lactam for the treatment of acute focal bacterial nephritis: a retrospective cohort study. *EUROPEAN JOURNAL OF CLINICAL MICROBIOLOGY & INFECTIOUS DISEASES*. 2024; 43(8). DOI:10.1007/s10096-024-04871-2. PMID:38856826. IF:3,700 (Q2/3D). Document type: Article.
- Alonso C, Moreno CB, Navarro F, Habison AC, González E, Blanco F, Borràs J, Garrigó M, Saker J. Bacteriuria and phenotypic antimicrobial susceptibility testing in 45 min by point-of-care Sysmex PA-100 System: first clinical evaluation. *EUROPEAN JOURNAL OF CLINICAL MICROBIOLOGY & INFECTIOUS DISEASES*. 2024; 43(8). DOI:10.1007/s10096-024-04862-3. PMID:38825624. IF:3,700 (Q2/3D). Document type: Article.
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- Benjumea C, Navarro F, Tarrés CA. Improving the diagnosis of urinary tract infections by the use of enriched media and a 48-hour incubation period. *JOURNAL OF MEDICAL MICROBIOLOGY*. 2024; 73(6):001846. DOI:10.1099/jmm.0.001846. PMID:38935081. IF:2,400 (Q3/7D). Document type: Article.
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- vancomycin-resistant *Enterococcus faecium* by Fourier-transform infrared spectroscopy and performance comparison with PFGE and WGS. *Emerging Microbes & Infections*. 2024; 13(1):2392659. DOI:10.1080/22221751.2024.2392659. PMID:39137261. IF:8,400 (Q1/1D). Document type: Article.
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