**The IdAB-CSIC Animal Health group**

Dr. María Jesús Grilló is a Senior Scientist of CSIC who leads the Animal Health group of the Institute of Agrobiotechnology (IdAB-CSIC) in Navarra, which is dedicated to the study of Brucellosis and other bacterial zoonoses. Dr. MJ Grilló has 30 years of research experience in brucellosis, starting her own research group in Navarra in 2007. Our group has participated continuously in several research projects dealing with the study *Brucella* biology, virulence factors, placental pathogenesis, and the application of this knowledge to the development of safe vaccines and therapies directed to control the spread of the pathogen to other animals and humans, as well as the development of diagnostic tests to Differentiate Infected and Vaccinated Animals (to address the DIVA problem). For this, we use routinely a great variety of genetics, microbiology, immunology and animal experiment techniques applied to *Brucella* typing and diagnosis, mutants’ construction and characterization, evaluation of virulence factors, and development of vaccine candidates. One of our strengths is our knowledge about different preclinical mice models and natural host experiments, focused to understand the real host-pathogen interactions. The PID2022 project joints all this expertise with the great skills and complementarity of our partner about synthetic biology and omics technologies, in order to deepen knowledge about the main issue of *Brucella* infections: the placental pathogenesis.

The PhD student will acquire a multidisciplinary training in a broad range of techniques, combining knowledge about *Brucella* genetics, typing, cell cultures, animal models, and biotechnology, applied to solve complex scientific issues. The student will be hosted in the Brucellosis Group of IdAB-CSIC and enrolled in the Public University of Navarra “Doctoral Program of Biotechnology''. This Program has been granted with the Heading Towards Excellence Award and it offers a wide range of transversal and specific activities.

The content and chapters of the PhD thesis will be directly related with the objectives and tasks of the project proposal. The training and educational predoctoral work plan will consists of: i) During the first year, he/she will be trained in a microbiology techniques general and specific of *Brucella*, working under BSL3 conditions, and receiving theoretical and practical training in Laboratory Animal Science; the studies on experimental animals (mice) will be focused to obtain the official accreditation of Categories a, b, c and d, according to the current legislation (RD 53/2015); ii) During the second year, he/she will combine laboratory and mice experiments with training in -omics techniques, bioinformatics and synthetic biology; iii) During the third year he/she will apply the techniques learned in a more independent manner, assuming autonomy and responsibilities in the laboratory; and iv) During the fourth year, he/she will be focused on the redaction of the PhD document. During all the training period, the FPI will participate actively in the weekly meetings of the brucellosis team, in the monthly journal club, and periodic general seminars of IdAB-CSIC to share his/her research with the rest of the scientists/ students. He/she will be evaluated periodically for his/her capacity to organize the work, reproducibility of the results, and benefit from teaching received. Besides, when considered adequate during all the training period, he/she will have the opportunity to receive additional training in national and international institutions.

**Last publications of the group related with the PRE2022 contract:**

Zabalza-Baranguá, A., I. Poveda-Urkixo, S. Mena-Bueno, G.A. Ramírez, X. De Bolle,**M.J. Grilló**. **2023**. Vaccine properties of *Brucella melitensis* 16M∆*wzm* and reactivation of placental infection in pregnant sheep. **VACCINE**, 41(9): 1554-1566.

Doi: <https://doi.org//10.1016/j.vaccine.2023.01.017>

Mazzolini, R., I. Rodríguez-Arce, L. Fernández-Barat, C. Piñero, V. Garrido, A. Motos, A. Rebollada-Merino, A. Torres,**M.J. Grilló**, L. Serrano, M. Lluch-Sénar. **2023**. Bacterial therapy for pulmonary infectious diseases. **NATURE BIOTECHNOLOGY**, 19/01/2023 .

Doi: <https://doi.org/10.1038/s41587-022-01584-9>

Mena-Bueno, S., I. Poveda-Urkixo, D. Asensio, I. Echarte, A. Zabalza-Baranguá, **M.J. Grilló**. **2022**. *Bru*SIC: a novel selective medium for the primary isolation of *Brucella* in veterinary samples. **MICROBIOLOGY SPECTRUM**, 10(6): e01759-22.

Doi: <https://10.1128/spectrum.01759-22>

Mena-Bueno, S., I. Poveda-Urkitxo, O. Irazoki, L. Palacios, F. Cava, A. Zabalza-Baranguá, **M.J. Grilló**. **2022**. *Brucella melitensis* Wzm/Wzt system: Changes in the bacterial envelope lead to improved Rev1∆*wzm* vaccine properties. **FRONTIERS IN MICROBIOLOGY**, 13: 908495.

Doi: <https://10.3389/fmicb.2022.908495>

Poveda-Urkitxo, I., G. Ramírez, **M.J. Grilló**. **2022**. Kinetics of placental infection by different smooth *Brucella* strains in mice. **PATHOGENS**, 11(3): 279.

Doi: <https://doi.org/10.3390/pathogens11030279>

Chacón, C., A. Zabalza-Baranguá, B. San Román, J.M. Blasco, M. Iriarte, D. Salas-Alfaro,G. Hernández-Mora, E. Barquero-Calvo, C. Guzmán-Verri,E. Chaves-Olarte,**M.J. Grilló**, E. Moreno. **2021**. *Brucella abortus* S19 GFP-tagged vaccine allows the serological identification of vaccinated cattle. **PLOS ONE**, Nov22: 1-17.

Doi: <https://doi.org/10.1371/journal.pone.0260288>

Garrido, V., C. Piñero-Lambea, B. Paetzold T. Ferrar, I. Rodriguez, M. Weber, C. Gallo, M. Collantes, I. Peñuelas, L. Serrano, **M.J. Grilló**, M. Lluch-Senar. **2021**. Engineering a genome-reduced bacterium to eliminate *Staphylococcus aureus* biofilms *in vivo*. **MOLECULAR SYSTEMS BIOLOGY**, 17: e10145.

Doi: <https://10.15252/msb.202010145>

Sanromán-Iglesias, M., V. Garrido, Y. Gil-Ramírez, J. Aizpurua, M. Grzelczak, **M.J. Grilló**. **2021**. Plasmon - assisted fast colorimetric detection of bacterial nucleases in food samples. **SENSOR & ACTUATORS B: CHEMICAL**, 349: 130780.

Doi: <https://10.1016/j.snb.2021.130780>

Zabalza-Baranguá A., San-Román B., Chacón-Díaz C., de Miguel M.J., Muñoz P.M., Iriarte M., Blasco J.M., **M.J. Grilló**. **2019**. GFP tagging of *Brucella melitensis* Rev1 allows the identification of vaccinated sheep. **TRANSBOUNDARY AND EMERGING DISEASES**, 66(1): 505-516 .

doi: <https://10.1111/tbed.13053>