



## BACPLANT

Plant bacteriology deals with plant-bacteria interactions that may be beneficial or harmful. In the latter, diagnosis, characterization and the study of pathogen biology can contribute to the development of measures to prevent and/or control plant bacteriosis.

The research activity of the R+D Team BACPLANT focuses on the study of plant-associated bacteria and their biotechnological applications. The team is led by Dr. Elena González Biosca and belong to the Microbiology and Ecology Dpt. of the Faculty of Biological Sciences at the University of Valencia.

### BACPLANT and associated members

Name	Nature of participation	Entity	Description
<a href="#">Elena González Biosca</a>	Principal Investigator	UVEG	Group leader. Full professor of Microbiology.
Ángela Figas Segura	Member	UVEG	Postdoctoral researcher
María Belén Álvarez Ortega	Collaborator	IMIDRA	Responsible of the Plant Health Laboratory of the Community of Madrid
Ricardo Delgado Santander	Collaborator	Cornell University	Postdoctoral researcher
José Francisco Català-Senent researcher	Collaborator	CIPF	Bioinformatics

### RESEARCH LINES:

- Characterization and diagnosis, and conventional and molecular identification of plant pathogenic bacteria\*: molecular characterization and epidemiology.
- Survival strategies of plant pathogenic bacteria in different environments\*: survival under oligotrophic conditions, viable but not culturable (VBNC) state and inducing factors, reservoirs and transmission ways. Recovery of bacteria from the VBNC state. Gene expression and obtaining of bacterial mutants of interest.
- Biotechnological applications of environmental microorganisms\*: isolation and characterization of microorganisms of biotechnological interest: producers of antimicrobial compounds, siderophores or other molecules, degraders and bacteriophages. Biological control of plant bacteriosis.
- Lichen bacteriology and biotechnological applications: isolation and characterization of lichen-associated bacteria: diversity, contribution to the lichen symbiosis and biotechnological applications

\* Laboratory authorized to work with quarantine plant pathogenic bacteria (biosafety level 2).

### RECENT PUBLICATIONS

- **E.G. Biosca**, J.F. Català-Senent, À. Figàs-Segura, M.M. López, B.Á. Ivarez, 2021. Genomic analysis of the first European phages with depolymerase activity and

biocontrol efficacy against the phytopathogen *Ralstonia solanacearum*. Viruses. **En revisión actualmente.**

- S. Maicas, B. Fouz; À. Figàs-Segura, J. Zueco, H. Rico, A. Navarro, E. Carbó, J. Segura-García, **E.G. Biosca**. 2020. Implementation of antibiotic discovery by student crowdsourcing in the Valencian Community through a service learning strategy. *Front Microbiol.* Nov 16;11:564030. doi: 10.3389/fmicb.2020.564030
- R.D. Santander, J.F. Català-Senent, À. Figàs\_Segura, **E.G. Biosca**. 2020. From the roots to the stem: unveiling pear root colonization and infection pathways by *Erwinia amylovora*. *FEMS Microbiology Ecology*. 2020 Oct 10;fiae210. doi: 10.1093/femsec/fiae210
- B. Álvarez, M.M. López, **E.G. Biosca**. 2019. Biocontrol of the major plant pathogen *Ralstonia solanacearum* in irrigation water and host plants by novel lytic water-borne bacteriophages. *Front Microbiol.* 06 December 2019. <https://doi.org/10.3389/fmicb.2019.02813>
- R.D. Santander, A Figas-Segura, **E.G. Biosca**. 2018. *Erwinia amylovora* catalases KatA and KatG are virulence factors and delay the starvation-induced viable but non-culturable (VBNC) response. *Molecular Plant Pathology*. 19: 922-934.
- P. Caruso, **E.G. Biosca**, E. Bertolini, E. Marco-Noales, M.T. Gorris, C. Licciardello, M.M. López. 2017. Genetic diversity reflects geographical origin of *Ralstonia solanacearum* strains isolated from plant and water sources in Spain. *International Microbiology*. 20: 155-164.
- R.D. Santander, **E.G. Biosca**. 2017. *Erwinia amylovora* psychrotrophic adaptations: evidence of pathogenic potential and survival at temperate and low environmental temperatures. *PeerJ*. 26: e3931.
- B. Álvarez, **E.G. Biosca**. 2017. Bacteriophage-based bacterial wilt biocontrol for an environmentally sustainable agriculture. *Frontiers in Plant Science*. 8: 1218.
- **E.G. Biosca**, R. Flores, R.D. Santander, J.L. Díez-Gil, E. Barreno. 2016. Innovative approaches using lichen enriched media to Improve isolation and culturability of lichen associated bacteria. *Plos One* 11(8): e0160328.

## Patents

- **González Biosca, E.**; Delgado Santader, R; Flores Martin R. Obtaining of lichen extracts and their use to improve the recovery of lichen-associated microorganisms. ES2575752B2.
- **González Biosca, E.**; López González, M.M.; Álvarez Ortega, B. Procedimiento para la prevención y/o el control biológico de la marchitez causada por *Ralstonia solanacearum*, a través del uso de bacteriófagos útiles para ello y composiciones de los mismos. ES2592352B2, 10/07/2017.
- **González Biosca, E.**; López González, M.M.; Álvarez Ortega, B. Method for the prevention and/or the biological control of bacterial wilt caused by *Ralstonia solanacearum*, via the use of bacteriophages suitable for this purpose and compositions thereof. US10508266B2, 17/12/2019.
- **González Biosca, E.**; López González, M.M.; Álvarez Ortega, B. Method for the prevention and/or the biological control of wilt caused by *Ralstonia solanacearum*. EP3305892B1, 09/09/2020.

## Recent Projects

**Desarrollo de estrategias de erradicación, contención y control de *Xylella fastidiosa* en España: análisis de riesgos y erradicación. E-RTA2017-00004-C06-01.** Instituto Nacional de Investigaciones Agrarias (INIA)-Ministerio de Ciencia, Innovación y Universidades.

From 01/01/2018 to 31/06/2022.

**IP: Dr. Antonio Vicent Civera.**

**Exploración de la microbiota de plantas como fuente de agentes de control de bacteriosis prioritarias en España: Bacteriófagos específicos para el control del fuego bacteriano y la marchitez bacteriana. RTA2015-00087-C02-02.** Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria INIA, Ministerio de Ciencia, Innovación y Universidades, Spain)-Fondos FEDER.

From 15/09/2017 to 31/12/2021.

**IP: Dra. Elena González Biosca.**

### **PhD thesis**

Title: Epizootiology of *Vibrio vulnificus* serovar E (Biotype 2): survival strategies, routes of transmission and reservoirs.

Author: Ester Marco Noales

University of Valencia, 2000

Title: Phenotypic and genotypic characterisation of Spanish isolates of *Erwinia amylovora*.

Author: Victoria Luis Donat

Polytechnic University of Valencia, 2004

Title: Survival of *Erwinia amylovora* under stress conditions: influence of the presence of copper and nutrient limitation.

Author: Mónica Ordax Ibáñez

Polytechnic University of Valencia, 2008

Title: Biology of *Ralstonia solanacearum* phylotype II in host and non-host environments. Author: Maria Belén Álvarez Ortega

Polytechnic University of Valencia, 2009

### **PhD with European Mention**

Title: Biology of the fire blight pathogen *Erwinia amylovora* in oligotrophic environments: survival responses and virulence.

Author: Ricardo Delgado Santander

University of Valencia, 2016

### **PhD Thesis with International Mention**

Bacterial communities associated with the lichen *Ramalina farinacea* (L.) Ach.: composition, biodiversity and biotechnological potential.

Author: Àngela Figàs Segura

University of Valencia, 2018

### **PhD thesis with International Mention.**

web: [www.uv.es](http://www.uv.es)