

Special STSM Offer hosted by Unibo - DISTAL

In Planta Quantification of Type III Secretion System and Amylovoran Biosynthesis Relative Gene Expression in *Erwinia amylovora* Under Thermally Variable Conditions with and without Biocontrol Agent Co-inoculation

The Offer: We invite a researcher with a strong molecular biology background to join our research team to work on an ongoing investigation of how biocontrol agent (BCA) co-inoculation affects virulence gene expression in *Erwinia amylovora* on apple flowers under different temperature and humidity conditions. You will participate directly in our experiments, contributing to the completion of this collaborative research project while developing expertise in in-planta bacterial gene expression analysis.

Research Objective: To determine whether biocontrol agent co-inoculation suppresses or modulates virulence gene expression (type III secretion system and amylovoran biosynthesis genes) in *E. amylovora* on apple flowers across different thermal and humidity scenarios. This work combines hands-on training with meaningful research contributions.

Training and Research Activities: During your visit, you will be trained in and contribute to:

1. **RNA Extraction & Quality Control:** Bacterial RNA isolation from infected apple flowers (single-inoculated and BCA co-inoculated) with validation of RNA integrity.
2. **RT-qPCR Assay Execution:** Hands-on work with established primers and protocols targeting virulence genes (*hrpL*, *hrpN*, *hrpA*, *dspA/E*, *amsB/amsG*) and reference genes (*recA*, *proC*, *ffh*).
3. **Data Analysis & Interpretation:** Quantification of fold-change in virulence gene expression using MNE (Pfaffl's method), $\Delta\Delta C_t$ methodology, and advanced normalization approaches; correlation with bacterial load (CFU) data.

Host Institute: Alma Mater Studiorum – University of Bologna, Italy

Lab: Prof. Francesco Spinelli's Research Group

Department: Department of Agriculture and Food Sciences (DISTAL)

Contact Person: Prof. Francesco Spinelli (francesco.spinelli3@unibo.it)

Focus Area: Bacterial pathogenicity, virulence gene expression, biocontrol efficacy, plant–pathogen interactions.

STSM Duration: 3 months

Funding: The participant must apply for a standard COST STSM grant for travel/accommodation. The host lab will provide all equipment, reagents, and technical supervision.

Selection Criteria: Only 1 participant will be selected. Ideal candidates have:

- Solid background in molecular biology (RNA extraction, RT-qPCR, primer design).
- Understanding of bacterial pathogenicity and gene expression.
- Ability to work independently yet collaboratively within a research team.

How to Apply: Interested researchers should submit a 1-page proposal covering:

1. **Motivation & Expertise:** Explain your interest in this project and highlight your molecular biology skills and experience with RT-qPCR or gene expression analysis.
2. **Research Background:** Brief description of your research experience and how it relates to plant–pathogen interactions or biocontrol.
3. **Expected Outcomes:** Describe how participation in this project will advance your research profile and career development.