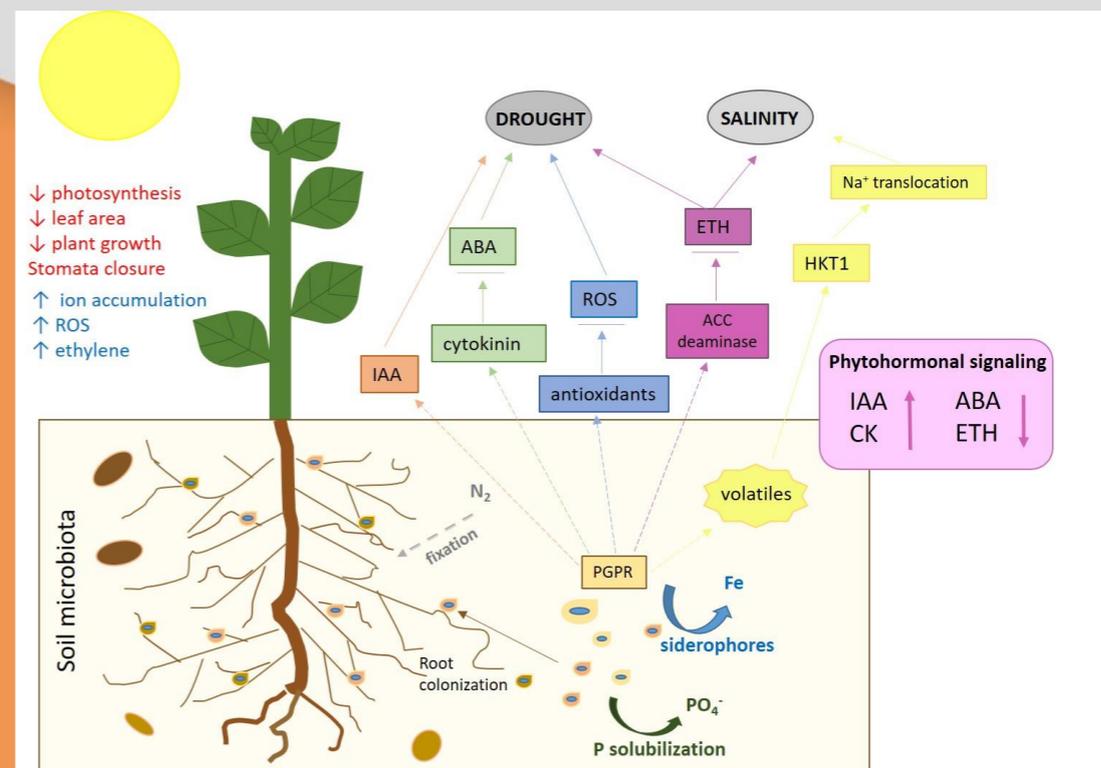




Research Project Title:

**Plant Growth Promoting
Rhizobacteria (PGPR) that
alleviate abiotic stress in plants
grown in the Mediterranean
environment: understanding the
biochemical and molecular
mechanisms of tolerance**

Principal Investigator:
Ifigeneia Mellidou



Popular Title:

The role of beneficial bacteria against stress in the Mediterranean environment

Scientific Field:

Agriculture, Natural Sciences

Host Institution:

Aristotle University, Greece



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Hellenic Foundation for
Research & Innovation

Environmental stresses such as drought, or salinity can severely injure plants, triggering a wide range of responses detectable at the physiological, biochemical, and molecular level. The synergistic effect of the striking losses of crop production and the constantly growing world population is expected to worsen in the future, thus representing a major challenge for current agricultural practices to find solution to the steadily escalating demand for food production. The use of Plant-Growth-Promoting Rhizobacteria (PGPR) can serve as a promising sustainable strategy to improve crop production under sub-optimal conditions. These bacteria are a group of microbes which colonize plant roots and improve plant growth, while some of them may also improve plant tolerance to (a)biotic stress factors.

On the basis of these considerations, bacterial strains from the rhizosphere of stress-tolerant plant species will be isolated and fully characterized using whole genome approaches. As a next step, the whole bacterial community diversity and activity of the soil and rhizosphere of stress-tolerant plant species will be investigated in order to identify additional players and to better understand the community function. The isolated rhizobacteria will be evaluated under drought and salt stress in order to select the strains that in vivo can promote growth and resistance to stress in tomato plants.

Before the public accepts the deliberate release of beneficial bacteria into the environment, the misconception towards thinking of bacteria solely as pathogens needs to be corrected. As a matter of fact, scientists will have to convince society that the use of PGPR in agriculture does not represent any hazards for public health. In this context, the project will have a major socio-economic benefit towards understanding the beneficial role of bacterial strains that colonize the rhizosphere of plant grown in the Mediterranean basin and elicit abiotic tolerance. Although these bacteria are already being used successfully in the developing world where agrochemicals remain expensive, their use in the developed world occupies a constantly growing niche towards sustainable agriculture. Considering the fact that PGPR may limit the losses on crop production due to abiotic stress, their use in various 'green' phytoremediation strategies can have a great impact in Greece and across Europe.

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With the 3-year grant that I received from the General Secretariat for Research and Technology (GSRT) and the Hellenic Foundation for Research and Innovation (HFRI), I will be able to undertake research with technological support, hire young scientists and establish 'my research team', team-up with European leading institutions such as KULeuven (Belgium), and be otherwise productive. For the first time, I will be responsible for the administrative duties of the project, for training and supporting research assistants, along with writing updates, reports and evaluations to maintain the grant. Although these tasks require a reasonable amount of energy and time, I feel that, by the end of the project, I will be able to conduct my own research independently, as well as develop follow-up proposals. Anyhow, the funding I received will give a boost in my confidence, and will probably improve chances for academic advancement.

*The Principal Investigator,
Ifigeneia Mellidou*

Funding

Amount: **320,000 €**

Duration: **36 months**

Foundation: **H.F.R.I.**





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