

# Laboratory of Plant and Environmental Biotechnology (BIOPLANET)

University of Thessaly

Department of Biochemistry and Biotechnology

<http://plantenvlab.bio.uth.gr>



**Assoc. Prof. Kalliope Papadopoulou**  
Plant – Microbe Interactions  
Plant Biotechnology



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Postdoc Fellow  
IKY



**C. Stendel**  
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**C. Garagounis**  
Postdoc Fellow  
Omic Engine

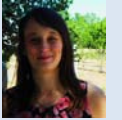


**Assoc. Prof. Dimitrios Karpouzas**  
Environmental Microbiology and  
Biotechnology



**E. Papadopoulou**  
PostDoc Niarchos  
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**C. Perruchon**  
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**S. Vasileiadis**  
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**P. Karas**  
Postdoc Fellow  
IKY



## Who are we? .....and the rest of the gang plus...



## What are our research priorities?

### Plant Microbe – Interactions

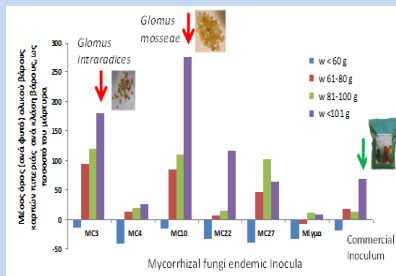
- **Arbuscular mycorrhizal fungi: ecology and function**



**THALIS** Contribution of Mycorrhizae to the sustainability of marginal Med. ecosystems – development of mycorrhizal inocula



**Support of New SMEs:**  
Isolation of indigenous AM fungi and development of mycorrhizal inocula used for rhizosphere inoculations and the production of soil improvers



### Collaborators:

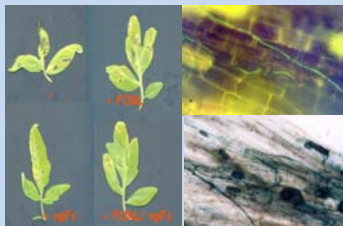
**Dr K. Ehaliotis**  
Agricultural Univ.  
Athens



**Dr I. Ipsilantis**  
Aristotle University  
Thessaloniki



- **Endophytic fungi suppressive to plant pathogens**

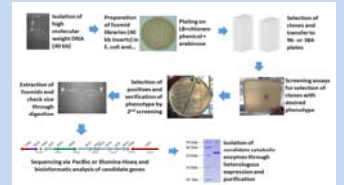


An endophytic *Fusarium solani* strain which is suppressive to tomato soil pathogen *F. oxysporum* f.sp. rl and induces systemic resistance to foliar pathogens

### Environmental Microbiology & Biotechnology

- **Metagenomics and synthetic biology for isolation and optimization of novel pollutant-degrading enzymes**

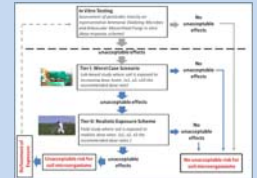
Application of functional metagenomic approaches in polluted environmental compartments (soils, biobeds) to obtain novel pollutant catabolic enzymes optimized via synthetic biology



**ΕΣΠΑ RI project 2014 – 2020 Omic Engine**

- **Toxicity of pesticides onto soil microbes**

New approaches in assessing the toxicity of pesticides on soil microbes using **standardized molecular tools** and **bioindicator functional microbial groups**

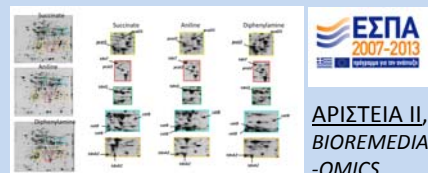


- **MSCA-FP7-IAPP project LOVE TO HATE**
- **IKY PostDoc project 2017-19**
- **IUPAC project 2016-2019**



- **Biodegradation of pesticides and applications in the depuration of agro-industrial effluents**

Degradation of pesticides used in the fruit packaging industry by soil bacteria & bacterial consortia: Elucidating the genetic mechanisms driving these pathways via omics and their use in biodepuration and bioaugmentation



**ΕΣΠΑ 2007-2013**

**ΑΡΙΣΤΕΙΑ II, BIOREMEDIAT-OMICS**

**MSCA-IF-H2020, EMIGRATE**



### Recent Relevant Publications

1. **Karpouzas, D.G., et al (2014)** A tiered assessment approach based on standardized methods to estimate the impact of nicosulfuron on the abundance and function of the soil microbial community. *Soil Biol Biochem* 75: 282-291
2. **Hadar Y, Papadopoulou KK. (2012)** Suppressive composts: microbial ecology links between abiotic environments and healthy plants. *Ann. Rev. Phytopath.* 50:133-153
3. **Papadopoulou E.S., .....Karpouzas D.G., (2016)** Land spreading of wastewaters from the fruit packaging industry and potential effects on soil microbes: Effects of the antioxidant ethoxyquin and its metabolites on ammonia oxidizers. *Appl. Environ. Microbiol.* 82: 747-755
4. **Ipsilantis I., Samourelis C., Karpouzas D.G., (2012)** The impact of botanical pesticides on arbuscular mycorrhizal fungi. *Soil Biology and Biochemistry* 45: 147-155
5. **Rousidou C., .....Karpouzas D.G. (2017)** Distribution and function of carbamate hydrolase genes *cehA* and *mcd* in soils: the distinct role of soil pH. *FEMS Microbiology Ecology* DOI: <http://dx.doi.org/10.1093/femsec/fiw219>
6. **Perruchon C., Chatzinotas A., Omirou M., Vasileiadis S., Menkissoglu-Spiroudi U., Karpouzas D.G., (2017)** Isolation of a bacterial consortium able to degrade the fungicide thiabendazole and determination of its metabolic pathway: the key role of a *Sphingomonas* phylotype. *Applied Microbiology and Biotechnology* doi:10.1007/s00253-017-8128-5