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## ARISTO – PhD Fellowship

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### **ARISTO: The European Industry - Academia Network for Revising and Advancing the Assessment of the Soil Microbial Toxicity of Pesticides**

#### **PhD scholarship in arbuscular mycorrhizal fungi (AMF) ecology (ARISTO)**

University of Thessaly, Department of Biochemistry and Biotechnology, Lab of Plant and Environmental Biotechnology, Greece and INOQ GmbH, Germany

University of Thessaly and INOQ GmbH, are offering a PhD scholarship in soil microbial ecology and plant-microbe interactions with expected commencement May 2021 or as soon as possible thereafter. The PhD will be awarded by the University of Thessaly, Greece.

**Project title:** ESR4: Assessing the toxicity of pesticides on natural soil and plant assemblages of AMF

#### **Project description**

Pesticide toxicity on soil microorganisms is insufficiently evaluated as yet, due to the lack of recognized key microbial indicator. Arbuscular mycorrhizal fungi (AMF) represent the most ubiquitous plant symbiotic microorganism that associate with almost 80% of plant species in beneficial interactions that can promote plant growth, and resilience to stresses. At the ecosystem level, AMF could affect the composition and productivity of plant communities with reciprocal effects on nutrient cycling, which in turn has an impact on soil microbiota. Thus, AMF have been identified as key species indicators for soil microbial toxicity of pesticides. Natural AMF soil assemblages will be used to develop assessment protocols in experimental lab and field tests. The effects on the AMF diversity will be determined by developing suitable molecular profiles at the highest possible resolution by amplicon NGS, by qPCR protocols and microscopy protocols at a soil community level. The impact of pesticides directly to AMF or via the plant host will also be evaluated. The experimental process will involve collaboration with other fellows' projects providing a holistic assessment of the soil microbial toxicity of pesticides on AMF.

The PhD position is associated to a larger European training network, ARISTO ([www.aristo.bio.uth.gr](http://www.aristo.bio.uth.gr)), funded by the European Commission for 48 months. The ARISTO project offers 8 other PhD positions at other participating institutions. We strongly encourage candidates to also apply for other similar positions within the ARISTO network.

**Principal supervisor:** Prof. Kalliope Papadopoulou, [kalpapad@bio.uth.gr](mailto:kalpapad@bio.uth.gr), +30-2410565244 and Dr Carolin Schneider, [schneider@inoq.de](mailto:schneider@inoq.de), +0 58 42-98 16 72

**Planned secondments:** to **BAYER CropScience**, Germany, Supervisor: Dr M.T. Marx, 3 months, Purpose: to setup collaborative soil microcosms (with INOQ and UTH) pesticide toxicity assays with AMF

#### **Brief Project Description**

ARISTO is an International Training Network (ITN) funded by the European Union's Horizon 2020 research and innovation programme under Marie Skłodowska-Curie grant agreement. Pesticides are major environmental pollutants. For this reason the European Commission has imposed a stringent pesticide regulatory scheme for pesticides authorisation, where risk assessment for aquatic organisms and terrestrial macro-organisms is well defined. In contrast the assessment of the toxicity of pesticides on soil microorganisms is lagging behind, still relying on an outdated protocol which fails to identify effects on key microbial functions and on microbial diversity, which can now be accurately determined through advanced and standardized methods introduced in soil microbiology in the last 10 years. EFSA identified soil microorganisms as an attribute to monitor during pesticides environmental risk assessment and stressed the need for novel tests to assess the toxicity of pesticides on soil microorganisms. **The ARISTO project will fulfil this scientific and regulatory gap through a unique doctoral program, based on the strong interaction of academia and industry, aiming to train the next**



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**generation of Microbial Ecotoxicologists.** These will produce benchmarking knowledge supporting the development of advanced tools and procedures, based on the response of key microbial indicator groups, for the comprehensive assessment of the toxicity of pesticides on soil microorganisms. ARISTO offers doctorate fellows a challenging training program build along 5 research objectives: (1) to develop pioneering *in vitro* tests, as a first conservative step, to assess the toxicity of pesticides on distinct ammonia-oxidizing microorganisms and arbuscular mycorrhizal fungi (2) to develop advanced lab and field tests to assess the toxicity of pesticides on natural soil assemblages of AOM and AMF, as a more realistic toxicity assessment step; (3) to develop an ecosystem-level toxicity assessment looking at pesticide effects at microbial networks and across different trophic levels along the soil food web (predator - prey); (4) to develop novel tools to determine the soil microbial toxicity of pesticide mixtures, and bio-pesticides; (5) to develop and validate advanced *in silico* tools for prioritizing pesticide transformation products with potential toxicity to soil microbes

### Job description

The position is available for a period of 36 months on these terms. Your key tasks as a PhD student in ARISTO are:

- Participate in the research environment at the host institutions and the network activities of ARISTO
- Manage and carry through your research project
- Take PhD courses
- Write scientific articles and your PhD thesis
- Participate in congresses
- Teach and disseminate your research

### Key criteria for the assessment of candidates

- A master's degree related to the subject area of the project
- The grade point average achieved should be more than 75 % of the maximum
- Professional qualifications relevant to the PhD programme
  - Relevant skills: experience with AMF, plant biology, microbial ecology, bioinformatics, biostatistics, experience on pesticide analytics will be a merit
- Previous research publications
- Other professional activities
- Language skills: fluency in English

### Formal requirements and eligibility

At the time of commencement, it is required that the candidate shall at the date of recruitment, be in the first four years<sup>1</sup> (full time equivalent research experience) of their research careers and have not been awarded a doctoral degree. Furthermore, the candidate **must not** have resided or carried out their main activity (work, studies, etc.) in Greece and Germany for more than 12 months in the 3 years immediately prior to their recruitment. Short stays, such as holidays, are not taken into account. The candidate is required to spend part of their project period at other institutions in the ARISTO consortium on secondments.

### Terms of employment

Recruitment and Terms of appointment will be done according to the rules and regulations of the hosting institutions and according to the rules and regulations laid down by European Union's Horizon 2020 Marie Curie Initial Training Networks. The stipend includes a living allowance (3270 €, adjusted by a country correction factor), mobility allowance (600 €) and family allowance (500 €), the latter allowance depending on the family status of the fellow.

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<sup>1</sup> is measured from the date when a researcher obtained the degree which would formally entitle him or her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher is recruited, irrespective of whether or not a doctorate is or was ever envisaged



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### Place of Employment

- **University of Thessaly**, Department of Biochemistry and Biotechnology, Laboratory of Plant and Environmental Biotechnology, Larissa, GREECE, Website: <https://plantenvlab.bio.uth.gr> (Month 1 to 18)
- **INOQ GmbH**, Solkau 2, 29465 Schnega, GERMANY, Website: [www.inoq.de](http://www.inoq.de) (Month 19 to Month 36)

Please notice that this PhD fellowship involves a split PhD studentship between an academic and an industrial partner. Hence the selected fellow will have to spend 18 months in the premises of the University of Thessaly and 15 months in the premises of INOQ GmbH, while the fellow will also spend time to other partners through short secondments, see above.

### Application Procedure

The application, in English, must be submitted by mail to [kalpapad@bio.uth.gr](mailto:kalpapad@bio.uth.gr), and [schneider@inoq.de](mailto:schneider@inoq.de) and the coordinator of the project [dkarpouzas@uth.gr](mailto:dkarpouzas@uth.gr)

### Please include

- Motivation Letter, stating which PhD project you are applying, why you want to pursue a PhD career in academic and industrial sectors, and to what extent does the given project complies with your skills and ambition.
- A statement if (and which) you have applied for other ARISTO PhD fellowships
- Full CV including studies, research experience, work experience and publications if any
- Diploma and transcripts of records (BSc and MSc)
- 3 professional referees (Name, address, telephone & email)
- Documentation of English language qualifications

The University of Thessaly and INOQ GmbH wish our staff to reflect the diversity of society and thus welcomes applications from all qualified candidates regardless of age, gender, race, religion or ethnic background.

The deadline for applications is 20.1.2021. Applications received later than this date will not be considered.

**Recruitment Process:** After the expiry of the deadline for applications, the project manager will provide all applications to the members of the recruitment committee. A recruitment sub-committee for this position composed of the members of the Supervisory Committee (Academic Supervisor, Industrial Supervisor and Secondment Supervisor) will evaluate all applications and select the best three candidates based on the quality of the candidates' previous training, qualifications and skills (as listed above), CV and their motivation for the research topic. The best three candidates will be interviewed by the recruitment committee which will select the best applicant for the position taking into consideration the recommendation of the co-supervisors for the position. The applicants will be notified of the final selection by the Project Manager and will be given 7 days to accept or decline.

### Questions

For specific information about the PhD scholarship, please contact the principal supervisors Prof. Kalliope Papadopoulou, [kalpapad@bio.uth.gr](mailto:kalpapad@bio.uth.gr), +30-2410565244 and Dr Carolin Schneider, [schneider@inoq.de](mailto:schneider@inoq.de), +49 58 42-98 16 72