



ARISTO – PhD Fellowship

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

PhD scholarship in environmental chemistry & cheminformatics (ARISTO)

Eawag, Switzerland and enviPath UG & Co.KG, Germany

Eawag and enviPath are offering a PhD scholarship in environmental chemistry and cheminformatics with expected commencement May 2021 or as soon as possible thereafter. The PhD will be awarded by the University of Zurich, Switzerland.

Project title: ESR9: Development of tools for *in silico* prioritization of pesticide TPs for soil microbial ecotoxicity testing

Project description

Pesticide transformation may lead to the formation of transformation products (TPs) that are equally or more toxic than the parent compound. The introduction of advanced analytical tools, e.g., high-resolution mass spectrometry, has enabled a more accurate annotation of the transformation pathways of pesticides. Based on these data, *in silico* tools have been developed that support the prediction of TPs for analytical suspect screening and also risk assessment purposes. The objectives of the project are to optimize *enviPath*, a publically available model for prediction of pesticides TPs jointly developed by Eawag and enviPath UG & Co.KG, and to expand it with *in silico* tools for predicting the soil microbial toxicity of pesticide TPs. Predictions will be validated for selected pesticides with experimental biotransformation studies carried out by the PhD student in collaboration with other fellows in the ARISTO project. The project will thus contain experimental work (including batch assays with activated sludge and soil, analytical chemistry) but its emphasis will lie on developing cheminformatics tools for transformation and toxicity prediction based on existing databases and new data generated within the ARISTO project.

The PhD position is associated to a larger European training network, ARISTO (<https://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. Kathrin Fenner, kathrin.fenner@eawag.ch, +41-587655058 and T. Lorsbach, lorsbach@envipath.com.

Planned secondments: (i) to **INRAE**, France. Supervisor: Dr. F. Martin-Laurent, 2 months, Purpose: to establish mode-of-action based toxicity screening criteria for microorganisms; (ii) to **Syngenta Crop Protection AG**, Switzerland, Supervisor: Dr. Claudio Screpanti, 1 month, Purpose: Soil cassette testing of relevant pesticides in the project.

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



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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 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: environmental chemistry, cheminformatics, analytical chemistry
- 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 years¹ (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 Switzerland 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

¹ 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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correction factor), mobility allowance (600 €) and family allowance (500 €), the latter allowance depending on the family status of the fellow.

Place of Employment

- **Eawag**, Environmental Chemistry Department, Dübendorf, Switzerland, Website: <https://www.eawag.ch/en/department/uchem/>
- **enviPath UG & Co.KG**, Ockenheim, Germany, Website: <https://envipath.com>

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 16 months in the premises of Eawag and 17 months in the premises of enviPath UG & Co.KG, while the fellow will also spend time at other partners through short secondments, see above.

Application Procedure

The application, in English, must be submitted by mail to the coordinator dkarpouzas@uth.gr and via the Eawag recruiting tool at <https://apply.refline.ch/673277/0817/pub/1/index.html>.

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

Eawag and enviPath 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. Kathrin Fenner, kathrin.fenner@eawag.ch, +41-587655058 and T. Lorsbach, lorsbach@envipath.com