PIPS Advert 2025

*Organisations Interested in hosting an EASTBIO-funded PhD student for a 3-month placement, are asked to fill in this form and send it to* [*placements@eastscotbiodtp.ac.uk*](mailto:placements@eastscotbiodtp.ac.uk)*. The EASTBIO team will advertise the internship opportunity directly to funded students who are between year 1 and 3 of their PhD study. Please make sure you visit our webpage* [*http://www.eastscotbiodtp.ac.uk/information-organisations*](http://www.eastscotbiodtp.ac.uk/information-organisations)*, or contact the EASTBIO DTP Manager at* [*Maria.Filippakopoulou@ed.ac.uk*](mailto:Maria.Filippakopoulou@ed.ac.uk) *for further information.*

*EASTBIO student interested in exploring this PIPS opportunity further, please follow the instructions within the posting and, if contacting the organisation, copy in* [*placements@eastscotbiodtp.ac.uk*](mailto:placements@eastscotbiodtp.ac.uk) *to keep the EASTBIO team informed of your application.*

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| Host Organisation Details | | | |
| Host Organisation Name | **Rothamsted Research** | | |
| Host Organisation Sector Type  Please select from list in [Appendix](#Appendix) | -Academia  -Agriculture, Livestock breeding & Fishing (including production, animal welfare)  -Science & Research | | |
| Please write a brief, plain description of what your organisation does (max 200 words) | Rothamsted Research (RRes) is the world’s oldest agricultural research institute, established in 1843 and based primarily in Harpenden, UK. It focuses on advancing sustainable agriculture and addressing global food security challenges through cutting-edge scientific research. RRes conducts experiments across its 800 hectares of farmland, including long-term studies such as the Broadbalk wheat experiment (ongoing since 1843) and the Park Grass experiment (since 1856). These studies provide invaluable insights into soil health, crop yields, and environmental sustainability.  The institute specializes in areas like crop science, soil health, agroecosystem resilience, crop protection and precision farming. It integrates experimental data with advanced modelling to develop innovative solutions for sustainable farming systems. RRes is home to national capabilities like the Insect Survey and the North Wyke Farm Platform, which focus on pest management and livestock systems research.  Its facilities include bioimaging, genome editing, controlled environment units, and high-throughput phenotyping platforms. Rothamsted collaborates with universities, government bodies, farmers, and industry partners globally to ensure its research benefits society. By combining historical expertise with modern technologies, Rothamsted continues to lead efforts in creating resilient agricultural systems that balance productivity with environmental stewardship. | | |
| Postal address | West Common, Harpenden, AL5 2JQ | | |
| Website | https://www.rothamsted.ac.uk/ | | |
| Contact person name and role in the organisation  *Please confirm whether they will be different to the Student Mentor/Supervisor (details to be confirmed below).* | Dr. Pradip Songara (same as student supervisor)  Post-Doctoral Research Scientist | | |
| Contact person email and phone number | Tel: +44 (0)1582 938338  Email: [Pradip.Songara@rothamsted.ac.uk](mailto:Pradip.Songara@rothamsted.ac.uk) | | |
| Will your Organisation provide physical premises external to the University with professional staff who will support the development of an intern’s professional skills appropriate to PhD level?  *Please note that EASTBIO DTP may approve remote or hybrid placements as long as the PIPS project is suitable for this*. | **Yes** |  |  |
| Any other relevant information, for instance how the project is suited to a remote or hybrid placement:  **Project will be fully in-person (No remote or hybrid working will be required)** | | |

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| **PIPS Internship Details and Desired Outcomes** | |
| PIPS Project Title | Exploring how micronutrient zinc impacts tomato plant resilience to (a)biotic stresses |
| Description of the internship project you are offering, which will be shared directly with eligible PhD students (max 500 words). | **Overview:**  Zinc is an essential micronutrient, fundamental to biochemical processes that sustain plant cellular function, drive growth and development, and bolster overall plant health and resilience to (a)biotic stresses. However, approximately 50% of agricultural soils globally are zinc deficient due to a combination of low soil moisture/organic matter, and high soil pH which reduce zinc bioavailability, weakening plant resilience and degrading crop quality, thus highlighting an urgent need for improved zinc management in agriculture. Moreover, zinc deficiency in crops causes zinc deficiency (hidden hunger) in a significant portion of the world's population (31%), which can lead to stunted growth, impaired immune function, and increased susceptibility to infections in humans. Attempts to overcome this zinc deficiency are challenging and the problem needs an urgent solution. Using zinc fertilizers (e.g. ZnO, ZnSO4) provides benefits to zinc bioavailability (biofortification of crops), however, depositing large quantities of zinc salts (10 to 100 kgha-1 ZnSO4) onto soil causes persistent issues, from hyperaccumulation in plants and insects (e.g. aphid zinc biomagnification to toxic levels has been detrimental to populations of the natural predator (ladybug)). Plant zinc uptake is improved following the application e of synthetic chelates (e.g. EDTA), increasing ZnSO4 uptake by 2-5-fold, thereby reducing overuse. Therefore, identifying novel, bio-compatible ligands that can be synthesised on large scale to promote zinc-selective uptake in crops could present a remedy to this problem. Furthermore, crop damage by pests and pathogens results in 40% loss of crops annually worldwide, for example, tomatoes, a globally significant crop, suffers up to 40% yield reduction from zinc deficiency and 34% losses from persistent pests annually, highlighting critical challenges in current production practices. Thus, optimising zinc uptake could enhance plant defences against pests by boosting production and efficacy of volatile organic compounds (VOCs) and secondary plant metabolites, which are crucial for defence responses.  **Hypotheses:**  1. Increased zinc uptake in tomato plants will promote plant resilience to both abiotic and biotic stresses.  2. Higher plant-zinc levels will boost production and efficacy of VOCs, priming plant-defences against pests and the synthesis of many secondary plant metabolites, crucial for defence responses.  3. Zinc deficiency can downregulate various biological processes in tomato plants, making them more susceptible to aphid (pest) infestations  **Objectives:**  1. Abiotic stress - Evaluate impact of zinc-fertilizers (low vs high concentration) on plant resilience by monitoring changes in plant volatile organic compounds and secondary metabolites induced by biochemical immune responses to changes in zinc concentration.  2. Biotic stress - Measure how zinc concentration affects aphid development (feeding experiment) on tomato plants in presence of secondary metabolites and behavioural response to isolated-VOCs.  3. Establish a relationship between soil-zinc bioavailability and plant-pest resilience by zinc distribution in plant matter (ICP-MS) as a measure. |
| Option for inviting interested students to apply directly by CV to generate a tailored internship project with your Organisation | Yes |
| Geographic location of this internship?  AND/OR  Option for a remote or hybrid placement, and a rationale for a virtual internship (max 150 words) | Rothamsted Research, Harpenden, Hertfordshire, UK (in-person only) |
| What range of professionals will the PhD student work with during this internship? | Chemical Ecology group - Principal investigators, research scientists, post-doctoral research assistants, PhD students, scientific technicians, visiting students/academics. As well as broader Rothamsted scientists/professionals. |
| Based on the project’s objectives, what specific results do you want the PhD intern to achieve? | Datasets for variation in production of secondary metabolites/VOCs in tomato plants based on variation in soil-zinc concentration (quantified through analytical chemistry) and the insect response to these chemicals (feeding and behavioural). |
| How do these outcomes fit with your wider business objectives? | The outcomes will support development of potential fertilizer strategies aimed at reducing the adverse impact of pests on crop health, especially in regenerative and reduced-input farming systems. |

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| **PIPS Internship Timing / Duration / Management** | | | | |
| Timing of the Internship  *If provisional dates at this stage, please mark on the form* | PIPS start date:  06/10/25 OR 05/01/26 | | PIPS end date:  19/12/25 OR 03/04/26 | |
| Format of the Internship, e.g.  3-month block or a number of shorter blocks | 3-month block (2025) – however the institute has a compulsory site closure from 20th Dec - 4th Jan inclusive, so this will effectively be a 2.5 month placement.  3-month block (2026) | | | |
| Internship anticipated time of work (e.g. full-time, 35 hours/week; part-time option, etc.) | Full-time, 35 hours/week | | | |
| Name of person who will act as the PhD student supervisor/mentor (line manager) during this internship (if different to the contact mentioned above) | Dr Pradip Songara | | | |
| Supervisor position in the host organisation | Post-Doctoral Research Scientist | | | |
| Supervisor Contact email and phone number | [Pradip.songara@rothamsted.ac.uk](mailto:Pradip.songara@rothamsted.ac.uk) | | | |
| Is the Organisation willing to make a contribution towards intern’s travel or accommodation costs?  *Please note that the student will be in receipt of their PhD stipend during the placement and they are also able to apply to EASTBIO for limited funds towards their travel and/or accommodation. If the student lives more than 50 miles from the Organisation’s location, we encourage a contribution from the PIPS host towards their travel or accommodation costs; this is optional. The only financial expectation from the PIPS host is to cover all costs associated with the PIPS project (consumables).* |  | **No** | |  |
| Any other information relevant to the intern’s financial support from your organisation? | Rothamsted Research will cover costs associated with research consumables. | | | |

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| **Person Specification**  *Please give details of what is required for this internship – skills, experiences and personal qualities, whether essential or desirable.* | |
| What skills does the PhD student need to complete this internship project? | * Good lab practice and experience * Experience in plant and insect handling is desirable * Analytical chemistry experience is desirable (GC, GC-MS, LC and LC-MS) |
| What soft attributes do they need to fit in/contribute? | * Pragmatic individual with an attention to detail * Ability to plan experiments and present data in meetings/supervisor meetings * Willingness to learn and is self-motivated |

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| **Application Details** | | |
| I wish this internship to be advertised open ended to PhD students? | **Yes** |  |
| If ‘No’, please specify a closing date for receiving CVs from interested students? |  | |
| Name and contact details for PhD students to submit their CV applications to | Dr. Pradip Songara, pradip.songara@rothamsted.ac.uk | |
| Would you expect further support from EASTBIO regarding this advertised opportunity? N/A | | |
| Any other relevant information: There is some flexibility in the start dates (2026) | | |
| Please provide, below, any further comments about his opportunity not covered in the sections above. Rothamsted Research has onsite/nearby offsite accommodation (chargeable): <https://lawestrust.org/accommodation/> | | |

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| **Completed & Signed by:** | |
| PIPS Host Organisation Name & Date |  |
| Date Advert submitted to EASTBIO |  |
| Date Advert circulated by EASTBIO |  |

*Thank you for your support of the UKRI BBSRC PIPS Scheme.*

**APPENDIX - PIPS Organisations - Sector List**

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| Academia | Fire, Police & Security |
| Advertising, Marketing & Public Relations | Food & Beverage |
| Aerospace & Defence | Government & Civil Service (including public service administration) |
| Agriculture, Livestock breeding & Fishing (including production, animal welfare) | Health & Social Care |
| Biotechnology, Medical & Pharmaceuticals | Hospitality, Leisure, Travel, Tourism and Sports |
| Business and Management (including business intelligence & market research) | IT & Telecommunications (Hardware & Software) |
| Chemicals | Law (including legal services) |
| Clothing, Footwear & Fashion | Logistics, Transport, Purchasing & Supply |
| Consultancy | Media, Communication, Journalism & Publishing |
| Charities & Voluntary work (non-profit / third sector) | Metals & Construction Materials |
| Creative arts, Design and Culture | Product Manufacturing |
| Education & Training (including teaching) | Real Estate & Renting |
| Energy & Utilities (including renewable energy and energy conservation) | Recruitment & Human Resources |
| Engineering (civil and mechanical) | Retail, Buying & Merchandising |
| Environment (including recycling, environmental services, conservationism and industries) | Science & Research |
| Financial services (including accounting, auditing & banking) | Other |