

# SCOTLAND EUROPA



In partnership with



## EU funded project Case-Studies from Scottish partners

# Novel biocontrol agents for insect pests from neuroendocrinology (nEUROSTRESSPEP)

Horizon 2020 Programme

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## PARTNERS

University of Glasgow (Coordinator), Scotland (UK)  
University of Leuven (KU Leuven) (Belgium)  
University of Ghent (Belgium)  
Volcani Institute, Agricultural Research Organisation (ARO),  
(Israel)  
Stockholm University (Sweden)  
University of Leeds, England (UK)  
University of Cologne (Germany)  
Scottish Government Agriculture, Food and Rural  
Communities Directorate, Scotland (UK)  
Science and Advice for Scottish Agriculture (SASA), Scotland  
(UK)  
Forest Research, Forestry Commission, England (UK)  
University of Cape Town (South Africa)  
Bruker Daltonics GmbH (Germany)  
The Pirbright Institute, England (UK)  
Oxitec Ltd, England (UK)  
KTN Ltd (UK)

### Project Launch

01 June 2015

### Project Completed

31 May 2019

### Further Information

University of Glasgow

Professor Shireen Davies

[Shireen.Davies@glasgow.ac.uk](mailto:Shireen.Davies@glasgow.ac.uk)

### Website

[neurostresspep.eu](http://neurostresspep.eu)

## OVERVIEW

The nEUROSTRESSPEP project aims to deliver novel, selective and effective biopesticides for insect pests, to positively impact agri-food security and safety, with significantly reduced environmental impact. We use dual approaches based on neuroendocrinology and genetics to develop novel biocontrol measures for insect pests that will not engender insect resistance; and will contribute to sustainable agriculture, horticulture and forestry. We are developing peptide (small protein) analogues that specifically target selected insects rather than other organisms, and Genetic Pest Management (GPM) tools based on new insect synthetic biology, which will be applied to a wide range of insect pest species.

The project has just successfully passed the first periodic review by the EC marking the half-way point and we have successfully achieved wide-ranging activities in insect genetics/genomics. Amongst many achievements, we have mounted the first comprehensive, searchable online database for insect neuropeptides; provided data for invasive alien insect pests as well as for beneficial species; and demonstrated that several peptide analogues reduce insect fitness in laboratory trials - interfering with development, reproduction and/or environmental stress tolerance. Moreover, with our 'omics, synthetic

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biology and functional biology approaches, we have significantly increased the possibility of new species-specific insect biocontrol which will be further tested under field-specific conditions.

Expected impacts would see significant economic gains/avoided losses for European agriculture and forestry; Increased product quality and lower environmental impact (e.g. lower level of chemicals, less new pests); Scientific support to the development of relevant EU policies; Development of science-based tools for developing strategies for improving the productivity and resilience of agriculture and forestry in the context of changing environmental conditions; Impact on a range of agricultural and forestry production and risk management practices; Improving innovation capacity and the integration of new knowledge; strengthening the competitiveness and growth of companies by developing innovations meeting the needs of European and global markets.

## BENEFIT DERIVED FROM EU COLLABORATIVE ENGAGEMENT

- Enabling research (technology, collaborations, planned future bids)
- Can set big questions and undertake large scale efforts to address these
- Coordinated research at European and international level towards innovation
- Getting ahead of main competitors in, e.g. US and China
- Increased industry and end user interactions

## HOW THE PROJECT AFFECTED CHANGE

The experience gained and expertise developed in supporting the development and implementation of this project has allowed University of Glasgow's Research Support Office (EU & International Team) to boost its capacity for dealing with other EU/ International opportunities and projects. In particular, valuable working relationships have been established with Innovate UK, the Knowledge Transfer Network and the US Department of Agriculture.

Moreover, the project makes a substantial financial contribution to the running costs of our Project Management Team, facilitating the creation and retention of valuable expertise in this area which, in turn, strengthens the university's position in bidding to coordinate future collaborative projects of this magnitude. As a result, The University of Glasgow has significantly increased its capacity for research, innovation and funding in AgriFood area especially with respect to crop protection.

Follow-on activities have included the coordination of follow on bid for H2020 RIA, which was unsuccessful, but established the right contacts for future bids. Furthermore, the network that formed as a result of the project has allowed us to enhance engagement with consortium partners (e.g. KTN Ltd for other follow on activities) and highlighted pathways that could lead to commercialisation and spin-outs.

## LESSONS LEARNED

- A successful project has an absolute requirement for a really effective project coordination team.
- Innovation requires in-depth research and discovery-based activities by those with the appropriate expertise, together with other activities (e.g. market analysis).

- The very real importance of the 'multi actor approach' and stakeholder knowledge for effective development of research-based solutions.
- The positive impact of an active and engaged project External Expert Advisory Board, which includes industry participation
- Improved communication and networking to wider audience including European Commission and Key Opinion Leaders.
- Policy outcomes from H2020 RIA projects.



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*"Project is unique, innovative and groundbreaking....next generation sustainable pest control agents' EC 1st periodic review"*

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