HORIZON 2020

How does dopamine link QMP with reproductive repression to mediate colony harmony and productivity in the honeybee?

Fact Sheet

Project Information

DRiveR

Grant agreement ID: 752656

Project website

DOI
10.3030/752656

Project closed

EC signature date
20 March 2017

Start date
1 March 2018

End date
29 February 2020

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions

Total cost
€ 183 454,80

EU contribution
€ 183 454,80

Coordinated by
UNIVERSITY OF LEEDS
United Kingdom

Objective

Insects pollinate 80% of crop plants in Europe and pollination services contribute €22 billion to the European economy annually. The honeybee (Apis mellifera) is the most extensively managed pollinator species, yet populations are declining. Understanding the biology of the honeybee and and factors contributing to its decline is critical for

food security and maintenance of biodiversity.
The honeybee has evolved a remarkable life history strategy where only one female is responsible for the majority of reproduction. The other females, the workers, forgo reproducing to care for the queen and her offspring. The presence of a reproductive queen is communicated via pheromones, arguably the most important of which is Queen Mandibular Pheromone (QMP). This pheromone inhibits ovary activity in worker bees and in its absence worker bees can activate their ovaries and lay unfertilised eggs that will become males. QMP is detected by the antennae and brain, but it is not currently known how the signal, initiated by QMP, is passed to the ovary. In this fellowship the applicant will address this fundamental gap in our knowledge by testing her hypothesis that dopamine acts to link the brain and ovary with exposure to QMP in the honeybee. The applicant will determine the role of dopamine signalling in maximising colony productivity and harmony and whether this is altered by sub-lethal doses of neonicotinoid pesticides. The experimental approach proposed in this fellowship is highly innovative as it combines state-of-the-art techniques both for measuring gene expression (RNA-seq) and for ovary culture and transplantation in honeybees. The applicant will combine these molecular approaches with behavioural ecology and colony monitoring (new skills that she will acquire under this fellowship) to understand not just how cells within the honeybee ovary respond to QMP, but how this signal affects the whole animal, its behaviour and, ultimately, the performance of the colony.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > zoology > entomology > **apidology**

social sciences > economics and business > economics > production economics > **productivity**

medical and health sciences > health sciences > **nutrition**

natural sciences > biological sciences > ecology > **ecosystems**

natural sciences > biological sciences > biological behavioural sciences > **behavioural ecology**

Programme(s)

H2020-EU.1.3. - EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions MAIN PROGRAMME

H2020-EU.1.3.2. - Nurturing excellence by means of cross-border and cross-sector mobility

Topic(s)

MSCA-IF-2016 - Individual Fellowships

Call for proposal

H2020-MSCA-IF-2016

See other projects for this call

Funding Scheme

MSCA-IF-EF-ST - Standard EF

Coordinator

UNIVERSITY OF LEEDS

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Region

Yorkshire and the Humber > West Yorkshire > Leeds

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation   Website
Participation in EU R&I programmes
HORIZON collaboration network

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