

Evaluation of the Research and Professional Activity of the Institutes of the Czech Academy of Sciences (CAS) for the period 2010–2014

Final Report on the Evaluation of the Institute

Name of the Institute: Institute of Organic Chemistry and Biochemistry of the CAS, v. v. i., Prague

Fields, in which the Institute registered its teams:

Biological sciences including biotechnology and agricultural sciences

Observer representing the Academy Council of the CAS: Vladimír Mareček

Observer representing the Institute: Jitka Moravcová, substitute observer Martin Fusek

Commission No. 7: Biological sciences including biotechnology and agricultural sciences

Chair: Emeritus Professor Erick Vandamme

Date(s) of the visit of the Institute: November 2 - November 11, 2015

Programme of the visit of the Institute: see attached Minutes from the visit

Evaluated research teams:

No. 16 - Irena Valterova - Chemical Ecology of Social Insects

A. Evaluation of the Institute as a whole

Evaluation of the Team No. 16: Chemical Ecology of Social Insects

1. Introduction

Dr. Valterova heads, with Dr. Jahn, a “Senior” research group called Natural Product Chemistry. This is a small group (9 chemists, 2 biologists, 3 technicians) with a broad age profile. A group, studying termites, was considered in the paperwork sent to us, but has since split away and formed a new junior research group, that is not considered independently here. Valterova’s group in chemical ecology is at the interface of biology and chemistry, central to the mission of the institute. The group combines analytical chemistry, electrophysiology, biochemistry, and genetic methods to identify chemicals and their biosynthesis of lipids and semiochemicals and defensive compounds in fruit flies, bumblebees and their parasites. The group shows, using qRT PCR, that pheromone compounds are synthesized in labial glands in bumblebee males. They aim to use that knowledge to regulate, control or protect insects. They also study the chemistry of the compounds.

2. Strengths and Opportunities

The most significant achievements are in bumblebee pheromones and biosynthesis, the role of lipids, the chemistry of compound in termites, and chemical ecology in other insects (e.g. wax moth and fruit flies). The work is distinctive. The work is fundable as shown through CAS and COST action grants, but there could also be IAEA funding here too.

3. Weaknesses and Threats

Whilst the group is currently generating substantial amounts of publishable data, there is no vision beyond the completion of existing grants. With the retirement of I. Valteriva, it is essential that legacy planning commences, so that young staff are working in a vigorous, active environment. Only two talks at international conferences are listed in the paperwork, although there is a suggestion of more exposure.

4. Recommendations

It is recommended that work focuses more towards proteomics and transcriptomics, including small RNAs.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

They have a large number of papers with IF (102), some good novel and competitive papers mostly quality rated 2 and 3 in a broad range of chemistry, zoology and ecological subject journals and more general journals (e.g. Proc Roy Soc).

Declaration on the involvement of students in research

The group has a large range of teaching commitments in several universities. Six Czech students and 3 overseas students defended their thesis in the period, the overseas students are in line with the Institute mission to attract international scientists.

Declaration on societal relevance

Pollination biology and pollinators are topical and of much societal interest. There has been public exposure, such as on TV and radio. A prize was awarded by Czech agency for groups work leading to a company Czech bumblebee subspecies.

Declaration on the position in the international and national context

The group is publishing in top subject journals. We were surprised at how few citations many papers had, including the Science paper on termites. This may reflect insufficient international exposure, conference attendance, workshops etc. These can be organised from the institute as well.

Declaration on the vitality and sustainability

The group is able to get competitive grants; one grant awarded in the period 2011-2014 was awarded by the grant agency as best in the category "usefulness of research". The group is small and leadership planning needs to be considered. If there is natural leadership that can emerge from I. Valterova's group, then that person needs to be empowered, and encouraged to interact much more vigorously with overseas researchers than is currently the case.

Declaration on the strategy and plans for the future

Complete existing grants and research directions. There is good collaboration amongst the staff in the group, especially with the group of “Viral and Microbial Proteins”, a collaboration in which both parties benefit. The short-term plans are appropriate through the completion of existing grants, but the longer term vision was obscure. Nevertheless the general objectives of combining population genetics, transcriptomics, endocrinology, behaviour, pheromone synthesis, chemistry and more will bear fruit.

B. Evaluation of the individual teams

Evaluation of the Team No.16: Chemical Ecology of Social Insects

(=see above)

Date: December 15, 2015

Commission Chair: Emeritus Professor Erick Vandamme