

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: Global Change Research Centre of the CAS, v. v. i.

Fields, in which the Institute registered its teams:

Biochemistry and molecular cell biology, biophysics, virology, ...

Observer representing the Academy Council of the CAS: Jiří Dědina

Observer representing the Institute: Zdeněk Žalud, substitute observer Karel Klem, Vladimír Špunda

Commission No. 6: Biochemistry and molecular cell biology, biophysics, virology

Chair: Professor emeritus Morten Kielland-Brandt

Date(s) of the visit of the Institute: November 18, 2015

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

Evaluated research teams:

No. 5 - Center of Nanobiology and Structural Biology

A. Evaluation of the Institute as a whole

1. Introduction

The Global Change Research Centre CAS (GCRC) was recently established (2010/2011) as a result of the support given by EU Operational Programme Research and Development for Innovations to develop the project of European Centre of Excellence CzechGlobe – Centre for the Study of Global Climate Change Impacts. The main structure of the GCRC consists of two relatively autonomous institutes: the CzechGlobe (seated in Brno) and the Institute of Nanobiology and Structural Biology (INSB, seated in Nové Hradky). The INSB is currently prepared to shift to the Institute of Microbiology of CAS, and partially also to the Biology Centre of CAS. After this transition (expected to be completed on 1st January 2016), GCRC will only consist of CzechGlobe.

The CzechGlobe consist of 5 divisions: Climate Analysis and Modelling, Ecosystem Analysis, Impact Studies and Physiological Analyses, Human Dimensions of Global Change Impacts, and Innovation and Adaptation Techniques. The INSB consists of two teams: Department of Nanobiotechnology and Center of Nanobiology and Structural Biology. This commission has only evaluated the activities of the team Center of Nanobiology and Structural Biology that is now moving out of GCRC; the herein institute evaluation may thus reflect a limited knowledge of the GCRC as a whole and a limited expertise on global change topics.

2. Strengths and Opportunities

The GCRC is core member of the ESFRI infrastructures ICOS, AnaEE, EUFAR; active in international networks, EU projects and bilateral projects with foreign institutions. GCRC employs researchers in various qualification levels from all around the world.

It has an intensive cooperation with the industry and private sector e.g. in the area of renewable resources (energy, agriculture, forestry).

3. Weaknesses and Threats

Although this commission did not identify obvious weaknesses or threats, some points are mentioned in the institute material. As weaknesses, the difficulty to find excellent PhD students, the rapid technical wear of the outdoor facilities and instruments due to weather conditions, the relatively high operating costs of the state-of-the-art equipment and facilities and the difficulty of coordinating interdisciplinary access, among others, are mentioned. As examples of threats, the outdoor location of large part of the facilities and equipment that threaten operation of experiments, the lack of competitive salaries threatening potential job candidates, the unstable economic and political environment and lack of long-term certainty of funding are some of the raised points.

4. Recommendations

Maintain the very good research activities and quality outputs. Maintain, and if possible even strengthen, the strong international visibility taking advantage of the synergies of the individual teams/divisions within the institute.

5. Detailed evaluations

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

Publication activity and quality are excellent as indicated by Phase I evaluations, with a good number of outputs in top decile and in quartile 1 journals.

Declaration on the involvement of students in research

The involvement of students in research is very good, as demonstrated by the number of theses supervised and defended at all levels during the evaluation period. In the frame of their thesis, students participate in national and international projects and present their work in national and international conferences. The Institute promotes annually various pedagogical activities such as summer schools, field courses and seminars.

Declaration on societal relevance

The Institute organises workshops for secondary school teachers or other stakeholders and excursions to its research sites, infrastructure and laboratories for university and secondary school students. The GCRC is also involved in educational activities towards the general public in cooperation with science centres or other exhibition partners, in the dissemination of research activities through the production of scientific videos, briefings on TV and radio channels and public open discussions on climate change topics.

Declaration on the position in the international and national context

GCRC has established international and national collaborations. Many teams have high visibility with international collaboration and participation in international projects (e.g. FP7, Horizon 2020, ESA, COST, cross-border and bilateral projects) and infrastructures (mainly ESFRI ICOS, ESFRI AnaEE, ESFRI ISBE, ESFRI EUFAR, ACTRIS).

Declaration on the vitality and sustainability

The GCRC is involved in national roadmap of research infrastructures (RIs), such as RI CzeCOS infrastructure, RI C4SYS and RI ACTRIS Czech Republic, providing unique open-access research infrastructures and a wide range portfolio of services to wide range users (students, national and international research centres, universities and private enterprises).

In addition to the participation in a good number of European funded projects, the centre's unique infrastructure in Central Europe and a number of investments contributes to assure long-term sustainability and attract very talented people.

Declaration on the strategy and plans for the future

Plans for the next 5-year period reinforce scientific and research activities and continuous development of the research infrastructure of GCRC for the purpose of enforcement of competitiveness of the Czech research of the global change impacts. Future plans are in accordance with the CzechGlobe Centre mission, aiming to be the main research centre in the Czech Republic for the integrated study of global changes.

B. Evaluation of the individual teams

Evaluation of the Team No. 5: Center of Nanobiology and Structural Biology

1. Introduction

The team, headed by Rudiger Ettrich, is composed of six sub-teams (evaluated as one unit) representing part of the Institute of Nanobiology and Structural Biology (INSB) located at Nové Hradý. Most team members are internationally well known and highly productive.

2. Strengths and Opportunities

Most sub-teams are very strong, as evidenced by international visibility and by excellent scientific results published in highly visible journals. The majority of the outputs in the evaluation period (impacted articles and patents) had (a) member(s) of the present team as the first and/or last author, places in author lists that by convention in the field indicate primary contribution in terms of work, design, ideas or discoveries. At the end of this year (?), the Team shall split off from GCRC (located in Brno) and will be officially linked to the Institute of Microbiology in Prague. This administrative step is justified by the fact that their expertise and research topics and interests are much closer to those in the Institute of Microbiology than in the GCRC. The research unit will most certainly be stabilised and have opportunities for further development and benefit from the inspiring scientific environment the new association might offer. At the same time, the infrastructure at Nové Hradý continues to provide excellent opportunities for organising courses, workshops and short-term visits for scientists; the Team is intensively taking advantage of this. This appears to compensate to a considerable extent the disadvantages due to their isolated geographical position.

3. Weaknesses and Threats

Most research topics are very interesting. However, they in many cases do not overlap with each other.

The Commission notes that the Membrane Physiology and Bioenergetics and the Molecular Liquids sub-teams are formed by the PIs alone. A major threat is the potential inability to carry out and develop research within these specific topics due to the lack of PhD students and personnels. The overall consolidation of the team in a new Institute, albeit promising, is still ongoing.

4. Recommendations

We recommend the Team to strengthen the interactions between their sub-groups. The future plans are detailed. We also recommend the number of PhD students increased.

5. Detailed evaluations

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

The quality profile from Phase I, the citation profile, and the journal impact of the publications are all very good.

The PI of the Membrane Physiology and Bioenergetics subgroup does not have outputs during the evaluating period, which can be explained by his recent adhesion to the team. In the other subgroups most of the impacted publications had (a) member(s) of the team as the first and/or last author, positions in author lists that indicate primary contribution in terms of work, design, ideas or discoveries by convention in the field.

Declaration on the involvement of students in research

Team members are active members on PhD programs and international courses, involved in teaching and student supervision. There is a good number of students and theses at all levels. However, it is not clear how the PhD students are distributed among the participating laboratories. The Team also regularly hosts foreign scientists and participants of international programs.

Declaration on societal relevance

The research team has been investing in the development of new methods in molecular systems biology and its application to systems of a common interest and/or hot topic systems. The work has led to formation of two spin-off companies to commercialize the technique and its applications. In addition, offering services to the community is demonstrated. Several team members are involved in scientific committees.

Declaration on the position in the international and national context

Most team members are internationally highly recognized. Several team members participate in international teaching programs. Only a few outreaching activities towards the general public are mentioned.

Declaration on the vitality and sustainability

The Team appears robust in terms of ability to maintain and enhance skills and to attract funds. The very good quality of this research should enable the sub-teams to successfully apply for grants that will form the necessary basis for their future activities.

Declaration on the strategy and plans for the future

The future plans are detailed and fit the Team's mission.

Date: December 16, 2015

Commission Chair: Professor emeritus Morten Kielland-Brandt