

REPORT of the INTERNATIONAL ADVISORY BOARD (IAB)

Research Activities of 2017-2019

*Jerzy Haber Institute of Catalysis and Surface Chemistry,
Polish Academy of Sciences*

Introduction

The Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences (hereinafter 'Institute') is an internationally recognized Institute addressing important areas for the future of society and industry, which include:

- i) Catalytic materials and processes for sustainable development
- ii) Physics and chemistry of surfaces and nanostructures
- iii) Biocatalysis and materials for medicine
- iv) Nanostructures of soft matter
- v) Physics and chemistry in cultural heritage protection

The Institute uses an interdisciplinary approach to create a critical mass of well-integrated competences, which combine fundamental knowledge with application with a view to high-quality publication and working with industry.

For this reason, it is necessary to maintain a good balance between fundamental investigations and their development in applied processes and materials. IAB appreciates the effort of the Institute to improve this balance as well as the effort made in applying the fundamental knowledge developed in the Institute to contiguous areas, from biology and soft matter to cultural heritage.

Impact of IAB previous report recommendations

The Leadership of the Institute has made a significant effort to consider and act upon previous recommendations, in particular regarding:

- Development of a strategy to strengthen the research output of the Institute, and to increase the use of the competences and collaborations to promote innovation
- The initiation of an extended internal discussion about the strategy of development of the Institute
- Initiate and establish new research directions, with the active involvement of young researchers
- An increase of young researchers in leadership positions, with creation of new opportunities for their career prospects. IAB recognizes that this development was enabled by the selfless actions of senior researchers
- An effort to secure ERC, EU and other international funds, although further effort is necessary
- A large increase in quantity and significance of research contracts with companies

The IAB recognizes the success in sustaining the number and quality of publications in good journals.



Research, education and promotion of science

The IAB applauds the effort of the Institute Leadership in expanding scientific capabilities and its recognition as a leading national research centre and an international excellence in research.

In the last three years, the Institute has further strengthened its leading position in research, education, and promotion of science. In particular:

- the Institute is ranked A+ category in Ministry ranking in 2017
- the Institute has maintained the HR Excellence Logo, a prestigious award of EC recognizing Institutions that align their human resources policies to EU "Charter and Code", which has aided recruitment on non-nationals
- it has sustained a good number of quality papers, both in terms of absolute number and per researcher
- it consolidated the number of principal investigators, with a decrease in their average age
- the Institute rationalized its internal organization in groups while expanding the number and type of projects
- it dedicated an appropriate fraction of the budget to new instruments and modernization of the Institute
- it made a significant effort in expanding national cooperation, the benefits of which are seen in the interdisciplinary nature of many new projects
- it participated in several national cooperation projects, among them SOLARIS – The Polish National Synchrotron, the Life Science Cluster, the Clean Energy Cluster. E-RIHS Polish Distributed Research Infrastructure for Heritage Science and more
- it intensified collaboration with several research centres and organization of joint laboratories, most notably the NAWA project and the effort for Erasmus+ mobility
- its researchers participated fully in international conferences, including several invited lectures
- the Institute made efforts in organizing conferences and scientific events
- the Institute made excellent contributions to several educational activities, from doctoral programs to postgraduate schools and collaboration with high schools
- it graduated a good number of PhD students
- it made very positive contributions to outreach activities, such as Open Doors, Science Festival, J. Haber competition for best MSc thesis, and more.

Members of the Institute have received a number of prestigious awards.

In particular the IAB congratulates Director Prof. M. Witko who has been elected as a Full Member of the Polish Academy of Science and to the European Academy of Science.

Transfer of research to application

IAB appreciates the effort made in enhancing the transfer of the results by securing the funds to create a novel biotech pilot building and facility. Further attention to innovation efforts and cooperation with industry is necessary to take the full advantage from this opportunity.

IAB acknowledges the increase in industrial collaboration and patentability of fundamental research. IAB encourages the Institute to develop a strategy (financial, patent and IP) to work with industry, both national and international. An IP strategy should be developed concerning whether to patent the results of fundamental research, with priority given to ensure application of that research.

Funding aspects

IAB recognizes the effort made by the Institute in applying for grants from both national and international research funds. National funds, which are the largest resource for fundamental research, have a rate of successful applications above the average.

IAB appreciates the effort made in applying for EU and ERC funds. Although the success was limited, we very much encourage continuing in this direction, including more intense mentoring of young researchers to improve success rate.

Scientific productivity

IAB is satisfied with the consolidated scientific productivity, both in respect to quality and quantity. Productivity is significantly above the criteria established by the Ministry of Science and Higher Education.

Personnel policy

Reorganization has further increased the opportunities offered to young researchers for leadership and promotion.

The IAB acknowledges the success in maintaining the HR Excellence Logo, and encourages continued efforts to attract foreign PhD students, post-docs and staff or guest researchers. This should include the participation in international activities (Marie Skłodowska - Curie, Erasmus Mundus, etc.) to overcome limitations in funds available.

IAB strongly encourages continuing international research periods for Institute researchers at all career stages to increase collaborations, to bring in new ideas and research directions and to promote transfer of Institute fundamental research internationally.

Opportunities

A lot of opportunities have been created from the participation in consortia, such as SOLARIS (the Polish National Synchrotron), the Life Science and Energy Clusters, E-RIHS PL "Polish Distributed Research Infrastructure for Heritage Science" and more.

The new biotech pilot building and facility will create new opportunities for collaborative work including with industry. An effort should be made also to increase collaborative opportunities for other research areas of the Institute.

Recommendations

As a consequence of the successful developments over the last three years, several areas of the long-term strategy should now be addressed. These include the strategy for interacting with industry, the handling of IPR and patents, and the consequences and opportunities arising from the new biotech pilot building and facilities.

The IAB feels that it is necessary to develop and implement strategies to increase fund raising at international level, for example by seeking guidance from successful applicants external to the institute, including internationally. Researchers will then be better positioned to suggest innovative applications for successful international grant applications.

Researchers, at all career stages, should be encouraged strongly to spend periods abroad to increase collaborations, to bring in new ideas and research directions and to promote transfer of Institute fundamental research internationally. The IAB encourages support with Institute



funds for resulting ideas via new small-scale projects. The Institute will then be better positioned to submit applications addressing new research frontiers.

At the same time the Institute should enhance the possibilities of recruitment of excellent talents and to exploit repatriation opportunities. IAB feels that governmental funds in this direction may be very important.

The reputation and international visibility of the Institute are crucial elements in both raising international funds and in attracting talented people: a strategy to enhance such visibility should be developed further.

The Institute has progressively expanded the core interests from the original nucleus of catalysis and surface science into biotechnology and medicine (in ways consistent with the Institute's mission). This is considered a positive development. The IAB recommends that a new strategy is developed along with the identification and recruitment of new leadership in the areas of heterogeneous catalysis and directly related fields.

IAB recommends that, in combination with the consolidation of new groups, the Institute seeks to maintain (informal) opportunities for discussion which will lead to enhanced participation and new collaboration opportunities across the whole Institute.

Krakow, 18 February 2020

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