

Scientific Advisory Board Report 2019

Instituto de Tecnologías Biomédicas

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Executive Summary

The Scientific Advisory Board (SAB) conducted a comprehensive site visit of the ITB on November 29-31, 2019. During the visit, the SAB attended scientific presentations by the Program leaders and selected Group Leaders and visited the ITB facilities. In addition, the SAB met with postdoctoral and predoctoral researchers. Furthermore, the SAB carried out a closed evaluation session and a final executive session to present recommendations to the ITB Director, Professor Tomás González Hernández and discuss future plans for the ITB. The SAB was impressed by the ITB's accomplishments over the past several years. In particular, by the creation of a biomedical research community with local medical practitioners, and the ITB's success in securing supporting grants and international cooperation.

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I. Introduction to the SAB Report

The previous Director, Rafael Alonso, and the current Director, Tomás González have both, together with their colleagues, raised the status of the ITB to an international position. The ITB has developed an exciting research environment and made an important move by recruiting both mature researchers from the University and abroad and excellent young researchers. Another important step forward has been pursuing and integrating both basic and clinical research. The Scientific Advisory Board (SAB) members were delighted by the progress made towards the creation of an international centre. We were also impressed by the ITB's success in securing national and international funds, in particular, "Dynamization Actions for Research and Technology of the Spanish National Health Service" and the IMBRAIN projects, which have positively impacted the institution. Members of the ITB have obtained an impressive number of competitive grants and raised a considerable amount of grant money to carry out their research. The ITB also demonstrated excellent communication of their basic and clinical advances as researchers develop new therapies based on the discovery of basic mechanisms. Finally, we were impressed by ITB's efforts to create companies that bring these new discoveries to the market.

Numerous issues were reviewed and discussed during the site visit, including:

- The scientific mission of the ITB and research excellence
- Synergies between the individual goals of the groups and the broader ITB mission
- Recruitment of scientific Group Leaders
- Training and support for doctoral students and postdoctoral researchers, with a focus on their career development
- ITB's scientific and administrative organization, policies and governance
- ITB's success in obtaining funds to support the centre and research programs
- ITB's contributions to regional scientific and societal advancement

In the following, we focus our report on our major observations and recommendations.

II. ITB Mission, Research Excellence and International Profile

The ITB has established its own scientific profile that spans research domains from genetics to cognition. Special attention is given to understanding the basic mechanisms underlying specific illnesses (e.g., cancer, rare diseases, etc.) and exploiting these mechanisms for effective clinical applications. The ITB is accomplishing a very important goal by bringing together basic research and clinical applications, specifically pursuing research in targeted areas with implications for clinical practice. In this sense, a unique strength of the ITB is the convergence of researchers who investigate both the early and clinical phases of diseases (without distorting the integrity of these two research approaches). This methodology allows ITB to develop basic-clinical programs to be generated that critically incorporate a patient-oriented approach. As a result the efficiency of the process of discovering new therapies and health technologies is increased. This is a very important achievement that should be maintained and actively promoted.

The SAB closely evaluated the research excellence and significance of ongoing work at the ITB. The teams have been grouped under three main research programs: (1) Genetic and Rare Diseases, (2) Chronic Age-Related Diseases, and (3) Neurobiology and Diseases of the Nervous System. While excellent research was evident at all levels and across programs, the SAB noted that articulating and coordinating common long-term goals within each research program and across the research centre as a whole, would enhance the scientific impact of the

ITB. Various teams at the centre have made major discoveries, including, to name just a few, the molecular bases of human channelopathies and molecular therapies for primary hyperoxaluria. However, the impact of this excellent research would be higher if the institution were oriented towards common goals. This might require some reorganization of the research programs.

The SAB also suggests that ITB schedule periodic internal lab meetings with attendance compulsory, at least for PhD students and postdoctoral researchers. These periodic meetings would allow members of the ITB to better understand their colleagues' research and identify further synergies between their research groups. It would also help build a stronger research community including important contributions from PhD and Postdoctoral researchers.

In sum, the various ITB groups have made major scientific discoveries with significant theoretical importance that have been published in high profile journals and therefore advanced the reputation of the centre. Importantly, these findings also have strong potential for immediate translation that addresses societal health challenges. Current efforts should be accompanied by strategies that increase the synergies between groups and helps to create a truly integrated biomedical research community with an international profile,

III. Faculty Development and Training and Support Program

Recruitment of Group Leaders. The SAB was pleased with the success in recruiting Group Leaders. At present, the ITB has around 26 research groups, with an attractive combination of basic groups from various University Departments (ULL), and clinical groups from the two main teaching hospitals of the Island. Some of these collaborations were highlighted by the PIs during their presentations. These collaborations are welcomed. Nonetheless they can still be improved. Group and program leaders should continue to work in this direction, seeking for solid synergies.

The SAB was also pleased with ITB's success in recruiting young PIs, scientists with remarkable international trajectories, who bring new research interests and international visibility.

The SAB was pleased to read in the 2018 ITB report that every research group must maintain an active project with significant external funding. Actions that fortify this requirement should be in place, as well as further consideration of how Group Leaders can best be evaluated. Emerging groups whose members are applying for competitive public grants for the first time (for example, Ramon y Cajal research investigators), should be considered as a special case.

The SAB was pleased with the presentations given by the postdoctoral and predoctoral fellows, but identified some weaknesses in terms of community-building among research fellows. Both predoctoral and postdoctoral researchers noted insufficient communication with their peers as a main weakness. The SAB suggested simple actions to the fellows such as a) implementing a fellows' mailing list to share information on reagents, trouble shooting in experimental design and implementation, etc; b) setting up regular formal and informal meetings. Although ideally these actions should be organized directly by fellows, some guidance for these actions could be provided by ITB. Also, note that half of the PhD students in the "Ciencias de la Salud" PhD program are supervised by PIs from the ITB.

The SAB suggests establishing a PhD/postdoc office at ITB, whose actions would be devoted to providing guidance and organizing community engagements and collaborations for fellows. There should also be a mechanism to address mentoring issues when problems arise within the supervisor /fellow relationship.

IV. Community and Regional Outreach and Programming, and Tech Transfer

The centre has made the communication of its results to society through its research members a key objective. Different actions have been taken to encourage interaction with the university, and the Island Cabildo of Tenerife. They have initiated various events and activities in appropriate forums for a number of target populations as described below.

1. Actions designed for various sectors of the public such as:

- Health screening for the general population (i.e. World Hepatitis C Day, World Kidney Day)
- Support for family members and caregivers of Alzheimer patients (three different but synergetic actions).
- Festivals such as “Magic Mind”
- Outreach videos (for example “Youtubes” about cardiovascular diseases and risk factors.
- A university journal for scientific dissemination (Hipótesis)
- Open days for students from schools
- Visits for high school students, information weeks, etc.
- TED Talk Festivals
- Pint of Science, Sceptics in the Pub...
- European Nights of Science
- Communication media: TV and radio programs, interviews on outreach programs, etc.

2) Specialized events for researchers and coordinators regarding innovation and transfer, such as Innovation Days and other events that promote access to European funds for research and innovation, ERA Net activities, etc.

3) Spanish and international seminars and conferences.

Innovation and transfer to society

Three actions have recently been created within a clear plan for technology transfer:

1. The Island Cabildo of Tenerife’s Agustín Betancourt Program supports ULL institutes in terms of promoting high transfer potential. Selection of projects is made through public tenders. Appropriate experts are then seconded to selected groups to help guide their research projects. There are seven active projects at this time.

2. A successful example of knowledge transfer is Orfan Biotech. This was i) the first biotechnology company established by researchers at the centre. It received medium-grade venture capital funds (from Bridge Venture, USA), and ii) now has its headquarters in the USA. It now gives ITB privileged access to the global commercial biotech environment and leadership; and iii) offers a strategic opportunity for transference and valorization: in coordination with the innovation manager, this company now conducts regular screening and scouting in order to acquire further programs from the ITB environment. This successful instance of global knowledge transfer has been an invaluable learning experience for the ITB team; the ongoing relationship with Orfan Biotech will help the institute to continue to manage rapid and successful transfer of its biomedical innovations on a global level.

3. The relationship with BioAdvance Foundation, an ideal umbrella organizational structure with its own legal status, enhances and streamlines ITB’s focus and accelerates and facilitates its opportunities for technology transfer.

V. Facilities

The SAB was impressed by the potential of the new ITB building. This building will house animal facilities and office/laboratory space for the research groups. The SAB noted that occupation of the building may be delayed because the acquisition of laboratory furniture and equipment seems to be on hold at the moment. The SAB would like to underscore that moving into the new building is a priority. This is not only because it will provide access to an extraordinary new animal facility, but also because it will help build a real research community and strengthen collaborations between groups

Research Grants. The success of the ITB in attracting support for research is impressive. The SAB notes that the portfolio of grants is quite diverse, including European grants (European Research Council, IMBRAIN), and competitive Spanish grants from ISCIII, Plan Nacional, competitive infrastructure calls, etc. The SAB congratulates the Director, Group Leaders, Scientific and Administrative Staff of the ITB on their success and encourages them to continue along this path.

VI. Organizational Structure:

The SAB reviewed the organizational structure of ITB with respect to the recent renewal of the Board of Directors and executive committee, and acknowledges the selection of young but very active scientists as leaders for the three different research programmes.

With respect to executive aspects of the organization, the Institute Council and the Executive Commission completed by the External Advisory Board seem to be dynamic structures that efficiently perform administrative tasks related to the research programs and platforms. In addition, these structures will allow the ITB to boost the much needed networking of the Institute with other scientific biomedical structures in Tenerife, including those that specialize in the chemistry of natural products. ITB's own chemical libraries can also make an important contribution. In sum, networking will help ITB both to build its own institutional profile and help it develop great synergy with other institutions.

The Bio_Advance foundation is able to manage research funds more dynamically than the University or the hospitals, which are limited by bureaucratic rules. It is therefore advised that grants received by members of the ITB be managed by this foundation. The foundation could also take an active role in searching for public and private funding and, importantly, building relationships with private companies in the field of bio-medicine.

VII. Recommendations of the International Scientific Advisory Board

The SAB congratulates the ITB and its Director on their success. The ITB today is a fully functioning institute for the study of genetic, rare and age-related diseases including those that affect the nervous system. In the following section, we provide recommendations intended to further enhance the development of the ITB.

Actions should be taken so that the ITB can begin to benefit from the new building as soon as possible. The SAB is aware that these actions require the commitment of other bodies, but advises this nevertheless be made a top priority. Establishing the lab spaces in the new building will strengthen collaborations between groups and help build a real scientific community.

Actions should be taken to improve synergies between research groups and research programs should probably be reorganized to make ITB's vision more cohesive.

Actions should be taken to maintain the requisites for ITB group leaders, and implementing successful recruitment policies

Actions should be taken in order to create a strong PhD student and postdoctoral fellow community within ITB. This should include establishing a PhD/postdoc office, among others.

Actions to secure research funding should continue according to the level of expertise of the research groups.

Actions should be taken to promote translational research taking advantage of ITB's dual track basic-clinical commitment—and the success of Orfan Biotech. The experience and lessons learned managing this rapid transfer of a biomedical innovation and the established connection Orfan Biotech enjoys with the global world of transference should be taken into account.

Actions should be taken to benefit as much as possible from the opportunities offered by the fact that there is a foundation (Bio_Advance) in place.

Actions should be taken to formulate a 5 to 10 years strategic plan under the leadership of the director of the ITB.

San Sebastian, November 7th, 2019

A handwritten signature in blue ink, appearing to read 'M. Carreiras', is written over a light blue rectangular background.

Manuel Carreiras
Chair of the Scientific Advisory Board