BIST ANNUAL REPORT 2016

BIST
Barcelona Institute of Science and Technology

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BIST

Barcelona Institute of Science and Technology

BIST CENTRES

CRG Centre for Genomic Regulation

ICFO The Institute of Photonic Sciences

ICIQ Institute of Chemical Research of Catalonia

ICN2 Catalan Institute of Nanoscience and Nanotechnology

IFAE Institute for High Energy Physics

IRB BARCELONA INSTITUTE FOR RESEARCH IN BIOMEDICINE

BIST

Barcelona Institute of Science and Technology

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TRANSFORMING TOGETHER, INSPIRING TALENT

Generalitat de Catalunya

PROMOTING CATALAN SCIENCE TOGETHER

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FOREWORD

ADVANCING WITH SURE STEPS

ANDREU MAS-COLELL
Chair of BIST Board of Trustees

The Barcelona Institute of Science and Technology (BIST) is a non-profit foundation with the ambition to relentlessly push an agenda with three interacting aims:

1. To establish a collective, multidisciplinary identity for the grouping of its component centers. An identity which can claim a significant position, and carry its weight, in the firmament of European Science.

2. To fully take advantage of the returns to scale that collaborative action, by all or a subset of centers, permits.

3. To constitute a vehicle for private – public cooperation in the development of research. BIST is, indeed, a joint effort of (public) research centers, of the Generalitat de Catalunya, of individual distinguishes researchers and of five private foundations ("la Caixa" Banking Foundation, Banc Sabadell Foundation, FemCAT Foundation, Cellex Foundation and Fundació Catalunya-La Pedrera). We believe that, given the present-day challenges to the organization and funding of research, this is a necessary and winning formula.

BIST is a very young institution. It is, nevertheless, with great pleasure that, in the following pages, we invite the reader to verify that we are advancing with sure steps in all three fronts. Of course, in the horizon we have many pending tasks and much work to be done. We will not falter in our commitment to carry them out.

Last but not least, we should express our appreciation and hearth-felt thanks to all the people, and institutions, whose enthusiasm and step-by-step climbing has made it possible to reach the current landing. We hope that, with dedication and a bit of luck, it will be but a stepping-stone towards the next one.

FOREWORD

A STIMULATING AND PROMISING YEAR

MIQUEL ANGEL PERICÀS
General director of BIST

The **Barcelona Institute of Science and Technology Foundation (BIST)** was officially created on 27 January 2015 with the manifold purpose of fostering multidisciplinary research at the forefront of scientific advance, developing world-renowned postgraduate training and boosting its members' capacity to participate in international projects.

The BIST scientific community is composed of the **Center for Genomic Regulation** (CRG), **Institute of Photonic Sciences** (ICFO), I**nstitute of Chemical Research of Catalonia** (ICIQ), **Catalan Institute of Nanoscience and Nanotechnology** (ICN2), **Institute for High Energy Physics** (IFAE) and **Institute for Research in Biomedicine of Barcelona** (IRB Barcelona).

While in 2015 BIST mainly focused on internal work to set up the structure of the Foundation and study the opportunities and challenges in its surroundings in the areas of multidisciplinary research and postgraduate training, 2016 can be broken into two distinct periods: the first third of the year focused on drafting the **Strategic Plan 2016-2020** and, starting in April, priorities shifted to establishing and structuring the work areas, putting together teams to promote them and, above all, launching the first activities, geared towards both the BIST Community and external audiences. These activities saw notable success in terms of participation and very positive perception from the stakeholders involved, as compiled in the pages that follow.

Some of the most noteworthy successes in this regard included the excellent response to the first call for proposals for the **BIST PhD Fellowships** program, with more than 750 applications for the 10 vacancies, and great

turnout at activities like the first **BIST Research Meeting Point** (July) and **BIST PostDoc Day #1** (November). In research, it is worth highlighting the kick off of the **Ignite Program**, the first internal call to fund the ignition of multidisciplinary research projects, which launched its first call in December.

On the institutional side, **Prof. Andreu Mas-Colell** took over as chair of the Board of Trustees from professor Rolf Tarrach in July 2016. Shortly afterwards, in October 2016, Professor Mas-Colell asked me to take the responsibilities of BIST general director once Dr. Montserrat Vendrell stepped out from this position. This has been a most rewarding (but also exhausting!) year to me where I have combined the impulse of the BIST initiative with my duties as director of ICIQ in October 2016.

The agreement signed with Diputació de Barcelona (Barcelona Regional Council) for BIST to move into the space formerly occupied by the **Escola Industrial** is one of the most important results of the work done on an institutional level in 2016.

And I can't bring this introductory summary to a close without highlighting the improved **international visibility of BIST scientific production**, thanks to the agreement signed by all six member centers. Beyond the impact achieved by unifying affiliation, the quality and volume of BIST scientific publications has led to a progressive improvement on impact indices throughout the year. So, at the end of 2016, Nature Index ranked BIST 100th in the world and 25th in Europe for the WFC indicator (Weighted Fractional Count). A great year for the *bisties*.

INSTITUTIONAL OVERVIEW

The Barcelona Institute of Science and Technology is a scientific initiative of six of Catalonia's top research centers of excellence. Its high-level objective is to build common scientific projects among these centres, thus giving momentum to multidisciplinary projects that will push the frontiers of knowledge ever further.

The **BIST** research centres include the **Centre for Genomic Regulation** (CRG), the **Institute of Photonic Sciences** (ICFO), the **Institute of Chemical Research of Catalonia** (ICIQ), the **Catalan Institute of Nanoscience and Nanotechnology** (ICN2), the **Institute for High Energy Physics** (IFAE), and the **Institute for Research in Biomedicine** (IRB Barcelona).

MISSION & STRATEGIC OBJECTIVES

Barcelona Institute of Science and Technology mission is to promote excellent research in a multidisciplinary environment. We are committed to the development and training of scientists to maximize science impact in society.

Our ambition is to become one of the leading European research institutes, able to attract the most talented scientists, and a reference in postgraduate research education.

Our strategic objectives are:

1. To consolidate **excellent multidisciplinary collaborative research** across the BIST community
2. To develop **world class postgraduate education and training**
3. To build **BIST as a stimulating and supportive working environment**
4. To boost the **scientific, economic and social impact of the research centers** at an international level

BOARD OF TRUSTEES

In July 2016, **Dr. Andreu Mas-Colell** took over as chairman of the Barcelona Institute of Science and Technology from Professor Rolf Tarrach. Additionally, on October 1, Professor **Miquel Àngel Pericàs** was appointed BIST director general, replacing Dr. Montserrat Vendrell, the first to hold the position (July 2015-September 2016). Pericàs directs both BIST and the ICIQ.

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Prof. Andreu Mas-Colell

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CEO of the "La Caixa" Foundation

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President of the UNESCO Center of Catalonia

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University of California at Berkeley

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Princeton University

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Nanotech Institute of the University of Miami

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European University Association

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Catalan Minister of Business and Knowledge

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Director of CRG

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Director of ICIQ, Director General of BIST

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Director of ICN2

Prof. Lluís Torner
Director of ICFO

Prof. Ramon Miquel
Director of IFAE

Prof. Joan Josep Guinovart
Director of IRB Barcelona

BIST Barcelona Institute of Science and Technology

FOUNDING RESEARCH CENTERS

6

CENTERS

CRG *(Centre for Genomic Regulation)*
ICFO *(the Institute of Photonic Sciences)*
ICIQ *(the Institute of Chemical Research of Catalonia*
ICN2 *(the Catalan Institute of Nanoscience and Nanotechnology)*
IFAE *(the Institute for High Energy Physics)*
IRB Barcelona *(the Institute for Research in Biomedicine)*

CRG Centre for Genomic Regulation

CENTER FOR GENOMIC REGULATION (CRG)

The Centre for Genomic Regulation (CRG) is an international biomedical research institute of excellence, founded in December 2000 and based in Barcelona. With 400 scientists from 43 countries, the CRG excellence is based on an interdisciplinary, motivated and creative scientific team that is supported by high-end and innovative technologies.

ICFO The Institute of Photonic Sciences

THE INSTITUTE OF PHOTONICS SCIENCES (ICFO)

The Institute of Photonic Sciences (ICFO) was created in 2002 and now hosts 400 ICFOnians in 24 research groups. It is a centre of research excellence devoted to the science and technologies of light, with programs directed at applications in health, renewable energies, information technologies, security and industrial processes, among others.

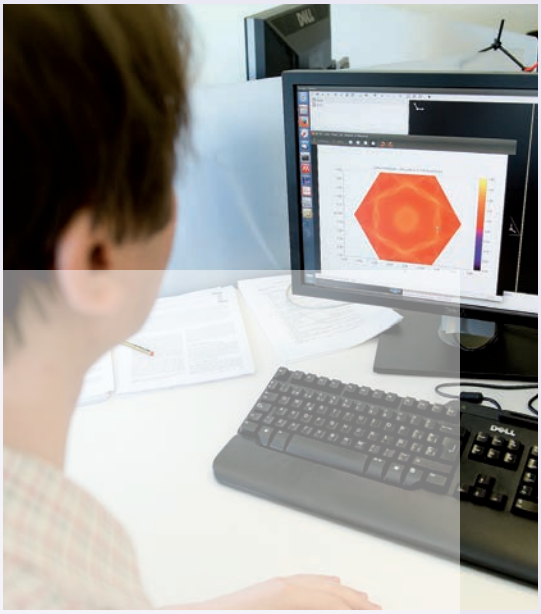
ICIQ Institute of Chemical Research of Catalonia

INSTITUTE OF CHEMICAL RESEARCH OF CATALONIA (ICIQ)

The **Institute of Chemical Research of Catalonia** (ICIQ) started its research activities in 2004 and hosts over 300 employees. Its 19 research groups work on catalysis, new processes and products for industrial use that exploit resources more efficiently and minimize waste, and renewable energy, generation of hydrogen through water splitting and development of more efficient photovoltaic devices.

FOUNDING RESEARCH CENTERS

ICN2 Catalan Institute of Nanoscience and Nanotechnology



CATALAN INSTITUTE OF NANOSCIENCES AND NANOTECHNOLOGY (ICN2)

The Catalan Institute of Nanoscience and Nanotechnology (ICN2) is located in the UAB Campus. ICN2's research lines focus on the properties that arise from the fascinating behaviour of matter at the nanoscale. With over 200 members, the Institute actively promotes collaboration among scientists from diverse backgrounds, industry and society.

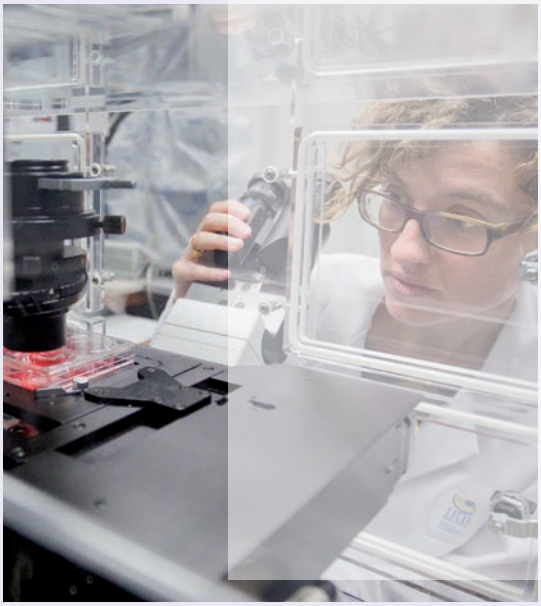
IFAE Institute for High Energy Physics

INSTITUTE FOR HIGH ENERGY PHYSICS (IFAE)

The Institute for High Energy Physics (IFAE) conducts experimental and theoretical research at the frontier of particle physics, astrophysics and cosmology and is involved in international experimw ents. IFAE also works at the cutting edge of detector technology, developing new instrumentation like telescope cameras and detectors for medical imaging.

BIST Barcelona Institute of Science and Technology

IRB BARCELONA
INSTITUTE FOR RESEARCH IN BIOMEDICINE



INSTITUTE FOR RESEARCH IN BIOMEDICINE (IRB BARCELONA)

The Institute for Research in Biomedicine (IRB Barcelona) was founded in 2005 and hosts more than 400 employees from 40 countries. Its 23 research groups and 7 core facilities conduct multidisciplinary basic and applied research that address biomedical challenges affecting our society, with special emphasis on cancer, metastasis, Alzheimer disease, diabetes and rare diseases.

The six BIST founding centers are accredited as Centers of Excellence Severo Ochoa. They are members of the Catalan Association of Research Entities and receive the support of Catalan Institution for Research and Advanced Studies (ICREA) and CERCA Institution.

EXCELENCIA SEVERO OCHOA

ACER Associació Catalana d'Entitats de Recerca

ICREA

Institució CERCA Centres de Recerca de Catalunya

STRATEGIC PLAN 2017-2020

For the first quarter of 2016, BIST was focused on laying out a Strategic Plan for 2017-2020. In addition to defining an ambitious vision and clear mission and setting strategic organizational goals and priorities in terms of actions for 2017-2020, this plan also allowed BIST to design a model of governance beyond the statutory bodies and identify key indicators for monitoring implementation and the Institute's impact.

By combining strategic and operational aspects, the plan was conceived as a guiding document to chart the course for the Barcelona Institute of Science and Technology between 2017 and 2020. It includes details on the kick off actions and unique initiatives tied to the arenas that have been deemed top priority: research, education, visibility and transfer.

The plan was elaborated through a series of actions involving both internal and external teams, which it must be noted included **international benchmarking** to understand and analyze the best organizational models being used at established multidisciplinary research bodies.

Specifically, several studies were conducted on effective models for grouping scientific capacities, like those used at the **Weizmann Institute** in Israel, **VIB** in Belgium, the **Francis Crick Institute** in the United Kingdom and

the **Beckman Institute** in Illinois (USA). In addition to the analysis of these institutions, the project also assessed the experiences at UCL (University College London) in academic planning and at British organization **Vitae** in developing transversal competences, as success stories related to some of BIST's strategic focal points.

Participative process

From the beginning, the goal was for the Strategic Plan to be created through a participative process that included benchmark figures from all the BIST centers. A steering team was set up for the plan, with people from BIST and the centers. This team, with support from external specialists in strategic planning and research management, carried out a series of actions to compile information, personal interviews and themed meetings.

In each phase of the process, documents and speeches were compiled to serve as the basis for discussion in the forums held. From these forums, several *ad hoc* working groups were set up featuring the benchmark figures in each subject from the six BIST member centers. After the Strategic Plan was approved, this structure of working groups has been further developed and expanded to facilitate collaboration among the centers and as an instrument through which to execute the various programs and projects approved.

The Barcelona Institute of Science and Technology 2017-2020 Strategic Plan was approved by the Foundation Board of Trustees in its meeting on June 28, 2016.

NEW HEADQUARTERS FOR A CHALLENGING FUTURE

The Escola Industrial is a privileged location in the center of Barcelona that will give a significant push to BIST's activities.

Diputació de Barcelona (Barcelona Provincial Council) and the Barcelona Institute of Science and Technology came to an agreement in July 2016, allowing BIST to establish its headquarters in the art-nouveau buildings in what was formerly the **Escola Industrial** on Carrer Urgell in Barcelona.

The agreement set out that BIST would move its executive and management offices sometime in early 2017 (the move has been completed as of publication of this report). The new space has just under 300 square meters and was occupied by the UPC School of Industrial Engineering until mid-2016. This new headquarters, with classrooms, offices and meeting rooms, is in a privileged location in the center of Barcelona and will give a significant push to BIST's activities.

The Barcelona Provincial Council and BIST aim to make more spaces in this emblematic architectural complex available to the Institute in the future (up to 5,000 m^2) for education, research and technology transfer activities. The oldest part of the Escola Industrial complex was built between 1868 and 1869, following the designs of architect Rafael Guastavino, to house the Can Batlló textile factory, which closed down in 1889. The building was acquired by Diputació de Barcelona in 1908 to be used for the Escola Industrial (founded as the Industrial University), the precursor to the School of Industrial Engineering that was located there until last year. Part of the space, the auditorium, is currently being refurbished.

BIST TEAM & WORKING GROUPS

The BIST has a small team in charge of carrying out the various activities planned in the areas of Research, Education, Talent, Impact, Identity, and Institutional development. An important part of its work is to streamline and coordinate the 14 working groups that articulate the collaboration of the different BIST centers, both in the field of research and in the field of management.

In addition to the above-mentioned working groups, there is a Coordination Committee made up of the directors of the six BIST centers, which meets regularly to coordinate and encourage the participation of the centers in the different programs and to support the general direction of the BIST.

BIST TEAM

From left to right: ***Miquel A. Pericàs,*** *Director General of the BIST;* ***Margarita Navia,*** *Head of Strategic Projects;* ***Jenny Kliever,*** *Communications Officer; first row,* ***Òscar Gimeno,*** *General Manager;* ***Adela Farré,*** *Communications Advisor; first row,* ***Àlex González,*** *Office Manager; and* ***Núria Bayó,*** *Education Programs Manager.*

COORDINATION COMMITTEE

LUIS SERRANO
Director of the Centre of Genomic Regulation (CRG)

LLUIS TORNER
Director of the Institute of Photonic Sciences (ICFO)

MIQUEL A. PERICÀS
Director of the Institute of Chemical Research of Catalonia (ICIQ) and Director General of BIST

PABLO ORDEJÓN
Director of the Catalan Institute of Nanosciences and Nanotechnology (ICN2)

RAMON MIQUEL
Director of the Institute for High Energy Physics (IFAE)

JOAN GUINOVART
Director of the Institute for Research in Biomedicine (IRB Barcelona)

BIST TEAM & WORKING GROUPS

MULTIDISCIPLINARY WG

Pia Cosma, CRG
Niek van Hulst, ICFO
Pau Ballester, ICIQ
José A. Garrido, ICN2
Federico Sánchez, IFAE
Àngel Nebreda, IRB Barcelona
Margarita Navia, BIST

CHEMICAL BIOLOGY WG

Pau Ballester, ICIQ
Ernest Giralt, IRB Barcelona
Margarita Navia, BIST

MICROSCOPY WG

Timo Zimmermann, CRG
Mónica Morales, CRG
María García-Parajo, ICFO
Gonçal Badenes, ICFO
Jordi Arbiol, ICN2
Julien Collombelli, IRB Barcelona
Jorge Domínguez, IRB Barcelona
Margarita Navia, BIST

ACADEMICS WG

Luciano di Croce, CRG
Robert Sewell, ICFO
Pau Ballester, ICIQ
Arben Merkoçi, ICN2
Rafael Escribano, IFAE
Raúl Méndez, IRB Barcelona
Núria Bayó, BIST

INFRASTRUCTURE WG

Mónica Morales, CRG
Gonçal Badenes, ICFO
Gisela Colet, ICIQ
Gustavo A. Ceballos, ICN2
Juan Cortina, IFAE
Jorge Domínguez, IRB Barcelona
Margarita Navia, BIST

GRAPHENE WG

Frank Koppens, ICFO
Stephan Roche, ICN2
Federico Sánchez, IFAE
Margarita Navia, BIST

BIG DATA WG

Mónica Morales, CRG
Roderic Guigó, CRG
Gonçal Badenes, ICFO
Núria López, ICIQ
Manuel Delfino, IFAE
Modesto Orozco, IRB Barcelona
Francisco Lozano, IRB Barcelona
Margarita Navia, BIST

ACADEMIC TRAINING WG

Imma Falero, CRG
Laia Miralles, ICFO
Pau Ballester, ICIQ
Julio Gómez, ICN2
Rafael Escribano, IFAE
Clara Caminal, IRB Barcelona
Núria Bayó, BIST

PREPARATION PROJECTS WG

Michela Bertero, CRG
Núria Beltri, ICFO
Lorena Tomás, ICIQ
Marta González, ICN2
Marta Balza, IFAE
Jorge Domínguez, IRB Barcelona
Óscar Gimeno, BIST

TALENT WG

Juan Laorden, CRG
Laia Miralles, ICFO
Mario Lorenzo, ICIQ
Rocío Pérez, ICN2
Julio Gómez, ICN2
Quim Bosch, IFAE
Sylvia Martínez, IRB Barcelona
Núria Bayó, BIST

COMMUNICATIONS WG

Glòria Lligadas, CRG
Brook Hardwick, ICFO
Ariadna Goenaga, ICIQ
Àlex Argemí, ICN2
Sebastián Grinschpun, IFAE
Sara Sherwood, IRB Barcelona
Adela Farré, BIST
Jenny Kliever, BIST

MANAGERS WG

Bruna Vives, CRG
Dolors Mateu, ICFO
Lluís Solà, ICIQ
Lluís Bellafont, ICN2
Quim Bosch, IFAE
Margarida Corominas, IRB Barcelona
Óscar Gimeno, BIST

ESCOLA INDUSTRIAL WG

Michela Bertero, CRG
Lluís Solá, ICIQ
Juan Cortina, IFAE
Óscar Gimeno, BIST
Àlex González, BIST

KTT WG

Lluís Solà, ICIQ
Pablo Cironi, CRG
Silvia Carrasco, ICFO
Jordi Reverter, ICN2
Isaac Esparbé, IFAE
Cristina Horcajada, IRB Barcelona

RESEARCH

BIST fosters cutting-edge multidisciplinary research by carrying out collaborative research between BIST groups, optimizing and increasing efficiency in the use of core facilities and equipment, and making BIST visible as a global scientific agent.

After establishing the executive team for the Barcelona Institute of Science and Technology, a series of institutional visits and meetings were held to share and take on the knowledge to lay the foundations for the institute's research area with a solid, lasting project.

In the first half of 2016, contacts and visits were made to international benchmarks like the **Beckman Institute** (Chicago, Illinois, USA) and the **Weizmann Institute** (Rehovot, Israel) to get a first-hand look at their facilities, research models and management style. Both cases are part of the analysis of international best practices in the field of research that was carried out as the basis for the strategic plan.

In addition to studying international success stories, this analysis also identified areas of interest shared by the six centers that make up BIST, a process that assessed both their future potential and opportunities to generate more and better results in the short and middle term by promoting collaboration among the centers. This process identified four strategic areas (**Chemical Biology, Advanced Microscopy, Graphene, and Big Data and Data Management**) in which the BIST centers had shared interests from complementary scientific standpoints and mutual interest in starting collaborative research projects (see section Strategic Research Projects).

Defining these strategic projects and launching, at the end of the year, the Ignite Program (see the section at the end of this chapter) were the core activities in terms of research, but not the only ones. The second half of 2016 also saw the launch of the BIST Online Dashboard project, which aims to create a computer tool to analyze the impact of the multidisciplinary research carried out at the BIST centers in scientific publications. In the future, this tool may also include other indicators to measure the Institute's activities.

The actions carried out, therefore, focused on establishing measures and indicators to visualize the impact of research at the BIST centers, encourage collaboration among all the researchers and kick off new projects. All of these actions are designed to be the starting point for processes with a much wider scope.

4

STRATEGIC AREAS

CHEMICAL BIOLOGY
ADVANCED MICROSCOPY
GRAPHENE
BIG DATA

IMPACT OF SCIENCE PRODUCTION

910
PUBLICATIONS

PUBLICATIONS 92%
REVISIONS 5.2%
OTHER 2.8%

89.2%
IN JOURNALS IN Q1

67.5%
INTERNATIONAL COLLABORATIONS

One of the first measures adopted after the Barcelona Institute of Science and Technology was created was to sign all scientific publications by BIST member centers jointly starting on October 1, 2015. Unifying the affiliation of scientific papers has quickly had an impact on international visibility of BIST research, as can be seen in the figures from the bibliometric analysis.

Through December 31, 2016, a total of **910 BIST publications** were indexed on the Web of Science and Scopus databases. The bulk of these publications were articles (837 publications, 92%), followed by 47 revisions (5.2%) and other publications (2.8%). There were 154 articles in total published in open-access journals, 16.9% of the total BIST scientific production.

A total of **614 documents (67.5%) were published by BIST research centers jointly with institutes of other countries** and, furthermore, this total includes 13 publications resulting from collaboration among the six BIST centers.

The majority of the publications have between 1 and 5 authors (421 documents, 46.3 %), followed by documents with 6 to 25 authors (349, 38.3 %) and, finally, publications with more than 25 authors (140, 15.4 %). **BIST researchers occupy noteworthy positions in the signing order** and are the first and/or corresponding author on 533 of the 910 documents (58.6%).

Of the BIST publications, 89.2% appeared in journals in the top quartile (Q1) of the Scimago Journal Rank (SJR 2015), while 374 BIST articles (41.1% of the total) were published in journals in the top decile (D1) of the Journal Citation Reports (JCR 2015).

Another indicator of impact is the number of BIST publications in the 68 journals of excellence on the Nature Index ranking. As of December 2016, 369 of the 910 BIST documents (40.6%) had been published in 46 of these 68 journals.

In late 2016, BIST was ranked 100th in the world and 25th in Europe on the Nature Index Weighted Fractional Count (WFC). At the time of publishing this report, **BIST was ranked 92nd in the world and 23rd in Europe on the Nature Index WFC.**

STRATEGIC RESEARCH PROJECTS

As mentioned at the beginning of this chapter, the strategic planning process undertaken in the first semester of 2016 made it possible to identify four priority areas for multidisciplinary research at BIST (Chemical Biology, Advanced Microscopy, Graphene, and Big Data and Data Management). Four strategic research project were launched in these areas that will yield their first results over the course of 2017.

To promote these strategic projects, working groups were set up with specialists from the centers involved. Specifically, ICIQ and IRB Barcelona are heading up the Chemical Biology group; CRG, ICFO, ICN2 and IRB Barcelona, the one in Advanced Microscopy; ICFO, ICN2 and IFAE are behind the Graphene group; and CRG, ICFO, IFAE and IRB Barcelona are collaborating on the Big Data and Data Management working group. This structure is complemented by a Multidisciplinary Research Working Group, whose mission is to promote transversal projects to help identify shared interests and kick off new collaborations among researchers in different disciplines.

In this area, 2016 was fundamentally a stage for defining strategy and kicking off initial projects. To reinforce this area, BIST hired a Head of Strategic Research Projects in December of 2016 to take charge of dynamizing the work of these groups.

CHEMICAL BIOLOGY

Chemical biology focuses on studying biological problems with the use of chemistry techniques. BIST promotes this research area by fostering collaboration between various disciplines including genetics, molecular biology, biochemistry, and synthetic biology, among others.

GRAPHENE AND 2D MATERIALS

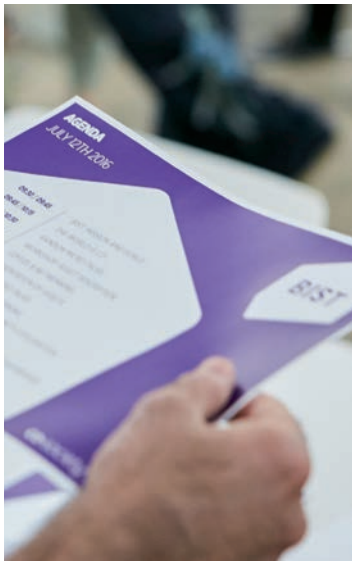
Graphene is a focus area for the research and industrial community worldwide and we are only just beginning to see its possibilities in technology, medicine, and energy. BIST has internationally leading researchers who work in areas such as photonics, spintronics, and biomedical devices.

ADVANCED MICROSCOPY

Obtaining information from materials at nanometric and molecular levels is of great importance to current cutting-edge research. BIST promotes a collaborative program that includes technological developments and the applications common to biology, nanomedicine, and materials.

BIG DATA AND DATA MANAGEMENT

BIST is in an excellent position to develop IT platforms for managing big data, incorporating new technological developments to meet the requirements of scientists in different fields, and taking a multidisciplinary approach to research challenges.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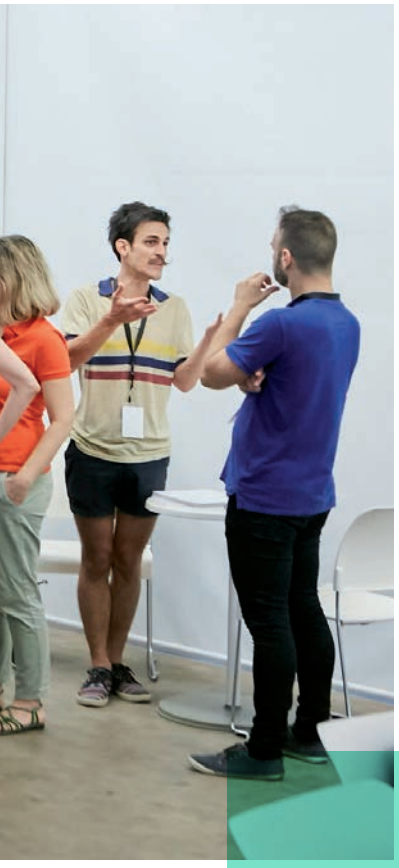
JULY 12TH 2016
BST



BIST RESEARCH MEETING POINT

The first BIST Research Meeting Point, held on July 12, 2016, was a turning point in promoting multidisciplinary research and collaboration among the BIST centers. The event, held at Fundació Tàpies, brought together 33 group leaders and researchers from the six BIST centers for a work session designed by open-innovation specialist Alfons Cornella (Infonomia). The goal of this event was to promote awareness among the various lines of research underway in order to encourage collaboration among the teams.

The event identified existing connections between the six BIST research centers and also discovered untapped cooperation opportunities, which will serve as the basis for planning new lines of research.

IGNITE PROGRAM

In mid-December 2016, the first call was launched under the Ignite Program, created to promote new collaborations among BIST researchers by encouraging them to share knowledge among disciplines and explore new approaches to complex issues.

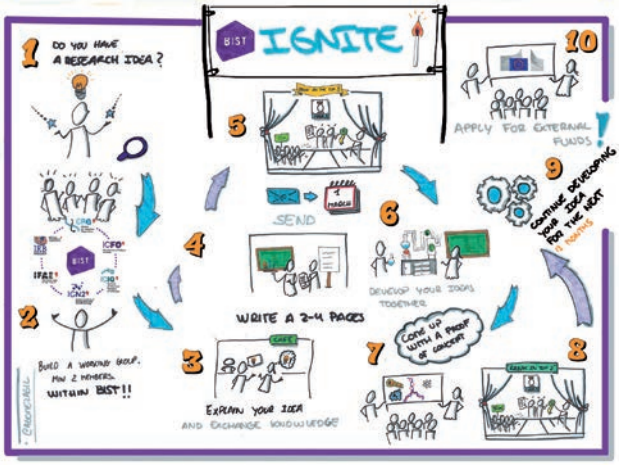
The program features a two-stage competitive call. In the first stage (seed), a minimum of five projects are chosen to receive €20,000 in funding each for researchers to develop the proposed ideas over 8 months. The projects must have at least two working groups at different BIST centers and a multidisciplinary approach.

In the second stage, the two best projects from the seed stage are chosen to receive an additional €50,000 each to continue developing their work to a point at which they can submit proposals to external competitive calls.

At the time of publication, the selected proposals in the first phase had been announced at the BIST Founding Conference (3/31/2017). Eight were chosen in the end, following the recommendations of the assessment panel, which highlighted the top quality of the projects submitted.

AWARDED PROJECTS IN THE FIRST IGNITE CALL (SEEDING STAGE)

- Transport of small molecules and ions across lipid bilayers using synthetic carriers **(CALIX4TRANS)**, a collaboration of Pau Ballester (ICIQ) and Manuel Palacín (IRB Barcelona)
- Near-Infrared Graphene Optoelectronic Devices with Atomically Controlled Nanostructures **(Nirgraph)**, a collaboration of Aitor Mugarza (ICN2), Francisco Javier García de Abajo (ICFO) and Valerio Pruneri (ICFO)
- Pushing the Tumor's Detection Limits in Positron Emission Tomography (PET): Developing Novel Materials with High-Z Value (**ZPro**), a collaboration of Federico Sánchez (IFAE) and Emilio Palomares (ICIQ)
- Towards the implementation of a multi-electrode array for retinal prosthesis (**THEIA**), a collaboration of David Merino (ICFO), Jose A. Garrido (ICN2), Mokhtar Chmeissani (IFAE) and Jeroni Nadal (Barraquer Ophthalmological Center)
- **GenStorm**: an integrated approach to visualize and model the spatial conformation of genes at the nanoscale level, a collaboration of Marie Victoire Neguembor (CRG) and Pablo Dans Puiggros (IRB Barcelona)
- Enlightening TANGO (**eTANGO**), a collaboration of Felix Campelo (ICFO) and Ishier Roate (CRG)
- Continuous flow oxidation processes via plasmon-assisted photocatalysis (**OxiFlowPas**), a collaboration of Romain Quidant (ICFO) and Miquel A. Pericàs (ICIQ)
- In-situ atomic resolution transmission electron microscopy of heterogeneous water oxidation catalysts (**inWOC**), a collaboration of Jose Ramon Galan-Mascaros (ICIQ) and Jordi Arbiol (ICN2)



EDUCATION

BIST works to offer high impact, integral postgraduate education, coordinating the BIST centers academic offer to gain efficiency and impact, creating new education programs focused on multidisciplinary research and through BIST Fellowships.

Encouraging young people to begin a research career and training them to develop it successfully are core elements in the BIST mission and a key instrument for promoting multidisciplinary research of excellence.

The programs designed in this area, with a clearly international vocation in order to attract the best students in the world, cover proposals for undergraduates that need specific training (master) to prepare for a PhD in research and PhD students looking for the best place to do their thesis.

DESIGNING THE FIRST MASTER OF MULTIDISCIPLINARY RESEARCH

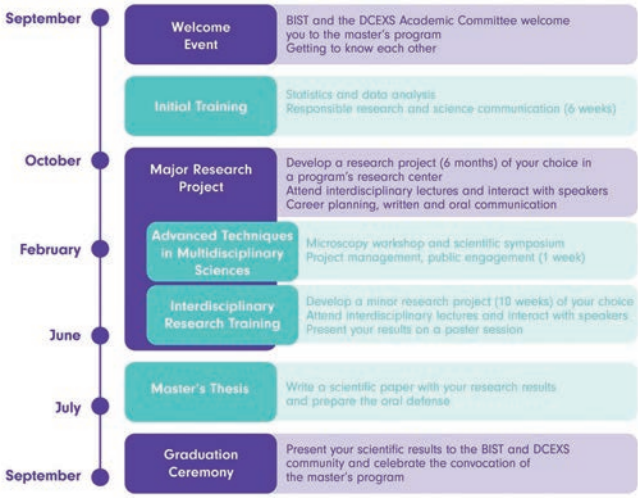
Since it was established, one of the key focal points of the Barcelona Institute of Science and Technology educational program has always been a master in research with a multidisciplinary approach. This is a totally new degree in our area, where there aren't any masters in research, and highly competitive on a global scale given its innovative nature and the exceptional multidisciplinary environment at the BIST centers.

Over the course of 2016, work was done to define the structure and contents of this new training program for graduates and start the administrative process to get it certified.

The BIST Master of Multidisciplinary Research on Experimental Sciences will give participants training in the skills needed to conduct research of excellence. At the same time, it will have an impact on the early stages of the students' research careers, the time when they are forging their unique scientific personalities. The master will also have an impact on improving the qualities of group leaders as mentors, and of post-doc researchers and trainers. The program is characterized, among other things, by the importance of laboratory research, which occupies more than 70% of the students' time, and has taken inspiration from other masters in research programs like those at University College London (United Kingdom) and the Weizmann Institute (Israel).

The master is a joint academic program of Pompeu Fabra University and BIST and classes are scheduled to begin in September 2017.

STARTING SEPTEMBER 2017



BIST PHD PROGRAM

The aim of this program is to offer unique training in multidisciplinary research for PhD students that will become a global benchmark and train the top students in the world. Two initiatives of renowned prestige were taken into account in creating this program: École des Neurosciences in Paris (ENP) and VIB in Flanders. Both institutions are light on structure and bring together the capacities of the various member centers to capitalize on economies of scale.

2016 BIST Fellowships Call

The fellowship program launched in 2016 is geared towards students with experience in biology, chemistry, pharmacy, physics, engineering or computer sciences who are interested in doing a PhD at one of the six BIST centers. In the first call, launched in April 2016, 10 fellowships were offered (for four years), with a competitive salary of €22,000 to €25,000. The fellowship includes a training program in transferable skills and active guidance to help fellows become a part of the BIST Community. The highly demanding selection process prioritized multidisciplinary projects.

Between April 8 and May 20, 2016, a campaign was carried out to attract candidates, investing in advertising in the main media outlets in science and education (*Nature* journal, naturejobs.com, sciencecareer.com, findphd.com, Universia and Euraxes) in addition to dissemination on the Barcelona Institute of Science and Technology website and social media, as well as the communication media of the six BIST centers. As a result, 750 applications were received (282 of which were complete) and 1,500 references.
In September 2016, the first nine BIST PhD Fellows —from Ireland, Italy, Sweden, Ucrania and Spain— joined the assigned BIST centers and there was a welcome session held at the Barcelona Science Park in December.

Welcome event

On December 14, there was a welcome event for the BIST PhD Fellows, who got the chance to present the work lines for their PhD theses to the BIST Community. Thanks to the fellowship, they will be able to develop these studies over the next four years at one of the BIST centers. The event began with a short speech from BIST director Miquel Àngel Pericàs and, before the presentation from the BIST PhD Fellows, Jorge Juan Fernández, head of e-Health and Health 2.0 at Hospital Sant Joan de Deu and academic director of the d·HEALTH Barcelona/Moebio master, gave a speech on innovation and multidisciplinary work.

The event was part of the **BIST Meet-up**, a working session for the BIST groups (see the chapter on **Talent)**, which closed with a networking session with nearly one hundred people.

PREBIST
FOUR-YEAR FELLOWSHIP / PRE-DOCTORAL RESEARCH

PROBIST
THREE-YEAR FELLOWSHIP / POSTDOCTORAL RESEARCH

MARIE SKŁODOWSKA-CURIE CO-FUNDING PROGRAMS

On September 2016, BIST and its constituent centers, submitted two programs applications—PREBIST and PROBIST— to the Horizon2020 Marie Skłodowska-Curie Co-funding of regional, national and international programs call.

PREBIST is an ambitious program of 28 four-year fellowships for multidisciplinary pre-doctoral research at BIST research centers and associated partner institutions (hospitals, private companies, technology centers, and other academic institutions), who will provide secondments, training, networking activities and other actions to complement the research activities and professional development of the fellows.

PROBIST offers 61 three-year fellowships to foster excellence in multidisciplinary postdoctoral research at BIST centers. The program includes opportunities for collaborations and secondments, training and networking activities in partner institutions.

Both programs will **reinforce the strategic areas of Education and Talent** by boosting the BIST capacity for attracting international talent through the avenue of PhD students and post-doctoral researchers. The programs will also give BIST increased visibility and will strengthen recruitment processes. Other objectives are to offer new research areas with interdisciplinary and intersectorial aspects, and improve on-boarding processes to facilitate mobility.

With this initiatives, the BIST centers will also enjoy the opportunity to enhance their capacities in the management of researcher career development, including scientific, technical, and complementary skills training and outreach activities. Finally, and very importantly, through fulfilling their objectives, the new programs will strengthen the connections with other scientific institutions, companies, individuals, and public and private entities.

At the time this Annual Report was written, **the European Union had granted BIST with the PREBIST and PROBIST programs** that have a value of **10 million euros**, to be distributed during the next five years to fund the above mentioned 89 fellowships.

TALENT

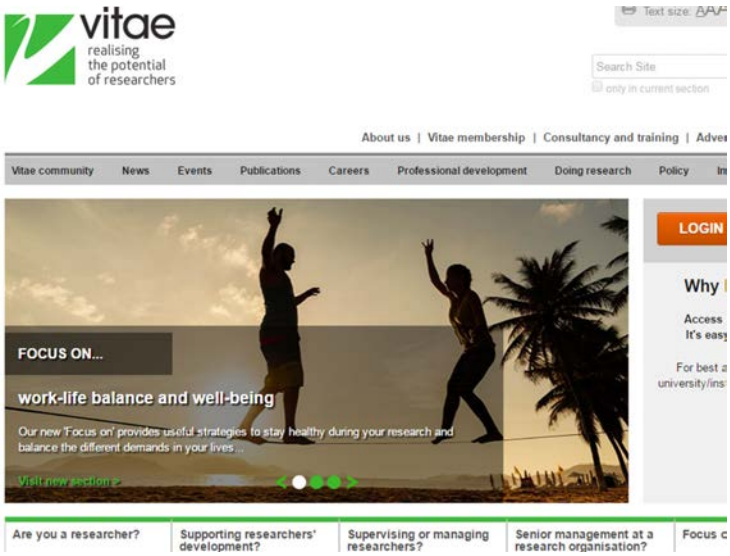
BIST wants to attract, develop, and retain global talent by creating training programs and fostering activities that help researchers acquire transferable skills and drive their own career development.

There is growing interest in talent development and career management in our scientific community. One of the top priorities of the BIST strategic plan is providing professional development and training for all our scientists and personnel.

Under the 2016 action plan, for this line of work, we contacted **Vitae**, a British organization that leads the world in professional support for researchers and has extensive experience working with research institutions. In June, Dr. Janet Metcalfe, head of Vitae, was in Barcelona to share her experience in talent development and begin conversations aimed at reaching a long-term collaboration agreement with BIST to develop this line of work.

Throughout the year, BIST has collaborated with several academic organizations to expand the development activities available for BIST researchers. Submitting the PROBIST program (see the *Education section*) to the 2016 call for Marie Skłodowska-Curie Co-funding of regional, national and international programs was a very important step towards boosting BIST's ability to attract international talent.

VITAE AGREEMENT



Having the right tools to promote the career development of research staff is one of the priorities set by BIST. In September 2016, significant progress was made towards this goal by signing an agreement giving the whole BIST team access to resources on the **Vitae** platform (www.vitae.ac.uk). Vitae, a global benchmark in research career development, gives both researchers and the centers where they work access to resources to put together personalized programs to promote excellence, innovation and high-impact research. They have a widely varied offer of resources that adapt to the needs of researchers at any stage in their career, from PhD students to group leaders with responsibilities in training other researchers.

BIST Meet-up

On December 14, at the Barcelona Science Park, an event was held with the teams in charge of researcher training and development at the six BIST centers and experts from Vitae. The aim was to share the strategies each center had implemented previously, learn about the new tools available through the agreement with Vitae and establish a framework for collaboration to align existing programs and promote new ones.

With this seminar on talent as a focal point, the meet-up also included a series of meetings of the various BIST working groups and a welcome event for the BIST PhD Fellows (see **BIST PhD Program** section in the chapter on **Education**). The event came to a close with a networking session featuring nearly one hundred participants.

NATURE JOBS CAREER FAIR

BIST participated in the NatureJobs Career Expo in London on September 16, 2016 in order to reinforce the Institute's international image, boost visibility of its training programs and raise awareness of the job opportunities at any BIST centers that wanted to participate in the initiative to promote vacant positions. Specifically, ICFO, ICIQ, ICN2 and IRB participated in the exhibition. BIST was a Silver sponsor for this event, which gave great visibility to the BIST centers and their programs.

BIST POSTDOC DAY #1

The first BIST PostDoc Day was held on November 23, 2016, bringing together nearly 200 post-doc researchers from the six BIST centers at the Sant Pau Art Nouveau Site. The aim of this event, designed and organized by a committee of post-docs from all of the centers with support from the BIST team, was for post-doc researchers to share their experiences and concerns, debate various aspects of career development and contribute ideas on how BIST can better support this group.

The event opened with a video (https://youtu.be/4BgpBQ3Lxgo) expressing this group's concerns through interviews with post-docs at the BIST centers. The event featured keynote speaker *Daniel Gerlich*, a group leader at the Institute of Molecular Biotechnology of the Austrian Academy of Science, who presented his group's studies on cell division, emphasizing the importance of interdisciplinary collaboration between biologists and computer scientists. The second keynote speaker was **Stephan Grill**, professor of Biophysics at TU Dresden, who shared his experience as a physicist working in the field of biology, a discipline he became attracted to at a conference when working in astrophysics. His research currently focuses on the mechanisms of morphogenesis.

Professors Gerlich and Grill participated in a panel discussion also featuring **Stephen Dunne**, managing director of Starlab, and **Laura Nevola**, CSO of the start-up IDP Pharma. The discussion focused on the challenges and uncertainties facing post-docs whether they choose to continue their career in academic research or opt for business and entrepreneurship. The speakers all agreed that passion and risk-taking are key qualities in a successful career in both the private and public sectors.

The first BIST PostDoc Day came to an end with an Unconference Session, which gave participants the opportunity to share information and ideas in a more informal setting, and a closing speech from BIST Chair Andreu Mas-Colell.

COURSES & WORKSHOPS

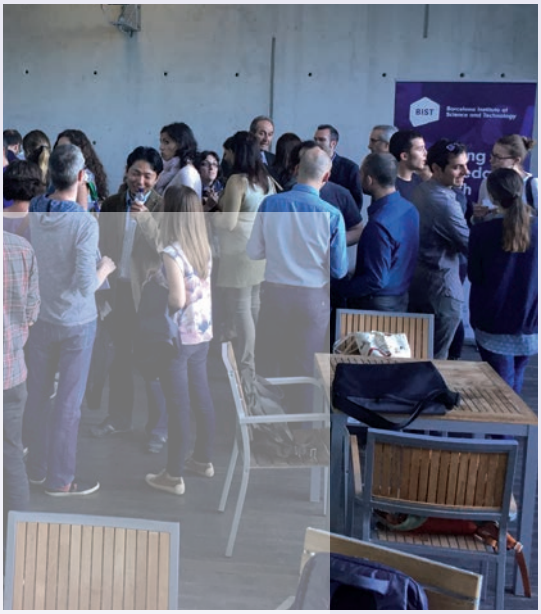
Sharing Multidisciplinary Research with COMPLEX (UCL)

Under the title *The (Mis)representation of Science*, in May 2016 UCL COMPLEX invited five students from the Barcelona Institute of Science and Technology to share their experiences in multidisciplinary research. The students who attended the English PhD retreat had the chance to share their research with colleagues from other arenas in a global language for all of them.

From Science to Business

The Barcelona Institute of Science and Technology and ESADE business school held a course called *From Science to Business* from 31 May to 2 June 2016 to promote entrepreneurship and accelerate the transfer of technology developed at the BIST research centers to the market.

The program is geared towards senior researchers, post-doc researchers and PhD students. It focuses on helping professionals become familiar with the business world, understand how companies work and create value, and familiarize BIST scientists with the business start-up process.



Biostatistics Courses

The Barcelona Institute of Science and Technology organized a series of biostatistics courses between May and October 2016. The classes were held at different centers (ICFO, CRG and IRB). The courses, through theory-based conferences and practical sessions with computers, gave participants an introduction to the basic concepts of statistics and probability, as well as the ways they can be applied to biological research.

Effective Research Course

On December 15 and 16, 2016, a two-day course on research skills geared towards PhD students at the BIST centers was held in collaboration with Vitae in Collbató. The course offered students the resources and techniques to identify and manage their own capacities and properly plan their research career. In total, 30 students participated in the course (including the nine BIST PhD Fellows) given by professors, specialized experts from Vitae and several researchers and group leaders from the BIST centers.

IMPACT

BIST is committed to responsible research that transfers knowledge to society and promotes innovation as a duty. We work with students, teachers and entrepreneurs to meet our impact objectives.

BIST's activities in this arena in 2016 focused on supporting its centers in projecting their initiatives to promote vocation in science among students and raise awareness among the general public.

Additionally, work has been done internally to launch a group to promote new activities and technology transfer programs starting in 2017. Particularly noteworthy in this arena are the results of the BIST centers in terms of promoting entrepreneurship, with three new start-ups created in 2016 joining the **19 active companies** that have been started since 2004.

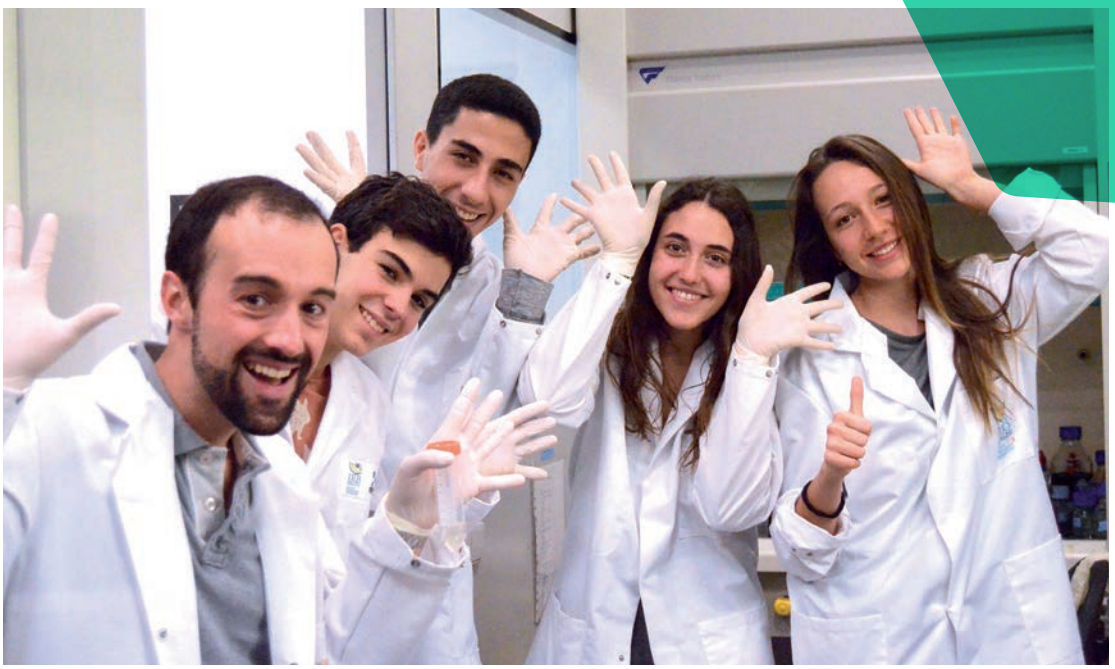
OUTREACH

One of the top priorities for all six BIST centers is to bring science to society through a variety of training and dissemination activities. These are held throughout the year, geared towards primary and secondary students and the general public. BIST provides support for these activities by facilitating collaboration among the centers and helping spread the word about the events. In 2016, the outreach activities of the six BIST centers brought together more than 20,000 people. Following are some of the most noteworthy actions carried out by the BIST centers.

Crazy about Science

BIST centers participate in the program created in 2013 by the Fundació Catalunya-La Pedrera, which targets baccalaureate students to foster vocation in science. In 2016, ICIQ held the third edition of its Crazy about Chemistry program, IRB Barcelona had its fourth group in Crazy about Biomedicine, and ICN2 and IFAE launched the first edition of Mad for Physics. The program, in the various disciplines, is geared towards students in the first year of the baccalaureate with a combination of theory-based sessions and experimental activities throughout the year, giving students the chance to interact with researchers at the centers. A total of 75 students participated in the three BIST Crazy about Science programs.

***IRB** - Crazy about Biomedicine*



OUTREACH

Ciència After Work

BIST collaborated in a panel discussion entitled *Càncer de Colon – Què hi ha de nou* (Colon Cancer – What's new?) held on May 3, 2016 as part of the "Ciència After Work" initiative. This forum allows participants to debate, discuss, learn from and pose questions to scientists working at research centers in Catalonia to find out what research is being done in the life sciences, technology, physics and genetics, among others.

Festa de la Ciència

BIST put together a joint program featuring several activities organized by its research centers under the framework of the Festa de la Ciència (Science Festival) held each year by the Barcelona City Council. This event includes demonstrations and discussions to bridge the gap between science and the general public. The 2016 edition was held on June 18 and 19 at Parc de la Ciutadella.

Barcelona International Youth Science Challenge (BIYSC)

The six research centers that make up BIST participated, alongside other centers from around Catalonia, in hosting the first edition of the Barcelona International Youth Science Challenge (BIYSC). This international event for secondary and baccalaureate students is promoted by Fundació Catalunya-la Pedrera to encourage scientific talent. The young people took part in an intensive two-week program (July 11-22) featuring conferences and practical experiments led by researchers from the collaborating centers.

Summer Internships

From June to October 2016, a summer internship program was held for undergraduate students. The centers that make up the Barcelona Institute of Science and Technology hosted students from Spain and abroad, giving them the opportunity to spend one to three months at one these top-notch centers.

TECHNOLOGY TRANSFER

Technology transfer and industry relations are key parts of the working model of BIST and its centers so that these inventions generated by our research groups are transformed into innovations that reach society.

Since it was founded, the BIST centers have always promoted new start-ups as a way to make sure the innovations resulting from their research make it to the public as quickly as possible. **In 2016, three new start-ups have joined the 16 others that had been created since 2004**. Three new companies were created out of the Catalan Institute of Nanoscience and Nanotechnology (ICN2): **Graphenicalab, Earthdas Graphene Powered Mobility** (working on new power-storage systems using graphene to apply to mobility technology) and **Paperdrop** Diagnostics, which is developing new medical diagnostics tools.

THE COMPANIES CREATED BY THE BIST CENTERS ARE:

Futurechromes
Spin-off company created in 2014 with participation from ICN2 that works on the creation of advanced photochromes.

Applied Nanoparticles
Spin-off of ICN2, UAB and ICREA that was created in 2013 and works on biogas production.

Cosigno
Spin-off of ICFO founded in 2008 that offers optical engineering services.

Graphenicalab
Spin-off of ICN2 that was created in 2016.

Biod
Spin-off of ICN2, CTB, UPM, ISOM and IDM that was created in 2010 and develops proprietary technology for measuring biochips and biosensors.

Earthdas Graphene Powered Mobility
Created in 2016 as a spin-off of ICN2 that works on energy storage based on graphene and applied to mobility technologies.

Hemophotonics
Founded in 2013 as a spin-off of ICFO, it commercializes portable, non-invasive and real-time blood flow monitoring devices based on photonics.

Inbiomotion
Spin-off of IRB Barcelona and ICREA founded in 2010 that develops biomarkers to predict bone metastasis.

Nostrum Biodiscovery
Spin-off of IRB Barcelona, BCN-CNS, UB and ICREA created in 2015 that offers specialized services for drug development based on bioinformatics.

Radiantis
Spin-off of ICFO established in 2005 that manufactures systems for laser tuning and instrumentation for optical diagnostics.

Intelligent Pharma
Created in 2007, this spin-off of IRB Barcelona and UB works in computational chemistry and bioinformatics.

Paperdrop Diagnostics
This spin-off of ICN2 created in 2016 is a nanobiotech company focused on the development of new diagnostic tools.

Sensia
Founded in 2004, this spin-off of ICN2 develops analytical instrumentation based on graphene biosensing.

Iproteos
Launched in 2011, this spin-off of IRB Barcelona and UB develops new therapeutic approaches to neurological and vascular diseases.

ProCareLight
Spin-off of ICFO founded in 2012 that works in safety issues related to laser and light emitting systems.

Signadyne
Spin-off of ICFO created in 2011 and acquired by Keysight Technologies in 2016. It produces control, test and measurement systems for several industries.

Nanotargeting
Spin-off of ICN2 and Nanonica holding, founded in 2011, and develops new drugs using nanoparticles.

qGenomics
Spin-off of CRG and UPF created in 2008 that offers analysis and interpretation services of genomic data.

Simune Atomistic Simulations
Established in 2014, this spin-off of ICN2 develops advanced materials to meet industry and research needs.

IDENTITY

BIST is developing a common culture and a sense of belonging that help researchers and technicians to work together more efficiently in a multidisciplinary and creative manner. BIST projects through its common brand the high quality results and potential of its six founding centers fostering their international visibility.

There is an internal side to promoting the BIST identity, which focuses on building the BIST Community. This community-building is part of every activity organized for the various groups (group leaders, post-docs, PhD fellows, etc.). However, it also has an external side, which in 2016 focused on creating the brand and visual code for the Barcelona Institute of Science and Technology and launching a series of basic communication instruments, including the corporate website and social media presence.

BUILDING THE BIST COMMUNITY

This is a transversal goal that has permeated all of the activities carried out in 2016, which this report has covered in previous sections.

One key element in building the BIST Community has been setting up the working groups (see section on BIST Team & Working Groups). They have since become a stable forum for teams at different centers to share expertise and experiences in both research, an area in which they already had experience collaborating, and more operational or technical aspects, where cooperation experiences were less common.

Establishing the BIST brand image, with a unique and recognizable color scheme, and creating the first communication materials and media (corporate website, social media profiles, stationery, posters, roll-ups, etc.) were necessary and valuable tools for making BIST and its members more recognizable. However, the various events that allowed the different groups to share their interests and concerns were even more important to foster mutual understanding, which will be the foundation for projects over the coming years. These events included the 1st BIST Research Meeting Point (July 12), BIST PostDoc Day #1 (November 30), BIST Meet-up (December 14), and the Effective Research course (December 15-16).

COMMUNICATING BIST

In mid 2016, the **corporate website** was created for the Barcelona Institute of Science and Technology (bist.eu). In this period, the Institute also began its social media activity, mainly on Twitter (@_BIST) and LinkedIn (https://www.linkedin.com/company/bist---barcelona-institute-of-science-and-technology). By the end of the year, the social media profiles already had a thousand followers and the website was receiving 2,000 visits per month, on average. These numbers have only increased since that time.

The corporate website went through several stages of development in 2016 and will incorporate new contents as the Institute's programs expand. In November and December, several changes were implemented to make the home page more dynamic and improve the browsing experience.

A short **introductory pamphlet** was also published to give out at activities like the Nature Jobs Career Fair, in which BIST and some of its centers

participated in September. Additionally, there was an extensive **campaign in international science media** in April and May 2016 to attract the first BIST Fellows.

Specifically, ads were published in *Nature Magazine* (365,000 readers) and on the **Science, Nature Online, Nature Jobs** and **Find PhD** websites, which were seen 75,000 times and generated one thousand visits to the application form.

Furthermore, management worked to raise awareness of the BIST project through interviews in corporate media and public presentations and conferences in Spain and abroad, explaining the new multidisciplinary research model BIST is based on.

The most media coverage resulted from Professor **Andreu Mas-Colell** being named **chair of the BIST Board of Trustees** (6/28/2016) and the **press conference** held on **July 15** at Palau Macaya presenting the Institute's strategic research lines, featuring CEO of the "la Caixa" Foundation Jaume Giró, Professor Mas-Colell and then-Director General of BIST Montserrat Vendrell.

BIST was one of the Catalan research projects highlighted in the special supplement to the journal *Nature* that was published in November 2016, entitled ***Spotlight on Catalonia***.

CEO of the "la Caixa" Foundation Jaume Giró, Professor Mas-Colell and Dr. Montserrat Vendrell presented the strategic research lines of BIST in the press conference held at Palau Macaya on July 2016.

COMMUNICATING BIST

MEDIA PRESENCE

The Barcelona Institute of Science and Technology's presence in the media throughout 2016 was particularly tied, as mentioned before, to Professor Andreu Mas-Colell being named chair of the BIST Board of Trustees (6/28/2016) and the press conference held on May 7, 2016 to present the Institute's lines of research. Following is a list of media appearances resulting from each of these activities, followed by references to other articles published on BIST, noteworthy among which is the long report published in the journal *El Temps* in December.

1. ANDREU MAS-COLELL Al frente del Instituto de Ciencia y Tecnología, **El Periódico de Catalunya** 29/06/2016, pàg. 28
2. Mas-Colell, nuevo presidente del BIST, **Expansión Catalunya** 29/06/2016, pàg. 6
3. El Bist se va a la Escola Industrial y Mas-Colell toma el mando, **La Vanguardia** 29/06/2016, pàg.. 2
4. LOS SEMÁFOROS, **La Vanguardia** 29/06/2016, pàg. 30
5. Mas-Colell, presidente del Barcelona Institute of Science and Technology, **@CRONICAGLOBAL.COM**
6. Mas-Colell presidirá el Barcelona Institute of Science and Technology, **@EUROPA PRESS**
7. Andreu Mas-Colell, nou president del Barcelona Institute of Science and Technology, **@IRBBARCELONA.ORG**
8. Andreu Mas-Colell takes over the presidency of the Barcelona Institute of Science and Technology (BIST), **@ LA VANGUARDIA**
9. Andreu Mas-Colell, nuevo presidente del Barcelona Institute of Science and Technology, **@LA VANGUARDIA**
10. Mas-Colell preside Instituto BIST, que se ubicará edificio Escuela Industrial, **@PRESSPEOPLE.COM**
11. Barcelona entra al ' top ten' de la recerca europea, **El Mundo de Catalunya** 16/07/2016, pàg. 28
12. La institución BIST centrará sus investigaciones en el gafreno, **El Periódico de Catalunya** 16/07/2016, pàg. 29
13. El BIST apuesta por el big data, **El Punt Avui** 16/07/2016, pàg. 14
14. Els grans centres de recerca volen ser referents mundials, **La Vanguardia** 16/07/2016, pàg. 35
15. Barcelona se sitúa en el 'top ten' de la ciencia europea, **La Vanguardia** 16/07/2016, pàg. 2
16. LOS SEMÁFOROS, **@EL PUNT**
17. Els grans centres de recerca volen ser referents mundials, **@ABC**
18. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@ARA.CAT**
19. Barcelona entra al "top ten" de la recerca europea, **@BARCELONANOTICIES.COM**
20. El Barcelona Institute of Science and Technology presenta els primers eixos de recerca, **@BOLSAMANIA**
21. El Bist centra les seves línies d'investigació en el 'big data', el grafè i la biologia química, **@EL DIA**
22. Viernes, 15 de julio de 2016 (07.00 GMT), **@EL PERIÓDICO DE CATALUNYA**

23. El BIST apuesta por el grafeno y el 'big data', @ **ELCONFIDENCIAL.COM**

24. El big data o el grafeno centrarán proyectos del instituto catalán BIST, **@ELCONFIDENCIAL.COM**

25. Viernes, 15 de julio de 2016 (12.00 GMT), @ **ELECONOMISTA.ES**

26. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@ELECONOMISTA.ES**

27. El Bist centra sus líneas de investigación en el 'big data', el grafeno y la biología química, **@EUROPA PRESS**

28. El Bist centra les seves línies d'investigació en el 'big data', el grafè i la biologia química, **@EUROPA PRESS**

29. El Bist centra les seves línies d'investigació en el 'big data', el grafè i la biologia química, **@EUROPA PRESS**

30. El Bist centra sus líneas de investigación en el 'big data', el grafeno y la biología química, **@GIRONA-NOTICIES.COM**

31. El Barcelona Institute of Science and Technology presenta els primers eixos de recerca, **@IRBBARCELONA.ORG**

32. The Barcelona Institute of Science and Technology presents its first lines of research, **@LA CAIXA**

33. El Barcelona Institute of Science and Technology presenta els primers eixos de recerca, **@LA CAIXA**

34. El Barcelona Institute of Science and Technology presenta los primeros ejes de investigación, **@LA VOZ DE CÁDIZ DIGITAL**

35. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@LAINFORMACION.COM**

36. El Bist centra sus líneas de investigación en el 'big data', el grafeno y la biología química, **@ Microweb**

37. El big data o el grafeno centrarán proyectos del instituto catalán BIST, **@ Microweb**

38. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@NOTICIASALBACETE.COM**

39. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@NOTICIASESPANOLAS.ES**

40. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos | ABC | ABC, **@NOTICIERO UNIVERSAL**

41. El BIST apuesta por la multidisciplinariedad para avanzar en sus proyectos, **@NUEVA ECONOMIA FORUM**

42. Eduard Vallory i Subirà, **@ RADIOINTERECONOMIA.COM**

43. El big data o el grafeno centrarán proyectos del instituto catalán BIST, **@RADIOINTERECONOMIA.COM**

44. Viernes, 15 de julio de 2016, **@ RADIOINTERECONOMIA.COM**

45. Viernes, 15 de julio de 2016 (07.00 GMT), @ **VILAWEB.CAT**

46. El Bist centra les seves línies d'investigació en el "big data", el grafè i la biologia química, **@ VILAWEB.CAT**

47. Barcelona, al 'top ten' europeu en innovació, **La Vanguardia** 30/10/2016, pàg. 44

48. Staying a steady course through the storm, *Spotlight in Catalonia*, **@ NATUREJOBS**, 24/11/2016

49. Recerca d'ampli espectre, **El Temps**, 20/12/2016, pàg. 54-57

FACTS & FIGURES

PEOPLE

2,096
BIST COMMUNITY

38% International

37% Women

128 Principal investigators (PI)

526 Postdocs

521 PhD Students

6 PEOPLE
BIST CORE TEAM

PUBLICATIONS

910
TOTAL

89.2% in Q1 journals (SJR ranking)

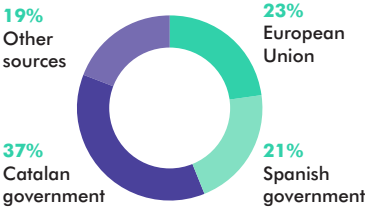
369 articles (40.6%) published in the 68 top journals selected for Nature Index

25TH 100TH
EUROPE / WORLD
Nature Index WFC position (December 2016)

FUNDING

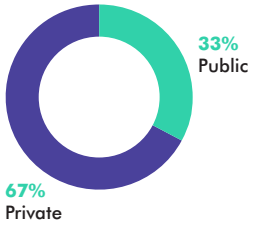
132M€
BIST GLOBAL BUDGET

BIST EXTERNAL FUNDING BY SOURCE

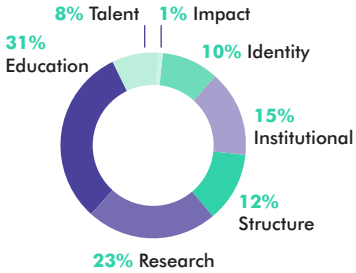


1.3M €
BIST FOUNDATION 2016 BUDGET:

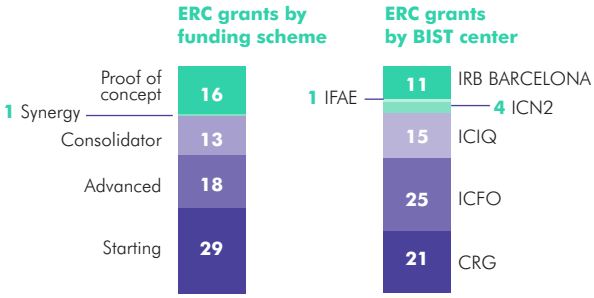
BY ORIGIN



BY APPLICATION



6 ERC GRANTS RECEIVED IN 2016 (OUT OF 77)



INNOVATION

3 spin-offs created in 2016 out of **19** active companies

26 new patent applications

BIST CENTRES

CRG Centre for Genomic Regulation

ICFO The Institute of Photonic Sciences

ICIQ Institute of Chemical Research of Catalonia

ICN2 Catalan Institute of Nanoscience and Nanotechnology

IFAE Institute for High Energy Physics

IRB Barcelona Institute for Research in Biomedicine

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"la Caixa" Foundation

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Fundació Privada CELLEX

Fundació Catalunya La Pedrera

Generalitat de Catalunya