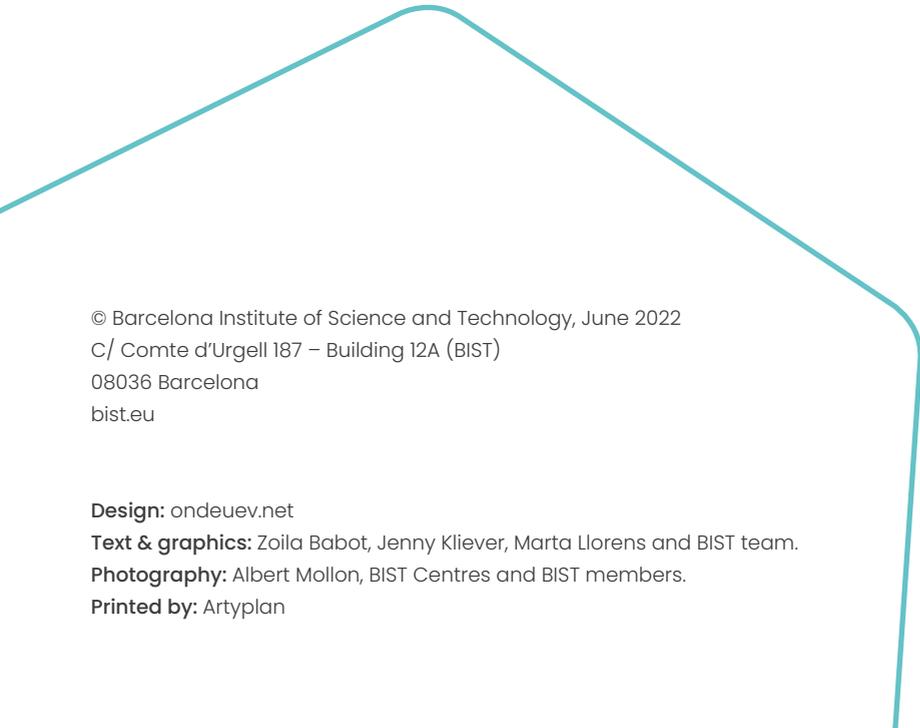




Barcelona Institute of
Science and Technology

BIST ANNUAL REPORT 2021





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Barcelona Institute of
Science and Technology

BIST ANNUAL REPORT 2021

BIST CENTRES



MEMBERS OF THE BOARD OF TRUSTEES



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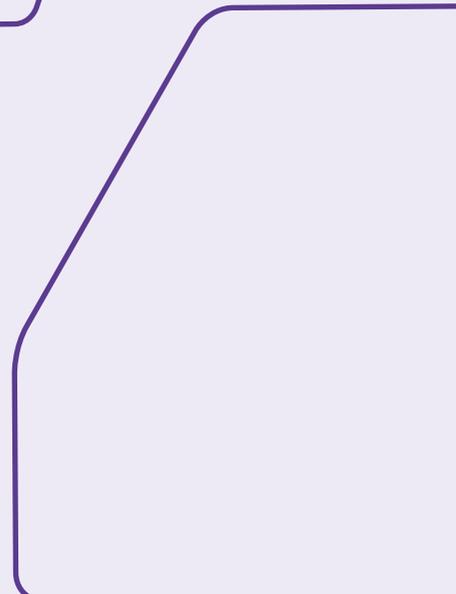
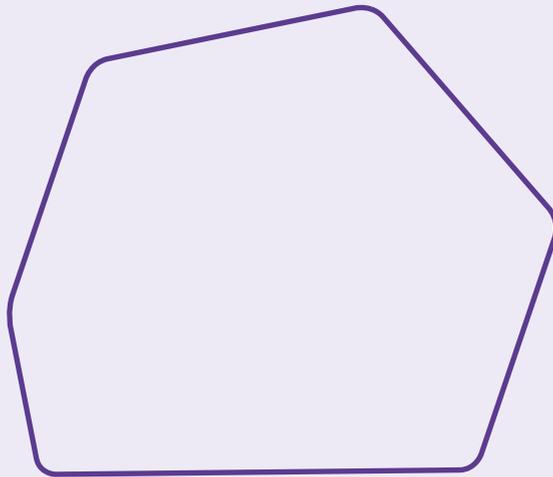
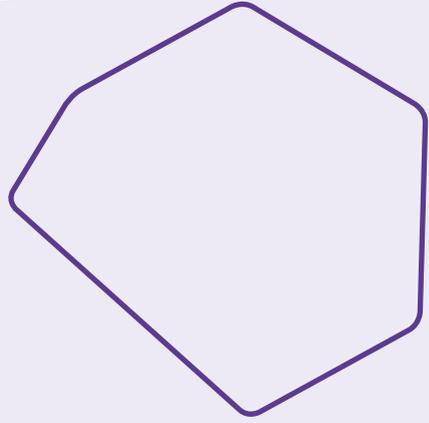
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FOREWORD





The strength of collaboration

ANDREU MAS-COLELL

President of the Board

Already in our second strategic plan, the BIST foundation is reaching adulthood. Years of practice have led to conceptual adjustments and have progressively put in place a clear idea of our role in the BIST ecosystem. It is a role that includes a number of facets. In his foreword the Director refers to some of them. He has intentionally left out an important one for me to cover: that of helping out the research of our centres with the type of initiatives that essentially require either the size or the variety that can only be provided by more than one centre.

In fact, we have been attending to this aspect from the very beginning. We have done this with, among others, our participation in the promotion of the EMCA (the Electronic Microscope Center at ALBA Synchrotron) which will open this fall, and with the Ignite programme, which is in a resplendent trajectory only constrained by the limited resources we can devote to it, a source, I confess, of some frustration. Continuing in this line, the year 2021 has been key for the development of our major building project: the BIST-Mercat del Peix building, in the context of the Ciutadella del Coneixement. Last July we selected the impressive architectural project of the Barozzi

FOREWORD

Veiga office, and we are excited at the prospect of disposing of about 25,000 m² in a sustainable building to be devoted to cutting edge research in precision medicine. I would like to thank here the institutions that are making the operation possible: the Municipality with the land plot, and the Generalitat with the seed resources provided by a Singulars Infrastructures Call, that saved the day when European funds intended for a Feder Call were re-directed to fight the pandemic. And, of course, the universities: the UPF that has led the overall initiative and the UB which, in 2021, has joined it. It is a group, to which I should add the CSIC, we are proud of. The whole makes for a powerful compact, which, with everything it has around it, should translate into a bright light in the landscape of biomedical research in the south of Europe.

In a direct way the new site will implicate four of our seven centres. So, it satisfies the principle of doing only things that implicate more than one. We will continue in this line of participating in and promoting initiatives that increase or consolidate research capacity. Of course, we will always do so in a sustainable and financially sound manner. But we are certain that over time all our centres will be implicated in some initiative.

At this point I wish to become more personal. Working for BIST all these years, and in an environment agitated by many winds, has been stimulating, to say the least. I'm also confident that it has been fruitful, although for that I remit to the test of time. My confidence is indebted to the fact that to push forward the BIST project we have been fortunate to count with Gabriel Silberman at the steering wheel. Unfortunately, elapsed the period for which he committed, he and Ani will settle back in the USA, close to

FOREWORD

their family. We, of course, understand it and wish them the very best. It is not that being in a new country is never easy, it is that being in a new country and being hit by two years of pandemic is not what one would normally expect of a good expatriate experience. So let me express my recognition to Gabby for having endured this situation with grace and with full devotion to the job to be done. A job that if it was difficult and challenging to begin with, became doubly so under the circumstances. But it has been done. For me, the many hours of conversation, face to face or through a screen, with Gabby, resolving matters large and small, sometimes unknotting impossible knots, have been a source of strength. I want to put on record that, perhaps helped by a degree of insensitivity on my part, I have not at any moment perceived tension emanating from him, even at very stressful periods. He is a great source of productive calm.

About the Board, two remarks. The first is that we have room for some expansion in the institutional segment and we are working with this purpose. The second is to give a warm welcome to our two new individual members: Professor Ana María Cuervo, from the Einstein School of Medicine, and Dr. Oriol Vinyals from Google Deep Mind. Professor Cuervo provides us with further depth of expertise in our areas of strength, and Dr. Vinyals provides us with wisdom and exposure to an area, artificial intelligence, that is becoming a central tool across the fields and of which our community is a heavy user, and increasingly so. Thanks for joining!



Science cannot slow down

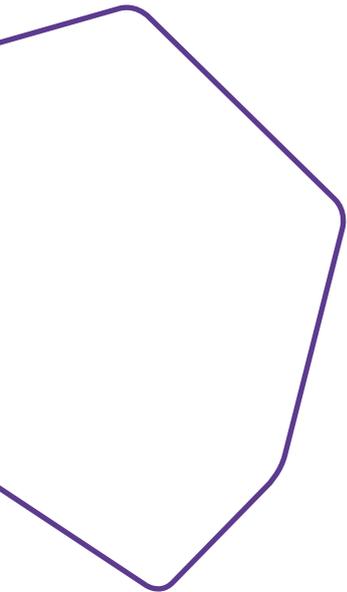
GABBY SILBERMAN
Director General of BIST

The initial year of the 2021–2025 BIST Strategic Plan kicked off with significant progress in our ongoing efforts to develop new lines of collaborative research, the broadening of our engagement with society, and continued expansion of training and career planning offerings for our community and beyond.

As a prime example of collaborative research, in 2021 we welcomed two junior group leaders under the umbrella of the new *“la Caixa” Foundation – BIST Chemical Biology Programme*, a joint initiative led by IBEC and IRB Barcelona. They are Irene Marco-Rius and Cristina Mayor-Ruiz, respectively, whose biographies and research programmes are found later in this report.

Our engagement with society, particularly geared to foster interest in science and technology among our youth, was highlighted by the opening of the first class at the *Angeleta Ferrer High School* in Barcelona, a new STEAM education reference centre. The school's access to leading edge researchers, and in particular female role models, serves to make science more appealing to all its students regardless of gender.

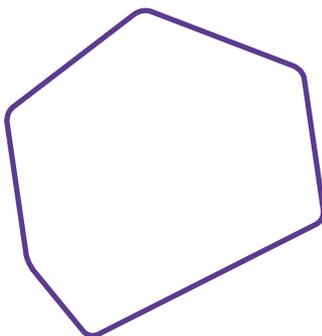
FOREWORD



The continuing monitoring of the training and career planning needs of the BIST community, during all stages of their research endeavours, led to the growth in the type and number of our offerings. Beyond offering general transversal skills training and tools for dealing with career transitions, BIST offered courses on both broad subjects, such as European Strategy, and specific topics, as is the case of Patents and Intellectual Property Rights. Furthermore, the *BIST Career Day* was expanded to the BIST Career Week, with the involvement of over 300 participants.

In addition to serving the BIST community, we also welcomed participants from peer institutions in the Catalan research ecosystem. They reached over 14% of course attendees in 2021, a number we expect to see grow in the future.

We opened 2021 with high expectations for overcoming the pandemic, thanks to the availability of vaccines developed and produced in record time. It did not take long to be reminded, again and again, the huge challenges of confronting a global pandemic, including their social, scientific, logistic, and economic perspectives. On top of these, we saw more clearly than ever the potentially dire consequences of failing to act on other global challenges, such as climate change and environmental pollution.



While policy and politics play a crucial role in answering these challenges, research in science and technology holds the key to developing viable solutions to address current and future needs of humanity. Thus, it is clear we must go beyond avoiding a slowdown and must strive to pick up the pace in the search for these solutions. Furthermore, we see quality solutions increasingly feature the need for a diversity of perspectives, highlighting the value of settings fostering collaborative, multidisciplinary research, an overarching objective underlying the creation of the Barcelona Institute of Science and Technology.

This annual report provides additional information about the above-mentioned activities, as well as others BIST undertook in 2021. I hope you find the information herein both useful and insightful.

ABOUT BIST

BIST was created in 2015 to facilitate the collaboration among its member centres, especially in research, talent recruitment and training. As 2021 ended, the BIST institution counted over 2,500 members among its seven research centres. The strength of BIST is its people, their knowledge, creativity, commitment and capacity to collaborate to find solutions to complex scientific challenges faced by today's society. The new strategic plan, operational from the beginning of 2021, aims to strengthen the BIST Community and its collaborative work. The evolution of the existing working groups and the creation of new ones, to better align with the objectives of the new plan, was a first step towards this goal.



BIST Centres

The Barcelona Institute of Science and Technology (BIST) is a leading institution of multidisciplinary research encompassing seven Catalan CERCA research centres, each with the highest level of excellence in its area of expertise. All of them have received the “Severo Ochoa Centre of Excellence” seal of distinction multiple times. We refer to these seven centres as **BIST Centres**.





CENTRE FOR GENOMIC REGULATION

CRG is a Barcelona-based international biomedical research institute at the forefront of life sciences research. Its excellence is based on an interdisciplinary, motivated and creative scientific team supported by high-end and innovative technologies.



INSTITUTE FOR BIOENGINEERING OF CATALONIA

IBEC conducts interdisciplinary research of excellence at the frontiers of engineering and life sciences. Researchers generate new knowledge by combining fields like nanomedicine, biophysics, biotechnology, tissue engineering, and the applications of health information technology.



INSTITUTE OF PHOTONICS SCIENCES

ICFO conducts frontier research in diverse areas in which photonic sciences play an enabling role, also fostering the translation of the newly generated knowledge to industry, hospitals, and society at large.



INSTITUTE OF CHEMICAL RESEARCH OF CATALONIA

ICIQ is committed to research of excellence at the frontier of knowledge in two main areas: Renewable Energy and Sustainable Catalytic Processes. Research groups work on computational chemistry, CO₂ recycling, renewable fuels, sustainable catalysis, and artificial photosynthesis.



CATALAN INSTITUTE OF NANOSCIENCE AND NANOTECHNOLOGY

ICN2's research explores new frontiers of knowledge at the nanoscale and brings value to society in the form of new understanding, capabilities, innovation and training of the next generations of researchers.



INSTITUTE FOR HIGH ENERGY PHYSICS

IFAE conducts experimental and theoretical research at the frontiers of fundamental physics, namely particle physics, astrophysics, and cosmology. It also develops cutting-edge detector technologies, medical physics devices, and quantum computing technologies.



INSTITUTE FOR RESEARCH IN BIOMEDICINE

IRB Barcelona is a world-class research centre devoted to providing ground-breaking solutions for unmet medical needs. Its major research challenges are cancer and other diseases linked to ageing.

BIST Board of Trustees



The annual meeting of the BIST Board of Trustees was held online on the 21st of June 2021.

During 2021, we saw various changes in the composition of the BIST Board of Trustees. In May, the changes in the Catalan Government were reflected in our Board with the incorporation of the new Minister of Research and Universities, Hble. Mrs. Gemma Geis, succeeding Hble. Mr. Ramon Tremosa. Also, at the end of the year, Prof. Ana María Cuervo, and Dr. Oriol Vinyals, joined the BIST Board of Trustees. The Annual Report reflects the resulting composition of the Board of Trustees on the 31st of December 2021.

CHAIR

Prof. Andreu Mas-Colell

SECRETARY

Dr. Eduard Vallory

DIRECTORS OF BIST CENTRES

Prof. Luís Serrano

Centre for Genomic Regulation (CRG)

Prof. Josep Samitier

Institute for Bioengineering of Catalonia (IBEC)

Prof. Lluís Torner

Institute of Photonic Sciences (ICFO)

Prof. Emilio Palomares

Institute of Chemical Research of Catalonia (ICIQ)

Prof. Pablo Ordejón

Catalan Institute of Nanoscience and Nanotechnology (ICN2)

Prof. Ramon Miquel

Institute for High Energy Physics (IFAE)

Prof. Francesc Posas

Institute for Research in Biomedicine (IRB Barcelona)

INSTITUTIONAL

Dr. Miquel Molins

Chair of the Banc Sabadell Foundation

Mr. Germán Ramón-Cortés

Chair of Catalunya-La Pedrera Foundation

Mr. Oriol Guixà

FemCat Foundation

GOVERNMENT

Hble. Mrs. Gemma Geis

*Minister of Research and Universities
Government of Catalonia*

RESEARCHERS

Prof. Ignacio Cirac

Max-Planck-Institute for Quantum Optics

Prof. Joan Massagué

Sloan Kettering Institute

Prof. Miquel Salmeron

University of California-Berkeley

Prof. Sylvia Daunert

Nanotech Institute of the University of Miami

Prof. M. Carme Calderer

University of Minnesota (Twin Cities)

Prof. Rolf Tarrach

European University Association

Prof. Ana María Cuervo

Albert Einstein College of Medicine

Dr. Oriol Vinyals

Google Deep Mind

BIST Team

BIST pursues its strategic goals leveraging a collaborative structure of **Committees** and **Working Groups** (WGs), built on a small, dedicated **Core Team** augmented with contributors from across the BIST community. A **Coordination Committee**, composed by the directors of the seven research centres and the BIST director, oversees BIST strategy and actions.

BIST CORE TEAM



GABBY SILBERMAN
Director General



ÒSCAR GIMENO
General Manager



NÚRIA BAYÓ
Director of Programmes



ADELA FARRÉ
Head of Communications and Branding



CLARA BARRENECHE
Head of Innovation & Business Development



ÀLEX GONZALEZ
Head of Institutional Relations



ELENA REDONDO
Talent Programme Manager



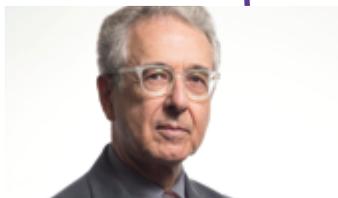
MÍRIAM NAVARRO
Education Programme Manager



MARTA LLORENS FONTS
Communications Officer



LAURA NIETO
Office Assistant



JOAN GUINOVART
Academic Director



ALBERT TEXIDOR
Project Director of Mercat del Peix Building

BIST COORDINATION COMMITTEE



LUIS SERRANO

Director of the Centre for Genomic Regulation (CRG)



JOSEP SAMITIER

Director of the Institute for Bioengineering of Catalonia (IBEC)



LLUÍS TORNER

Director of the Institute of Photonic Sciences (ICFO)



EMILIO PALOMARES

Director of the Institute of Chemical Research of Catalonia (ICIQ)



PABLO ORDEJÓN

Director of the Catalan Institute of Nanoscience and Nanotechnology (ICN2)



RAMON MIQUEL

Director of the Institute for High Energy Physics (IFAE)



FRANCESC POSAS

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



GABBY SILBERMAN

Director of the Barcelona Institute of Science and Technology (BIST)

BIST AREAS, COMMITTEES AND WORKING GROUPS

BIST pursues its strategic goals leveraging a collaborative structure of Committees and Working Groups (WGs), built on a small, dedicated core team and with participation from across the BIST community. Operating under the oversight of the Coordination Committee, the four committees and ten working groups are grouped into five areas: Research, Education and Talent, Financing, Systems and Infrastructures, and Functional Committees.

In 2021, over 100 people from the BIST community contributed to BIST Committees and Working Groups (WG), as shown below. They met throughout the year to drive the BIST agenda by planning and executing joint activities within and across their respective areas.

RESEARCH AREA

There are four WGs in this Area, three dedicated to each of the research initiatives in the 2021-2025 Strategic Plan (**Health**, **Sustainability** and **Quantum Physics**), and a fourth being the Microscopy WG as an ongoing strategic activity across several of our Centres. Some of these WGs have thematic sub-groups, as is the case of **Chemical Biology** inside the Health Initiative, and **Complex Materials** within the Quantum Physics Initiative. The **Research Committee** gathers mainly the co-chairs from the four WGs and is chaired by the BIST Director General. Its role is to help set the overall BIST collaborative research strategy and coordinate programmes across their respective groups.

RESEARCH COMMITTEE

Gabby Silberman, BIST, chair
 Jordi Arbiol, ICN2
 Giuseppe Battaglia, IBEC
 Pia Cosma, CRG
 Pol Forn Díaz, IFAE
 Maria García-Parajo, ICFO
 Sebastián Grinstein, IFAE
 Maciej Lewenstein, ICFO
 Angel Nebreda, IRB
 Valerio Pruneri, ICFO
 Elisabet Romero, ICIQ
 Niek Van Hulst, ICFO

SUSTAINABILITY INITIATIVE WG

Elisabet Romero, ICIQ,
 co-chair
 Niek Van Hulst, ICFO,
 co-chair
 Samuel Sánchez, IBEC
 Monica Lira-Cantú, ICN2
 Pedro Gómez, ICN2
 Manel Martínez, IFAE
 Núria López, ICIQ

QUANTUM PHYSICS INITIATIVE WG

Valerio Pruneri, ICFO, co-chair
 Pol Forn Díaz, IFAE, co-chair
 Pau Gorostiza, IBEC
 Gabriel Gomila, IBEC
 Maciej Lewenstein, ICFO
 Feliu Maseras, ICIQ
 Klaas Tielrooi, ICN2
 Stephan Roche, ICN2
 Sebastián Grinstein, IFAE

Complex Materials:

José A, Garrido, ICN2
 Frank Koppens, ICFO

HEALTH INITIATIVE WG

Angel Nebreda, IRB, co-chair
 Pia Cosma, CRG, co-chair
 Turgut Durduran, ICFO
 Jorge Ferrer, CRG
 Marcos García Suero, ICIQ
 Arben Merkoci, ICN2
 Mohktar Chmeissani, IFAE
 Elena Martínez, IBEC

ChemBio:

Irene Marco-Rius, IBEC
 Cristina Mayor-Ruiz, IRB

MICROSCOPY WG

Jordi Arbiol, ICN2, co-chair
 Maria García-Parajo, ICFO, co-chair
 Giuseppe Battaglia, IBEC, co-chair
 Nadia Halidi, CRG
 Lorenzo Albertazzi, IBEC
 Pablo Loza, ICFO
 Julien Colombelli, IRB
 Christian Neissner, IFAE/PIC

EDUCATION & TALENT AREA

A committee and three WGs are dedicated to support scientific talent and provide a nurturing work environment within the BIST community. The **Academic Committee** is responsible for the BIST academic programmes, including those belonging to the BIST Dolors Aleu Graduate Centre. The **Science Education WG** supports the development of the new Angeleta Ferrer high school, as well as the professional transition of researchers towards the education system. This WG is also a space to share best practices in science education and outreach. In the **People WG**, representatives from Talent and Human Resources units at the BIST centres share best practices in recruiting, training, and overall wellbeing. They coordinate training opportunities and organise events to promote career progression and transition, like the Career Week or the Mentoring Programme. The **Gender and Equity WG** works towards including gender equality, diversity and inclusion perspectives in all BIST processes, from talent recruiting to career development programmes, events and communications.

ACADEMIC COMMITTEE

Robert Sewell, ICFO, co-chair
Joan Guinovart, BIST,
co-chair
Thomas Surrey, CRG
Luciano Di Croce, CRG
Pau Gorostiza, IBEC
Mónica H. Pérez-Temprano,
ICIQ
Arben Merkoçi, ICN2
Rafel Escribano, IFAE
Roger Gomis, IRB
Núria Bayó, BIST
Míriam Navarro, BIST

SCIENCE EDUCATION WG

Pilar Jiménez, IBEC, co-chair
Sebastian Grinschpun, IFAE,
co-chair
Muriel Arimon, IRB, co-chair
Marta Solís, CRG
Federica Beduini, ICFO
Lydia Sanmartí, ICFO
Laura Hernández, ICIQ
Alex Argemí, ICN2
Núria Bayó, BIST
Joan Guinovart, BIST
Míriam Navarro, BIST

PEOPLE WG

Olalla Bagues Bedoya, CRG
Damjana Kastelic, CRG
Imma Falero, CRG
Carolina Marí Cañadas, IBEC
Anke Kleff, IBEC
Neus Vilalta Tuset, IBEC
Laia Miralles, ICFO
Giovanna Petrillo, ICFO
Cristina Quiñoa, ICIQ
Ana Belen Ávalos, ICN2
Julio Gómez, ICN2
Yolanda Canut, IFAE
Leyre Caracuel, IRB
Maria Isabel Labrid, IRB
Núria Bayó, BIST
Elena Redondo, BIST

GENDER AND EQUITY WG

Olalla Bagues, CRG
Isabelle Vernos, CRG
Anke Kleff, IBEC
Laia Miralles, ICFO
Leticia Chico, ICIQ
Julio Gómez, ICN2
Martine Bosman, IFAE
Maribel Labrid, IRB
Elena Redondo, BIST

FINANCING AREA

This Area includes the **KTT WG**, which continues the work developed in previous years, and two new WGs: **Endowment** and **Competitive Programmes**. The members of the KTT WG include the heads of Innovation and Knowledge Technology Transfer of the seven centres and BIST. In 2021 the group shared resources and best practices to develop joint training offerings and collaborate in other initiatives, such as joint participation in events and conferences to increase local and international visibility for the centres and their spinoffs. The new WGs were created under the new strategic plan to raise funds from patronage and initiatives such as Fons d'Inversió en Tecnologia Avançada (FITA), and to search for competitive programmes in which the sum of the BIST Centres would offer an advantage.

KTT WG

Anabel Sanz, CRG
 Eduardo Salas, IBEC
 Silvia Carrasco, ICFO
 Lluís Solà, ICIQ
 Pablo Pomposiello, ICN2
 Isaac Esparbé, IFAE
 Cristina Horcajada, IRB
 Clara Barreneche, BIST

ENDOWMENT WG

Joana Vives, CRG
 David Badia, IBEC
 Guillermo Orts, IBEC
 Dolors Mateu, ICFO
 Lluís Solà, ICIQ
 Irene Puntí, ICIQ
 Margarita Navia, ICN2
 Pablo Pomposiello, ICN2
 Quim Bosch, IFAE
 Isaac Esparbé, IFAE
 Oriol Alsina, IRB
 Clara Barreneche, BIST
 Òscar Gimeno, BIST

COMPETITIVE PROGRAMMES WG

Michela Bertero, CRG
 Teresa Sanchís, IBEC
 Núria Beltri, ICFO
 Lorena Tomás, ICIQ
 Margarita Navia, ICN2
 Marta Balza, IFAE
 Jorge Domínguez, IRB
 Clara Barreneche, BIST
 Núria Bayó, BIST

SYSTEMS & INFRASTRUCTURES AREA

There are three WGs in this area. The **Information Technologies WG** is formed by the heads of IT services of the seven BIST centres, as well as the head of the *Port d'Informació Científica* (PIC, a joint unit of Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas -CIEMAT- and IFAE). In 2021 the group shared experiences regarding purchasing IT goods and services, had meetings focused on cybersecurity and shared their significant concerns on talent recruiting and retention. Also, the Mercat del Peix project and its associated IT infrastructures were shared among all the WG members. The **Mercat del Peix WG** consists of the heads of Facilities and Infrastructures of the four centres sharing space in the BIST-Mercat del Peix building. The goal of this WG is to ensure the various types of spaces in the new building meet the specific technical requirements of their respective research activities. A **Sustainable Research WG** was created in 2021 to lead work in this area and to become a permanent forum for sharing good practices among all BIST centres. Including both researchers and administrative staff, this WG works to establish protocols and indicators across all BIST centres to minimise the environmental impact of our activities.

INFORMATION TECHNOLOGIES WG

Ramon Rocasastre, IRB, chair
 Yann Dublanche, CRG
 Emyr James, CRG
 Julio Bafaluy, IBEC
 Oriol Bardes, ICFO
 Angel Mosquera, ICIQ
 Javier González, ICN2
 Andreu Pacheco, IFAE
 Gonzalo Merino, PIC/IFAE

MERCAT DEL PEIX WG

Eugenia Silva, CRG
 Isabel Oliveira, IBEC
 Gustavo Ceballos, ICN2
 Josep Queralt, IRB
 Àlex González, BIST
 Albert Teixidor, BIST

SUSTAINABLE RESEARCH WG

Donate Weghorn, CRG, co-chair
 Àlex González, BIST, co-chair
 Marcos Fco. Pérez, CRG
 Teresa Sanchís, IBEC
 Isabel Oliveira, IBEC
 Clara Vilches, ICFO
 Xavier Blanch, ICIQ
 José Pérez, ICN2
 Xavier Ros, ICN2
 Vanessa Acin, PIC/IFAE
 Anna Vilches, IRB

FUNCTIONAL COMMITTEES

The general managers and heads of communications of the seven centres and BIST constitute the **Managers** and **Communications** functional committees, respectively. They share resources and coordinate transversal aspects to continuously improve the centres functioning. The Communications Committee also works on initiatives to enhance the visibility of BIST and its centres.

MANAGERS COMMITTEE

Bruna Vives, CRG
 David Badia, IBEC
 Dolors Mateu, ICFO
 Laia Pellejà, ICIQ
 Lluís Bellafont, ICN2
 Quim Bosch, IFAE
 Margarida Corominas, IRB
 Òscar Gimeno, BIST

COMMUNICATIONS COMMITTEE

Glòria Lligadas, CRG
 Guillermo Orts, IBEC
 Brook Hardwick, ICFO
 Laia Pellejà, ICIQ
 Àlex Argemí, ICN2
 Sebastián Grinschpun, IFAE
 Oriol Alsina, IRB
 Adela Farré, BIST

The lists represent the people in the working groups as of the 31st of December, 2021. During the year, the following people also participated in the working groups and committees: Leticia Chico (ICIQ) and Anna Salvadó (ICIQ), both in the People WG, and Joana Pi-Suñer (ICN2), in the Science Education WG.

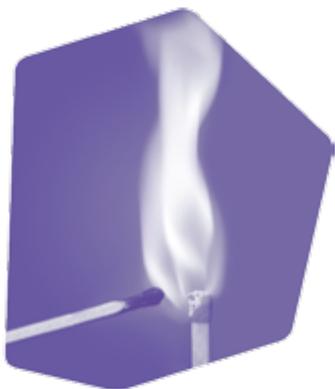
MULTIDISCIPLINARY AND COLLABORATIVE RESEARCH

The BIST Research Initiatives serve as a vehicle to focus our activities while articulating the research proficiency of our investigators. As identified in the 2021-2025 Strategic Plan, three broad research areas already represent significant capabilities within BIST Centres: health, energy and environmental sustainability, and quantum physics and its technological applications. The sum of these capabilities, when leveraged through collaboration, creates a multiplicative effect and produces innovative solutions to major scientific and social challenges.

Ongoing programmes and activities, such as the BIST Ignite Programme and the BIST Annual Conference, facilitate opportunities for multidisciplinary and collaborative work. These are further enhanced by the new research thrust on Chemical Biology and the acquisition of state-of-the-art microscopy equipment.

BIST Ignite Programme

FUELING MULTIDISCIPLINARY AND COLLABORATIVE RESEARCH



The BIST Ignite Programme promotes new multidisciplinary projects of excellence among members of the BIST community. An external scientific committee selects the winning teams, who receive seed funding to develop their ideas for 10 months. Projects then move to the second phase of the programme, where the most promising efforts, judged again by an external panel, receive a **BIST Ignite Award** with additional funding to continue work for one more year.

In spring 2021, the five projects selected to receive seed funding as part of the fifth edition of the BIST Ignite Programme were announced. These projects are:

Poly-STOP: studies the genetic alterations of the polyglutamines that cause

neurodegenerative diseases; led by Benedeta Bolognesi, group leader at IBEC, and Xavier Salvatella, ICREA Research Professor at IRB Barcelona.

EXPLODE-TNBC: aimed at using cellular mechanism of protein degradation to cure currently incurable cancers. Antoni Riera and Sara Sdelci, group leaders at IRB Barcelona and CRG, respectively, lead this project.

SENEGOLD: looks to develop a catalytic drug production system with the capacity to eliminate senescent cells *in vivo*; this project is led by Marc Montesinos and José Alberto López, postdoctoral researchers at ICIQ and IRB Barcelona, respectively.

ASITOC: develops muscles-on-a-chip and biomagnetism sensors to accelerate the design of muscular dystrophy treatments; led by Juan Manuel Fernández-Costa and Michael Tayler, postdoctoral researchers at IBEC and ICFO, respectively.

TeraFox: seeks to modulate Transition Metal Oxides properties with light to achieve a more efficient method to control the functionality and optimise the properties of materials with a wide range of applications. Ekaterina Khestanova and David Pesquera, postdoctoral researchers at ICFO and ICN2, respectively, lead this project.

Towards the end of the year, two projects from among five selected in the seed round of the fourth edition of the BIST Ignite Programme were selected to receive the 2021 BIST Ignite Awards. These projects are:

MAKI: aimed at developing a portable sensor which can be attached to urinary catheters to monitor two biomarkers of acute renal failure with minimal effort; led by Gemma Aragay and Ruslan Alvared, postdoctoral researchers at ICIQ and ICN2, respectively.

QEE2DUP: design of new materials which combine chemical synthesis, 2D material nanofabrication, and advanced optics, to serve as the basis for designing new quantum chips. Roshan Krishna Kumar and José Ramón Durán, postdoctoral researchers at ICFO and ICN2, respectively, lead this project on its second phase.



2021 BIST Conference

QUANTUM TECHNOLOGIES: PRESENT AND FUTURE



The fifth BIST Annual Conference took place on the 3rd of November 2021, at La Pedrera Auditorium in Barcelona. Entitled Quantum Technologies: Present and Future, it focused on discussing the **state of the art and current research on quantum technologies**, both **internationally and locally**, and presenting their many applications.



Professor **Ignacio Cirac**, Director and Scientific Member of the Max Planck Institute of Quantum Optics, and member of the BIST Board of Trustees, gave the opening keynote, exploring the current status of quantum technologies in Europe and globally. The conference also included two panel discussions: *Quantum in Catalonia*, in which researchers from BIST Centres and other research institutions discussed the latest quantum-related developments in the areas of communication, simulation, computing, sensing and infrastructures; and *Quantum in Industry: Corporations and Spin-offs Developing Quantum Applications*, with industry professionals

discussing existing and future applications of quantum technologies. Professor **Spyridon Michalakis**, mathematical physicist at Caltech's Institute for Quantum Information and Matter, closed the conference sharing his experience as a science consultant for movies such as *Ant-Man*.

The 2021 Conference also included **four online satellite sessions**: *How to Communicate Complex Scientific Topics* (November 2), *Presenting the research breakthroughs of the next generation of scientific leaders* (November 4), *Wellbeing and mental health in science: towards a more enjoyable research career* (November 5), and *What are quantum technologies and what are they good for?*, delivered in Catalan for secondary school students and teachers on November 16, within the framework of the Science Week in Catalonia.



Quantum technologies are based on the principles of quantum physics, a field of study that examines the physical properties of atoms and subatomic particles. From smartphones, computers, GPS, and data security to traffic optimisation, weather monitoring, medical diagnostics, and drug design, quantum technologies have the potential to radically impact every facet of society. More research is needed to reach the full potential of these technologies.

Chemical Biology

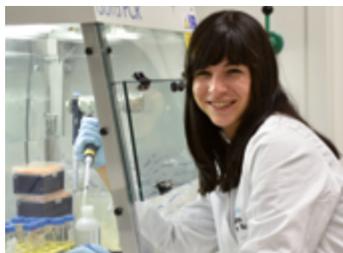
“LA CAIXA” FOUNDATION – BIST CHEMICAL BIOLOGY PROGRAMME



The year 2021 saw the launching of the “la Caixa” Foundation – BIST Chemical Biology Programme, a joint initiative aimed at attracting talent and creating an ecosystem to foster research excellence for improving health. Thanks to this initiative, supported by “la Caixa” Foundation and BIST, two new junior group leaders joined BIST Centres: Dr. Cristina Mayor-Ruiz, at IRB Barcelona, and Dr. Irene Marco-Rius, at IBEC.

CRISTINA MAYOR-RUIZ

Mayor-Ruiz started her *Targeted Protein Degradation & Drug Discovery* laboratory at IRB Barcelona in January 2021. At the interface of chemical biology and cancer research, the group focuses on the development and systematic discovery of a novel type of drug: monovalent degraders.



The progress of Mayor-Ruiz’s research group in the first year was impressive. The researcher secured important national and international competitive grants, including a Junior Group Leader la Caixa fellowship, a Ramón y Cajal (ranked first in Biomedicine in Spain), and an ERC Starting grant for her project TrickE3 (€1.5M for a five-year period). She also developed strategic collaborations with pharmaceutical companies, such as Aelin Therapeutics and Almirall, to pursue research activities.

The research group established and validated a drug screening strategy to find monovalent degraders at scale, and already conducted a first high-throughput drug screen. Beyond drug discovery efforts, Mayor-Ruiz’s group is tackling exciting biological questions with targeted protein degradation as a foundational basis. During 2021, they engineered models to explore drug resistance to degraders, identify pancreatic cancer vulnerabilities, and study the Angelman Syndrome, among others. Many of these research efforts are conducted in collaboration with internal and external scientific colleagues, including Dr. Irene Marco-Rius.

IRENE MARCO-RIUS

Marco-Rius set up her new group at IBEC in the fourth quarter of 2021. The main goal of the group, named *Molecular Imaging for Precision Medicine*, is to detect, identify and validate biomarkers of disease. In particular, the group focuses on developing molecular imaging tools to identify abnormalities of cell metabolism in human disease and predict treatment efficacy.

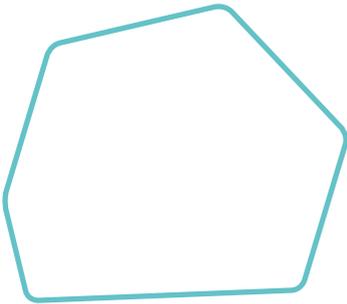
In this short time, Marcos-Rius established a young team of passionate researchers who work at the forefront of molecular imaging using a technique known as Hyperpolarised Magnetic Resonance (HP-MR), which increases the signal of MR more than 10,000 times. This dramatic increase allows them to see molecular processes in real time, in situ, and non-invasively for a wide range of biological systems. To do so, a HyperSense polarizer (one of only two in Spain) was installed in Marco-Rius laboratory. The group has already produced proof-of-concept data showing the feasibility of the research projects proposed by Marco-Rius, and more equipment is expected to be acquired in 2022.

2021 was also a year of important highlights for Marco-Rius: she filled a patent application with the European Patent Office, and a spin-off company from IBEC –named Vitala Technologies– was founded to bring technologies developed by Marco-Rius and collaborators to the market. Besides fostering continuing collaborations, Marco-Rius has also sought to establish new ones with researchers in both academia and industry.

Chemical Biology studies the behaviour and fate of small molecules in the context of living systems, and as such finds its place in the overlap between biology and chemistry. One of the goals of chemical biology research is to develop new drugs. The “la Caixa” Foundation – BIST Chemical Biology Programme looks to become the core of a chemical biology hub in Barcelona, in partnership with an already strong biopharmaceutical sector.

Microscopy

NEW ELECTRON MICROSCOPY EQUIPMENT



Microscopy has been a priority area for BIST since its inception, as developments in this field are crucial for the advancement of research in both biomedicine and new materials.

In the spring of 2020, the European Regional Development Fund (ERDF) published the resolution of its call for cooperative projects, aimed to create, build, acquire, and improve shared scientific and technological equipment and platforms. Among the seven ERDF projects co-funded by the Catalan Government, three related to electron microscopy proposals participated by BIST and its centres. In 2021, we saw the fruits of a joint effort by several research institutions, started as early as 2016. This effort will **provide new advanced electron microscopy equipment for molecular biology and materials science to the entire Catalan research ecosystem.**

In August 2021, a Glacios **high-voltage cryo-electron microscope for biological applications** was installed at the ALBA Synchrotron. This microscope allows observing the structure of biomolecules at atomic scale without the need to obtain crystals. The new equipment is the result of an ERDF project valued at 1.7 million euros led by the Molecular Biology Institute of Barcelona (IBMB-CSIC) and with the participation, among others, of BIST centres CRG and IRB Barcelona.

The following month, a **Focused Ion Beam** was placed at ICN2. This instrument, which allows to cut material samples in very thin layers, is part of the equipment contemplated in the ERDF project led by the ICN2, valued at 4.1 million euros. The project also includes the acquisition of a Transmission Electron Microscope with monochrome aberration correctors (METCAM), to be installed at the ALBA Synchrotron in 2022. The new equipment will permit to study materials at atomic resolution.

In November 2021, a tender announcement to acquire a STEM microscope to be installed at the University of Barcelona facilities

was published. This microscope will be co-funded by a third ERDF project and involves the BIST centre IBEC.

From 2020 to 2022, BIST will have contributed nearly 600.000 euros to these three cooperative projects, besides serving as a catalyst for the successful pursuit of ERDF funding.

BIST Symposium on Microscopy, Nanoscopy and Imaging Sciences



The fourth edition of the BIST Symposium on Microscopy, Nanoscopy and Imaging Sciences (BSyM 2021) was held online in June 2021. An outstanding list of keynote speakers, including electron microscopy, optical microscopy, scanning probe microscopy, Raman Imaging and Spectroscopy, Imaging Technology and correlative microscopies, among others, participated and made for a great event once again.

The Symposium, co-organized with ICFO and ICN2, and sponsored by the Spanish Microscopy Society, counted with eight keynote speakers, 24 flash talks and more than 200 attendees. The list of Keynote speakers included: Niels de Jonge (INM – Leibniz Institute for New Materials; Saarbrücken, DE), Guillaume Schull (Institut de Physique et Chimie des Materiaux, Strasbourg, FR), Frances M Ross (MIT, MA, US), Roger Proksch (Asylum Research and Oxford Instruments, Santa Barbara, US), Verena Ruprecht (CRG, Barcelona, Spain), Willy Supatto (Ecole Polytechnique, Paris, FR), Francisco Balzarotti (Research Institute of Molecular Pathology, Vienna, AU), and Melike Lakadamyali (University of Pennsylvania, US).

Sustainable Research

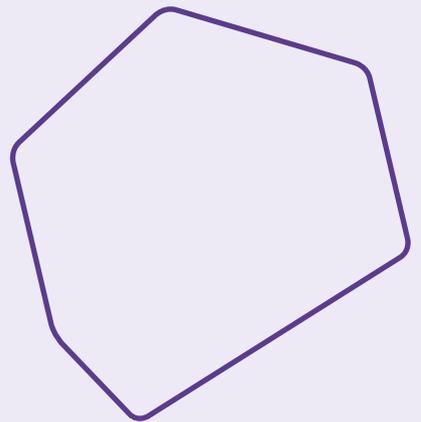
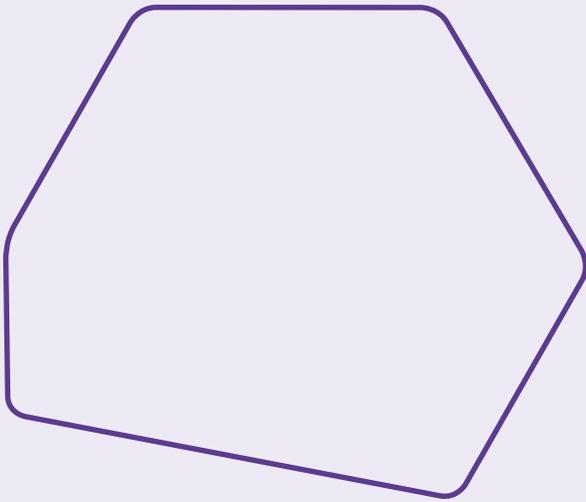
A COMMITMENT TO REDUCE THE ENVIRONMENTAL IMPACT OF OUR RESEARCH ACTIVITIES



BIST has made an explicit commitment to sustainable research, which reinforces our position as responsible members of society and ultimately makes us more competitive. BIST works towards more sustainable research in various ways, including raising awareness of the environmental impact of the work done by our community of researchers and science professionals, and promoting best practises to reduce them. Working across all BIST Centres, we look to establish measures and protocols to increase the sustainability profile of our activities. This means, for example, prioritising sustainability and the reduction of environmental impact when making decisions about the management of our premises and research facilities, or the construction of new ones.

As a noteworthy action, in October 2021, BIST launched the **Green Lab = Cleaner World** awareness campaign to encourage the BIST Community to take individual and collective action to save energy, reduce and manage waste properly, and diminish our carbon footprint. The campaign was illustrated by the artist Marina Juanet whose graphics were incorporated into internal messaging as well as social media postings. The seven BIST Centres worked together through the Sustainable Research Working Group to establish nine weekly messages sent to the BIST Community. Each message came with an illustration inviting everyone to take action. Some of the Centres posted the illustrations within the laboratories as a friendly and beautiful reminder to the community.

BIST-MERCAT DEL PEIX BUILDING



BIST-Mercat del Peix Building

DESIGNING 25,000 m² DEDICATED TO BIOMEDICAL RESEARCH



In July 2021, a project to design the new BIST-Mercat del Peix building presented by the Barcelona-based studio Barozzi Veiga was selected in an international architecture competition organized by BIST. The jury chose Barozzi Veiga's proposal among five finalists for the uniqueness of its proposed design, characterised by its volume and defining eaves, the interior layout, and its solutions in response to environmental requirements.

The BIST-Mercat del Peix building will house, in its nearly 25,000 m², more than 500 researchers and some sixty research groups conducting biomedical research from four BIST centres (CRG, IBEC, ICN2, and IRB Barcelona). Hence, the new BIST facility will allow a very close interaction among researchers working in disciplines such as nanotechnology, genomics, molecular biology, and bioengineering, working towards understanding the mechanisms behind pathologies and finding new ways to prevent and cure disease through better diagnostic, prognostic and therapeutic systems. Having shared state-of-the-art technological platforms and laboratories under the same the roof will also contribute to further push the limits of BIST multidisciplinary research in health.

To oversee the design and construction of the new building, Albert Texidor, a civil engineer with vast experience in the management of construction projects, joined the BIST core team in September 2021. Also, a dedicated working group formed by the Heads of Facilities and Infrastructures of the four centres that will occupy the BIST-Mercat del Peix building was created to define the spaces and technical requirements of the building.

Part of the 2021 expenditures for the BIST-Mercat del Peix building were covered by funds from a competitive grant by the Generalitat's Department of Research and Universities within the framework of the EMC/954/2019 call. This call was aimed at implementing singular institutional projects that generate excellent research, attract talent, and develop knowledge transfer and valorisation by means of constructing, acquiring, refurbishing, or substantially extending buildings for the purpose of housing R&D infrastructures.

The construction of the new building will start in the autumn of 2023, and it is expected to be completed by the end of 2025.

A prime location to develop strategic BIST objectives

The new building will be constructed near Barcelona's *Parc de la Ciutadella*, where the city's old Fish Market (*Mercat del Peix* in Catalan, hence the naming) used to be. The project for the Mercat del Peix area -roughly 7,500 m² currently used as an outdoor parking- also involves the construction of two additional new buildings, one to consolidate in one space the Institute of Evolutionary Biology (IBE, CSIC-UPF), devoted to biodiversity, and a second building for the Pompeu Fabra University (UPF), dedicated to research and innovation for planetary wellbeing. Below these three new buildings, the company Barcelona Serveis Municipals (B:SM) will build and manage an underground parking. The construction of this parking, and hence the foundations for the BIST-Mercat del Peix building, will begin in the last quarter of 2022.

It is worth pointing out the Mercat del Peix project and its three buildings dedicated to research, are the first action within the





Ciutadella del Coneixement (Knowledge Citadel) initiative, to include additional scientific, cultural, and urban planning components. The initiative, which is led by the Barcelona City Council and UPF, together with the Catalan Government, and with the support of the Spanish Government's 2030 Agenda, aims to turn the Parc de la Ciutadella area in the centre of Barcelona into a **hub of reference for science and knowledge in southern Europe**.

The new BIST building in the Mercat del Peix is strategic for advancing some of the BIST agenda for the coming years: **to exploit synergies within BIST Centres and to enhance interactions with hospitals and clinicians**. The Mercat del Peix site is in an area of Barcelona where other relevant health-related institutions, such as the Barcelona Biomedical Research Park, the European Molecular Biology Laboratory, the Barcelona Beta Brain Research Centre, and the Hospital del Mar, among others, are located. Therefore, the construction of the BIST-Mercat del Peix building will not only facilitate collaboration within the BIST community, IBE and UPF, but also allow for alliances with researchers and practitioners from nearby institutions sharing a privileged space in the city.

EDUCATION & TALENT

BIST wants to attract the brightest researchers from around the world by offering a stimulating working environment and accompanying them at each step in their careers. BIST Education and Talent activities cover all stages of the scientific career, from academic programmes to jumpstart scientific careers (such as the BIST Master of Multidisciplinary Research in Experimental Sciences, MMRES), to professional workshops and coaching offered under the BIST Global Science programme. These are designed for researchers interested in transitioning to sectors such as education, business, or public policy. Between these two extremes lies a wide range of BIST training courses, designed to help researchers develop their scientific careers and make full use of their capabilities.

BIST Master

WELCOMING THE FIFTH MMRES EDITION



The Master of Multidisciplinary Research in Experimental Sciences (MMRES) is a full time, one-year programme (60 ECTS credits) run by the **BIST Dolors Aleu Graduate Centre**, affiliated to the Pompeu Fabra University (UPF). The MMRES programme is based on experiential learning through the development of two research projects in different disciplines in laboratories from BIST Centres and the Department of Medicine and Life Sciences (MELIS) of Pompeu Fabra University (UPF), under the supervision of outstanding researchers. The students also receive training courses on statistics and data analysis, responsible research and science communication, advance microscopy and imaging techniques, and seminars by internal and external researchers.

MMRES students are selected based on their academic performance and research potential by a selection committee according to criteria established by the Master Commission. As it can be seen in the Facts and Figures section of this report, 84 students have successfully graduated from the MMRES since it was launched in 2017. Approximately 75% of them enrolled in a PhD after

EDUCATION & TALENT

completing the MMRES, many at BIST Centres and some at other prestigious international universities such as Harvard, Stanford and Imperial College London. Also, MMRES students have produced 41 research publications up to date.

On September 14, 2021, BIST held the **Fifth Annual MMRES Ceremony** at the Fundació Catalunya La Pedrera Auditorium. The event brought together 22 incoming students from the 2021/2022 class and 21 class of 2020/2021 graduating students. The event celebrated the enormous achievements of the outgoing class and welcomed the new cohort into the BIST Community, with a keynote speech by the group leader at ICFO, Pelayo Garcia-Arquer.



The MMRES programme includes various activities open to the broad research community. Among them, the BIST Colloquium Series in which renowned local and international researchers are invited to give seminars. In 2021, the following researchers participated as speakers in the spring and fall Colloquium Series:

Spring (course 2020/21): José Ramón Galán-Mascarós (ICIQ), Arnau Sebe (CRG), Aurelio Juste (IFAE), Lorenzo Albertazzi (IBEC), Cecilia de Carvalho (ICN2), Núria Lopez-Bigas (IRB Barcelona), Ana Janic (DCEXS), Stefan Wieser (ICFO)

Fall (course 2021/2022): Donat Weggorn (CRG), Oriol Gallego (DCEXS), Maria Jose Esplandiú (ICN2), Roger Gomis (IRB Barcelona), Irene Marco-Rius (IBEC), Valerio Pruneri (ICFO), Toni Llobet (ICIQ), Aurelio Juste (IFAE)

Also open to the research community is the BIST Symposium on Microscopy, Nanoscopy and Imaging Sciences, which was held in June (see page 36).

The MMRES is managed by the Academic Committee, which, among other tasks, evaluates candidates to ensure the quality of the programme. Also, a Technical Committee oversees the programme dissemination, the incorporation of the students, and the development of the activities that take place at the Centres. This MMRES technical committee members are Anna Solé (CRG), Ciara Boter (IBEC), Katerina Kiourtzidou (ICN2), Noelia Flores (ICIQ), Alba Echarte (IRB Barcelona), Mireia Vilamala (ICFO), Rafel Escribano (IFAE), and Rubén Vicente (MELIS-UPF).

Working towards the AQU Catalunya accreditation

The BIST Dolors Aleu Graduate Centre is fully responsible for the academic management of the MMRES since 2019. In 2021, an application was submitted to accredit the MMRES by the **Catalan University Quality Assurance Agency (AQU Catalunya)**. AQU Catalunya is an independent, internationally recognised public entity, whose mission is quality assurance of higher education in Catalonia in accordance with international quality, academic and social standards, while safeguarding the interests of society in ensuring that higher education fulfils its potential. As part of the accreditation procedure, an external panel appointed by AQU Catalunya conducted interviews with the MMRES coordinators, some of the teachers, current students, and alumni.

MSCA-COFUND Programmes

PREBIST PHD STUDENTS AND PROBIST POSTDOCTORAL RESEARCHERS

ARE YOU PROBIST?

Postdoctoral Researcher Programme

LAST CALL!!

10 fellowships available to develop a **two-year** research project at scientific centres of excellence in Barcelona

Deadline: 17/6/2021

www.bist.eu/probist

BIST Barcelona Institute of Science and Technology

ICFO ICIQ ICN2 IFAE IRB

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 754510

In 2017, BIST obtained two competitive H2020-MSCA-COFUND projects, bringing 9.5 million euros from the European Commission to cofund a pre-doctoral programme (PREBIST) and a postdoctoral one (PROBIST). Thanks to these two programmes, 28 PhD students with four-year fellowships, and 61 postdoctoral fellows with three-year fellowships, have been incorporated in participating BIST Centres. Both programmes run until the end of 2023.

In 2021, some of the postdoctoral fellows in the PROBIST first call ended their training period, and a few others left the programme to pursue other opportunities. These fellows continued their careers as group leaders, independent consultants, researchers in industry or senior postdocs in Austria, Germany, Italy, Poland, Slovenia, Switzerland, United Kingdom, China, USA and Spain.

In April, a fifth PROBIST call offering ten additional two-year fellowships was launched. This last call resulted in the incorporation



of nine postdoctoral researchers (3 women and 6 men) in five BIST Centres: Máté Farkas, Stefano Signorini and Victoria J. Wright at ICFO; Ranga Rohit Seemakurthi at ICIQ; Thomas Guillet at ICN2, Mervé Nazlim Agaras, Adrian Macquet and Ignasi Pérez Ràfols at IFAE; and Margherita Protasoni at IRB Barcelona.

The PREBIST and PROBIST fellows came together on November 4 at the online BIST Annual Conference Satellite Event “Presenting the research breakthroughs of the new generation of scientific leaders”. As part of the event, five PROBIST and two PREBIST fellows presented their research advancements through flash-talks. The session was recorded and may be seen in the BIST YouTube channel.

To further grow the BIST postdoctoral programme, in 2021 BIST submitted a proposal to the HORIZON-MSCA-2021-COFUND call. This project proposal, named **PROBIST Plus**, is an ambitious programme intended to recruit 55 postdoctoral fellows for the seven BIST Centres. The programme contemplates, alongside cutting-edge research, training on leadership and research management, and complementary training to increase science impact on society.



The PREBIST and PROBIST projects have received funding from the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreements No. 754558 and No. 754510, respectively.

BIST-FBA Fellows

THREE NEW POSTDOCTORAL RESEARCHERS JOINED BIST CENTRES



In 2020, BIST and the **Bosch Aymerich Foundation (FBA)** launched the BIST-FBA Fellows Programme to promote outstanding scientific research and teaching in the fields of health and the environment. The programme involved the recruitment of six excellent researchers for a period of three years, to be incorporated in BIST Centres and in the Universitat Internacional de Catalunya (UIC Barcelona). Two calls, one at UIC and one at BIST, were launched in 2020 to select the six fellows. Three postdoctoral fellows joined BIST Centres in 2021 as a result. Their bios follow.



James Eills. James joined the group led by Irene Marco-Rius at IBEC after moving from the Division of Chemistry at the University of Southampton (UK). His research project seeks to accelerate preclinical methods development by implementing parahydrogen-induced polarization as a rapid and inexpensive method to produce hyperpolarized biomolecules. These biomolecules will be key to the development of hyperpolarized magnetic resonance imaging (MRI) as a clinical tool for probing medical conditions.



Ekaterina Khestanova. Coming from the Department of Physics and Engineering at ITMO University (Saint Petersburg, Russia), Ekaterina joined ICFO's Quantum Nano-optoelectronics research group, led by Frank Koppens. Her research project focuses on the study of optical properties of superconductors in the THz range, a field that has important applications in communication and energy. This project is being developed in collaboration with ICN2.



Marion Salzer. Trained as a PhD student at IRB Barcelona, Marion joined CRG's Böke Lab to study the potential aging of dormant oocytes at the molecular and functional level using single-oocyte transcriptomics combined with ovary transplantation experiments in mice. Her research results are expected to be of great importance for the development of new therapeutic strategies to delay or even prevent oocyte decline with age.

The three researchers who joined the UIC thanks to the BIST-FBA Fellows Programme were: **Conrado Aparicio**, researcher in biomaterials and dental implants, **Lorenzo Chelleri**, expert in sustainability in architecture, construction and urban planning, and **Osnat Hakimi**, expert in biomedicine, bioinformatics and bioengineering. The later left UIC in September 2021, and a new call was launched towards the end of the year. Conrado Aparicio also joined IBEC as an associate researcher to develop his multidisciplinary research project to create advanced biomaterials for the repair and regeneration of human tissues in dental, orthopaedic and other biomedical applications.

On November 17, an event to introduce the BIST-FBA Fellows to the Fundació Bosch Aymerich Board was held at the UIC. UIC Rector Alonso Méndiz, BIST President Andreu Mas-Colell, UIC vice-rector of Research, Innovation and Knowledge Transfer Cristina Monforte, and BIST Director General Gabby Silberman participated in the event.



Career Development Programme

TOOLS AND SKILLS FOR RESEARCHERS AT ALL CAREER STAGES



"I've specially liked the fact it was really interactive and full of useful tips"

Participant in **How to succeed in your PhD I course**

"I liked the variety of specific tools that were given that I can actually use and apply to my work"

Participant in **How to succeed in your PhD II course**

"A course that teaches you that some of the daily problems of scientists have been studied and some of them have pretty simple solutions."

Participant in **How to succeed in your PhD II course**

Led by the People Working Group, the Career Development Programme offers an array of courses and activities to help researchers succeed in different phases of their careers. Some of the courses are also open to the broader research community, which gives additional visibility to BIST within the Catalan research community.

Feedback from participants is systematically collected at the end of each course, allowing the Programme to improve with every edition. In 2021, a total of **382 researchers** (14% external to the BIST Community) participated in the six courses featured in this programme. Most of the courses were held online. These courses were:

HOW TO SUCCEED IN YOUR PHD I (February, 48 participants)

Intensive two-day course intended for first-year PhD Students. Using VITAE's framework, participants use and develop skills essential for a researcher, such as communication, planning, time management, problem solving or conflict resolution. Even though the course was held online, the course was very interactive, and small learning groups were used.

HOW TO SUCCEED IN YOUR PHD II (April, 36 participants)

Addressing the needs of PhD Students in the second or third year of their PhD work, this four-day course was held online spread over

"The SMART objective framework has been particularly useful for me. I can now systematically review whether a project is lacking some of these objectives (most of the times, it is either unrealistic or not timebound) and correct it. I think this has saved me a lot of time!"

Participant in **Leadership in action course**

"A good course to understand how to choose a call and what do you need to work out before and during the writing of a proposal"

"The trainer was excellent in all senses. His own experience as evaluator was extremely relevant for us."

Participants in **How to Write a Competitive Proposal for Horizon Europe course**

"The real examples helped me to have a better idea of the many aspects you need to consider when applying for a patent."

Participants in **Patents and other IPR for Researchers course**

two weeks. It provided a blend of experiential and reflective learning opportunities, covering aspects such as High Intensity Productivity, wellbeing and resilience.

LEADERSHIP IN ACTION (March, 36 participants)

Offered to Postdoctoral Researchers, this course uses VITAE's framework to help researchers in developing leadership skills, including stress management and effective communication.

HOW TO PREPARE A EUROPEAN RESEARCH STRATEGY (May, 61 participants)

Workshop designed to help Directors, Senior Support Staff and Researchers to plan strategically for Horizon Europe.

HOW TO WRITE A COMPETITIVE PROPOSAL FOR HORIZON EUROPE

(July, 84 participants)

A workshop designed to train researchers, research managers and research support services in writing professional and competitive proposals for Horizon Europe. The course analysed the relevance of Horizon Europe to EU policies, common problems in proposal writing and success criteria for proposals.

PATENTS AND OTHER IPR FOR RESEARCHERS (November, 48 participants)

Three-day course targeted at researchers with advanced ideas and projects that need to get ready for IP protection, as well as for those individuals interested in tech transfer, learning how to read a patent, or taking full advantages of the possibilities of technology transfer. Real examples from BIST Centres technology transfer departments were also presented.

In addition, two workshops designed for researchers supervising Master and PhD students were offered in April (19 participants) and May (50 participants), respectively. Both workshops were two half-day long and provided interactive training focused on developing supervision skills.

BIST Global Science

KNOWLEDGE AND TOOLS FOR CAREER TRANSITIONS



In addition to seeking permanent positions in academia as group leaders, senior researchers or university professors, some of our PhD students and postdocs may consider reorienting their careers to other sectors in need of outstanding talent. The BIST Global Science Programme is a framework to offer these researchers the necessary knowledge and tools to inform their consideration of career paths in areas that can benefit from top scientific talent, such as **science education, business and entrepreneurship, and public policy.**

CAREER WEEK

In July 2021, BIST organized its first Career Week over five days of online morning workshops and afternoon roundtables with inspiring speakers from different backgrounds, professional trajectories and current positions. The workshops with titles such as *LinkedIn and Twitter for researchers*, or *How to face a job interview?* were meant to give practical tools to researchers to plan their next career move. The roundtables showcased a variety of career possibilities, including academic research, science communication, pharma and industry possibilities, data science, and consultancy. The Career Week attracted an average of 70 participants for each of its events.

INNOVATION WEEK

"Getting an overview over the general innovation process was great. I valued the workshops to get hands-on practise, and I think it's great that we have access to all materials and recorded webinars."

Participant in the Innovation Week



On the last week of November 2021, BIST held its first Innovation Week: four days of webinars and online workshops on topics such as, value proposition analysis, business model design and improvement, market orientation, problem-solution fit, funding sources and pitching skills. The programme included company showcases and hands-on analysis during the workshops. Approximately 30 people participated in the webinars and workshops every day. The Innovation Week was offered in the framework of the GraphCAT initiative, as part of its activities on valorisation and tech transfer.

BIST-ESADE FROM SCIENCE TO BUSINESS COURSE

"It was pitched at exactly the right level for me, consolidating much basic knowledge that I have without having formal business training."

Participant in the BIST-ESADE FS2B



"Working with other people from other and other scientific fields was very motivating and a great experience."

Participant in the BIST-ESADE FS2B

In collaboration with the prestigious ESADE business school, BIST organized once again in 2021 the BIST-ESADE From Science to Business (FS2B) course, with the goal of expanding the innovation and entrepreneurship knowledge among the BIST community. The programme kicked-off with a roundtable discussion with leading academic researchers and BIST spin-offs founders, CEOs and CTOs, followed by a 4-day course spaced from October 4 to 15. Course

EDUCATION & TALENT

attendants worked on their own scientific projects, analysed their market potential and value proposition, developed a business plan and learned how to pitch in front of an investor. Researchers got acquainted with the business world and with the venture creation process, which allowed them to consider entrepreneurship as an attractive career path. 30 researchers (mainly postdocs) from the seven BIST Centres, as well as some from external institutions, such as the ALBA-CELLS Synchrotron, participated in this course which took place in the Pedralbes Campus of ESADE.



MENTORING PROGRAMME

In October 2021, BIST launched a Mentoring Programme, an eight-month initiative designed to help junior researchers, such as PhD students and postdoctoral researchers, articulate their professional aspirations and get support as they explore and develop their individual career paths. The mentors are senior researchers, scientific staff, and external professionals who share their expertise with the next generation of talented and motivated scientists. Before starting the actual mentoring, all programme participants take a three-hour professional online training session. In the first edition, 35 mentor-mentee couples were matched and given access to a dedicated website (mentoring.bist.eu) with guidelines and support materials for this new programme.



A Supportive Work Environment



To attract top talent, BIST strives to provide a best-in-class workplace environment for research professionals. To reach this goal, we work to establish policies and follow best practices to promote gender equality, diversity and inclusion, support for mental health and wellbeing of our community. During 2021, we also carried out activities, some listed below, to encourage community engagement in opportunities to increase motivation and a sense of purpose.

ANNUAL CONFERENCE SATELLITE EVENT ON WELLBEING AND MENTAL HEALTH

On November 5, BIST organised an online session titled *Wellbeing and mental health in science: towards a more enjoyable research career*. Moderated by BIST Talent Programme Manager Elena Redondo, the event hosted experts Kate Jones, Head of Learning and Professional Development at Vitae (UK); Elena Martínez, Group Leader and Talent and Training Deputy Director at IBEC; and Hanna Kranas, PhD student at IRB Barcelona involved in the Psychosocial Risk Evaluation Team and Student Council of the Institute.

COURSE ON RESILIENCE & WELL-BEING TOOLS AT WORK

On November 23, a four-hour workshop open to all the BIST community was held at ICFO. The workshop helped researchers in identifying and introducing healthy habits to increase health and well-being, as well as learn and practice stress-management techniques.

Supporting Women Researchers

As seen in the Facts and Figures section of this Annual Report, there is a gender gap in higher level research positions at the BIST Centres, where women represent 38% of postdoctoral researchers, only 22% of its group leaders, and there are presently no women directors. We have seen the numbers improve over the past two years, in particular from 18% women as group leaders in 2019. However, much work remains to be done. The policies developed by BIST Centres and specific joint programmes, as described below, are steps taken to reduce this gender gap, present in science and technology in practically all developed countries worldwide.

BIST is fully committed to support women researchers in achieving leadership positions, through actions such as providing training and networking opportunities for women researchers, and making them and their research outputs more visible. In 2021, these included the screening and subsequent debate of the documentary *Picture a Scientist*, and events related to the *100tiffiques* initiative. Gender equality is a value embedded in all BIST activities, from speakers we select for conferences, to the composition of selection panels for our programmes.

On March 11, BIST organised an online screening of the documentary **Picture a Scientist** exclusively for members of its community, as well as an open online debate about the film and how to make science more diverse and equitable. In the documentary, biologist Nancy Hopkins, chemist Raychelle Burks, and geologist Jane Willenbring lead viewers on a journey deep into their own experiences in the sciences, ranging from brutal harassment to years of subtle slights. Along the way, from cramped laboratories to spectacular field stations, we encounter scientific luminaries –including social scientists, neuroscientists, and psychologists–

who provide new perspectives on **how to make science itself more diverse, equitable, and open to all**. Members of the BIST Community debated various topics arising from the film, such as sexual harassment (with the vast majority consisting of subtle slights and micro aggressions), underestimation of female scientists' work, the pressure many women researchers feel not to take family leave so as not to reduce their potential for success, and more.



In 2021, there were **two #100tifiques meet-up events**: one online on January 21, which also served as a training session to prepare the talks given at schools on February 11, and one in-person session on June 10 at Parc Científic de Barcelona in the framework of the City and Science Biennial. The in-person event, also streamed online, was opened by Barcelona's Mayor, Ada Colau, and included a talk by Anna N. Schlegel, Vice President of Procore Technologies' Department of Product, International Market and Globalization, and a roundtable on how to expand the influence of women in science. Participants in the roundtable included Gina Aran, CEO at Inginium, lecturer and academic director at ESADE, Mònica Roca, president of the Barcelona Chamber of Commerce and founder and CEO of the isardSAT group, Anke Kleff, Senior HR Development Officer at IBEC, and Marina Garcés, philosopher, essayist and associate professor of Contemporary Philosophical and Scientific Thought at the Universitat Oberta de Catalunya (UOC). A motivational video for girls to pursue STEAM careers was produced as part of the event.

BIST & SOCIETY

An essential part of the BIST mission is to boost the social and economic impact of our research. Towards this goal, BIST collaborates with public and private entities and opinion leaders in areas as diverse as science education, entrepreneurship and industry, arts and culture, and public policy.

In 2021, we expanded our activities to nurture a dialogue with society at different levels. Examples include broadening the programme of our Annual Conference to also feature a session for high-school students, a number of joint activities with industry under the GraphCAT umbrella, and leadership roles in several of the City and Science Biennial activities.

SCIENCE EDUCATION

Angeleta Ferrer Institute

A HIGH SCHOOL FOCUSED ON STEAM DISCIPLINES OPENED ITS DOORS



Visit of Angeleta Ferrer Institute's construction site with institutional representatives



On February 2021, the Minister of Education of the Catalan Govern Josep Bargalló announced that a new public high school in Barcelona, named “Institut Angeleta Ferrer”, would be the first centre in Catalonia focused on encouraging and improving the education of science, technology, engineering, art, and mathematics (STEAM), in collaboration with BIST. The Angeleta Ferrer Institute aims to become a reference for all institutes in Catalonia for promoting secondary and baccalaureate students’ vocations in the areas of STEAM. The centre is also intended as a centre for training teachers and carrying out educational research in these areas, inspiring other institutes to adopt its educational model. The announcement of this collaboration among the Catalan Department of Education, the Barcelona Education Consortium

and BIST was made at the construction site of the new high school, with the presence of local media, and the participation of BIST Director General Gabby Silberman and BIST Director of Programmes Núria Bayó.

In September, the Angeleta Ferrer Institute started its educational activity with 60 first-course students in a temporary location nearby BIST headquarters. The Institute’s director is Blanca Armengual, who brings to her position experience in both research –she holds a PhD in Biology and did postdoctoral research at the Institute Pasteur, in Paris- and teaching –over ten years teaching sciences in high school. The institute will grow with new cohorts of students over the coming years.

#100tífiques

REACHING NEARLY 500 SCHOOLS ACROSS CATALONIA



In 2021, BIST once again worked with the Fundació Catalana per a la Recerca i la Innovació (FCRI), and in collaboration with the Generalitat de Catalunya's Department of Education, to organize the third edition of #100tífiques. This annual event aims to break gender stereotypes by highlighting women's contributions to science and technology, and by empowering children—girls especially—to pursue STEM fields (Science, Technology, Engineering, and Math). The event took place on February 11, 2021—the International Day of Women and Girls in Science, with more than 450 women scientists giving talks at 483 schools across Catalonia. Due to the COVID-19 pandemic the event was held virtually, and reached a total of around 20,000 school children. In addition to the main event on February 11, two #100tífiques training and networking meet-ups were also organized in 2021. The first took place online on January 21 and brought together more than 300 researchers participating in #100tífiques to network, prepare their presentations, and discuss the shared goal of promoting women role models for children. The second gathering took place in-person on June 10 at Parc Científic de Barcelona in the framework of the 2021 City and Science Biennial (Biennial Ciutat i Ciència). Barcelona's Mayor, Ms. Ada Colau opened the event, which included a roundtable on increasing women's influence in science and society.

Quantum in High Schools

A SATELLITE EVENT OF THE BIST ANNUAL CONFERENCE REACHES 1400 STUDENTS



As part of the 2021 BIST Annual Conference, a satellite session was built specifically for 14- to 18-year-old high school students to learn about quantum technologies. The session, titled “Què són i per què serveixen les tecnologies quàntiques?” (“What are quantum technologies and what is their use?”), took place on November 16 as part of the 2021 Science Week (Setmana de la Ciència). Researchers from three BIST centres—ICFO, ICN2, and IFAE—explained in an engaging and inspiring way what quantum technologies are and why they have become so important. More than 1400 high school students from 44 schools in Catalonia registered for the event, which took place online. Some of the topics covered during the session included the quantum behaviour of photons, the quantum internet, what is a quantum computer, and how to build one.

Amgen TransferCiència

IMPROVING SCIENCE EDUCATION

BIST collaborated in the second edition of Amgen TransferCiència in 2021. The programme, organised by the biotechnology company Amgen and the Fundació Catalana per a la Recerca i la Innovació (FCRI), brings researchers into high school classrooms to improve science learning and support teachers, especially in areas such as genetics and biotechnology. For the second year in a row, BIST was responsible for selecting the researchers to be placed in high schools across Catalonia. These included 14 talented scientists from 10 research institutes, including two BIST centres: IBEC and IRB Barcelona. More than 800 students from four autonomous communities in Spain benefitted from the programme in 2021. From a BIST perspective, this initiative fits within the BIST Global Science programme, which gives postdoctoral researchers the skills to pursue positions in important sectors including research leadership, business, science policy, and science education.

INDUSTRY

Spin-off companies

BIST and BIST Centres are strongly committed to innovation and knowledge transfer. In 2021, researchers from the BIST Community created five new spin-off companies, bringing the total number to 45, of which 39 are still active companies. The new spin-offs launched in 2021 are:



Cooling Photonics (ICN2): The company's technology provides passive cooling solutions without energy consumption or carbon emissions.



LuxQuanta (ICFO): Its mission is to deliver an unprecedented way of securing communications and data, integrating innovative and secure Quantum Key Distribution (QKD) systems into current telecommunications infrastructures.



Nuage Therapeutics (IRB Barcelona): Its goal is to leverage chemical biology and biomolecular condensation to develop selective drugs targeting proteins with disordered regions for unmet medical needs.



Vitala Technologies (IBEC): It delivers deep insights into metabolic kinetics at the cellular level, improving the quality of life and eliminating erroneous, or even hazardous, medical treatments.



Vitsolc (ICFO): It produces transparent photovoltaic modules to convert sunlight to electricity with a high potential to be integrated within any type of object or vehicle.

BIST spin-offs had a good year for fund-raising. **INBRAIN Neuroelectronics**, an ICN2 spin-off, raised 14.35M€ to bring graphene technologies to patients; Data orchestration startup **Seqera Labs**, spun out from the CRG, raised \$5.5 million in seed

funding; and **Deep Detection** (IFAE) raised 1M€ for X-ray inspection technology. Alta Life Sciences led an oversubscribed investment round into **Inbiomotion** (IRB Barcelona) to launch its diagnostic product in breast cancer; and **Quside** (ICFO) received funding from the Catalan Department of Business and Labor.

It was also a year of awards for a couple of BIST spin-offs, as CRG received the Catalonian National Research Award for Creating a Science-based Enterprise for its spin-off **Pulmobiotics**, and **Trellum Technologies** (ICIQ) won Emprèn Award from Diputació de Tarragona.

BIST at the 4YFN, Mobile World Congress 2021



4YFN (4 Years From Now) is the startup event of the world's largest exhibition for the mobile industry, the GSMA Mobile World Congress. The goal of the event is to bring together startups, investors and companies to connect and launch new joint business ventures. For the first time, on June 29, 2021, BIST organized a workshop in the 4YFN event, with the topic: "From Lab To Market: Showcasing Three Deep Tech Startups from quantum computing to photoreactors to drug discovery". In this session, BIST introduced scientific entrepreneurs and founders representing spin-offs from three BIST Centres, featuring industry sectors as diverse as quantum computing (Qilimanjaro Quantum Tech), photoreactors for photocatalytic chemical reactions (Trellum Technologies), and computing technologies for drug discovery (Nostrum Biodiscovery). The speakers discussed specific challenges scientific entrepreneurs need to face and overcome in front of a full audience of researchers and entrepreneurs.

EIT Health

A KNOWLEDGE AND INNOVATION COMMUNITY



As a core partner of EIT Health, the knowledge and innovation community of the European Institute of Innovation and Technology focused on health, BIST participated in several events during 2021. These included Partners Forums and Assemblies, as well as the main matchmaking event for Business Plan 2022.

The main goal of the **EIT Health Matchmaking Event** for the Business Plan 2022, held online February 2 through 5, 2021, was to network and identify project partners for new activity proposals. BIST held one-to-one meetings with industry and academia partners to analyse potential collaborative proposals and took part in sessions for Education and Business Creation activities. As a result, BIST, together with the three BIST Centres IBEC, CRG and IRB Barcelona, have joined the European Consortium of over 15 European corporations and institutions that will launch the **SCIFI Programme – From Scientists to Innovators for Industry** in 2022, supported by EIT Health. This course will help researchers transition from academic research to working in the pharma and MedTech industry with the guidance of academic and industry partners.

GraphCAT

THE GRAPHENE COMMUNITY OF CATALONIA



BIST is an institutional member of the GraphCAT Community, whose goal is to establish Catalonia as an international reference in **graphene research, development and innovation**, with multiple local industries deriving strong competitive advantage in the global marketplace through the integration of proprietary graphene technologies into their products and services. The GraphCAT community, which is formed by ten institutional and six associated members, is coordinated by BIST Centres ICN2 and ICFO.



Unió Europea
Fons Europeu
de Desenvolupament Regional



Generalitat de Catalunya
Departament de Recerca
i Universitats

GraphCAT projects and activities are co-funded through the Catalan regional Research and Innovation Strategy for Smart Specialisation, RIS3CAT, which in turn is co-financed by the European Regional Development Funds (ERDF) within the framework of the ERDF Operational Programme of Catalonia 2014-2020, with the support of the Departament de Recerca i Universitats from the Government of Catalonia (GraphCAT 001-P-001702).

Below these lines we showcase some of the activities organized or participated by GraphCAT in 2021. BIST's Head of Innovation & Business Development, Clara Barreneche, had an active role in most of them.

Kick-off and Community Building event (March and April; online)

The GraphCAT kick-off event took place online in March, bringing together all GraphCAT members to identify synergies, share common challenges and define activities for 2021 and 2022 that provide real value to partners and maximise GraphCAT's impact. In April, there was a co-creation workshop for GraphCAT members as well as an INFOday on European funding for graphene research and innovation projects.

Expoquimia (14-17 September; Fira de Barcelona)



BIST, together with ICN2 and ICFO, organized several GraphCAT-related events at Expoquimia, the international chemistry trade show, which took place from September 14 to 17, 2021, at Fira de Barcelona. The main objective was to provide visibility and exposure to the GraphCAT research projects and establish contacts to foster collaboration with companies and institutions participating in the show. Expoquimia had 15,000 visitors and 377 exhibitors in 2021. A GraphCAT stand was setup to hold meetings among GraphCAT members and visiting companies and institutions. Additionally, two GraphCAT presentations titled *GraphCAT: Graphene Technologies in Catalonia* and *GraphCAT: Accelerating the Commercial Trajectory of Graphene*, were held at the Expoquimia Tech Transfer Forum.

Graphene Conference (26-28 October; Grenoble, France)

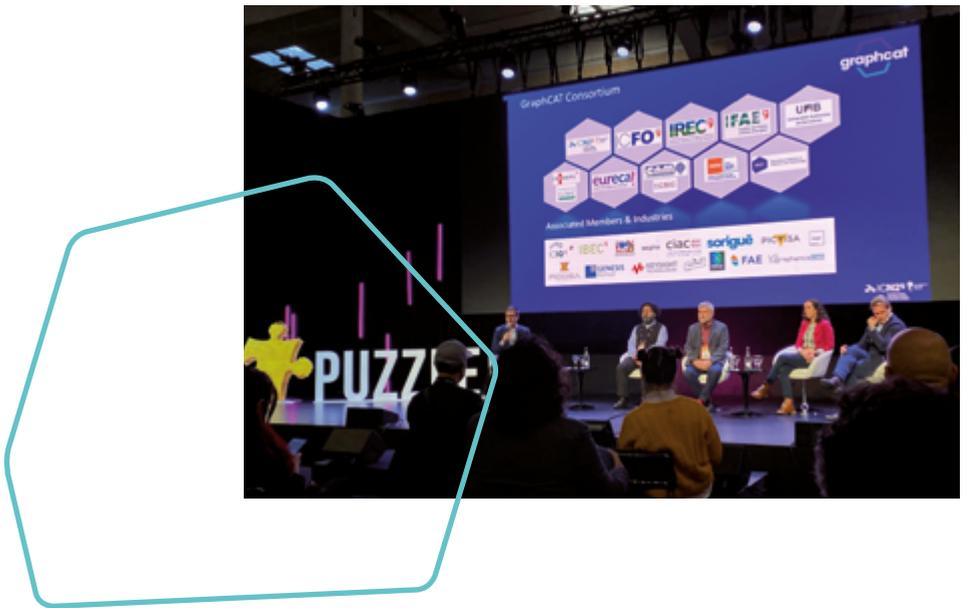
With more than 400 participants in its 2021 edition, the Graphene Conference is one of the largest events in Europe dedicated to graphene. GraphCAT had a prominent presence at the event with a delegation of more than 40 GraphCAT partner representatives, mainly from ICN2, ICFO and BIST, who also organised an exhibition stand in which meetings were held. On October 28, a session with six speakers from GraphCAT presented the initiative and some of the graphene research projects developed within the framework of the programme.

Puzzle X forum on Frontier Materials (16-18 November; Fira de Barcelona)



BIST, ICN2 and ICFO sponsored and coordinated the GraphCAT participation in the first edition of **Puzzle X**. This forum is meant “to bridge the world of Frontier Materials, societal impact, entrepreneurship, venture building, corporate innovation, bleeding edge of material science and United Nations Sustainable Development Goals to facilitate the use the materials of the future to help our world today”. Puzzle X’s first edition received more

than 1,000 visitors from all over the world and had an extensive program of conferences throughout its three days. A large GraphCAT stand was set up for BIST Centres and their spinoff companies working on advanced materials to present projects, showed demos and held meetings with companies and investors during the three days of the event. GraphCAT also organised a roundtable titled *Graphene Catalonia: Driving the Graphene Evolution*, with speakers Dr. Jose Antonio Garrido, Group Leader, ICREA Professor and Vice Director at ICN2, Dr. Nina Carretero, Staff Scientist at IREC, Dr. Anibal Pacheco-Sanchez, Computational Nanoelectronics Research Group (NANOCOMP) at UAB, Dr. Pedro Gomez-Romero, Group Leader at ICN2 and Josep Ll. Sanfeliu, Managing Partner and Co-Founder at Asabys Partners.



BROADER SOCIETY

City and Science Biennial

A WEEK OF ACTIVITIES FOR ALL KINDS OF AUDIENCES



The second edition of the City and Science Biennial (Biennial Ciutat i Ciència) took place in Barcelona from June 8 to 13, 2021, with more than 250 activities and around 300 speakers. This massive event, organised by the Barcelona City Council (Ajuntament de Barcelona), brings scientific knowledge closer to the public. BIST and several of its centres participated in the planning and delivering of activities, intended to encourage attendees to discover the major challenges facing us this century. Núria Montserrat, ICREA Professor at the BIST centre IBEC was among the commissioners of the event.

On June 8, 9, and 11, BIST and the Barcelona Education Consortium organised three meetings called **Àgors Urbanes** between women scientists and primary school children around three different themes: COVID-19, Sustainable Food, and Exoplanets and Space. Researchers from IBEC, IRB Barcelona, CRG, ICN2 and IFAE, IRTA, CRAG, and IECC participated in the meetings. A **#100tifiques** meet-up, intended to give visibility to women's contribution to science, was also organised by BIST and the Fundació Catalana per a la Recerca i la Innovació (FCRI) within the framework of the Biennial on June 10. Then, on

June 11 within the Biennial's "Nit de la Ciència" section, a **Pecha Kucha** session on art, science and technology took place. Researchers from four BIST centres (ICIQ, ICFO, IBEC, and ICN2) presented their work to a diverse audience in the special Pecha Kucha format: 20 images for 20 seconds each. More than 120 people attended this event, co-organized with Hac Te and Hangar. Finally, several BIST Centres participated in the Barcelona-wide Science Festival (**Festa de la Ciència**) on June 13, with workshops, micro-talks, and other outreach activities for children, families, and the general public. In total, the festival brought together over 95 institutions to present a total of 121 activities across all fields of science.



BIST Friends

BIST Friends are organisations and individuals who have chosen to support our work in exploring the frontiers of knowledge, helping us find innovative solutions for the great challenges we face today and into the future.

We want to thank this growing community for their commitment to fund our research and innovation efforts, and in doing so help move towards a healthier and more sustainable world.



Collaborating Entities

BIST believes networking and institutional collaboration at all levels are essential elements to deliver on our goals of performing excellent multidisciplinary research, grooming a diverse collective of future scientific leaders, and maximizing the scientific, social and economic impact of our actions. Furthermore,

BIST aspires to help society to gain a broad understanding of our work and create mechanisms for capturing their concerns and suggestions, as well as build platforms for a more direct engagement. Listed below are the entities BIST engaged in 2021. We are grateful for their collaboration and generosity.

Ajuntament de Barcelona

Associació Catalana de Comunicació Científica

Barcelona Global

Barcelona Supercomputing Centre

BIOCAT

Careers Research and Advisory Centre, Vitae

CELLS – ALBA Synchrotron

Consejo Superior de Investigaciones Científicas

Consorci d'Educació de Barcelona

Coordinadora Catalana de Fundacions

Davidson Institute of Science Education

Departament d'Educació, Generalitat de Catalunya

Departament de Recerca i Universitats, Generalitat de Catalunya

Diputació de Barcelona

EIT Health

ESADE

Fraunhofer-Gesellschaft

Fundació Catalana per a la Recerca i la Innovació

Fundació Èpica, La Fura dels Baus

Hub d'Art, Ciència i Tecnologia – HacTe

Institut de Biologia Evolutiva – CSIC – UPF

Interuniversity Microelectronics Centre – imec

Mobile World Capital Barcelona

Universitat Autònoma de Barcelona

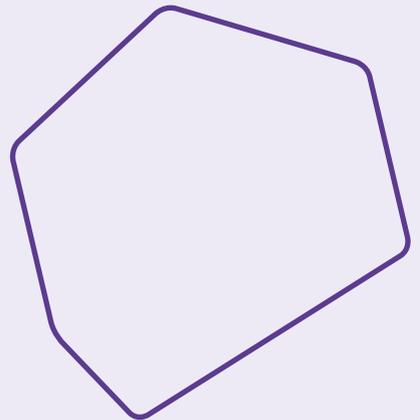
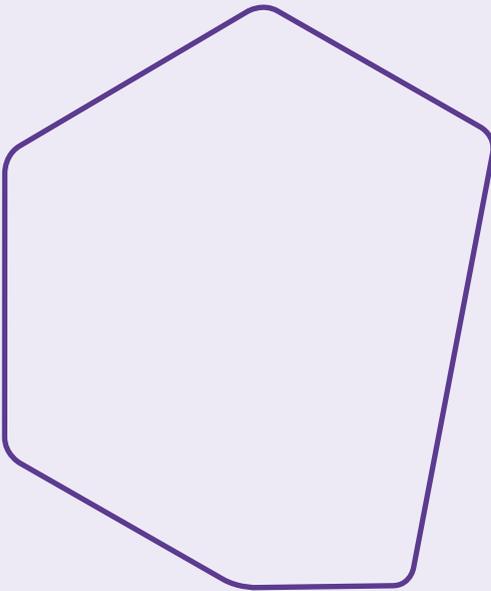
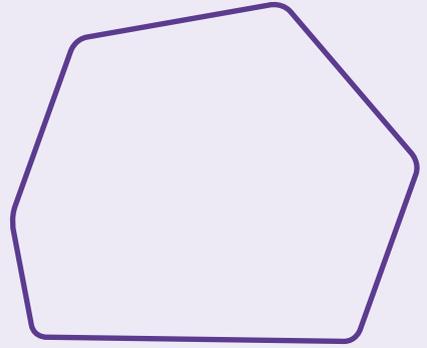
Universitat de Barcelona

Universitat Internacional de Catalunya

Universitat Oberta de Catalunya

Universitat Pompeu Fabra

FACTS & FIGURES





PEOPLE

2,586

BIST COMMUNITY

46%

WOMEN

41%

INTERNATIONAL

172

GROUP LEADERS

515

POSTDOCTORAL RESEARCHERS

662

PHD STUDENTS

118

STAFF SCIENTISTS

443

TECHNICIANS

401

ADMINISTRATIVE & SUPPORT PERSONNEL

12 BIST CORE TEAM

GENDER BREAKUP BY ACADEMIC STAGE

	% Women	
	2019	2021
PhD Students	45	45
Postdocs	36	38
Group Leaders	18	22



MMRES (BIST MASTER)

	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022
Class size	14	27	22	21	22
% Women	43	41	50	62	59
% International	25	18	39	23	26
Countries	3	6	8	4	6



PUBLICATIONS

	2017	2018	2019	2020	2021
Total publications	1,087	1,289	1,324	1,331	1,421
% Leadership	56%	56%	57%	53%	56%
% Open Access	87%	87%	87%	86%	82%
% Q1	80%	74%	75%	72%	75%
% D1	40%	38%	38%	37%	37%

Bibliometric analysis done with publications showing BIST author affiliation indexed in the Web of Science Core Collection excluding: book chapters, corrections, reprints, meeting abstracts, and publications done elsewhere and showing BIST as the current address only. “% Leadership” shows the percentage of publications in which a BIST author is listed first, last and/or is the corresponding author. The percentage of first quartile (Q1) and decile (D1) publications have been calculated using Journal Citation Reports (JCR).

PUBLICATIONS INTERNATIONAL BENCHMARKING (2016-2021)

Institution	% HCP	C/AR
Caltech	4.09%	24.99
BIST	3.68%	24.83
Imperial College London	3.40%	21.85
Weizmann Institute of Science	3.38%	24.17
RIKEN	2.23%	16.03
Leibniz Association	1.79%	16.13

HCP = Highly cited publications

C/AR = Citations per article/review

70.3%

PUBLICATIONS WITH INTERNATIONAL INSTITUTIONS.



ERC GRANTS

2021 CALLS

5

STARTING GRANTS

4

PROOF OF CONCEPT
GRANTS

ERC GRANTS BENCHMARKING (SPAIN; 2019-2021)

Institution	Personnel	Grants	ERC Funds
CSIC	11,046	36	55,792,215 €
BIST	2,566	33	54,563,890 €
USC	4,518	12	17,214,885 €
UAB	7,660	10	14,121,804 €
UPF	3,458	9	13,283,746 €

Source: European Commission. Horizon Dashboard; Ministerio de Universidades. Estadísticas.

CSIC: Consejo Superior de Investigaciones Científicas; USC: Universidad de Santiago de Compostela;

UAB: Universitat Autònoma de Barcelona; UPF: Universitat Pompeu Fabra.



INNOVATION

5

SPIN-OFF COMPANIES
LAUNCHED IN 2021

39

ACTIVE SPIN-OFF
COMPANIES
(AS OF DECEMBER 2021)

45

PATENT APPLICATIONS
IN 2021

30

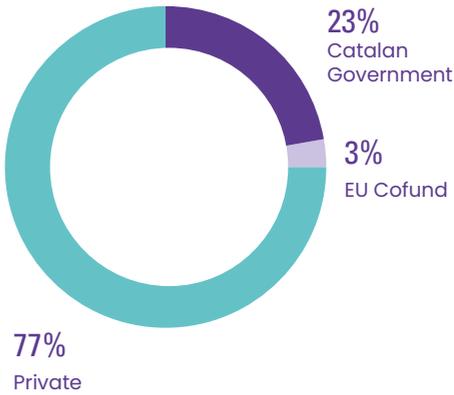
PATENTS GRANTED
IN 2021

€ FUNDING

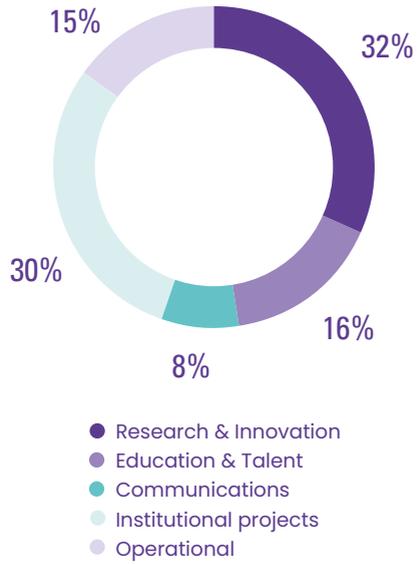
BIST CORE FUNDING

1.7 M€ BIST BUDGET

SOURCE



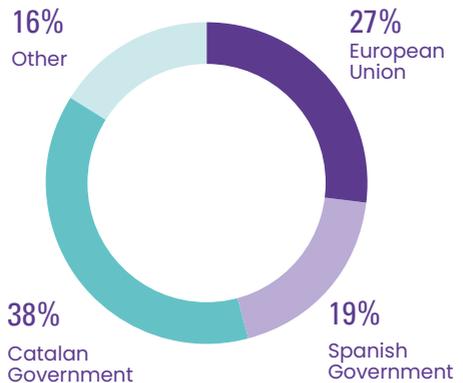
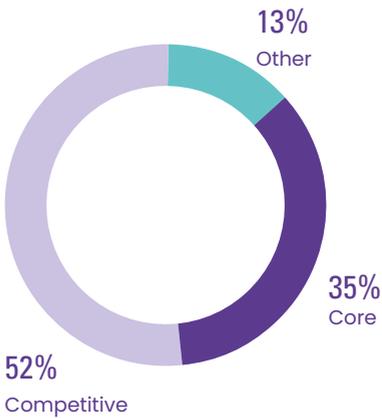
EXPENSES BY ACTIVITY



BIST CENTRES FUNDING

152.7 M€ BIST CENTRES BUDGET

SOURCE





BIST COMMUNICATIONS

BIST Social Media	2021
Twitter followers	5,856
Facebook followers	229
LinkedIn followers	4,054
Youtube views	6,208

Web users	2021
bist.eu	41,622
mmres.bist.eu	17,419

659

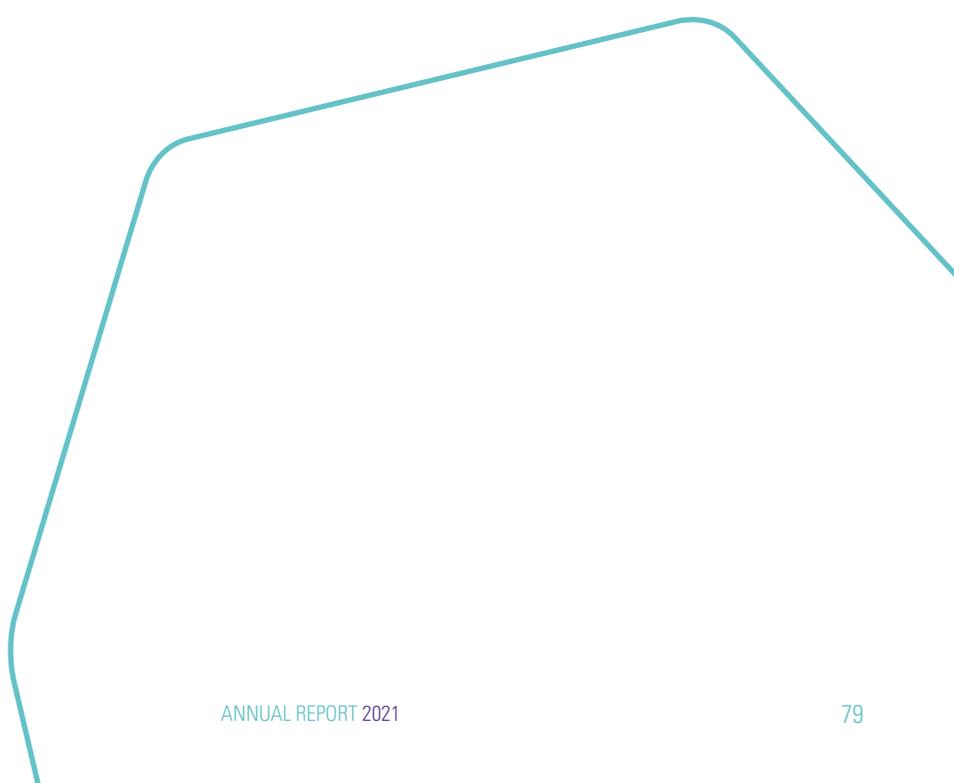
Subscribers to the
BIST Newsletter
(+45% Y/Y)

508

Media impressions
(+86% Y/Y)

235,882,326

Audience Reached
(+105% Y/Y)



BIST CENTRES



MEMBERS OF THE BOARD OF TRUSTEES

