



SCIENCE



RESIDENTS

INFRASTRUCTURE



SOCIETY

# PRBB PERFORMANCE REPORT 2020

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Barcelona  
Biomedical  
Research  
Park

 SCIENCE

 RESIDENTS

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“We connect science and diversity in a unique creative space”

The mission of the Barcelona Biomedical Research Park (PRBB) is to provide the best environment for research of excellence. The Park brings together different research centers and 1,500 people from 52 different countries.

Although still in a situation of restrictions because of the COVID-19 pandemic, we invite you to look back to 2020 and review the main milestones and data from last year of the PRBB.

For further institutional, administrative and economic information, please consult our transparency portal at [transparencia.prbb.org](https://transparencia.prbb.org) (in Catalan).

## Centres

- Hospital del Mar Medical Research Institute (IMIM)
- Department of Experimental and Health Sciences at Pompeu Fabra University (DCEXS-UPF)
- Centre for Genomic Regulation (CRG)
- Barcelona Institute for Global Health (ISGlobal, Mar Campus)
- Institute of Evolutionary Biology (IBE: CSIC-UPF)
- European Molecular Biology Laboratory (EMBL Barcelona)
- Institute of Applied Radiopharmacy of Barcelona (IRAB)

## Selected discoveries in life sciences and bio-medicine

Designing PARP-specific inhibitors would enhance their effectiveness against cancer. IMIM researchers show that PARP-1 or PARP-2 specific deficiency in T lymphocytes results in better antitumor response than depleting both forms. 02/20

Weight changes affect lung function in adulthood. A study led by ISGlobal and carried out over a period of 20 years confirms that weight gain significantly worsens lung function, regardless of the body mass index. 03/20

Towards the generation of blood stem cells in the laboratory. A research team at IMIM has analyzed, in mouse embryos and with computer models, the process by which endothelial cells – the cells that cover the inside of all blood vessels – become blood stem cells. 03/20

Study of genetic oscillations of the segmentation clock sheds some light into a disease of the vertebrae. A new study at EMBL Barcelona recapitulates in the lab the oscillating patterns of gene expression that coordinate across time and space within a tissue to give rise to the periodic arrangement of the vertebral column. 04/20



Bacteria can store information in a similar way to neurons. DCEXS-UPF researchers confirm in a new study that bacteria of the species *Bacillus subtilis* can store information about their past conditions by controlling the flow of ions through their cell membrane. 05/20

Formation of epithelial-like structures in single-celled organisms. Researchers at IBE (CSIC-UPF) discovered that the single-celled organism *Sphaeroforma arctica* also presents a multicellular stage in its development, which manifests typical characteristics of an epithelium. 05/20

Scientists identify how the endocannabinoid system decreases neuropathic pain. In a study in mice, researchers at DCEXS-UPF have found a mechanism that can decrease neuropathic pain by activating the endocannabinoid system, while avoiding psychoactive effects. 07/20

Night-time exposure to the light emitted by mobiles and white LEDs linked to higher colorectal cancer risk. Using satellite images of outdoor lighting in Barcelona and Madrid, researchers at ISGlobal have found an association between colorectal cancer and night blue light exposure. 08/20

Real-time RNA sequencing could now be applied to patient-derived samples. CRG's researchers have developed a method to detect diverse RNA molecules, such as viral RNAs, in samples with minimal biological material. 09/20



Deciphering the cell signalling code: the role of  $\beta$ -arrestins. Researchers at the IMIM have discovered how  $\beta$ -arrestins participate in the modulation of cell behaviour. 09/20

Neanderthals and Homo sapiens, closer than ever. A study, in which the IBE (CSIC-UPF) has participated, has revealed ancient hybridizations that would explain the genetic similarity between Homo sapiens and Neanderthals. 09/20

Long live the muscle stem cells. Researchers at DCEXS-UPF and others have identified a subgroup of muscle stem cells that maintains its regenerative capacity over time, declining only at geriatric age. 11/20

Key gene for Ewing's sarcoma found. The CRG has collaborated in the discovery of the gene involved in tumor regulation of Ewing's sarcoma, a type of bone and soft tissue cancer. 11/20

Stem cells to the rescue of the retina. A team at CRG has found two cellular signals – known as Ccr5 and Cxcr6 – that retinal cells send out when they are dying, so that stem cells come to replace them. 12/20

## Change of the director of the PRBB Animal facility

Joan Antoni Fernández Blanco is the new director of the PRBB Animal facility since September 2020. He replaces Juan Martín Caballero, who has run this facility since its creation in 2006 and who requested his replacement in order to join a new scientific project at CSIC in Madrid.

Joan Antoni Fernández Blanco is a Veterinarian specialized in laboratory animal science and welfare with a master's degree and a PhD in immunology. For more than 10 years, he was involved in the use and development of in vivo models for both basic research and drug discovery across respiratory, gastrointestinal, infectious and ophthalmology therapeutic areas. During that time, he directed studies, coordinated projects and managed collaborations both in academia (Autonomous University of Barcelona, UAB) and in the pharmaceutical industry (Salvat, Astra Zeneca and Almirall).

Linkedin profile: [Joan Antoni Fernández Blanco](#)

## Scientific publications

	2020	2019*	2018*	2017*
Total	<b>1300</b>	1272	1296	1200
Nature	<b>8</b>	4	8	6
Science	<b>9</b>	3	3	6
The Lancet	<b>3</b>	1	0	4
New Engl J Med	<b>2</b>	1	2	2
Nature Group	<b>50</b>	55	53	33
Lancet Group	<b>9</b>	3	5	5

\* There are fluctuations during the year in the total number of publications that are in press at the end of the year. For this reason, the numbers do not coincide with the reports of 2019, 2018 and 2017.

## Scientific conferences at the PRBB

	2020	2019	2018	2017
Total	<b>202</b>	316	277	322
PRBB CRG Conferences	<b>21</b>	49	41	54
Female Speakers	<b>2 (10%)</b>	17 (35%)	5 (12%)	11 (20%)
Group Leader Seminars*	<b>9</b>	-	-	-
Female Speakerst**	<b>7 (39%)</b>	-	-	-

\* With the onset of the COVID-19 pandemic, the PRBB facilitated the format of online webinars and also organized the Group Leader Seminars.

\*\* The Group Leader Seminars had 2 speakers each. There were a total of 18 speakers.



## The demography of the residents

	2020	2019	2018	2017
Personal Centres / Total	<b>1452</b>	1360	1312	1366
IMIM	<b>390</b>	384	359	370
UPF (DCEXS + IBE)	<b>387</b>	317	384	371
CRG	<b>413</b>	425	409	423
ISGlobal (Campus Mar)	<b>179</b>	157	89	134
EMBL Barcelona	<b>47</b>	36	28	-
IRAB	<b>10</b>	12	10	7
Consorti PRBB	<b>26</b>	29	33	35

Categories	2020	% of total	% female	2019
Senior researchers	<b>187</b>	13	41	167
Postdocs	<b>290</b>	20	56	254
PhD students	<b>273</b>	19	57	243
Research technicians	<b>462</b>	32	67	460
Administrative staff	<b>243</b>	17	70	236
Foreign residents	<b>377</b>	26	-	335
Male	<b>580</b>	40	-	553
Female	<b>872</b>	60	-	807

More information: [PRBB Demography 2020 \(PDF\)](#)

## COVID-19

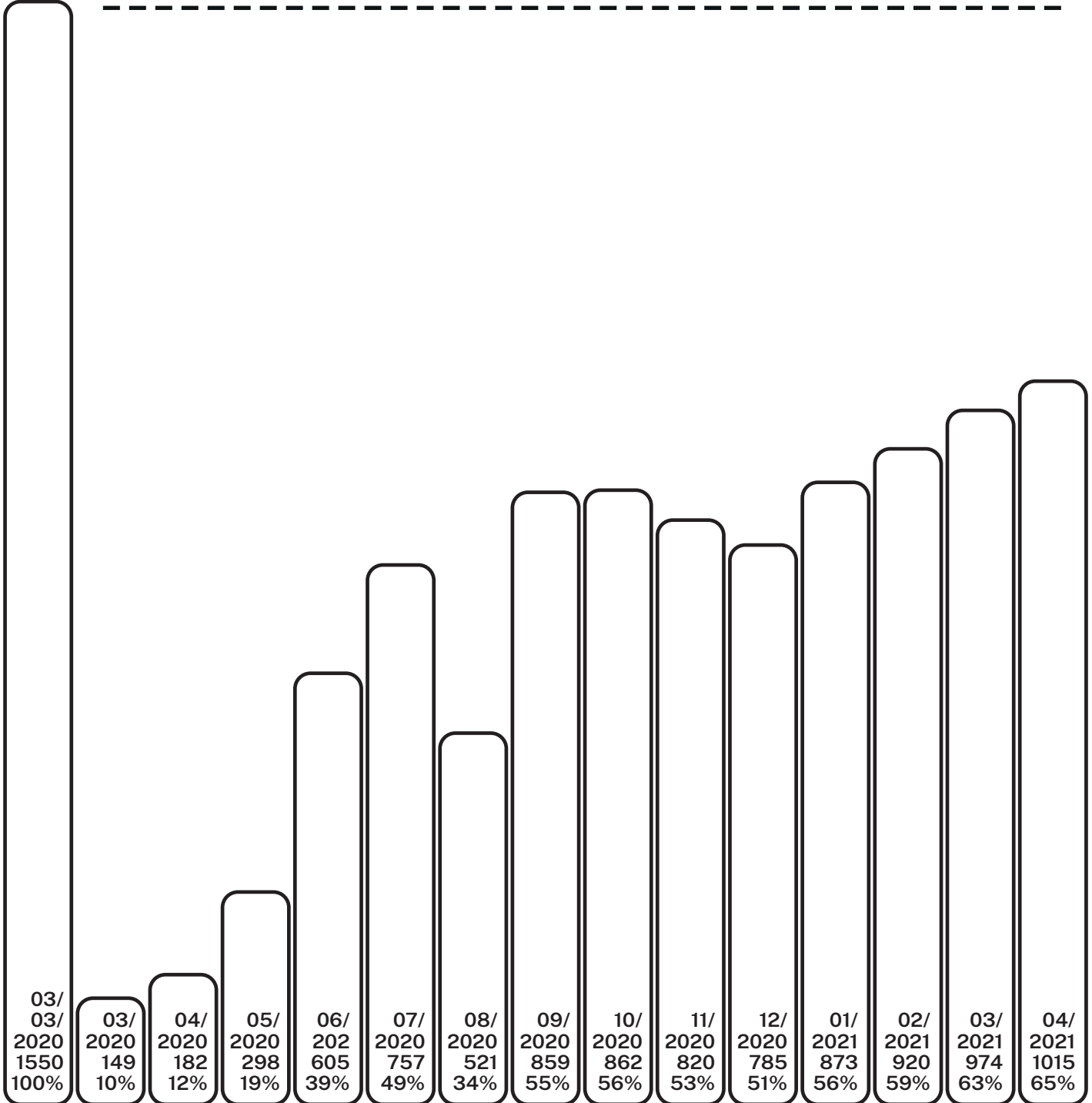
The state of alarm in Spain was declared on March 15. The next day, the PRBB management met with the directors and managers of the centers. Two days later the PRBB was almost empty, although the building was never closed completely during this crisis. Everything had been reduced to the minimum and teleworking was encouraged wherever possible.

But scientific research went on, and exceptional prevention measures for a phased comeback of PRBB residents to the building were coming into effect in May. These measures were accompanied by a colourful communication campaign and new signalling with clear messages.

The animal facility has never stopped working, and some of the maintenance and improvement works in the building had to be stopped temporarily. To continuously serve the community of the park, the scientific sessions became online webinars, the face-to-face PRBB Intervals courses took place remotely and all communication and outreach activities moved from the physical space at the beach of Barcelona to the virtual realm

## COVID-19

Average number of people per day in the building



## Making a contribution to Hospital del Mar

To fight against the new coronavirus pandemic and the shortage of medical equipment, the PRBB and its centres made a contribution to Hospital del Mar in April. It consisted of several pallets of basic material such as lab coats, masks and gloves.

The PRBB Animal Facility donated: 100 non-sterile white lab coats, 10,000 masks, 70 boxes with 200 nitrile gloves and 58 boxes with 100 latex gloves.

More information: [El·lipse news](#)

## A new PRBB Portal for residents

The PRBB has created a new “Portal PRBB” with privileged information for the residents of the park that is fully responsive. The main improvements of the Portal PRBB, which requires registration, are:

- A detailed welcome section for new residents.
- Access to the main directory of all residents.
- An agenda that is more visible for internal and external events.
- Access to the Slack community space [#SomPRBB](#).
- An internal news section with official information.

The “Portal PRBB” can be accessed through the link in the upper-right header of the website [www.prbb.org](http://www.prbb.org).

## PRBB Intervals: Continued professional training

The PRBB Intervals Programme is an interdisciplinary space for vocational training, reflection and dialogue. It has a dual purpose. Firstly, it provides learning opportunities that support personal and professional development, enabling all our staff to become more effective influencers, whatever their current or future role in society. Secondly, it encourages relationship-building between people in all the PRBB centres, across disciplines and profiles.

	2020	2019	2018
Courses	<b>28</b>	36	46
Places	<b>418</b>	451	597
Attendees	<b>396</b>	404	554

More information:

[PRBB Intervals Report 2020](#)

[PRBB Intervals Website](#)

## The PRBB choir and orchestra with online rehearsals during lockdown

On the occasion of #WorldMusicDay on June 21, the PRBB choir and orchestra have released versions of two popular pieces of music. On the one hand, the PRBB Choir, together with the Mar Choir, both directed by Òscar Salvador, have made a “parody” version of the Mamma Mia song, by ABBA. On the other hand, the PRBB Orchestra, conducted by Borja Mascaró, has covered La Vita È Bella, by Nicola Piovani.

Youtube: [Mamma Mia, PRBB Choir](#)

Youtube: [La Vita È Bella, PRBB Orchestra](#)

More information: [El·lipse news](#)

## New PRBB website

Beginning of October, the fully new PRBB website was launched. It is fully responsive and has a modern feel. The web was designed by Ouyeah Studio and programmed by Owius in a very effective collaboration. It took only 6 months to complete the website and the portal.

Visitors can find a detailed section of scientific services, a more visual agenda with a mailing list, a new section with job offers and the updated El-lipse news, which appear throughout the website.

More information: [www.prbb.org](http://www.prbb.org)

## Shortfilm: We are scientists

On the occasion of the organization of a completely virtual Openday, we produced a shortfilm. "We are scientists" is an intimate portrait of life at the PRBB with a gender perspective. In 12 minutes, you can see the park as you have never seen it before; during day and night, from top to bottom, inside out. Ramon Balagué from Minifilms directed the shortfilm on occasion of the virtual Openday of the PRBB. The premiere was on October 26 at 11 am on the PRBB Youtube channel.

Youtube: [We are scientists](#)

## #OpenPRBB 2020

From 26 to 31 October we have been broadcasting from the PRBB to the world. Under the slogan “Som PRBB. We are scientists”, the park and its centers celebrated their annual festival of scientific outreach for the whole family. #OpenPRBB aimed to promote scientific vocations, to transmit the importance of scientific thought and to show what is behind this great scientific infrastructure on the beach of Barcelona.

Impact: The results shown are data collected on the start of the #OpenPRBB activities (Oct 26) until a week after the end of the event (Nov 7). The numbers refer to total visualizations of live-events, recordings, in the PRBB Youtube channel and in social media. These numbers are continuously rising.

Visualizations #OpenPRBB2020	
Shortfilm: We are scientists	+11400
13 videos of Labtours and Failed Experiments t	+5400
Six live interviews from our Instagram and Facebook profiles with scientists and Youtubers.	+58500
<b>Total</b>	<b>+75000</b>

More information:

[#OpenPRBB website](#) (in Spanish) | [Youtube: Playlist #OpenPRBB2020](#) | [Ellipse News about the #OpenPRBB](#) | [Informe OpenPRBB2020](#) (in Catalan) | [Article in FEBS Network: Sharing research with society in times of Covid-19: 'Open PRBB 2020'](#)





## Educational activities and outreach: Sept 2019 - June 2020

During the school year (September-June), the research centers of the PRBB organize various activities and workshops for primary, secondary and high school students, as well as various scientific dissemination activities for the general public, inside and outside of the PRBB building. The commitment of the centers, and especially of the Park, to the dissemination of science translates into the annual participation of approximately 10,000 students, teachers and citizens in more than 15 different activities.

More information:

[Memòria d'activitats educatives i divulgació \(PDF in Catalan\)](#)



## A gender perspective on the scientific career

For both the International Day of Women and Girls in Science (February 11) and International Women's Day (March 8), female scientists from the PRBB shared their experiences, on a professional and a personal level, as well as the combination of both, with the rest of the PRBB residents. The purpose of these events, organized by the PRBB Gender Equity Committee, was to analyze the reality of the gender gap in science.

Scientifilia: a documentary about the scientific job with debate on Feb 11

Insider's view on the scientific career: 3 sessions solving doubts for early career scientists on March 8

More information: [El-lipse news](#)



## Presence on the Internet and social media

	2020	%	2019	2018	2017
<b>Social Media</b>					
Twitter	<b>15600</b>	+9	14300	11900	9145
Facebook	<b>3900</b>	+1	3875	3541	3277
Linkedin	<b>10352</b>	+22	8475	5977	4870
Instagram	<b>1463</b>	+48	926	0	0
Youtube	<b>309</b>		0	0	0
<b>Web prbb.org</b>					
Visits	<b>84400</b>	+50	56196	125429	81861
Users	<b>28600</b>	-22	36659	39269	49897
<b>El·lipse</b>					
Visits	<b>290000</b>	+755	33895	0	0
Users	<b>184000</b>	+706	22823	0	0
Subscribers	<b>1051</b>	172	386	0	0

Links:

[El·lipse](#) | [Linkedin](#) | [Twitter](#) | [Instagram](#) | [Facebook](#)

## A seductive research buildingt

The PRBB building grabs your attention because of its beauty and incomparable location next to the sea. It has an aesthetic appeal that inspires and stimulates scientific activity.

The building was inaugurated in 2006 and has been occupied to capacity ever since.

## A new and flashing cryogenics room

During nearly a whole year – and coinciding in part with the coronavirus pandemic – construction works have taken place at the cryogenics room on floor -1 of the PRBB to adapt and expand the facility.

In particular, digital control of the installation has been modernized with a new management system that improves the safety of users and extends alarm control remotely.

In addition, space has been created to locate 7 more liquid nitrogen tanks, using part of the radioactive waste warehouse located next to the room. The new cryogenics room now contains 23 liquid nitrogen tanks to freeze (at almost -200 °C) and preserve the valuable samples of the research carried out in the centers of the park.

More information: [El-lipse news](#)



## Total renovation of the seminar rooms

The work that has been done was very complete and affected both the seminar rooms and the surrounding areas. In the seminar rooms, the floor, ceilings, walls, air conditioning, lighting and projection screens have all been replaced.

Work began on May 11, at the height of the coronavirus pandemic, and was completed in September. The aims of the works were to renovate the four seminar rooms to improve their functionality, comfort, energy efficiency and aesthetics. The toilets and the breastfeeding room were fully re-designed.

The PRBB has taken advantage of these works to make other improvements, such as the air conditioning in the auditorium.

More information:

[El·lipse news](#)

[Rooms & spaces website](#)

## Other finished and pluriannual works

In the PRBB Animal Facility a new SFP experimental area has been inaugurated that meets the growing needs of several research groups at the centres. Also, the last two air conditioning machines were installed to complete the modernization of the climate in this installation, which had started 3 years ago.

The installation for the biobanks of IMIM and CRG at the -2 floor was equipped with new air conditioning. Before, the climate in the rooms was supplied by electrical machines. Now the biobanks are connected to the general climate system of the building that is more reliable and works with a better energetic efficiency. Also, a new backup system for the cooling was installed.

The experimental wetlabs in the building use high quality purified water. In a pluriannual project of 5 years, the PRBB is renewing this installation throughout the building. Last year the purification system of the UPF on floor 3 was renewed. The new system optimizes the process by 30%. Before, 9 litres were needed to produce 1 litre of purified water and now only 6 litres are necessary.

Data and telephone cables are distributed vertically on each side of the building and horizontally on each floor. They are connected through 2 nodes on each floor. In a pluriannual project of 6 years, the infrastructure of racks that distributes the cables is restructured and newly ordered. 2020 was the first year.



## Data for consumption and maintenance

	2020	%	2019	2018
Electricity	<b>12.935.304 kWh</b>	-2	13.211.926	13.149.755
Natural gas	<b>4.965.977 kWh</b>	+2	4.879.619	4.782.343
Water	<b>25.012 m3</b>	+2	24.622	29.723
Liqu. nitrogen	<b>344.921 litres</b>	+30	264.625	259.847
Nitrogen gas	<b>66.016 litres</b>	-12	74.741	90.048
CO2	<b>20.355 Kg</b>	-17	24.508	20.529



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