

Back behind the wheel
Interview with veteran
racer Pedro de la Rosa

Shooting animals
First group of finalists from
our monthly photo contest

April 2010 - N° 329 3 euros


Home of science

Behind the scenes at the Barcelona research park

Parc
Recerca
Biomèdica
Barcelona

Parque
Investigación
Biomédica
Barcelona

Barcelona
Biomedical
Research
Park

 Generalitat
de Catalunya



Ajuntament
de Barcelona



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CONTENTS

OPINION

From the editor	5
Matthew Tree: Eyeless in Fraga.....	7
Letters to the editor	8
Martin Kirby: The most uncomfortable undeware.....	9
Joseph Wilson: Man and Bull.....	13
Neus Figueras: ETFL and ELFL.....	17
Andrew Gwatkin: A healthy state of affairs..	44
Miquel Berga: The image of politics or the politics of image?.....	44
A Short Tale: The Curious Case of the Japanese Hairdresses, by Terry Parris.....	45
Neil Stokes: Religion of climate change.....	62

MY KIND OF PLACE

Barcelona's Raval.....	10
------------------------	----

MY SPACE

Damià Barceló	14
---------------------	----

CATALONIA

Barrel tap museum.....	18
Catalonia Today awarded with Memorial Francesc Macia 2010 prize	20
Alba heralds new dawn in scientific research	21
Vox Pop	21

EUROPE-WORLD

The power of radio	22
EU to provide 45,000 start-up micro-loans	23
Vox Pop	23

MONEY AND BUSINESS

The king of swing.....	24
------------------------	----

SPORT

Pedro M. de la Rosa: "I'm a better driver"....	26
--	----

FEATURES

Photography Competition: Animals.....	28
Top class research.....	32
Putting the accent on language.....	40

ART

The art of dirty hands.....	46
-----------------------------	----

MUSIC

A new man returns.....	48
------------------------	----

BOOKS

The funny thing about comedy.....	49
When Germany ruled Guernsey.....	49
Travellers in Catalan lands: Rebellious traders	50
Urban caresses: Not so elementary, my dear Watson!.....	52

THE NET

Photoshop turns 20.....	54
-------------------------	----

THE EYE

Cometh the spring, cometh the chaos	56
---	----

ENTERTAINMENT

Crossed words, quiz ladder, word pool, find the name game, sudokus, etc.....	58
--	----



32-39 FEATURE

Inside Barcelona's biomedicine HQ

A tour of the Parc de Recerca Biomèdica on the seafront in the Catalan capital reveals state-of-the-art scientific facilities that are home to a number of research centres working on projects that range from bio-informatics to regenerative pharmacology



40-43 FEATURE

United by language

Linguistic partners are building cultural ties



46-47 REVIEW

Culture at work

Palau Robert focuses on working people

28-31 CONTEST

Our readers and other animals

The finalists of Catalonia Today's first monthly photograph competition, which for April was about animals.

Every month readers are invited to send in their best shots of subjects related to a different theme. Next month, 'streets'. Get shooting!



Top class research

As the headquarters for a variety of top research centres, Barcelona's **Parc de Recerca Biomèdica** is at the forefront of biomedical science in the country

The facts behind the PRBB

MARIA PASCUAL
A stone's throw from Barcelona's seafront there is a building that sticks out from those around it. With its elliptical shape and shuttered façade, the Parc de Recerca Biomèdica de Barcelona, or PRBB, would not be out of place in a science fiction film. Indeed, this biomedical research facility is all about science and it is one of the largest of its kind in Catalonia.

What takes place within its futuristic walls is also of science fiction, as the scientists and researchers within work on the latest advances in a long list of subjects, including bioinformatics and systems biology, genetic and epigenetic regulation, regenerative pharmacology and clinical pathophysiology, evolutionary biology and epidemiology and population health, among others.

Jordi Camí, director general of the park, says that his institution deals with subjects "from the molecular perspective in the

Barcelona's Parc de Recerca Biomèdica (PRBB), located on carrer Doctor Aiguader – next to the Hospital del Mar and on the Barceloneta seafront – was inaugurated on May 15, 2006 as a joint initiative between the Generalitat de Catalunya, the Barcelona City Council and the Universitat Pompeu Fabra.

The park's objective is to create new knowledge in the sphere of life sciences as well as developing strategies for promoting biomedical research and health science that can be applied in clinical practice.

Some 1,300 people work in the park, which has an annual budget of between 60 and 70 million euros, more than half of which comes from competitive subsidies.

analysis and study of cells, for example, to a more population-based perspective."

This breadth of research is reflected in the roll-call of research centres to be found under the PRBB's roof, which include the Institut Municipal d'Investigació Mèdica, the Departament de Ciències Experimentals i de la Salut from the Universitat Pompeu Fabra, the Centre de Regulació Genòmica, the Centre de Medicina Regenerativa de Barcelona, the Centre d'Investigació en Epidemiologia Ambiental and the Institut d'Alta Tecnologia, as well as it being the temporary headquarters of the Fundació Pasqual Maragall while the foundation's future home is under construction in the Barcelona-Beta complex.

While the various research centres are mostly independent of each other, they do share key scientific and technical services offered by the park, such as the animal facility, as well as tech-



A view of the exterior of the PRBB scientific park in Barcelona. / QUIM PUIG



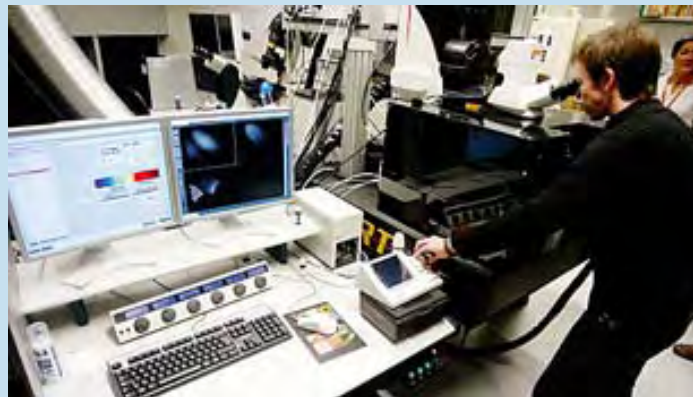
Plaça de l'Estació
Barcelona
1901

or Aiguader, 88





Brightly-lit laboratories. The windowed façade of the Parc de Recerca Biomèdica allows plenty of natural light into the different laboratories spread over the building's nine storeys. / QUIM PUIG



Latest technology. The PRBB researchers hail from all over the world and work with the latest technology in the advancement of applicable knowledge in biomedicine and health science. / QUIM PUIG

An original building

nological platforms set up between the different centres.

Young researchers

According to figures published in 2009, the PRBB has 1,300 people working within its walls, of which 60% are women. At the same time, a similar percentage of this staff is under 35, something that Camí sees positively, as "it reflects a stage in the personal training of researchers when they are writing their doctoral theses or starting their post-doctoral period and are becoming more independent. This makes up the larger part of the researchers, with a layer of more senior personnel overseeing things in a global sense."

Apart from the majority of researchers being young women, many of them are also foreign. A quarter of the staff in the park come from some 50 countries around the world. Germany, with 57 people, is the country that is best represented, followed by Italy (53), France (35), the UK (19) and Portugal (18).

According to the director, it is "extremely normal" in the world of science to have so many foreign researchers working together because "scientists go wherever they can find a good scientific environment. They do not take the decision to come because the place is near the beach or because it is Barcelona.

The Parc de Recerca Biomèdica de Barcelona was designed by architects Manel Brullet and Albert de Pineda. The building has a floor area of 55,000 m² on a plot of land measuring some 9,000 m². The park has a distinctive elliptical shape and its floors are suspended by 110 metal cables for each of its nine storeys. The building also has three basement floors, which connect via underground tunnels with the nearby Hospital del Mar. The roof supports solar panels for heating water while the windowed façade is layered with cedar wood panels.

The building also boasts state-of-the-art safety mechanisms, such as the anti-fire system installed in the façade itself.

One of the centre's most spectacular features is the hanging auditorium; 150 tonnes of steel mounted on six concrete pillars. The architects claim that the supports for the hanging structure allow for a greater use of the auditorium's interior space, which has a capacity for 250 people.

This is important, but only after they have guaranteed that they will find a good scientific environment, and I think that is what we have achieved."

Naturally, the fact that so many of the staff at the park are foreign means that a common language is required. In the case of the PRBB, the lingua franca is English, which is also used to impart the weekly seminars offered to the researchers.

Working together

Inside the building it is something of a surprise to see natural light streaming through the large windows into the laboratories. Each researcher has his or her own working space but the individual cubicles are arranged in an open-plan layout that emphasises and encourages teamwork.

However, the research itself takes place using biological material, such as cells, bacteria, proteins and DNA, which is stored in large freezers that are connected to an alarm system controlled from the building's reception area. The laboratories are also stocked with a variety of utensils and machinery. One of the most important gadgets is in the microscopy unit, which includes prototype microscopes that allow living cells to be observed. In fact, this unit contains specialist microscopes designed

to avoid vibrations, allowing researchers to work with increased precision.

Another of the park's most important facilities is the animal unit, in which all of the animals used for research are kept. This 4,000 m² area is kept sterile and only authorised personnel are allowed in on behalf of the six independent research centres housed in the building. The area for aquatic animals has a cornucopia of exotic animals, including 50,000 zebra fish, 500 African clawed frogs and 100 axolotl salamanders.

The animal facility also contains three support laboratories with space for 60,000 germ-free mice housed in self-ventilating micro-isolators, the transgenic area – with its spacious laboratories with a capacity for 5,000 animals – where both traditional and innovative techniques are applied in the production of genetically-modified mice and an experimental area with laboratories for studying live imagery and carrying out irradiation and surgical procedures. The unit also has quarantine facilities, with their own sterile changing rooms, a laboratory for embryo transfer rederivation, a sterilisation area and four different rooms containing micro-isolators for 5,000 laboratory mice.

Meanwhile, the conventional



From the smallest to the largest. The work that takes place in the scientific park is both on the molecular level, such as the study of cells, and the global level, with research into such things as epidemiology or public health. / QUIM PUIG



Research on the seafloor. The PRBB staff work in a privileged environment, in a state-of-the-art building, in front of the Barceloneta beach. / ORIOL DURAN



The scientific park's animal unit has capacity for some 65,000 lab mice, 50,000 Zebra fish, 500 frogs (*Xenopus laevis*) and 100 salamanders (*Ambystoma mexicanum*). / QUIM PUIG



Medical research

The Institut Municipal d'Investigació Mèdica (IMIM) is dedicated to scientific research in biomedicine and health science as well as the training of highly-qualified researchers in these fields. Its director is Dr. Miguel López-Botet.



Training

The Departament de Ciències Experimentals i de la Salut de la UPF (CEXS-UPF) provides graduate and post-graduate studies in biology, biotechnology, bioinformatics and medical and health science. Its director is Dr. Francesc Posas.



Human genome

The Centre de Regulació Genòmica (CRG) has the aim of promoting basic research in the field of biomedicine and, in particular, in the areas of genomics and proteomics [the study of proteins]. Its director is Dr. Miguel Beato.



Stem cells

The Centre de Medicina Regenerativa de Barcelona (CMRB) carries out research with both human and animal stem cells. It also works on the application of regenerative medicine on degenerative diseases. Dr. Juan Carlos Izpisua is its head.

Good practice

animal facilities are situated in another building that is linked to the main building by an underground tunnel. This unit is 1,000 m² and contains up to 5,000 mice that are mainly used for the study of neuro-pharmacology or immunology.

However, it must be emphasised that any experiment involving animals must go before an ethical committee in which both scientists and people from outside the world of science decide whether the work be allowed to go ahead or not.

Hospital link

As the PRBB is located next to Barcelona's Hospital del Mar (and physically connected with underground tunnels), researchers are allowed the opportunity for clinical practice in such areas of research pertaining directly to bio-medicine and health science.

According to Camí, the link between the two centres is "an added value for us, firstly because it provides us with a fruitful working area from the scientific viewpoint and, secondly, because it allows for what we call translational research, which means that questions of research that come up during clinical practice can be answered straight away or begun to be dealt with thanks to the resources of the PRBB. It also

The PRBB has adopted the set of good practice regulations called the *Codi de Bones Pràctiques Científiques*, which is a code of conduct common to all the centres that make up the research park and that aims at improving the quality of the scientific work carried while minimising the chance of problems and mistakes.

Director general Jordi Camí comments on some of the issues covered by the regulations, saying it covers areas "from relative norms in the relationship between chief researchers and their doctoral students, to the criteria for authors in presenting their work, to the rules behind obtaining, storing and sharing of information and biological samples."

The regulations have been welcomed by researchers. "A key has been not to impose it but to convince people of its need," says Camí.

Moreover, the *Comitè per a la Integritat de la Recerca*, made up of professionals from within and without the body, provides researchers with a place to air doubts about the application of the code.

works the other way around, as sometimes there is knowledge that needs to be shared, applied or practised as part of clinical practice and, therefore, there is an opportunity for an extraordinarily close relationship between the two institutions."

Science for all

However the scientific park also has a stated aim of reaching out beyond the scientific community to the general public. That is why last October, the PRBB organised its open-doors event *Ciència per a tothom!*, for the second year running and attracting 3,200 people who came to see the facilities for themselves.

Camí talks positively of the experience: "We have an obligation to share what we do with the public, to get closer to people, to avoid the park being seen as something strange. We have the obligation to provide pay-back in all sorts of ways because we use public funds and the public has the right to know what we are doing and how we are doing it. We also have to work at stimulating scientific vocations because it is no easy matter and, therefore, we have to look for mechanisms to attract school children when they are deciding what they want to do when they are older," he says.

It is with the aim of making scientific research more attract-

ive to youngsters that the Universitat Pompeu Fabra and the PRBB created the prize *Recerca en Ciències Biològiques* in 2006. The award gives older school children the chance to have their work in biology evaluated by real researchers. For Camí, this award is "a way of stimulating scientific vocations" and he declares himself taken aback by the quality of the work presented: "the prize-winning work normally leaves us open-mouthed because it is fantastic, excellent."

However, this is not the only prize set up by the research park and last November saw the award of the *I Premi El-lipse de Divulgació Científica*. This award, given along with the *Science Meets Society* organisation, has two categories for written and graphic work.

"It is a prize that looks to stimulate communication with the public," says Camí. "We scientists need learn how to explain our work in a language that is accessible, entertaining and attractive, as that is something that was never done before but that now has to be promoted. It is an obligation that we all share."

It seems that the futuristic building on Barcelona's seafront has the future firmly in mind.

For more information visit the website: www.prbb.org.



Epidemiology

The Centre d'Investigació en Epidemiologia Ambiental (CREAL) studies the environmental factors of respiratory diseases, cancer and the effects of pollution on health in early life. Dr. Josep M. Antó is the centre's director.



Fighting against Alzheimer's

The Fundació Pasqual Maragall per a la Recerca sobre l'Alzheimer aims to promote research into improving the diagnosis, treatment and cure of Alzheimer's disease and other neurodegenerative illnesses associated with old age. Former president and Alzheimer's sufferer Pasqual Maragall is president.

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Hi-tech medicine

The Institut d'Alta Tecnologia (IAT) aims to offer pharmaceutical companies and the scientific community a range of medical imagery services, including molecular images. Dr. Francisco Javier Fernández is the institute's director.

JORDI CAMÍ. **Director general of the PRBB**

'Our aim is excellence'

MARIA PASCUAL

Four years after its inauguration, Jordi Camí, the director general of the PRBB, is positive about the progress made by the scientific park.

"We are moving ahead at the pace of a cruise liner; everything is stable and the different research groups are producing and inter-relating at a good steady pace," he says.

As for the situation of Catalonia within the scientific world, Camí says that all the hard work done is starting to pay off.

"Even though there are certain groups that are very good at the universities of Tarragona, Girona and Lleida, most of the work is concentrated in the Barcelona metropolitan area. I think that in Barcelona we are achieving a critical mass that is considerable and that allows us to maintain a dialogue on certain issues with the international scientific community. This is something that has taken many years but we are getting into a position in which we are respected and recognised and we want to keep that going. Perhaps the most important thing right now is continuity," he says.

In terms of the resources and



Jordi Camí, director general of the PRBB. / QUIM PUIG

effort put into research by public institutions, Camí thinks that "it has been done well, particularly in recent years, because if not, we wouldn't have what we have. From the political point of view, now that more complicated times are upon us, the government of Catalonia, as a minimum, has committed itself to protecting and maintaining what we have

achieved so far. I think this is a very good sign."

Looking to the future of the scientific park, Camí hopes that "to keep doing things better all the time. Our main aim is to produce new knowledge that moves us forward and is relevant and, so, what we aspire to is producing knowledge. Our objective is excellence."

Biocat, promoting research

The PRBB is a member of Biocat, the organisation that coordinates and promotes biotechnology, biomedicine and medical technology in Catalonia. As an initiative of the Generalitat and the Barcelona City Council, Biocat was set up in 2006 and has since promoted Catalonia's BioRegió, or the professional area consisting of companies, research institutions, administrations and organisations providing support structures for the transference of knowledge and innovation. The existence of Biocat as a response to the growing global interest in developing the so-called knowledge society, has helped Barcelona to be among the world's leading cities in biotechnology.

Biocat's ambitious objectives are to facilitate the relationships and synergies between the various elements that make up the biotechnology community in Catalonia and help turn the sector into an economic driver for the country by promoting it worldwide. It also has the task of promoting biotechnology and biomedicine carried out in Catalonia.

For more information, visit the website: www.biocat.cat.