

Career strategies for
young European scientists (XIX)

Hola España!



When working in Spain, prepare to eat paella...

Spain has much to offer when it comes to culture, climate and lifestyle. It is amongst the world's top three holiday destinations. But can Spain also attract young scientists from abroad?

Last year, the Spanish Minister of Science and Innovation, Cristina Garmendia, announced that Spain needs an additional 50,000 highly qualified scientists, irrespective of nationality, for its research to gain momentum. Here, *Lab Times* will report on the latest developments in Spain and also introduce a few exceptional biomedical research institutes. Despite recent cuts to its science budget, Spain provides excellent career opportunities for foreign research talent. Find out whether a spell in Spain could benefit your career as well as your suntan!

Inventory

Spain is divided into 17 autonomous communities with substantial legislative and executive autonomy, even when it comes to research and innovation. Spanish and Castilian are the official national languages. However, there are also a number of regional languages including Catalan, Galician and Basque. English is not widely spoken. If you are browsing the Spanish net

for jobs or funding opportunities, do not expect to find too many details in English.

With about 46 million citizens, Spain is the fifth largest European country and still belongs to the world's ten leading economies. Due to the current economic crisis, its unemployment rate is likely to reach 20% next year according to the Organization for Economic Co-Operation and Development (OECD). Expenses for research and development steadily increased to €12 billion or 1.27% of gross domestic product in 2007. A recent OECD report identified future challenges for Spanish innovation: scattered public research funding, low impact of scientific output, poor innovativeness of companies, lack of researcher mobility and weak co-ordination of innovation policy. To meet these challenges several national plans and programmes are in place, including INGENIO 2010, the sixth National Working Plan for Research, Development and Innovation (2008-11), and the long-term National Strategy on Science and Technology (2008-15).

All over the country more than 80 science and technology parks have been established. They provide lab space and infrastructure and promote technology transfer and collaboration among companies, research centres and other organisations located in the park. For example, the University of Barcelona founded the Barcelona Science Park, the first of its kind, in 1997. It is currently home to four research institutes, 75 companies and about 70 research groups with more than 2,200 employees and is still expanding. Besides regional money, the establishment of these parks was made possible by funds from the European Union. Plenty of European money will also be provided between 2007 and 2013. About €12 billion from the European Cohesion Fund, the Regional Development Fund and the Social Fund is foreseen for Spanish research, innovation and entrepreneurship.

In the 2009 THE-QS World University Rankings, only the University of Barcelona made it into the top 200 overall. In the Biomedicine and Life Sciences category

ry the University of Barcelona was again the leading Spanish university at position 107, followed by the University of Complutense Madrid, Universidad Autónoma de Madrid, Universidad Autónoma de Barcelona and the University of Granada, all placed somewhere between 176 and 279. According to SCIMAGO, Spain is not among the 10 leading nations when it comes to publication categories including neuroscience, biochemistry/genetics and molecular biology, immunology and microbiology, and medicine. In addition, overall patenting activity is quite low. So far, only two Spaniards have been honoured with the Nobel Prize in Physiology or Medicine: the anatomist Santiago Ramón y Cajal in 1906 and the biochemist Severo Ochoa in 1959.

Spain is an active and full member of many international and European organisations and large facilities including EMBO, ESA and CERN. Latest developments include the opening of the Iberian Nanotechnology Laboratory, the first international institution in Europe in the field of nanosciences and nanotechnology. Spain also provided 90% of the cost of a new €105 million telescope, the world's largest optical telescope, which is located on the Canary island of La Palma. Other large-scale efforts such as the Synchrotron Light Facility ALBA and the Genome Sequencing Laboratory, headquartered in Barcelona, will certainly attract more international scientists to Spain in the near future.

The Spanish Science System

The overall structure of the Spanish research system was laid down in the 1986 Science Act. The Interministerial Commission on Science and Technology (CICYT) is the major agency for scientific and technology policy and includes the ministries involved, such as the recently established Ministry of Science and Innovation (MICINN). Two councils assist CICYT: the Advisory Council for Science and Technology, with the participation of the scientific community, and the General Council on Science and Technology, with participation of the independent sector. The development and execution of research and development and innovation policies have been delegated to MICINN. The Spanish Foundation for Science and Technology (FECYT), as part of MICINN, provides support for Spanish decision-making bodies. Typical for the Spanish system are four-year R&D plans specifying the main policy programmes and providing a framework for the coordination of national and regional activities. However, the ex-

act amount of funding is decided in annual action plans.

The National Research Council, or Consejo Superior de Investigaciones Científicas (CSIC), is the largest public research organisation in Spain. In 2007, the CSIC was transformed into a state agency, thereby enabling more independence and flexibility. Its annual budget amounted to roughly €675 million in 2007, two thirds were received as block funding from the national budget. The CSIC has more than 12,500 employees, with about 11,000 in the research staff category. It operates more than 100 research institutes by itself and 150 research units in association with universities and other public research organisations. It promotes research in almost any thematic area from humanities and social science to biology and biomedicine. Other CSIC activities include technology transfer and cooperation with industry, international cooperation and participation in EU programmes, research training and policy advice.

The Carlos III Health Institute, or Instituto de Salud Carlos III, coordinates Spanish health research and supports the national health system. It was established as an autonomous public institution and in 2008 was assigned to MICINN. It has multiple functions as a policy maker, funder and research performer and close to 1,000 employees, including a research staff of about 650. Its annual budget amounts to almost €350 million. The Carlos III Health Institute is associated with healthcare research centres, institutes and cooperative research networks to perform research on pre-defined topics. In addition, it has four foundations: the Spanish National Cancer Research Centre (CNIO), the Spanish National Cardiovascular Research Centre (CNIC), the Foundation for Cooperation and International Health Carlos III (CSAI) and the Neurological Disease Research Centre (CIEN).

Higher Education

Universities have a long tradition in Spain. The University of Salamanca, founded in 1218, is the oldest Spanish university still in operation. Today, there are 1.6 million students enrolled in more than 75 Spanish universities, about two-thirds of which are publicly funded. The overall reputation of the current higher education system is far from good. Complaints include overcrowded classes, poor remuneration of junior academics, an obsolete and non-performance dependent patronage system and low investment in research. A 2008 report on university systems by the Lisbon Coun-

cil for Economic Competitiveness and Social Renewal revealed that Spain was the taillight of 17 investigated countries. Weak points were the slow implementation of Bologna measures, a lack of responsiveness to the demands of the labour market and an inability to attract foreign students. A 2009 OECD report on tertiary education in Spain raised similar issues, including “inbreeding” in academic recruitment, which prevents an open market for academics.

Career stages at Spanish universities are: PhD candidate/research assistant (Ayudante), postdoc (Profesor Ayudante Doctor), lecturer (Contratado Doctor), associate professor (Profesor B) and full professor (Profesor A). Postdoctoral positions at universities are temporary positions (4 years) and require accreditation by the national evaluation agency, ANECA. Posts as lecturers are permanent but come without the benefits of a civil service position. Professors are permanent civil servants with a high teaching load. As mentioned above, internal recruitment is the rule and further barriers within the academic system for non-nationals include bureaucracy and language, since all job announcements and application forms as well as the majority of lectures are in Spanish.



Spain was one of the last European countries to introduce the three-cycle structure of bachelor, master, doctorate. The Bologna measures and a university reform package, called Ley Orgánica de Universidades, generated massive protest in late 2008 and early 2009. Students claimed that their increasing workload prevents them from meeting their living expenses, as no major grant or loan system seems to be in place. They also fear that public universities may in the long run be privatised and that study fees may increase.

To boost innovation at universities the government last year launched a highly ambitious programme called University Strat-

egy 2015. The aim of the programme is to promote educational and scientific excellence and internationalisation. From the first call, 15 campuses of excellence will be funded with a total budget of about €200 million from the government and regional authorities. Winners will be announced at the end of 2009. Since part of the budget is also reserved for human resources, this means that Spanish universities may, in the near future, also become more attractive to scientists from abroad.

Biomedical research at its best

Outstanding Spanish scientists from abroad have been engaged either to reform old or establish new research institutions. The advantage is that they are able to contribute their knowledge of foreign research systems without having too many ties to established structures back home. Examples include the developmental biologist Izpisúa Belmonte, with a joint appointment at the Centre of Regenerative Medicine in Barcelona and the Salk Institute in La Jolla; the HHMI investigator Joan Massague, the most cited Spanish biomedical researcher and expatriate, with a joint appointment at the Institute for Research in Biomedicine in Barcelona and the Memorial Sloan Ketter-

Interview I: Marcus Buschbeck

“I Feel Fully At Home Here”

Marcus Buschbeck is a German group leader at the brand-new Institute of Predictive and Personalized Medicine of Cancer (IMPPC) in Barcelona. After studying biochemistry he joined the lab of Axel Ullrich at the Max-Planck-Institute for Biochemistry in Martinsried, Germany, for his doctorate. With fellowships from EMBO and the German Research Foundation (DFG) he then moved to Barcelona to Luciano Di Croce’s group at the Center for Genomic Regulation (CRG). In 2008, he was recruited by the IMPPC to start his own independent group looking at cancer epigenetics.



with three groups in different countries and the decision I made was for a particularly good feeling with the young group leader in Barcelona. After my postdoc I had the chance to interview for as many PI positions in Barcelona as in Germany, Switzerland and Austria together. This was due to the fact that during the last years Spain, and particularly Barcelona, have made major efforts to extend their scientific activities. In Barcelona alone several completely new research institutes have been opened. Thus, the number of *de novo* recruitments was just extremely high. When I received the particularly attractive IMPPC offer, I already knew that my wife and my kid enjoy living in Barcelona and would not mind staying. This made the decision to stay quite easy.

What has been your postdoctoral experience at the CRG?

Buschbeck: When I joined the CRG in 2004 it was a very small and had just recently become an institute. The atmosphere was familiar and I think I was literally introduced to every single co-worker at the institute. While doing my bench work it was interesting to see the institute growing. Today the CRG is among the top three research institutions in Spain, which is certainly due to amazing efforts by its co-founder and director Miguel Beato. During my five years at the CRG, it has converted itself from a no-name institution and a risky option for postdocs to a first class institution.

What are your career perspectives?

Buschbeck: My current contract at the IMPPC is limited to five plus five years. This means I have to pass an evaluation after five years. If things work out, I will be promoted from junior to regular group leader and my contract extended for another five years. In addition to my own position, the institute was providing me with generous lab

Why Spain?

Buschbeck: I had learned Spanish in school. That is why Spain was not excluded when I was looking for interesting postdoctoral positions. In the end, I had interviews

ing Cancer Centre in New York; the former director of the Institute for Molecular Biology and Tumour Research at the University of Marburg, Germany, Miguel Beato, who is now head of the Centre for Genomic Regulation (CRG) in Barcelona; and finally the cancer researcher Mariano Barbacid, a former scientist at the National Cancer Institute in Frederick and vice president of oncology drug discovery at Bristol Myers Squibb, now Director of the National Cancer Research Centre (CNIO) in Madrid.

Some new institutions are autonomous when it comes to budgets and recruitment and are assisted by high profile international advisory boards. New organisational structures reduce the administrative and bureaucratic burden. For example, some institutions have been established as foundations with substantial funding by not-for-profit partners in the form of public-private partnerships. Thus, these new institutions serve as prototypes for other Spanish institutes and organisations. Two primary institutions are introduced below.

CRG

The Centre for Genomic Regulation (CRG) is part of the Barcelona Biomedical Research Park. The EMBL in Heidelberg,

Germany, served as a model for its operational structure. It is a dynamic institution offering five-year contracts for junior group leaders with a maximum of four-year expansion. The future goal is to house 36 research groups with about 450 research staff. Currently half of all researchers, including group leaders, postdocs and PhD students are non-Spaniards. Previous international employees include Thomas Graf from the Albert Einstein College of Medicine and Vivek Malhotra from the University of California in San Diego. The CRG has an international PhD programme supported by the La Caixa Foundation. According to Gloria Lligadas of the CRG, a multidisciplinary postdoc programme funded by the EU will start next year. The CRG is home to four winners of the first round for European Research Council (ERC) grants. The institute's research topics range from gene regulation, developmental biology and cancer to bioinformatics and analysis of disease genes. The systems biology programme, headed by Luis Serrano, teamed up with EMBL Heidelberg and this partnership will be supported by MICINN until 2015 with €1.4 million per year. Cutting-edge core facilities including advanced microscopy, genomics and proteomics and access to one of the largest an-

"I do not think that it is more difficult for a foreigner than a Spaniard to obtain national grants."

space, equipment, start up funding and two positions (postdoc and technician). I

also managed to get my first Spanish Ministerial Grant. This is a crucial step, since with the increasing number of scientists in Spain, competition for grants is getting harder every year. An intrinsic limitation of the system is that you are not allowed to hold or to apply for more than one Spanish Ministerial grant at once. Most grant applications can be written in English and I do not think that it is more difficult for a foreigner than a Spaniard to obtain national grants. Any foreigner might even have the advantage of been treated as a beginner.

Do you feel integrated?

Buschbeck: Yes, I feel fully at home here now. And little by little I have also become integrated in the scientific community. When I came here I knew some Spanish and by now I am fluent. For the scientific life it is not necessary to speak Spanish

but it certainly is a prerequisite for social life outside the lab. If you want to fully

dip into the cultural life of Barcelona, you need to speak or at least understand Catalan. From my point of view, the way science is done in Spain is similar to anywhere else. The main working differences come along with the cultural differences. The Spanish spontaneity for instance is sometimes difficult to handle for a German mind. Also the perception of time, organisation and punctuality is just different and the bureaucracy is a topic for itself. Nevertheless, I can highly recommend Spain as a working and living place.

How is the spirit of younger Spanish researchers?

Buschbeck: Of course they are worried in light of the fact that the government is planning to cut down the budget for science. But the motto is: do not panic. Let's wait and see what is coming up. -RS-

Calbiochem® Novabiochem® Novagen®

BUY DIRECT

Can I save time with my protein expression?

Absolutely!

Overnight Express™ Instant TB medium induces your cultures while you sleep and helps to improve your protein solubility.

That's what's in it for you.
Merck Chemicals

Find out more:
www.merck4biosciences.com/overnightexpress

Contact us for free:

France	0800 699 620
Germany	0800 6931 000
UK	0800 622 935
All other countries	00800 1166 8811

techservice@merckbio.eu
customer.service@merckbio.eu
www.merck4biosciences.com

MERCK

imal facilities in Europe provide a great opportunity to spur on your career in biomedical research.

CNIO

CNIO, the Spanish National Cancer Research Centre, was established in Madrid a decade ago and is today autonomous in its strategic planning and daily operations. Half of its budget comes from the government as block funding, the other half from grants. Since CNIO employees are not civil servants, it has greater flexibility when it comes to hiring scientists from abroad. Salaries are comparable to those of EMBL and roughly a quarter of scientific personnel are non-Spaniards. Recent recruits include the Austrian Erwin Wagner, a pioneer in transgenic mouse models and former Deputy Director of the Institute of Molecular Pathology (IMP) in Vienna, and the German stem cell biologist Christopher Heeschen. CNIO has an international postdoc programme and provides appealing start-up packages for young group leaders, which include the funding of two to three additional positions and running expenses for up to three years.

The scientific director of CNIO is Mariano Barbacid. He is supported by an illustrious advisory board including J. Michael Bishop (University of San Francisco), Julio Cellis (Institute of Cancer Biology, Copenhagen) and Anton Berns (Netherlands Cancer Institute, Amsterdam). According to their 2008 annual report, CNIO ranks in the first third of major international cancer centres. CNIO is also responsible for almost a fifth of all Spanish high impact factor publications in life sciences and biomedicine. Three junior and three senior investigators chose the CNIO as host institution in the first round of ERC Starting and Advanced grants, making it one of the most attractive European host institutions. In summary, the CNIO is definitely a place to consider if you want to advance in basic, translational or clinical cancer research.

Funding Opportunities

There are lots of funding opportunities at the local, regional and national level. Individual universities, research institutes, science parks and foundations have information on fellowships, grants and jobs on their homepages but, as already mentioned, not always in English. Helpful entry sites for your search are provided by the Ministry of Science and Innova-

tion, the Spanish Foundation for Science and Technology, the Spanish National Research Council and the Spanish Mobility Portal. You may also consider looking under ec.europa.eu/euraxess for opportunities in Spain.



Common features of applications at the regional and national level are that they are usually open to foreigners, can be made in English, are open to all scientific disciplines and fund working contracts. A few examples of national and regional programmes are given below. Important national programmes are Ramón y Cajal, Juan de la Cierva, JAE/DOC and Torres Quevedo. The **Ramón y Cajal** programme offers experienced researchers the opportunity to join a Spanish research institution in the private or public sector with a project of their choice. The programme targets researchers between two and ten years after obtaining their doctorate. Scientists must have at least 24 months experience as a postdoc in a research institution other than their future host institution. Funding is provided for five years, after which tenure should be granted upon positive evaluation. It covers the salary of the researcher (up to €44,370 per year before taxes) and start-up funding of €15,000. Applications are considered by MICINN's General Directorate of Research. Taken into account are your CV (80%) and your research project (20%). In addition, the host institute also has to demonstrate its commitment by applying and defining the proposed topics of research. After pos-

itive evaluation the institution receives a number of contracts. Thereafter, successful institutes and applicants with matching interests start contract negotiations. Seven months after the deadline the results are made available. Since 2001, seven calls have been made and about 3,000 researchers got lucky. The success rate so far has been about 14%. Over time, the number of applications from Spaniards has decreased to 70% in the last call. In the last annual call 250 positions were announced.

The **Juan de la Cierva** programme is for postdocs who obtained their doctoral degree within the last three years. You may not join the institute where you received your doctorate. At least 12 months of postdoc work at a research institution is also mandatory. The programme pays your salary of €33,360 per annum for three years. In the last annual call with a deadline of February 24th 2009, 350 positions had to be filled. Your CV, your project and the quality of the host group are all evaluated. Evaluation is carried out by ANEP, the National Evaluation and Planning Agency. Since 2004, there have been four annual calls with 1,400 beneficiaries in total, of whom a third were non-Spaniards. The past success rate is 23%.

The **JAE/DOC** programme is quite new and intended for researchers who obtained their PhD within the last ten years. Researchers have to work at a CSIC centre or institute. Requirements are a PhD or postdoctoral experience of 18 months outside the CSIC. Funding is for three years and covers a salary of up to €36,000 per year. Evaluation criteria are the quality of your CV, host institution and research project. Hosts must be contacted before the application is made. The 2008 call announced 248 positions. The Carlos III Health Institute also has several programmes including **Sara Borell** for advanced postdocs, which provides a one-year contract that is renewable for up to four years or **Ayudas para contratos de investigadores en el Sistema Nacional de Salud**, which provides co-financing of contracts and projects for three years.

Noteworthy regional programmes are offered by ICREA, the Catalan Institution for Research and Advanced Studies, which published 25 open permanent senior research positions at Catalan institutions in a 2009 call, and by the Government of Catalonia, which supports the **Beatriu de Pinós** postdoctoral programme, offering 40 positions per year. Ikerbasque,

Internet Resources

- ▶ Mobility Portal Spain - www.ericareers.es
- ▶ Ministry of Science and Innovation - web.micinn.es
- ▶ Spanish Science and Technology Foundation - www.feyct.es
- ▶ Spanish National Research Council - www.cisc.es
- ▶ Carlos III Health Institute - www.isciii.es
- ▶ University Strategy 215 - www.educacio.es/universidad215

the Basque Foundation for Science, is currently offering ten **Ikerbasque fellowships** for visiting senior researchers to work for up to one year in any Basque research centre, with a deadline at the end of November 2009. Early in 2010 there will also be a new call for permanent research professor positions for experienced researchers with international exposure, covering salary and start-up funding.

Due to space constraints only a very few Spanish foundations are mentioned here. Depending on the foundation or specific programme, you should apply either to the foundation itself or to the funded institution direct. For example, Spanish banks including Banco Santander, La Caixa, BBVA

and Caja Madrid have established foundations providing between 10 and 60 million euros per year for science, research and universities.

Outlook

The Spanish Government has done its homework and is aware of the challenges of a modern and competitive university and research system. Long-term strategies with the aim of substantial improvements before 2015 have been developed and tackle many of the problems mentioned above. Some problems can be solved just by pouring more money into the system, while fundamental reforms at universities and other institutions may need arm-twisting and

perseverance. Funding cuts have been made for the 2010 budget but will, according to David Sayago Hilera from the European Office of MICINN, have little impact on human resources, meaning that the financing and number of contracts is secured at least until 2010. In recent years, a couple of international competitive research institutions with novel finance and management structures have been established. The challenge now is to secure long-term finance and to intensify collaborations between these institutions. The motivation to hire the best people available makes Spain interesting to scientists from abroad. If you receive an attractive job offer at one of the primary Spanish institutions, take your chances. **RALF SCHRECK**

Interview II: : Josipa Bilić, Barcelona

“An Institute Directly On The Beach”

Josipa Bilić studied molecular biology in Zagreb, Croatia. For her PhD thesis she joined the lab of Christof Niehrs at the German Cancer Research Center (DKFZ) in Heidelberg, Germany. Currently, she is doing her first postdoc at the Centre of Regenerative Medicine (CMRB) in Barcelona.

Why did you choose the CMRB?

Bilić: I find this institute to have the optimal mix I was looking for – exciting and competitive research on stem cells, but still living in the area of the Mediterranean with its sea, weather and the atmosphere. After my PhD in Germany I got a little homesick. Unfortunately, the prospects of getting a satisfying job as scientist in Croatia looked pretty slim, so Spain was a good second choice. The decisive thing in the end was the possibility to work here on human stem cells, in an excellently equipped laboratory and with an attractive salary.

What are your career perspectives at the CMRB?

Bilić: In the first year I got my salary directly from the CMRB but this year I received a Spanish Juan de la Cierva fellowship. CMRB internal structure is very simple: we have one director and group leader, Juan Carlos Izpisua Belmonte, and then there are only postdocs in the lab and a few PhD students associated with a particular postdoc. In this kind of flat hierarchy there is not much room for career advancement in the classical sense, but this is a very young institute and we will have to see what structures will form.

Do you feel integrated?

Bilić: Yes, pretty much so. CMRB is a part of the Biomedical Research Park (PRBB). As in all centres there is a turnover of people and newcomers are welcome. My impression is that there is quite strong social bonding between people in CMRB and also in other centres. There are advantages of having an institute di-



rectly on the beach. Every summer we organise volleyball competitions and parties, where people from various centres interact and it is not rare that people hang out Friday evenings or weekends, too. At work the official language is English, but knowing at least a bit of Spanish makes life easier – not so much for the interaction with other scientists as with administration personnel and in everyday life. Being part of Catalonia there is of course the Catalan language as well. But if you are a foreign scientist struggling with your ‘Spanglish’, nobody really expects you to speak Catalan too. Although some friends of mine at other institutes have more pressure to speak Spanish at work.

What about foreign and female scientists at the CMRB?

Bilić: CMRB is quite international – it has around 50% foreigners among postdocs and PhD students. Looking at the PRBB, the situation is similar – it has 51% foreigners as postdoctoral researchers and 31% foreign PhD students. In such an environment it is obvious that the language is English and foreigners as well as Spanish people are treated equally. With respect to gender, we have more female than male scientists. This is also true for the whole research park but at the level of group leader the number of females drops significantly.

“One possible drawback of doing science in Spain in general is the low salary.”

Any advice to other young scientists wishing to pursue their career in Spain?

Bilić: I think research in Barcelona is comparable to research in other western European countries. Generally people are committed and like their work. As long as Spain keeps funding research, in spite of the all-present economic crisis, it should offer a good career perspective. But this has to be closely observed over the next years, as the Spanish government now plans to slash its research budget by more than 30% to retrieve some of the costs for its anti-crisis spending. One possible drawback of doing science in Spain in general is the low salary. CMRB is an exception, because it pays salaries comparable to German institutions. **-RS-**