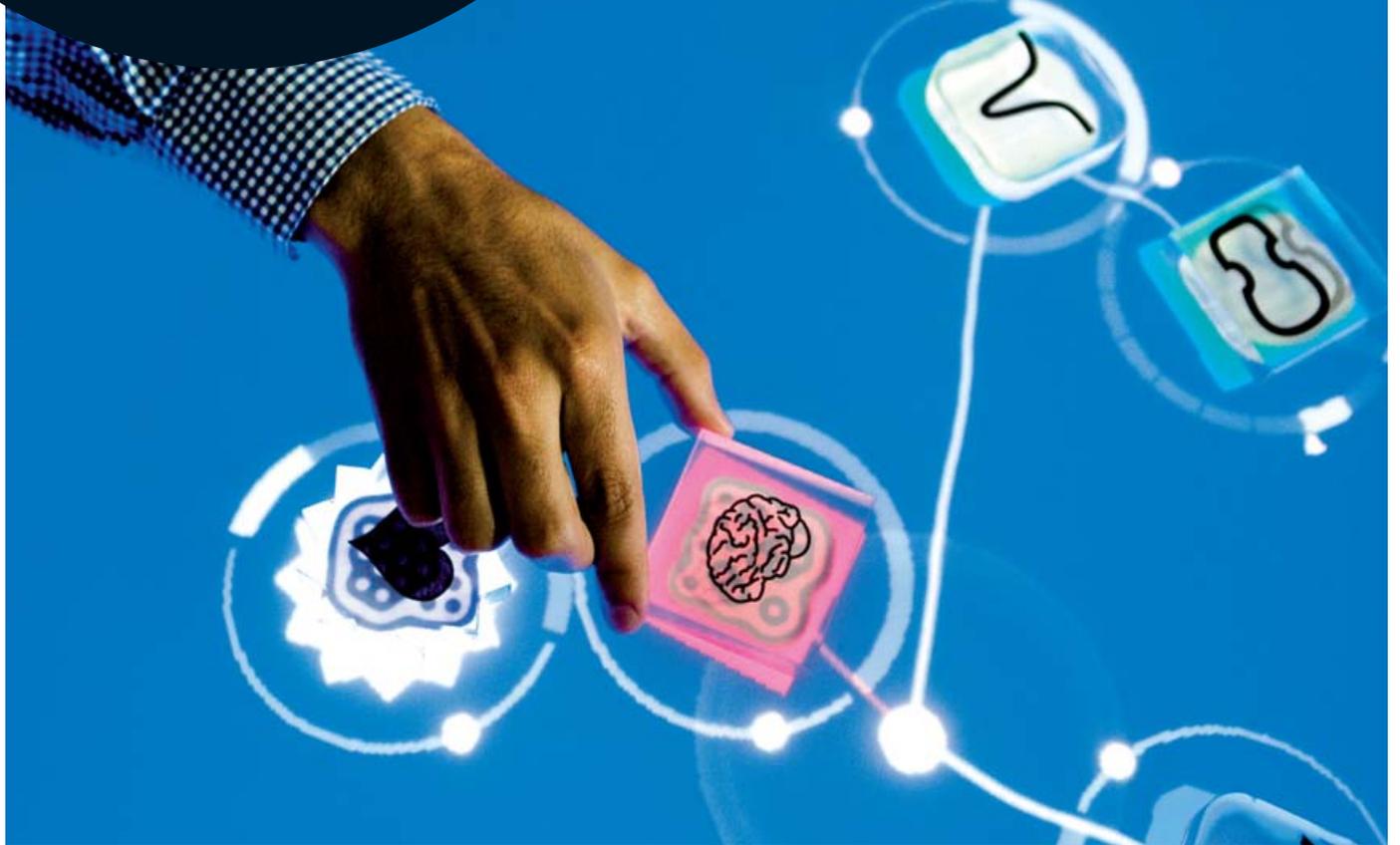


# BCN Tech

Innovation and research are forging Barcelona's future. We look at the key projects, people and places.



**BCN** SMART ALWAYS

By Eulàlia Iglesias

## ►1BC

### BARCINO, A ROMAN CITY

On top of what was called Mount Taber, the Romans built Barcino. Two large perpendicular streets, *Decumanus maximus* and *Cardo maximus*, converged in a huge forum. Today's Gòtic neighbourhood has echoes of the grid layout of the time.

## ►11TH CENTURY

### LET THEM HAVE WATER

Just outside the city, you can still see a section of the Rec Comtal, one of BCN's first hydraulic projects, built to replace the abandoned Roman aqueduct. Its glory days began in the 11th century, when it carried water to crops, businesses and fountains.

# WHAT?

Barcelona and Catalonia are vibrant centres for scientific research into a variety of subjects, including medicine, energy and robotics.

**Lluís Rovira**, director of the Institute of Catalonia Research Centres (CERCA), details ten of the main projects currently underway in this region.

## 01. CLOSING THE CARBON CYCLE

Among the solutions scientists are exploring to deal with global warming and increasing energy demand is the chemical recycling of carbon dioxide into fuels such as methanol (a raw material that can be used for a wide range of chemicals), thereby closing the carbon cycle. At the Institute of Chemical Research of Catalonia (ICIQ), a group led by Dr Atsushi Urakawa has developed a continuous-flow process that allows for the conversion of CO<sub>2</sub> into methanol with record results. [www.iciq.org](http://www.iciq.org)

## 02. BRAIN WATCHING

A team at the Institute of Photonic Sciences (ICFO) has developed a non-invasive, portable optical monitor that can measure and track blood flow in the brain of premature or full-term babies as well as adults. Staff at Barcelona's Santa Creu and Sant Pau Hospital are collaborating on the project to help develop the most efficient monitor, suitable for the most vulnerable patients. [www.icfo.eu](http://www.icfo.eu)

## 03. SCRUBS UP WELL

The Catalan Institute of Nanotechnology (ICN2) has created a new generation of disinfectants for hospitals that have both immediate and lasting antimicrobial effects. Non-irritant and non-toxic, cost-effective, easy-to-use and invisible once applied to a surface, the products have been welcomed by international companies in the sector. [www.icn.cat](http://www.icn.cat)

## 04. HELPING MEN BECOME DADS

Since the first test-tube baby was born in England nearly 40 years ago, treating infertility – which affects millions worldwide – has become a US\$3 billion business. At IDIBELL (Institut d'Investigació Biomèdica de Bellvitge), Dr. Sara Larriba is researching how to recognise fertile sperm using four genetic markers. Such tests are an effective, non-invasive way of identifying infertility, and much easier than the initial tests on women. [www.idibell.cat](http://www.idibell.cat)

## 05. LET THEM EAT OYSTERS

Dr Dolores Furrone and her team at IRTA in Sant Carles de la Ràpita, in the south of Catalonia, have state-of-the-art facilities for producing a range of shellfish – including clams and oysters – from seeds to full size. In the face of concerns about viral disease in oyster farms around the globe, the IRTA team are working on ways to harvest disease-resistant bivalves. [www.irta.cat](http://www.irta.cat)

## 06. I AM (DR) ROBOT

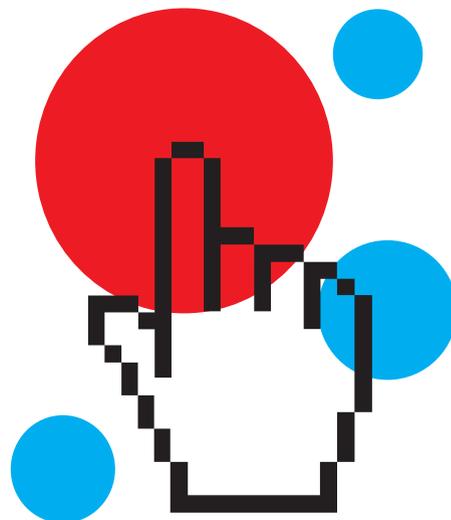
Rob Surgical Systems, a spin-off from the Institute for Bioengineering of Catalonia (IBEC) and the Universitat Pompeu Fabra (UPF), is currently developing its first product, a robotic station for minimally invasive surgery. Designed for chest surgery, it includes enhanced design, size and ergonomics compared to the surgery robots currently in use, and has attracted interest from prestigious hospitals worldwide. [www.ibecbarcelona.eu](http://www.ibecbarcelona.eu)

## 07. AIR BRIDGES OVER TROUBLED WATERS

When a natural disaster strikes, the destruction of local infrastructure can hamper rescue and restoration efforts. At CIMNE (the International Centre for Numerical Methods in Engineering), Professor Eugenio Onate is leading work on a new system of emergency air bridges that use computer-controlled, low-pressurised, air-filled beams connected by an upper deck. The beams are lightweight, inflate rapidly and can be folded after deflation, easing transportation and storage. In tests to date, the bridge has carried weights up to 8 tonnes. [www.cimne.com](http://www.cimne.com)

## 08. INTELLIGENT DRESSING

Leg ulcers are among the most common wounds chronic wounds suffered by old people. They are caused by diabetes, poor circulation or



inappropriate pressure and are notoriously difficult to manage. Past solutions based on cell therapy have proved costly as well as complicated to manufacture and store. At IBEC they are testing an innovative dressing that encourages much improved blood flow to the affected area. This results in much better circulation of oxygen and nutrients so that cell healing occurs in the most natural way. [www.ibecbarcelona.eu](http://www.ibecbarcelona.eu)

## 09. LOOKING AT EYES

Brain disease is one of the EU's biggest health problems but developing therapies for preventing and treating them is complicated because of the difficulties of studying the brain. IDIBAPS is aiming to develop new molecular imaging technology for studying the human retina, as a 'window to the brain'. Raman Spectroscopy (RS) is a technique that allows the chemical content of the retina to be examined, in order to start identifying diseases such as multiple sclerosis, glaucoma and other neurodegenerative diseases as early as possible. [www.idibaps.org](http://www.idibaps.org)

## 10. THE WONDERS OF OLIVE OIL

The IMIM and IMABIS Foundations and CSIC have developed a family of unsaturated fatty alcohol derivatives from olive oil compounds that, in trials on rats, have shown a capacity for inhibiting food intake. Such compounds may be used for treating obesity by inducing a feeling of being full, as well as certain cardiovascular diseases including hypertension and atherosclerosis, through the prevention of cholesterol build-up in the blood. [www.imim.es](http://www.imim.es)

### ► 1599

#### LET THERE BE LIGHT

As the 16th century came to a close, the city got its first public lighting system, albeit one that used precarious open flames. It wasn't until the 18th century that oil lamps were introduced. And in 1842, Barcelona became the first Spanish city to have gas lights.

### ► 1775

#### CITY OF THE DEAD

Bishop Josep Climent ordered the construction of the Poblenou cemetery – the first to be situated outside the city walls – bringing to an end burials in parish grounds, which had become the source of all manner of illnesses and epidemics.

### ► 1835

#### FEWER CONVENTS, MORE SQUARES

Riots, such as those in the city in 1835, and various property seizures put an end to the proliferation of convents in Ciutat Vella. On the former church lands, the Boqueria and Santa Caterina markets, the Liceu opera house and Plaça Reial were built.

# WHO?

Meet some of the key figures who are part of Barcelona's hub for innovators, scientists and entrepreneurs all looking to the future.

## José Luis de Vicente

Journalist, writer, curator and researcher specialised in digital culture, art, design, technology and social innovation. Among other roles, he is currently the curator of Sónar+D, the innovation section of the annual Sónar electronic music festival – creativity and technology combined. De Vicente has also curated many symposia and exhibitions, for example 2014's 'Big Bang Data' show at the CCCB.

## Ana Maiqués

Co-founder of Starlab, an avant-garde scientific and technological company with its HQ in Barcelona but proud of its global outlook, Maiqués was one of the winners of a European Women Innovators Award in 2014. One of her most recent creations is Enobio, a portable, wireless helmet capable of reading brain activity. Based on her experience, Maiqués says that it's impossible to develop a good idea if there's no teamwork involved.

## Reactable

Electronic musical instrument created by Sergi Jordà, Marcos Alonso, Gunter Geiger and Martin Kaltenbrunner at Barcelona's Pompeu Fabra University. Futuristic, simple and with an intuitive design. Based on plastic objects of varying colours and sizes, Reactable enables experiments with sound, changing its structure and controlling its parameters. It invites a tremendous level of creativity among users (of which there are

many – its table has been downloaded over a million times), and *Rolling Stone* magazine declared it Hot Instrument of the Year in 2007. Björk and Coldplay are just two of the acts to incorporate it into their recent live performances, while it has also proved a popular tool for producing music videos.

## Roc Herms

Ever since he joined the digital world in 2008, Herms has used photography to document everything that 'cyber aborigines' do. He joined this parallel universe on December 31, 2008, when he went into PlayStation Home and discovered hundreds of people there celebrating New Year's Eve by re-creating social behaviour familiar from the physical world – that was the moment he decided to

capture what was happening in that virtual space. He interviews and photographs the inhabitants of the digital world, and is the only digital photojournalist who uses this tool with an anthropological vision rather than with the objective of explaining to the rest of us what's going on over there.

## Fàbrica Futur = #ffbcn

The platform #ffbcn is a Barcelona-based movement that explores the future. Ten young talents drive ten projects about the future in ten different areas: arts, cinema, architecture and urban planning, communication, education, work, food, personal relationships, community and tourism. The website [ffbcn.bcn.cat/en](http://ffbcn.bcn.cat/en) centralises the most relevant innovative content, and also houses a platform from where to follow both the research processes of the young creatives and a series of related conferences.

## Jaume Ripoll

Editorial director and co-founder of Filmin, the first electronic platform for home cinema in Spain, and a place to find alternative and independent films, legally and in a high-quality format. Ripoll's creative and innovative nature has seen him win various prizes, and last year, his team was nominated for three Proyecta prizes awarded for film marketing. He sees the internet as the solution to many of the film industry's problems, based on payment and working side-by-side with traditional cinemas.

## Tomás Diez

Venezuelan Tomás Diez is director of Fab Lab Barcelona, a centre specialised in 3D printing that runs workshops for amateurs and pros, and is part of a worldwide network of laboratories. Diez believes the creation of products using computers will bring about a change in society as big as that seen when computers first arrived. 'It will change the way we interact with each other because democratising production methods basically means liberating people. It might sound a bit naive, but I think it will allow equal access to things and to solutions for our needs, and show that not everything depends on money.'

**'3D PRINTING WILL BRING EQUAL ACCESS TO THINGS AND TO SOLUTIONS FOR OUR NEEDS, AND SHOW THAT MONEY ISN'T EVERYTHING'**



### ►1860

#### THE GREAT CERDÀ PLAN

The renovation and expansion (*exemple*) plan of Ildefons Cerdà is the most important local urban transformation of the past few hundred years. Barcelona escaped its medieval prison (1854 saw the city walls demolished) to grow into the future.

### ►1902

#### SEWER SYSTEM

The Romans had a wastewater system, but it wasn't until 1891 that the first modern sanitation plan was created for the city. The works began in 1901, and the inauguration was on September 24, 1902, feast day of Barcelona's patron saint, Mercè.