

EUREKA

I N N O V A T I O N A C R O S S B O R D E R S



FEATURE ON HEALTHCARE

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ISSN 1470-7489

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Printing · Artos / Havez

Publisher · Pedro de Sampaio Nunes

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Cover Illustration · Tribute to Health Innovators by Pablo Diartinez (2016)

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Colophon · Body copy text set on Tisa Pro (FontFont Foundry) and DIN 2014 (Paratype Foundry), headlines set on Epilepsja (by designer Mikolaj Grabowski)

The EUREKA magazine is published two times a year.

Opinions expressed within EUREKA magazine do not necessarily reflect those of the organisation.

EUREKA



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EDITORIAL

EUREKA is all about bringing different people and players together:

SMEs and large multinationals,
the European Commission and national ministries,
academic research and businesses, start-ups and investors.

This issue's feature on healthcare technology will focus on innovative SMEs that collaborate with partners on an international scale: Which opportunities can arise for them? What are the particular challenges and risks? Where do they need which type of support along the way? And what's in there for the big players?

We can already say so much: the pros of engaging in international markets outrank the cons by far. Globalisation is a fact, and we better see it as a big opportunity. That is also one of the reasons why EUREKA is increasingly engaging in activities outside Europe (pages 6 and 11).

Somewhat paradoxically, one of the effects of globalisation is an increasing concentration of know-how in regional hubs (page 36-37). But this doesn't mean that regions don't need to collaborate with each other in order to create amazing new technologies (check out for instance the Eurostars NewBone project on page 19).

Collaborations between the different providers of funding are also needed to fully explore the European economy's potential. The European Commission and EUREKA already collaborate in the Eurostars-2 programme (see the interview with Commissioner Moedas pages 8 to 10) and EUREKA is committed to continue this very successful collaboration.

By bringing different people together, EUREKA can provide a perfect platform to make innovation happen, and we hope this magazine can make a humble contribution to exchanging information within that platform. EUREKA is all about innovation —this is also reflected in this magazine that comes in a completely new shape and look.

We hope you enjoy reading it!

And don't hesitate to stay in touch

communications@eurekanetwork.org

EUREKA NETWORK DEVELOPMENTS

GOING LATINO

ONE OF THE PRIORITIES OF THE CURRENT SPANISH EUREKA CHAIRMANSHIP IS TO OPEN EUREKA TO THE WORLD

EXPANSION PLANS TO LATIN AMERICA AND A DEDICATED INSTRUMENT FOR GLOBAL COOPERATION –GLOBALSTARS– PROVE THAT THIS IS MORE THAN JUST A CATCHPHRASE

SENIOR INTERNATIONAL RELATIONS OFFICER SUSANNE MADDERS ON GLOBALISING THE NETWORK

Watercolor illustration by Pablo Diartinez

Smart globalisation is one of EUREKA's strategic goals, as laid out in the network's 2020 Strategic Roadmap.

It has been continuously pursued in order to increase European industry participation in international value chains and to raise market-access opportunities in international partner countries and regions.

In 2016 EUREKA decided to extend its scope of activity to the Latin American continent, responding positively to the request of the Chilean government for closer, more systematic cooperation. As a result, the association process for Chile was opened this year, and a pilot GlobalStars call was launched in September 2016.

Chile is not only one

of South America's more stable and prosperous nations but is also the leading country for innovation in this region. It is expected that, once associated, Chile will become a benchmark for the cooperation with EUREKA in this part of the world. This was also the idea behind the association of South Korea, Canada and South Africa. A EUREKA delegation

visited Chile in December 2016 to learn about the Chilean innovation landscape, stakeholders and potential partners.

As mentioned by the Chilean Minister of Economy, Development and Tourism, Luis Felipe Céspedes, "with its participation in EUREKA, Chile wants to learn how science and technology can be related to new opportunities and innovation". Although Chile had developed quite well economically in the last years, the traditional industries in Chile had not kept the same path. With the participation in

EUREKA there were expectations to attract new players in order to contribute to a diversification of Chilean economy.

Chile's participation would be of added value also for the region. It could act as a facilitator for the collaboration of other countries in the region within EUREKA.

Apart from Chile, another pilot GlobalStars call with Argentina is open since end November 2016. Argentina was chosen as a privileged country to increase cooperation also in the region. Through the new GlobalStars dedicated calls, a temporary

collaboration with a third country through a limited set of calls under conditions that can be determined on a case-by-case basis is now possible.

EUREKA has continued to support its associated countries in deepening their integration in its network. In 2016, Canada and South Africa both declared their participation in the Eurostars Programme, and the EUREKA Secretariat helped in promotional activities to improve stakeholder awareness about these new possibilities in both countries.

By Susanne Madders | susanne.madders@eurekanetwork.org



GLOBALSTARS

eurekanetwork.org/calls

FOR CALLS

Collaboration between at least two EUREKA members OR one EUREKA member and one associated country and a GlobalStars partner country (or group of GlobalStars partner countries) outside the EUREKA Network.

Participating countries must have dedicated funding to support their companies.

ON PROJECT LEVEL

Minimum two participants, one organisation from a EUREKA member or associated country and one organisation from a GlobalStars partner country.

FINAL RESULT

EUREKA Network and Cluster projects*.

*see pages 27 and 32 for further info

“COOPERATION BETWEEN PUBLIC AND PRIVATE FUNDERS OF HEALTHCARE R&I IS ESSENTIAL”

EUROPEAN COMMISSIONER
FOR RESEARCH, SCIENCE
AND INNOVATION

CARLOS MOEDAS

**TALKS ABOUT THE ROLE OF SMES IN HEALTHCARE
INNOVATION AND THE BEST WAYS TO SUPPORT
THEM IN FINDING BREAKTHROUGH SOLUTIONS TO
GLOBAL CHALLENGES.**

Interview by Thomas Ehritz. Photo by European Commission

E! ▶ Usually, what first comes to mind when we speak about ‘healthcare innovation’ are the global players: multinational pharma companies with large market shares that invest millions a year in R&I. How do you see the role of SMEs in healthcare innovation? Do they have a chance to compete on the market?

CM ▶ SMEs are very important players in the health sector in Europe. If we look at publicly traded European biotech companies, three out of every four will fall under the market capitalisation category of micro or nano cap. In Europe alone, healthcare biotech comprises more than 1700 companies, many



of them SMEs, and a market worth above €17B. SMEs are very active in finding breakthrough solutions towards preventing, diagnosing, or treating diseases whether it is a medical device or an ICT based technology just to name a few. In recent years, we can see an increase in the number of IPOs by the European SMEs operating in the biotech industry, which also proves to be a good sign for real market opportunities for these small and medium size companies. In addition, more than 300 SMEs that registered with the European Medicines Agency are contributing to the development of future medicines or vaccines for the benefit of not only EU citizens.

E! ▶ How do you support healthcare R&I in the current EU funding programmes? What initiatives support SMEs specifically?

CM ▶ The EU drives the development of better research and innovation ecosystems across Europe with great spin-offs for SMEs through its current EU R&I framework programme for Horizon 2020, which aims to provide €8.6B to the sector. Via innovative financial facilities, SMEs with a higher risk profile are encouraged to develop products or services which may tackle unmet needs in health and care delivery systems. The SME instrument takes into account the special nature of these entities. A company can utilize as much as €5M to advance a close to market innovation addressing specific health topics. We have also piloted another funding tool called Fast Track to Innovation that has been very popular among SMEs. Besides grants, Horizon 2020 also offers various financial schemes also for SMEs including, for example, the targeted InnovFin Infectious Diseases. Under this scheme, the European Commission together with the European Investment Bank, makes loans available between €7.5-75 million for entities developing vaccines, drugs, medical devices and infrastructure to combat infectious diseases.

E! ▶ Health problems are not only European, the global health challenges that we face are enormous.

Through effective international cooperation, especially with developing countries, we can bring benefits to all parties enhancing health innovation.

What steps is the EC taking in encouraging such cooperation and removing roadblocks on the journey from research to market in healthcare in order to identify concrete solutions?

“
Via innovative financial facilities, SMEs with a higher risk profile are encouraged to develop products or services which may tackle unmet needs in health and care delivery systems.
”

CM ▶ Developing countries lack consistent health innovation and the result of poor healthcare systems is exemplified by the alarming spread of poverty-related infectious diseases, including neglected or emerging ones (i.e. outbreaks of Ebola, Zika or yellow fever).

The European Commission (EC) responds to these threats by supporting international research towards the development of new vaccines against this type of diseases. We also fund the European and Developing Countries Clinical Trials Partnership with sub-Saharan Africa, which brings together public funders of clinical trials in Africa and Europe.

Moreover, via the InnovFin Infectious Diseases Facility, the EC and the European Investment Bank provide loans to companies so that they can advance their innovation on infectious diseases up to market readiness. In addition, together with our partners, the EC has recently launched the Birth Day Prize to reward innovations that demonstrated a significant reduction in maternal or newborn mortality.

E! ▶ Research and innovation in healthcare often has to deal with ethics questions (e.g. use of stem cells). How does the EU ensure that its research follows ethical standards?

CM ▶ All projects selected for EU funding undergo an ethics review before grant agreements are signed. Every project is ‘screened’ by independent experts. All projects considered to include ethically sensitive issues, such as stem cells or interventional clinical trials, undergo a more thorough assessment. If the H2020 ethics standards cannot be met, EU funding is refused. During ethics audits on ongoing projects, ▶▶

the ethics framework is rigorously monitored and, if found wanting, projects can be suspended or terminated. The ethics review and audit processes ensure responsible innovation in compliance with agreed ethical standards.

E! ▶ Industry driven public-private partnerships (PPPs), such as the EUREKA Clusters, have expanded rapidly in the last few years. How do you see their role in supporting R&I in healthcare? Is the Commission planning to increase its focus on PPPs, as they leverage industrial investment in fields where big pharma and VC money is not available, but where there is a clear need?

CM ▶ While currently there is no health-related EUREKA Cluster we are very proud to have founded the world's largest public-private partnership in health research, the Innovative Medicines Initiative (IMI). From 2008 to 2013, IMI had a total budget of close to €2 billion. From 2014 to 2024, its budget will reach €3.3 billion, half of which comes from Horizon 2020. I consider PPPs as an essential element of healthcare R&I. There is clear evidence that joining the specific strengths of industry, with academics, SMEs, patient organisations and regulators, increases the impact of the research results. A number of IMI projects are delivering on this promise, ranging from new antibiotics against life-threatening infections to steps

to develop the first drug candidate ever to specifically treat autism. The abovementioned increase in the budget of IMI from the previous to the current EU R&I framework programme gives you an idea of the importance that we attach to PPPs in this area.

E! ▶ Facebook Mark Zuckerberg and his wife, paediatrician Priscilla Chan, announced last September they would spend 3B USD to “cure, prevent or manage all disease”. What is your view on this initiative? What role can tech giants play to support healthcare innovation?

CM ▶ We welcome this kind of ambitious initiative —we have noticed that lately the business environment has shown a growing interest in contributing to research platforms for the benefit of society. Nevertheless, no single funder alone can raise the money needed to deliver healthcare innovation to “cure, prevent or manage all disease”. I believe that cooperation between public and private funders of healthcare research and innovation is essential to sustainable progress. Therefore, the EC developed strategic partnerships with major private funders of healthcare innovation, including the Bill and Melinda Gates Foundation and the Calouste Gulbenkian Foundation, as well as European industries through IMI, along with the European Federation of Pharmaceutical Industries and Associations. ◀

H 2020 SUPPORT FOR SMES IN HEALTHCARE

SME INSTRUMENT

structured in three phases, with the aim of transforming disruptive ideas into concrete, innovative solutions with a European and global impact

INNOVFIN INFECTIOUS DISEASES

European Investment Bank funding between €7.5M and €75M to innovative players active in developing vaccines, drugs, medical and diagnostic devices, and research infrastructure for combatting infectious diseases

INNOVATIVE MEDICINES INITIATIVE

supports collaborative research projects and builds networks of industrial and academic experts in order to boost pharmaceutical innovation in Europe

www.ec.europa.eu/easme/en/horizons-2020-sme-instrument
www.eib.org/products/blending/innovfin/
www.imi.europa.eu/

COUNTRY FOCUS

SOUTH KOREA

AN ASSOCIATED COUNTRY WITHIN THE EUREKA NETWORK SINCE 2009, SOUTH KOREA IS A TRUE TECH POWERHOUSE

NATIONAL PROJECT COORDINATOR, DR. MYUNG JUN OH, ON KOREA'S STRATEGIC SUPPORT FOR INNOVATION, INTERNATIONAL COOPERATION AND ITS INVOLVEMENT IN EUREKA

IN 2014, Korea ranked first worldwide in terms of R&D investment as percentage of GDP (4.29%)

and sixth in terms of volume (\$60.5 billion), and the government is promoting continuous economic development through strategic R&D policies. Nevertheless, due to low global growth and manufacturing oversupply, Korean core industries are

going through crisis. To overcome the difficulties, the Ministry of Trade, Industry and Energy (MOTIE) recently focused on supporting 12 new industries in order to create new growth engines for the future, while continuing to strengthen core

industries. The 12 new industry areas are Electric and Autonomous Vehicles, Smart and Environment-friendly ships, IoT appliances, Robotics, Bio/Health, Aviation and Drones, Premium High-end Consumer Products, New Energy, New Materials, AR-VR, Next-generation Display, Next-Generation Semiconductors. The government primarily

invests R&D funds in those fields. To promote corporate investment, it helps companies by implementing overall deregulation, providing financial and tax system support, etc.

Open innovation is an important factor for the growth of companies. Therefore, MOTIE continuously strives to support industrial technology cooperation >>

and international joint R&D. As the national funding body, Korea Institute for Advancement of Technology (KIAT) has bilateral joint R&D programs with 10 countries, and is also engaged in multilateral collaboration including EUREKA. Recently, outcomes of Korea-Europe technology collaboration are very encouraging. Ever since Korea joined the EUREKA Network in 2009 as an associated country, technology cooperation with European partners has been increasing. After joining the Eurostars-2 programme

in 2014, SMEs' interest and participation levels are also increasing. In EUREKA and Eurostars-2, Korean SMEs achieve remarkable results. They can create partnerships with European counterparts, become more technologically competitive on a global level, and access overseas markets.

KIAT also offers various support measures spanning from the point of consortium creation to commercialization. It co-organises the annual Korea EUREKA Day with the respective EUREKA chair country. It also holds Korea-Europe

technology cooperation workshops and various matchmaking events in collaboration with other EUREKA members. Korea also actively participates in the E!nnoVest programme and Enterprise Europe Network. The level of technology collaboration between Korea and Europe is constantly on the rise. MOTIE and KIAT will continue exerting all efforts within EUREKA and Eurostars-2. And through EUREKA, we hope to contribute to broadening knowledge horizons, leading technology innovation and solving social issues.

Oh Myung Jun | mjoh@kiat.or.kr

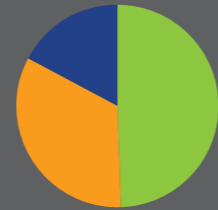


SOUTH KOREA

EUREKA FUNDING FROM 2004 TO 2016



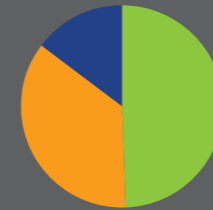
PROJECTS FUNDED



E! NETWORK	46
EUROSTARS	16
CLUSTERS	31

TOTAL 93

INVESTMENT MILLIONS, PUBLIC & PRIVATE



E! NETWORK	€ 45.73
EUROSTARS	€ 13.61
CLUSTERS	€ 33.13

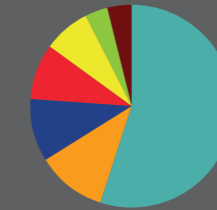
TOTAL € 92.47

ORGANISATION TYPE



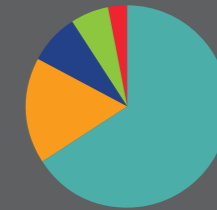
SME	49.3 %
RESEARCH / ACADEMIA	38.2%
LARGE E. / OTHERS	10.5%

MARKET AREAS



ICT	55%
INDUSTRIAL	11%
ENERGY	10%
CONSUMER / SERVICES	9%
LIFE SCIENCES	6%
ENVIRONMENT	3%
TRANSPORTATION	3%

TECHNOLOGICAL AREAS



ICT	66%
INDUSTRIAL	17%
ENERGY	8%
ENVIRONMENT	6%
LIFE SCIENCES	3%

COUNTRY COLLABORATIONS



SPAIN	17%
TURKEY	12%
FRANCE	9%
GERMANY	6%
FINLAND	6%
THE NETHERLANDS	6%
OTHER	44%

A GREENER DRIVE: MAKING CARS MORE FUEL EFFICIENT



A South Korean company picked two European partners to secure its lead in the clean diesel sector. Hanil Tubes may not be a household name for European consumers but many of us are driving cars fitted with fuel injection and power steering pipes made by the South Korean company.

It supplies some of the world's biggest car manufacturers including Kia Motors and Hyundai Motor and, thanks to two European companies and EUREKA project HTPPT, will be playing a key role in the next generation of clean diesel cars.

A cloud is hanging over the industry in the wake of the VW scandal, which revealed many cars on the road were not as "clean" as the results of laboratory tests showed. Regulation is likely to become tougher as a result. That's not a prospect that scares Hanil, French partner Arkema and German partner Frankische. While some engineers were

focused on software tricks to lower emissions levels, their engineers were concentrated on producing new hoses to make cars more fuel-efficient. "We wanted to improve the fuel efficiency of the hoses connecting a car's radiator to the water cooling system, the oil-cooling system and the lubrication system and we thought we could do it by making them lighter," explained Seong Hwa Choo. Hanil Tube wanted to switch some of those hoses from metal and rubber to plastic, which would also make them more durable and less prone to corrosion.

However, the task was challenging. Developing a durable

new plastic tube required investment and expertise. "We knew that coming up with the concept design, validating it, producing prototypes, engine durability tests, simulations and optimising the product would mean we wouldn't be able to sell it for three to five years," said Seong Hwa Choo.

GREAT EXPECTATIONS

Hanil asked plastics specialist Arkema if it could develop a plastic resin to withstand extremely high temperatures of 160° C and Frankische, experts in bellows tubes, to help make it flexible enough to do the job. Plastic was already used in part of the car's cooling system but this hose needed to withstand heat and be flexible. Hanil oversaw the whole design and how it would connect in cars and the trio secured funding in their

respective countries for a total of €4.1M.

"Without Hanil's financing we would never have been able to do the project," said Marc Audenaert, R&D Partnerships Manager at Arkema.

The tube developed is heat and pressure resistant. It improves fuel efficiency by being 50-60 percent lighter than previous hoses, an attractive improvement for car manufacturers who began buying it from Hanil in 2015, using it in vehicles that meet clean diesel regulations like Euro-6 in Europe, Japan's Post New Long Term Target and the United States' strict Tier2/ Bin5 standard. "We're expecting our sales figures to get better and better as a result of this project over the next 1-2 years," said Seong Hwa Choo. <<



EUREKA EUROSTARS PROJECT E! 6311 HTPPT

COUNTRIES PARTICIPATING

SOUTH KOREA

Korea Institute for Advancement of Technology (KIAT)

GERMANY

Federal Ministry of Education and Research (BMBF)

FRANCE

BPI France

TOTAL COST €4.1 MILLION

DURATION

MARCH /2011 TO JANUARY /2015

MAIN PARTNER

Hanil Tube, South Korea
www.haniltube.co.kr

OTHER PARTNERS

Arkema, France
Frankische, Germany

BIG OPPORTUNITIES

FOR SMALL COMPANIES

INNOVATIVE START-UPS CAN MAKE A MAJOR IMPACT IN HEALTHCARE IF THEY DEVELOP A TECHNOLOGY THAT SOLVES A REAL-WORLD PROBLEM.

FOR ENGINEERS, ACADEMICS AND SURGEONS BRINGING PRODUCTS TO MARKET, SOUND ADVICE FROM EXPERIENCED EXPERTS CAN HELP CLEAR THE FINANCIAL, INTELLECTUAL PROPERTY AND REGULATORY HURDLES THAT LIE AHEAD.

GARY FINNEGAN ASKS EXPERTS AND INVENTORS FOR THEIR TOP TIPS

By Gary Finnegan. Illustrations by Pablo Diartinez

Fifteen years ago, while working at the University of Oslo, Ståle Petter Lyngstadaas, found a problem in need of a solution.

Patients with broken bones sometimes undergo surgery to have replacement bone transplanted from their hip or shin. The operation helps the broken bone to repair.

The trouble is that the procedure is complex and can come with risks. Many of the older patients who endure the surgery find it burdensome. And, as Europe's ageing population is expected to mean many more fractured and broken bones, there are concerns that the costs are beginning to mount.

Prof Lyngstadaas wanted to find another

way. Working with a diverse team of scientists and industry experts, he co-founded a company that aimed to develop biomaterials – substances engineered to interact with the body. One of their goals was to invent a simpler and cheaper way to accelerate bone healing. What followed was a text-book case of a nimble university spin-off company balancing the

urgent need for external funds with their mission to push the boundaries of biomedical science.

“We received some public funding to develop the ideas we had and patented a number of novel technologies,” recalls Prof Lyngstadaas, CEO of Corticalis. “By selling some of the bioactive surfaces we had come up with we had money to invest in new

inventions.”

The company's founders had good links with industry and were able to pitch their next ideas to investors and funding agencies. Finance is an essential piece of the puzzle for biomedical start-ups but so too is finding partners and tapping into valuable sources of advice from experienced advisors. “You need to convince

people that your technology is industrially viable,” he says. “One of the things we have done right is to consider commercial needs from the early stages.”

Through EUREKA's Eurostars programme, Corticalis and its partners in the University of Oslo, Numat Biomedical and the University of the



“
Consider
commercial needs
from the early
stages
”

1
TOP TIP

HEALTHCARE FAST FACTS

▶ **25,000** medical technology companies in Europe

▶ **575,000** medtech jobs in Europe

▶ SMEs make up almost **95%** of the medtech industry

▶ **More patents** filed than any other industry

▶ Most medtech SMEs employ fewer than **50 people**

*Source: MedTech Europe

Balearic Islands, have brought their 'NewBone' technology to the point where it is ready for clinical testing.

FROM BENCH TO BEDSIDE

Now, the company finds itself at a crossroads. "We are reaching the stage where we want to go into clinical testing," says Prof Lyngstadaas. "The question is whether we partner with a bigger player or do it on our own with the support of investors —or maybe even a combination of the two."

While the regulatory burden grows as

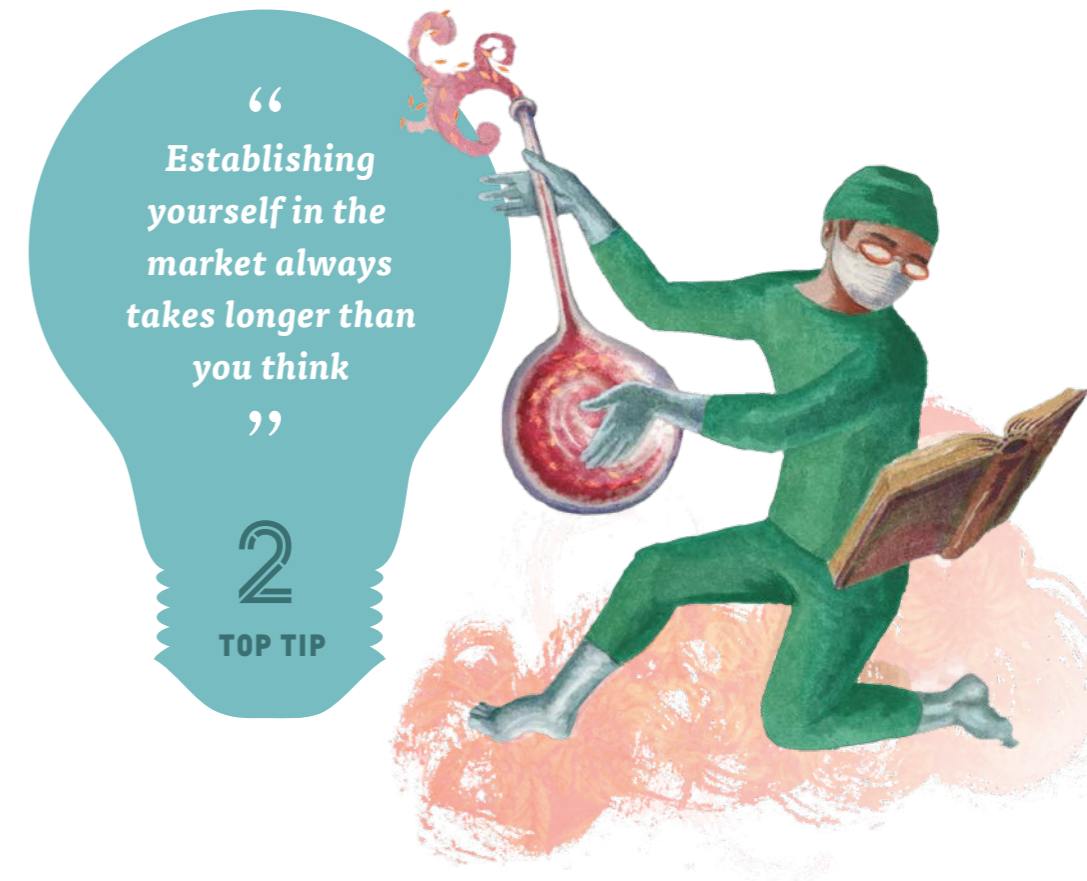
companies get closer to market, medical technology is a field where small and medium-sized enterprises (SMEs) can develop and launch products without necessarily selling to a big-name partner. The journey to market is much faster and less expensive than in the pharmaceutical sector —particularly for technologies that are not implanted into the body.

"Medical devices are easier and faster to get to market," says Prof Lyngstadaas, "but I would still advise people that it always takes much

longer than you think to establish yourself in the market."

Firms developing e-Health solutions or diagnostic tests can access Europe's single market by securing CE-marking. In contrast, a university spin-off that identifies a molecule with potential to become a new cancer drug would find it almost impossible to conduct the large and lengthy clinical trials required to secure marketing authorisation.

This explains why the pharma sector is dominated by large multinational companies while medtech is »



PREVENTING BRAIN DAMAGE WITH INNOVATIVE SENSORS

Swiss SME NEMODevices and its partners have developed and patented two groundbreaking sensors to help doctors save the lives of patients threatened by strokes and other brain injuries.

With commercialisation negotiations now underway, NEMODevices and project partner Creaholic are exploring new applications for their technology.

Around 7 million people suffer brain damage due to stroke, heart attack and head trauma every year across the EU alone. The economic cost is among the highest of any medical condition, to say nothing of the impact on patients and their families.

One key to reducing this suffering is to give doctors a better picture of how much oxygen is getting to the brain. The problem, explains NEMODevices' founder Professor Emanuela Keller, is that "only imaging devices can measure cerebral blood

flow accurately, but they're too bulky for the bedside or surgical theatres. We do have ultrasound at the bedside, but it doesn't measure the volume of blood flowing, nor its oxygen concentration. Both factors are critical to preventing brain damage."

In 2000, Professor Keller realised that optoelectronics could do better. As head of the Neurointensive Care Unit at University Hospital Zurich, she turned to the University's engineers for help. Seven years of research and two patents followed.

UNIVERSITY SPIN-OFF

"Those first patents were very ideas-based, so we still had work to do," Professor Keller recalls. "NEMODevices was founded as a spin off with exclusive licenses for the patents by the University and ETH Zurich in 2007."

Four years later, NEMODevices launched the Eurostars project Opto-Brain with Swiss innovation house Creaholic, German usability experts Use-lab, and medical universities from Austria and Germany for clinical testing.

Together, the three SMEs developed two new products: Nemo Probe, which is inserted into the brain to measure bloodflow directly, and Nemo Patch, which measures via a patch applied to the scalp. Both monitor the quantity and

oxygen concentration of blood flowing in the brain using miniaturised optoelectronics, measuring the way four laser beams reflect off blood vessels in the brain. Two more patents resulted from the project.

The two devices are complementary, explains Professor Keller. "While we need to drill a hole in the

Nemosystem brings brain blood flow monitoring to the bedside, preventing brain damage

skull to use the Probe, doctors do that anyway to measure the pressure in the skulls of patients at risk. We shrank our Probe to the same size as today's pressure probes, so it measures much more without requiring more surgery."

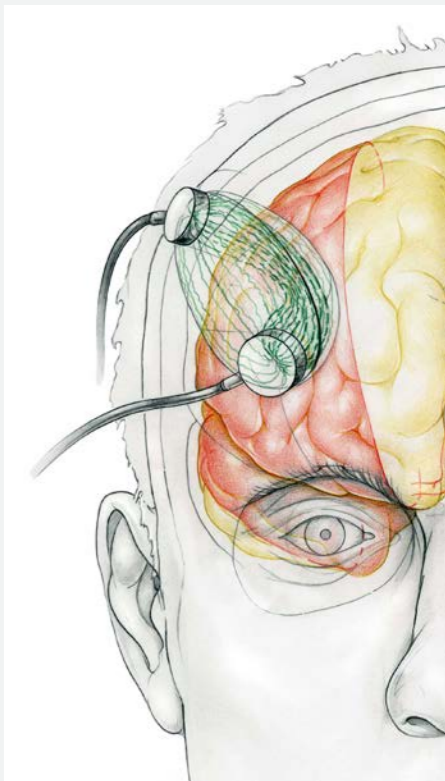
The Patch, on the other

hand, can monitor patients' cerebral blood flow from the bedside, non-invasively. This opens brain monitoring to entirely new groups of patients, potentially preventing brain damage in millions of people.

MULTIPLE APPLICATIONS TO COME

"We didn't have all the skills we needed inhouse, so the Opto-Brain project was crucial in turning our research into marketable products," Professor Keller explains. "Use-Lab developed an interface suited to the clinical environment, which is absolutely critical if doctors are to accept any new technology. Creaholic's skills with materials, on the other hand, were essential for the Patch —in fact, they co-own that patent."

All three SMEs are growing as a result: NEMODevices, awarded the CE mark in July 2015, are currently planning the »



populated by smaller companies —sometimes started by an engineer, an academic or a surgeon who spots a niche.

“The medtech sector is, in many ways, a model European industry,” says Serge Bernasconi, Chief Executive of MedTech Europe, the trade association for diagnostics and devices.

“Around 95 % of Europe’s 25,000 medtech companies are SMEs.

They develop smart new technologies that help us live longer, healthier, independent lives.”

THINK ‘PRODUCT’

Despite these encouraging statistics, making it to market can be a daunting task, particularly when company founders have limited business experience. Dolf van Loon, a member of the Independent Evaluation Panel (IEP) for the Eurostars programme, says healthcare start-ups need to “stop thinking technology and start thinking product”. Defining the product, who might use it, what is already on the market and what value you bring to users are essential to

moving beyond the ideas stage.

He says engineers or tech companies who are new to healthcare can break into the market but they need to consider the environment in which their technology will be used. The product may need to perform in a sterile environment, interact with existing operating room technology, have very high levels of reliability and, ideally, require minimal staff training time.

“Knowledge of the field is essential,” says Prof van Loon.

“An investor would look at the group of people involved in the company and ask whether they are suited to developing products for this market, and whether they have the skills.”

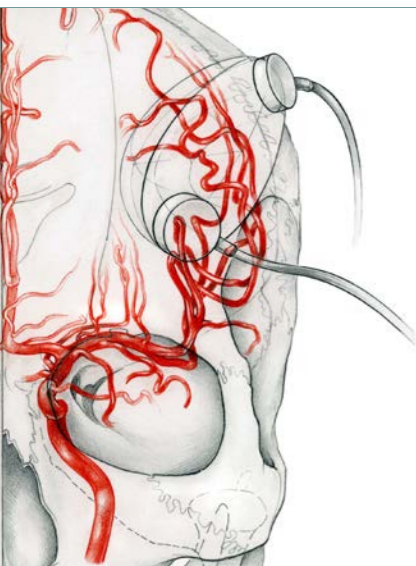
Liaising with regulatory authorities early is also advisable, he adds, as this can help to make connections with safety and technical experts familiar with the field. Funding agencies are another valuable source of technical advice and market intelligence.



“Eurostars gives smaller companies a chance to collaborate across borders and brings them outside their own small circle,”

says Prof van Loon. “They also get expert feedback and advice. The Swiss national funding agency goes one step further and provides an interactive system where companies can engage with experts and send revised funding applications.”

This sentiment is echoed by Dr Kjell Stenberg, a member of the Eurostars IEP with experience working at >>



market entry for their products and developing new medical applications in parallel; Use-Lab has launched a new medical design unit; and Creaholic is developing applications for the Patch outside the human body, for which they have exclusive licenses.



EUREKA EUROSTARS PROJECT E! 6526 OPTO-BRAIN

COUNTRIES PARTICIPATING

SWITZERLAND

State Secretariat for Education, Research and Innovation SERI

AUSTRIA

Österreichische Forschungsförderungsgesellschaft FFG

GERMANY

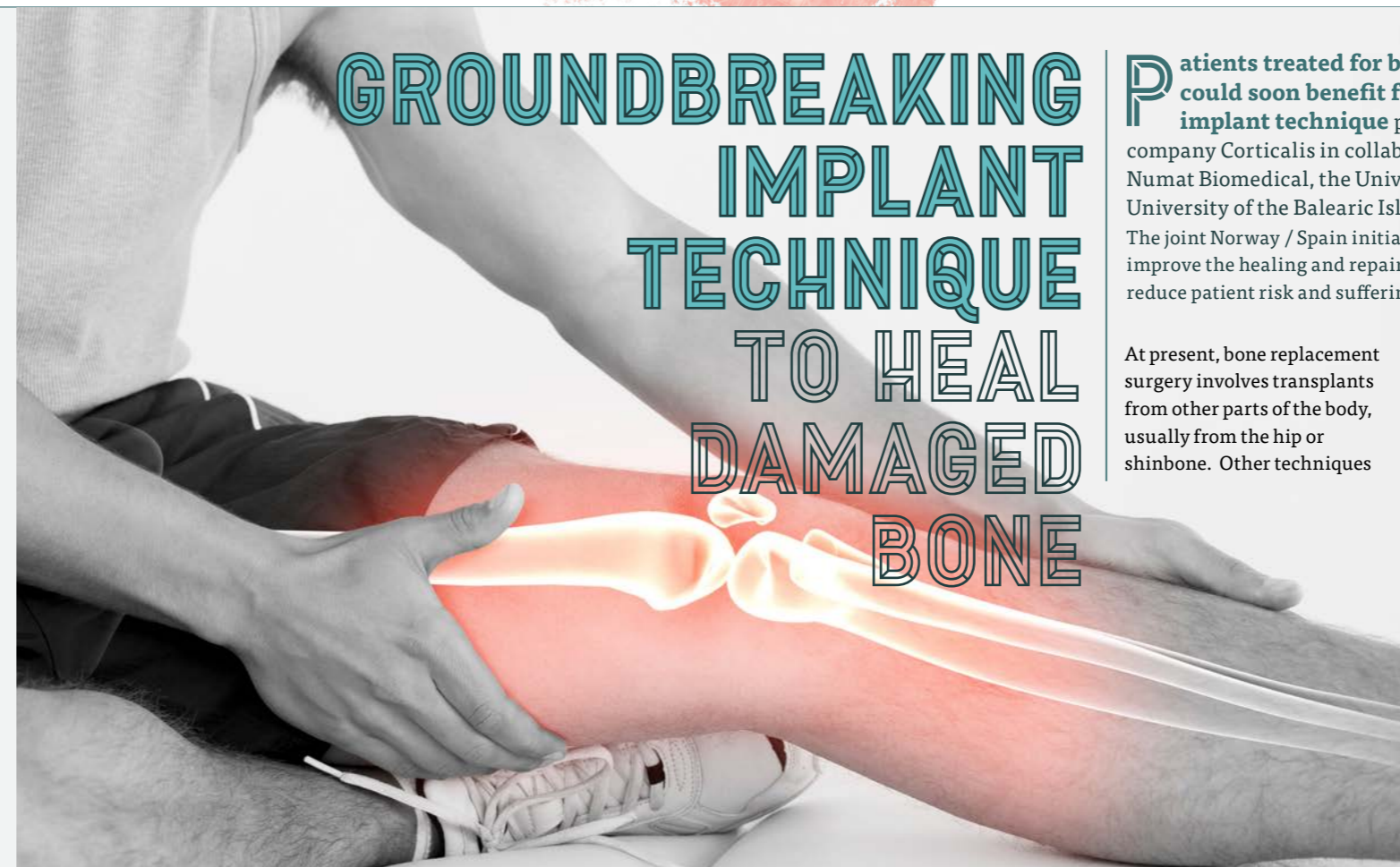
Bundesministerium für Bildung und Forschung BMBF

TOTAL COST €2.19 MILLION

DURATION JANUARY /2012 TO DECEMBER /2013

MAIN PARTNER NeMo Devices AG, Switzerland <http://nemodevices.ch/> info@nemodevices.ch

OTHER PARTNERS Creaholic SA, Switzerland Medical University of Graz, Austria Universität Freiburg, Germany Use-Lab GmbH, Germany



GROUNDBREAKING IMPLANT TECHNIQUE TO HEAL DAMAGED BONE

Patients treated for broken bones and fractures could soon benefit from an innovative implant technique pioneered by Norwegian company Corticalis in collaboration with Spain’s Numat Biomedical, the University of Oslo, and the University of the Balearic Islands.

The joint Norway / Spain initiative aims to drastically improve the healing and repair of damaged bones, reduce patient risk and suffering, and cut costs.

At present, bone replacement surgery involves transplants from other parts of the body, usually from the hip or shinbone. Other techniques

involve using the ground bone from donors or even ground or heat-treated bone from cattle. The complexity of the surgery often increases the risk of complications.

Those most affected by bone graft surgery are the elderly, who are set to represent 25 per cent of Europe’s population by 2030. This means that demand for such procedures will grow exponentially and reiterates the need for urgent innovation. >>

pharma companies, large and small. “Start-ups need guidance from people with business experience,” he says. “It can be helpful to submit an application to Eurostars and, even if you do not win funding, the specific feedback you get can be valuable if you take it to heart and use it constructively.”

In addition to his own business experience, Dr Stenberg has worked with venture capital firms supporting clinical development of new drugs and diagnostic technologies. His advice to SMEs in healthcare is to retain objectivity—a



tall order for founders passionate about their labour of love.

“I’ve seen a lot of wishful thinking from scientists and inventors,” he says. “There can be wonderful excitement about data from cellular models but investors need to see a plan for long-term development and answers to other key questions: Is the product going to be too expensive? Could there be stability issues when manufacturing it? Are there competitors?”

Rather than dreaming of hitting the jackpot with a game-changing new technology, smart

scientists pick the brains of seasoned healthcare entrepreneurs who have known failure as well as success.

Of all the early stage projects emerging from universities and small laboratories, only between 1% and 5% will hit the big time while the rest fizzle out.

SUCCESS FACTORS

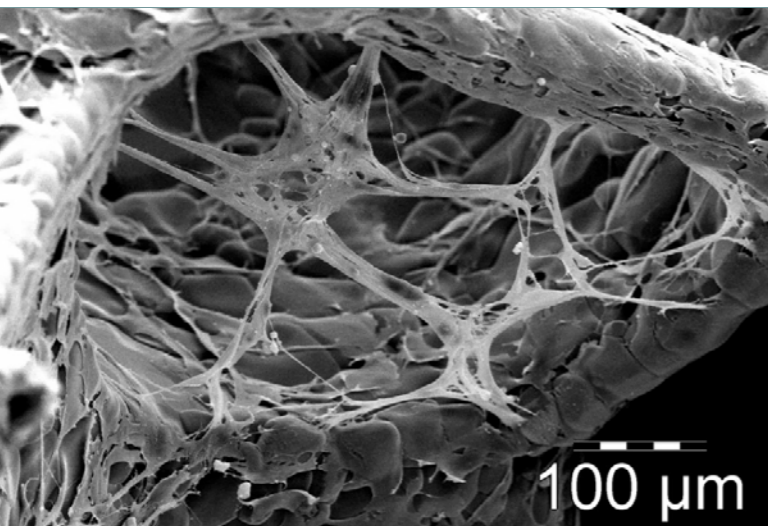
Filling a niche, finding partners, securing patient protection, taking expert advice—Professor Emanuela Keller has been applying these tips for

more than two decades, and her entrepreneurial career is far from finished. As an active clinician, Prof Keller began doing research in the 1990s when spotted spot demand for new technologies in the clinic.

In collaboration with the Technical University in Zurich, she developed prototypes for devices to be used in intensive care units, patented her ideas and worked with industry partners to get the technology into clinics. Her company Nemo Devices was founded in 2007 and secured Eurostars support in 2009.

“Scientific prototypes and intellectual property protection are prerequisites for founding a spin-off company, and so is working with industry,” Prof Keller says. “With the Eurostars project we were able to move forward with industrialisation.”

Her tips for academics with big ideas is to protect their intellectual property before they publish or share it at conferences. “Academics don’t always think about IP but it is very important,” she says. “The other tips I would give colleagues is to identify a clear demand for a product, build >>



A novel ultra-porous titanium dioxide ceramic with excellent biocompatibility. (J Biomater Appl 2011;25:559-580)

SAFER, MORE EFFICIENT, AND VERSATILE

Corticalis, in collaboration with its European partners and with support from EUREKA’s Eurostars programme, thinks it may

have the answer to improving bone interventions, whilst simultaneously cutting costs.

It involves the invention of a new material that can be inserted into the affected area as artificial scaffolding to allow the bone to repair itself.

“With our method, it’s sufficient to insert a small piece of synthetic osseous matter into the bone. The artificial scaffold is as strong as real bone and yet porous enough for bone tissue and blood vessels to grow round it and replace it,”

says Corticalis co-founder and CEO, Stale Petter Lyngstadaas. One of the main benefits of the porous ceramic material is that it can easily be cut to shapes that fit the bone defect, making it highly versatile to treat any number of fractures and defects anywhere in the body.

One particular use case scenario has been to treat jaw defects or mandibular cancer. Professor Lyngstadaas says he hopes dentists will be able to use NewBone within two years. “Many millions of

kroner are spent annually on implanting new bone tissue in mandibles in Norway. Worldwide, we are talking about several million patients.”

The NewBone project contributes to European industrial policy by strengthening the scientific and technological base for research into biologically-based hard-tissue treatment. More specifically, it will greatly impact the quality of life for a significant proportion of European citizens. “Around 90 per

cent of the population is expected to experience some type of hard tissue loss and 30 per cent of these are estimated to undergo surgery”—says Professor Havard J. Haugen at the University of Oslo’s dentistry faculty. “It is obvious from these statistics that improved treatment alternatives will have profound effects on the quality of life and health of our citizens”.

As a means to develop the product, Corticalis stated that working within the framework of a Eurostar project had allowed it great maneuverability. Professor Haugen said it provided flexibility for the lengthy medical trials needed to launch a

product such as NewBone. He also underlined the importance of cross-border collaboration to widen the field of expertise and reduce costs. Whilst Corticalis led the consortium, Numat Biomedical provided vital technical and management support and the University of the Balearic Islands conducted complex in vitro experiments at costs that are far cheaper than in Norway. The University of Oslo also worked in tandem with Corticalis, most specifically on a NewBone proof-of-principle in vivo study.



EUREKA EUROSTARS PROJECT E! 5069 NEWBONE

COUNTRIES PARTICIPATING

NORWAY

The Research Council of Norway

SPAIN

CDTI (Centre for the Development of Industrial Technology)

TOTAL COST

€2.215.440

DURATION

FEBRUARY/2010 TO DECEMBER/2012

MAIN PARTNER

Corticalis AS, Haakonsvæi 5, N-14150 Nesoddtangen, NORWAY
<http://www.corticalis.com/>
lyngstadaas@corticalis.com

OTHER PARTNERS

Numat Biomedical SL
 University of the Balearic Islands. Health Sciences Research Institute (IUNICS)
 University of Oslo, Institute for Clinical Dentistry



“
Protect
your
intellectual
property
”

5
TOP TIP

strategic partnerships and think about the business model —where will the revenue streams come from, is this idea scalable and how long will it take.” In addition to coaching and support from national and European funding bodies, Prof Keller undertook a two-month business course in the US to learn about business development. Her latest innovation uses sensor technology to help save the lives of people at risk of brain injury or stroke and, by working with key opinion leaders in the field, the company hopes



**EUROSTARS-2,
CALLS 1-5,
€306M OF
FUNDING IN
HEALTHCARE
(45% OF THE TOTAL
FUNDING AMOUNT)**

to record its first sales in the next two years. Once they build a solid customer base, they will consider selling to a larger company that could take the technology global.

But that’s the end of a chapter rather than the end of the story. “I already have the next idea” —Prof Keller says. “It’s in the area of software and data management —a hugely interesting area right now. It’s very exciting.” ◀

Gary Finnegan has a degree in physiology from Trinity College Dublin, and an MSc in science communications from Dublin City University. Working as a health and science writer for 15 years in Dublin, Brussels and Beijing, he has written for national newspapers, specialist medical publications and online media. Gary was a national winner at the EU Health Prize for Journalists in 2009, 2010 and 2011, and won Irish Medical Media Awards in 2007 and 2013.



EUROPEAN
PARTNERS
COMBINE TO
CREATE
VACCINE
AGAINST
PLACENTAL
MALARIA

OF all the people most vulnerable to contracting malaria, there is no group more susceptible than pregnant women. And in particular, it’s the threat of Placental Malaria (PM), which can be fatal for both mother and fetus.

But efforts to provide an effective vaccine against PM brought *Expres2ion* (Denmark), *Mucosis* (The Netherlands) and *The University of Copenhagen* (Denmark) together under the *Improved Vaccines* project supported by EUREKA’s Eurostars programme.

To understand the work done during this project is to understand what makes PM so difficult to stop in the first place. And although there are many factors which contribute to its widespread effects, the two causes that concerned the partners the most were *Cost* and *Efficacy*.

COST

Coming up with a vaccine for PM is not cheap. The engineers

and scientists need to be paid, huge funding is required to carry out research etc.

Now, think of the sub-Saharan countries in Africa where the vaccine is most needed. These are amongst the poorest economies in the world, who often cannot afford to pay for the inevitably expensive vaccines being developed.

On top of all this, the vaccine industry is a multi-billion dollar market which means it is exposed to all the usual competitive aspects of any market.

SOLVING THE PROBLEM

So, how did the *Improved Vaccines* deal with these cost issues?

“We had developed a vaccine

against PM in 2003”, says Ali Salanti of the University of Copenhagen (UCPH). “However, the vaccine couldn’t produce enough protein to make it really effective.”

Protein is a key component of the vaccine which helps to repair tissue, blood, muscle, skin etc.

“So one of the ways we minimised cost was by maximising the amount of protein that the vaccine produces. The problem with most vaccines is that the amount of protein being produced is quite low. So pregnant women have to keep getting immunised over and over again to avoid getting PM. Logically, the more potent the vaccine, the less immunisations you need to give and the less money needs to be spent”.

And this is where the work done by *Expres2ion* (Denmark) was so important. They had

developed a way of enabling a vaccine to continue producing more protein, through a process called ‘Glycoengineering’, which increases the protein’s capacity to recruit immune cells, therefore strengthening the vaccine produced by UCPH.

EFFICACY

Using only the UCPH’s vaccine with *Expres2ion*’s protein expression system, would mean that although more protein was being produced, the vaccine would not last long enough to prevent frequent re-immunisation.

“Obviously, we cannot predict when a woman will get pregnant”—says Mr Salanti. “So if she has not been immunised before getting pregnant, and contracts PM at that stage, it’s too late. So ideally, what we need is a vaccine that women can take before getting pregnant which would last

long enough to immunise her when she *did* eventually become pregnant.”

It was the SME *Mucosis* (Netherlands) that provided the solution. Using the same bacteria that preserves cheese and milk, they applied what are called ‘*Bacterium-Like-Particles*’ to the vaccine. The chemical process that takes place creates a robust cell. And it’s this surface that produces the long lasting immunity for protecting against PM.

SO WHAT NOW?

“It’s a long process, from coming up with the initial blueprint for the vaccine, to strengthening it, to testing it, to getting it to the people who need it”, says Mr Salanti. “So right now, clinical trials for the vaccine are ongoing. All going well, we hope to have it available for people in three years.”

◀

E! EUROSTARS PROJECT E! 7245

▶ COUNTRIES PARTICIPATING

DENMARK

Innovation Fund Denmark

NETHERLANDS

Netherlands Enterprise agency

▶ TOTAL COST €1.028 MILLION

▶ DURATION SEPT./2012 TO SEPT./2015

▶ MAIN PARTNER

Expres2ion Biotechnologies ApS

▶ OTHER PARTNERS

University of Copenhagen, Denmark
Expres2ion Biotechnologies, Denmark
Mucosis, Netherlands

INNOVATION HERO

THE MAN WHO CROSSES DESERTS

OSCAR CHABRERA

HAS ONE OF THE HARDEST JOBS AT ANY START-UP COMPANY: RAISING MONEY TO FUND RESEARCH AND DEVELOPMENT

AS CO-FOUNDER AND PROJECT COORDINATOR AT SPANISH COMPANY VILYNX, CHABRERA TELLS US WHY HE BECAME AN ENTREPRENEUR AND HOW TO FINANCE INNOVATION

Interview by Sarah Morris; illustration by Pablo Diartinez after a photo by NEM Summit

“From homemade films of cats and babies to serious news reports, we’re bombarded by millions of hours worth of video on the internet every day. Vilynx can sort the brilliant from the banal,”

says Spaniard Oscar Chabrera, thanks to a cloud-based software sold by his company. “There is an ever growing number of videos on the internet, Facebook, Youtube and elsewhere, but unlike text, video is like a library without any catalogue or a book

without an index,” says Chabrera.

Vilynx’s software analyzes videos and extracts five-second highlight clips that are used by customers as a teaser or preview to get people to click through on video content. Vilynx also automatically generates intelligent

tags that help index the videos.

While it was business partner Juan Carlos Rivero who spotted the niche in organising video, Chabrera is in charge of raising grant money to develop the product. “The hardest part of the job is when you are raising another

round of financing, then you are alone because you have to protect the rest of the business team from worrying,” he says. “Venture capital gives you enough water to get to the next oasis but you’re in the desert until you get solid sales and become cash flow positive.”



ENTREPRENEURIAL FAMILY

Luckily, Chabrera got early lessons in managing money and assessing risks. While he was still a student, his grandfather, who grew orange trees in Valencia on the south-eastern coast of Spain, entrusted him to invest some of his savings in the stock exchange. He learnt a lot about investing and running a business from his grandfather and father. “My grandfather managed to grow the size of the farm left to him by his father by five times and my father grew the amount of hectares by another five times,” says Chabrera.

His father introduced new varieties of oranges onto the market carefully studying specialist fruit growing magazines. He moved onto new varieties before everyone followed the trend and the prices

would drop based on the added supply. “He was proactive which taught me a valuable lesson on how to adapt in a market,” says Chabrera.

That entrepreneurial spirit rubbed off on Chabrera. After studying business and IT, he jumped right into entrepreneurial world of start-ups. Before graduation he taught unemployed business graduates about computers in order to earn extra money (“I was teaching them something they should have learned at university” he says, adding: “I would always worry that they’d ask me if I had a degree!”).

Later he joined a home networking start-up, Gige Networks, where he was finance director. Gige ended up being acquired by BROADCOM in 2010 which led him to help found Vilynx.

INTEL AND AMAZON ARE IMPRESSED

Vilynx had to adapt the original product to find a paying market. Initially, the company sold its application to individuals but then switched to businesses when they saw that their consumer product was not ramping as fast as expected.

They now sell to the world’s largest media companies, including U.S. media power house CBS, Spanish newspaper *El País* and French magazine *Au Feminin*. Vilynx’s five-second movie summaries —think trailers for movies— help redirect viewers back from social media sites, boosting traffic of the content owner and ultimately increasing advertising revenues.

Vilynx’s product allows more targetted advertising and has other

commercial applications like allowing doctors to carry out online consultations. Specialists can speed through videos that show the healing progress of a burn injury, a commercial use developed in EUREKA-funded projects Hipermed & E3.

Amazon and Intel think Vilynx’s solution has so much potential they have partnered Vilynx to help advance the technology.

With more clients signing up, Chabrera estimates the company’s revenue will exceed €100M in the next two to three years. His dream to list the company on the stock exchange may not be far off.

“Start-up life is filled with many ups and downs,” he says. “Entrepreneurs need to make a plan and then execute to it. They also need to expect things to take twice as long.”

OSCAR CHABRERA'S ADVICE TO OTHER INNOVATORS



Think about whether the market is ready to buy your product. The market is not always there when you need it.



A financial plan is a roadmap. You’ll need more time and money than you expect.



Surround yourself with the best possible human capital you can.

AFFORDABLE CONJUGATES FOR TYPHOID VACCINES

A LOW-COST PROCESS FOR PRODUCING THE ACTIVE INGREDIENTS IN TYPHOID AND PARATYPHOID VACCINES COULD PUT A LIFE-SAVING JOINT VACCINE WITHIN THE REACH OF DEVELOPING COUNTRIES.

T yphoid infects over 20 million people a year, causing typhoid fever —also known as enteric fever. It is a major health problem, particularly in areas such as Bangladesh, India and parts of Africa.

Although two vaccines are widely available, they give only limited protection, which runs out after a few years. Additionally, a growing number of people in South-central and Southeast Asia are developing paratyphoid fevers, against which there is no licenced vaccine.

Developing countries need a combined long-lasting vaccine that can be produced cheaply for preventative programmes, in particular for children and young adults, who make up most typhoid cases. The EUREKA network project TYPHIVAC has completed an important first step —and at the same time improved the drug-development capacity of the Portuguese

biotechnology sector.

INNOVATIVE PRODUCTION

Led by Genibet, a Portuguese SME, the project has implemented a simple pilot-scale method of producing vaccines against Salmonella Typhi and Salmonella Paratyphi A, the bacteria most commonly responsible for typhoid and paratyphoid fevers respectively. This pilot-scale manufacturing was done in accordance with good manufacturing practices (GMP) and under a fully documented system, thus allowing easy technology transfer to other organisations.

Genibet produced these with Novartis Vaccines Institute for Global Health

S.R.L. and Instituto de Biologia Experimental e Tecnológica (IBET). Novartis shared its experience on vaccines, scaling up and process documentation while IBET focused on the development and implementation of the analytical procedures for the manufacturing process and its quality control.

Implementation of the Quality Management System and the GMPs was a new skill for Genibet. “The project helped us enter a novel field, to learn and apply new techniques,” says its CEO Raquel Fortunato.

Both TYPHIVAC vaccines are conjugates —vaccines in which the disease antigen is combined

with a carrier protein, which boosts the body’s immune response. One uses Vi antigen from the extra-cellular polysaccharide layer produced by an attenuated (weakened) Salmonella typhi strain, the other uses O antigen from a lipopolysaccharide produced by a Salmonella paratyphi strain. In each, the carrier protein is CRM197, a non-toxic mutation of the diphtheria toxin that improves protection compared to traditional carriers.

“Our goal was to keep production costs as low as possible,” says Fortunato. Simplicity was key to their success. “The bacteria are grown in a stainless-steel bioreactor to produce

and excrete the active product,” says Fortunato. The product is then purified and mixed with the carrier protein so the two bind together.

FROM PILOT SCALE TO TRIALS

TYPHIVAC is big step in a wider programme to develop a combined vaccine against both fevers. Its vaccines have passed the animal toxicity stage of development at Genibet. They are now being made by Novartis in India for basic safety trials with volunteer humans (Phase 1 trials). Results have been good so far and, all going well, the typhoid fever vaccine should be on the market in a couple of years, says Fortunato.

Public funding allowed Genibet to offer their new GMP service to the vaccine development project at a much-reduced cost, says Fortunato. It also attracted Novartis. “The collaboration was very important for us in terms of the support and visibility it gave us,” she adds. “We came from nowhere to having Novartis as our first customer. We are now well-established with various clients.” The company has grown from having six employees at the start of the project to 30 and can now run three to four projects at a time. “In part, this is due to TYPHIVAC,” says Fortunato.



 EUREKA
NETWORK
PROJECTS
eurekanetwork.org

- ▶ EUREKA's most flexible instrument.
- ▶ Applications can be submitted all year long.
- ▶ Open to any type of organisation and technology.
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EUREKA NETWORK PROJECT 4 533 TYPHIVAC

▶ COUNTRIES & NATIONAL FUNDING BODIES INVOLVED

PORTUGAL
ANI
ITALY
MIUR

▶ TOTAL COST

€950 000

▶ DURATION

JANUARY /2009 TO APRIL /2011

▶ MAIN PARTNER

Genibet Biopharmaceuticals, S.A., Portugal
Website: <http://www.genibet.eu>
Raquel.fortunato@genibet.com (Genibet CEO)

▶ OTHER PARTNERS

Instituto de Biologia Experimental e Tecnológica, Portugal
Novartis Vaccines Institute for Global Health S.R.L., Italy

MEET ANDREW

YOUR INTELLIGENT LAB ROBOT

THROUGH THE EUROSTARS DORA PROJECT, THE ANDREW ALLIANCE HAS BEEN ABLE TO RAPIDLY COMMERCIALISE ANDREW: A NOVEL INTELLIGENT PIPETTING ROBOT FOR USE IN LIFE SCIENCE LABORATORIES.

ANDREW IS THE FIRST INDUSTRIAL ROBOT THAT CAN BE USED BY PROFESSIONALS WITH NO KNOWLEDGE OF ROBOTICS. LAUNCHED IN JANUARY 2013, IT HAS RECEIVED FOUR NOTEWORTHY AWARDS AND ALREADY ACHIEVED SIGNIFICANT GLOBAL SALES.

The execution of routine liquid handling operations can be a painful and delicate activity within the life sciences industry;

but it is one that is vital to the discovery and exploitation of new pharmaceuticals and in delivering advanced healthcare.

“Robotics and other digital technologies are set to change humanity,” says Piero Zucchelli, CEO of the Swiss company Andrew Alliance. “Today, we have intelligent people spending hours at the

bench doing repetitive manual, but intelligent, operations and large ‘dumb’ automation systems performing high throughput testing. Robots like Andrew fit between these two scenarios: integrating part of the human intelligence that is required for exacting execution and releasing human scientists for higher level functions.”

The name Andrew comes from an Isaac Asimov story ‘The Bicentennial Man’ in which a robot begins to display characteristics, such as creativity, traditionally >>



**EUROSTARS-2
PROJECTS**
eurostars-eureka.eu

Designed for R&D-intensive SMEs.

Two annual cut-off deadlines for project applications.

Open to all types of technologies.

Products resulting from Eurostars projects must be market ready within 2 years.

Eurostars is a joint EUREKA-EU programme, in effect in 30+ countries.



Co-funded by EUREKA member countries and the European Union Horizon 2020 Framework Programme



the province of humans; the robot is ultimately declared a human being. From a technical viewpoint all the components to enable Andrew were already available, but required innovative design and integration to make a reliable device. However, convincing customers in big pharma companies would be a more difficult challenge.

The DORA project was critical to Andrew's success. Probably the most important factor in a start-up company succeeding is to secure that first sale or contract. "In an ideal world you want to develop a product together with your customers from the first step," explains Piero. "But normally, no customer will invest their precious resources and time to work

together with a start-up of unknown history and success."

The project allowed the Swiss company to work with two potential customers, CEREP S.A. in France and Population Genetics Technologies Limited in the UK, to fully develop the product including vital user feedback. The EUROSTARS programme helps companies across borders to create joint ventures to develop new technologies and products that address global markets.

GLOBAL IMPACT

According to one of the awards that Andrew Alliance received after the product launch, Andrew is the first industrial robot that can be used by professionals with no knowledge of robotics. This intuitive usability is a key success factor and one that the DORA project helped to achieve.

And Andrew is making a global impact. The company now boasts more than 15 of the top 20 pharma companies as customers, as well as the largest diagnostics companies and top ranking universities around the world. Although still relatively young, the Andrew Alliance is now a mature

“
*Robotics
and other digital
technologies are
set to change
humanity*
”

company employing 12 EU nationals at its Swiss headquarters, with a sales office in the US, and hundreds of customers worldwide using their

robots daily. "We are continuing along the direction of developing companion robotics and new solutions that improve the lab experience. I would argue that we are one of the world leaders in a novel wave of industrial robotics, where the final users are not robotics experts nor engineers, but are using our robots as daily tools to improve their working conditions, the quality of their results and, ultimately, making all our lives better," concludes Piero. ◀



EUREKA EUROSTARS PROJECT E! 6 482 DORA



COUNTRIES & NATIONAL FUNDING BODIES INVOLVED

SWITZERLAND

State Secretariat for Education, Research and Innovation

UNITED KINGDOM

Innovate UK

FRANCE

BPI France



TOTAL COST

€1.2 MILLION



DURATION

SEPTEMBER /2011 TO MAY /2013



MAIN PARTNER

Andrew Alliance SA, Switzerland

www.AndrewAlliance.com

Piero.Zucchelli@AndrewAlliance.com



OTHER PARTNERS

Population Genetics Technologies Ltd, United Kingdom

Cerep SA, France

SAVING TIME SAVING LIVES

MEDICINE IN THE CLOUD

MEDUSA COMBINES ADVANCED DATA PROCESSING, IMAGE ANALYSIS, VIRTUAL COLLABORATION AND MEDICAL DECISION-SUPPORT TO SAVE LIVES. PRODUCTS AND SERVICES FROM AT LEAST THREE COMPANIES ARE ALREADY ON THE MARKET.

Hospital Accidents and Emergencies departments are frenetic environments the world over.

Medical staff examine patients as they emerge from ambulances, knowing that diagnosing each condition correctly and quickly can be the difference between life and death.

And right now they're examining a woman who was found unconscious on the street.

Elsewhere in the hospital, a cancer patient is being scanned. He's upset—this is his second scan. His first was in a different hospital, and there were problems transferring it. That led to delays in getting the experts around the table to determine his radiation therapy. His tumour kept growing as the delays mounted, so a new scan is required.

FASTER AND BETTER DECISIONS

But what if the doctors knew more about the woman before her

ambulance arrived? And what if the cancer specialists could have examined the man's first scan together, without leaving their desks?

These are two of the scenarios developed in the MEDUSA project, managed by Philips Healthcare and bringing together French and Dutch university hospitals and SMEs. However, stresses project manager Frank van der Linden, there are many more.

"Our aim was to develop a generic approach through which medical staff could collaboratively analyse patient data and decide treatments, no matter the medical

condition," he explains. "The common factor is that bringing medical staff, patient data and support software together accelerates and improves medical decision-making, which saves lives."

With MEDUSA, doctors would already know the woman's relevant medical history before the ambulance picked her up, thanks to secure transmission of relevant medical data linked to her eHealth identity. During the ambulance ride, moreover, they could watch the paramedic's initial investigations by live video. The operating theatre and team would be ready for her by the time

she arrived.

Meanwhile, the cancer patient's first scan would have been shared and analysed by doctors from both hospitals from their desktops. The virtual collaboration, enhanced by decision support systems, shortens delays between analysis and treatment.

VIRTUALISATION PLATFORM

The key to MEDUSA's vision is a platform through which many different eHealth systems—data management, visualisation and analysis, decision support and more—can be "virtualised", or made available via the cloud. This allows previously

“
*Bringing
 medical staff,
 patient data and
 support software
 together in the
 cloud accelerates
 decision-making
 and saves
 lives.*
 ”

incompatible systems to work together, provides virtual workspaces for medical staff to collaborate, and assures patient data privacy.

“Apart from allowing different medical systems to ‘talk’ to each other, this also means that hospitals can now access the latest image processing and other systems as cloud-based services,”

adds van der Linden. “This is inherently more efficient than every hospital buying their own hardware and software, and constantly keeping it all up to date.”

MEDUSA significantly augmented Philips’ medical technology suite, now marketed as the Health Suite Digital Platform. It also improved the image processing tools of University of Amsterdam’s Academic Medical Center spin-off Nico-lab, and helped Dutch SME Sopheon virtualise their data processing processes, allowing their decision support systems to respond in microseconds.

In France, finally, one of the PhD students who worked on the project while at Institut Mines-Télécom has now launched the company uStartApp to further commercialise the software virtualisation approach developed in the project. ◀



ITEA CLUSTER PROJECT MEDUSA



COUNTRIES & NATIONAL FUNDING BODIES INVOLVED

NETHERLANDS

RVO

FRANCE

Systematic



TOTAL COST

€17.94 MILLION



DURATION

JANUARY /2013 TO DECEMBER /2015



MAIN PARTNER

Philips Healthcare

<http://www.philips.nl/healthcare>

frank.van.der.linden@philips.com



OTHER PARTNERS

FRANCE

Bull,
 Cassidian Cybersecurity,
 DOSIsoft,
 Hôpitaux Universitaires,
 IMSTAR,
 Institut Gustave Roussy,
 Institut Mines-Télécom,
 Prologue

NETHERLANDS

Sopheon,
 Thecnolution,
 University of Amsterdam

CLUSTER PROJECTS



FIND OUT MORE AT

eurekanetwork.org/clusters



Strategic initiatives launched by major European multinationals.



Biannual or annual calls.



For SMEs, a Cluster project is ideal for a collaboration with a major player.



Focus on particular industrial sectors in different countries: hardware, software, telecommunications, renewable energy, new materials and more.

CURRENT EUREKA CLUSTERS

CELTIC-PLUS

EURIPIDES²

EUROGIA2020

ITEA 3

METALLURGY EUROPE

PENTA

NOTHING IS MORE CONVINCING THAN TAKING SOME RISK YOURSELF

SWEDISH SILICON CARBIDE COMPANY ASCATRON HAS RAISED 5 MILLION EURO AND IS DEVELOPING A STRONG PRESENCE IN CHINA JUST FIVE YEARS AFTER ITS LAUNCH.

CEO CHRISTIAN VIEDER TALKED TO EUREKA ABOUT POWER ELECTRONICS, THE EINNOVEST PROGRAMME AND WHAT IT TAKES TO FIND GOOD INVESTORS.

Christian Vieder is not a man of big words.

But when he does get talking, you realise he is up for something important.

His company Stockholm-based Ascatron has rapidly consolidated its business model offering next generation Silicon Carbide (SiC) power semiconductors. A spin-off from Swedish ICT research institute Acreo, Ascatron now employs ten people. »»





“We had a lot of technology developed within the research institute, but it was not clear who would be the local receivers of this technology,” Vieider explains. Together with three colleagues from the institute, he wanted to bridge that gap between research and market, and founded Ascatron in 2011.

The company quickly needed money. An initial €1M funding round included investment from all the founders. Vieider says this proved to be a significant strategy when talking to prospective investors. “Nothing is

more convincing than if you take some risk yourself. If I can say for example ‘I already put in €100 000, are you willing to add another €100 000?’ that’s much more convincing than any graphs or tables I could show you” —he says.

In order to be able to develop its own SiC semiconductor products, however, 1M Euro was not enough. On the look-out for new investors, Ascatron was approached by Vinnova, Sweden’s Innovation Agency, to take part in EUREKA’s E!nnoVest programme,

which promotes innovative companies towards the investment community and facilitates investment matching with experienced investors.

For Vieider, the main benefit of E!nnoVest was a pitch training event organised in Copenhagen. “The feedback I got not only improved my presentations, but also made us think about the way we look at our business; the focus we have on our product and the way we should look at our competitors. So it helped me to get a clearer picture of our business plan” —he explains.

The company now successfully managed to raise a total of €4M, which is shared between €3M in equity capital, and €1M in an innovation grant.

“

My advice to other companies is that since we all have limited time available to look at potential investors, try to speak to the ones that already have know-how in your field

”

WHAT IT NEEDS —AN INNOVATIVE TECHNOLOGY AND INVESTORS WITH KNOWLEDGE OF THE MARKET

The market for silicon carbide (SiC) materials in power electronics is growing rapidly because they are cheaper and more energy efficient. The SiC semiconductors developed by Ascatron allow for a radical reduction of electrical conversion losses making the transformation of electric energy from one voltage to another more efficient.

Since this conversion needs to be done whenever electricity is produced or used, the possible applications range from process industry, data centres and electrical cars to wind and solar power.

Ascatron’s A-round investors are from Italy

and China, including the four venture capital investors Quadrivio, Como Venture, Rise Leader Investment and InteBridge Technology, together with the equipment producer LPE. According to Vieider, this is no coincidence, as it reflects the global power electronic industry and interest for silicon carbide.

“All investors have some kind of know-how in our business or technology; all those who had been investing in the end actually already had some interest. My advice to other companies is that since we all have limited time available to look at potential investors, try to speak to the ones that already have know-how in your field” —says Vieider.

FUTURE PLANS

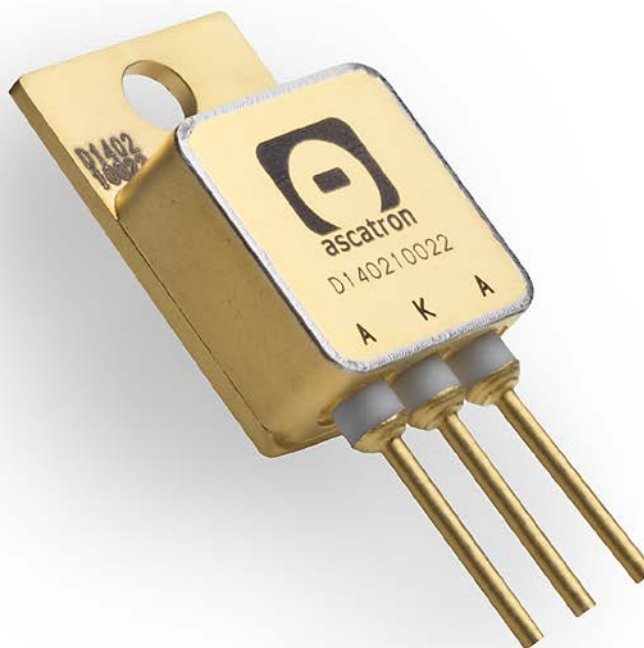
Initially sceptical about the possibility of investors from China, Vieider now sees it as a big opportunity. “We see this will help us access a much broader market and maybe go faster to the market. Everything is moving very fast in China” —he says.

But not everything is as fast as the Chinese market. Vieider suggests that firms looking for investment need to factor in that it may take time

for investor funds to arrive. In Ascatron’s case, the time-frame from first meeting until completion of investment was one year. This means that product development and the investor search has to run in parallel.

The first of Ascatron’s semiconductor products should be in the market by mid-2017, and by end of 2017 Vieider wants to close the next funding round. He is starting to look for new partners now.

“We need to raise €5M next year, and we predict that we will need another 5M two years later; so we need an investor with some muscle who is in the power electronics field” —he says.



E!NNOVEST

- ▶ Investment readiness programme.
- ▶ Business and investment coaching of innovative SMEs.
- ▶ Promoting innovative SMEs towards the investment community.
- ▶ Facilitating matchmaking with internationally active investors.

FIND OUT MORE AT
www.eurekainnovest.eu

The logo for E!nnoVest, featuring a stylized Greek letter sigma (Σ) followed by the word 'innoVest' in a lowercase, sans-serif font.

PROJECT TRENDS

LIFE SCIENCES & ICT HUBS IN EUROSTARS-2

WHERE ARE THE HUBS AND CLUSTERS IN EUROPE, AND WHAT CONTRIBUTES TO THEIR SUCCESS?

EUREKA DATA ANALYST PETER LALVANI ON THE LINKS BETWEEN INNOVATION AND GEOGRAPHY IN EUROSTARS-2

As linkedin co-founder Reid Hoffmann put it, Silicon Valley is a mindset, not a location. It is therefore unsurprising that, despite the mixed history of attempts to emulate and re-create its success, innovation cities, hubs and clusters have become a permanent feature of the global industrial landscape.

Analysis of the first five calls of Eurostars-2 reveals extensive participation from start-ups¹, other SMEs and research organisations based in some of Europe's most innovative cities. In particular, it shows a pattern of SMEs clustered around university departments and research institutes, in large cities such as Amsterdam (27 participations) or Barcelona (22) — both previous winners of the EU's iCapital award which feature strongly in Eurostars-2 — but also in smaller towns such as Leiden (22), Lund (14) and Uppsala (13).

This reflects Eurostars' support for open innovation, facilitated by geographical proximity between research organisations and industry.

As the recent EDCi 2016 rankings underline², digital hubs provide a fertile environment for start-ups and scale-ups, excelling in areas such as access to capital, business environment, digital and non-digital infrastructure, entrepreneurial culture and skills. However, these factors also make these cities

excellent places for companies in other sectors to start and grow. In Eurostars-2, the single most common market sector for projects, attracting the highest level of public and private investment via the programme, is Life Sciences / Health (190 projects; 613 participants), followed by Industrial projects

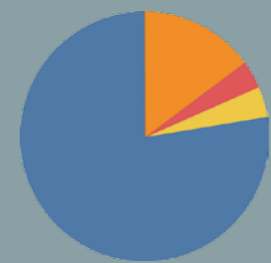
(82; 262) and ICT (76; 241). <<

¹ Start-ups are defined in this articles as companies which are 0-4 years old upon Eurostars project application.
² See <https://digitalcityindex.eu> for further information



INFOGRAPHIC
Size of circles and city name reflects number of participations in the Eurostars-2 programme. Cities are placed by geographical proximity.
INFOGRAPHIC BY Peter Lalvani & Pablo Diartinez peter.lalvani@eureka-network.org

FULL INTERACTIVE CITY AND REGIONAL DATA:
public.tableau.com/profile/eureka.network



TOTAL COST OF PROJECTS €15.8M

AMSTERDAM
Amsterdam has seen 20 entities —half of them start-ups— participating in as many as 22 Eurostars-2 projects. All but six of these projects have been in the Life Sciences / Health market sector, with a focus on therapeutics and drug delivery. In the ICT field, one start-up is cooperating with Dutch, Italian and US partners to develop tourism software.



TOTAL COST OF PROJECTS €13.9M

ZÜRICH
With 27 participations in the first five calls, Zürich's R&D community has already benefitted from significant investment via Eurostars-2. Activity revolves around two closely-linked hubs —Technopark and ETH. Of 9 start-ups, 5 are active in ICT, including a project involving a Danish partner to develop emotion-detection software, and a project with a Dublin-based SME to develop mobile robot navigation.



TOTAL COST OF PROJECTS €11.7M

VIENNA
13 Vienna-based SMEs and 16 research organisations have participated in 22 Eurostars-2 projects. The Austrian capital has attracted funding in 8 Life sciences/health projects and 6 in ICT. The Austrian Institute of Technology and the Technical University of Vienna have been active participants in the programme.

- Energy & Environment
- Consumer / Services
- Industrial & Transport
- ICT
- Life Sciences / Health

WHAT IS EUREKA?

www.eurekanetwork.org

EUREKA is a publicly-funded, intergovernmental network, involving over 40 countries.

EUREKA's aim is to enhance European competitiveness by fostering innovation-driven entrepreneurship in Europe, between small and large industry, research institutes and universities.

Today, in this network, there is more than ever a strong belief that cross-border collaboration is crucial for European industry to compete effectively on world markets in advanced technologies.

While innovation is increasingly becoming an international activity, 90% of the public funding available to researchers and innovators in Europe is to be found in national programmes and most of it is dedicated to national activities. This is why the EUREKA network ensures that a steady flow of national public funds is directed towards transnational collaboration in research, also leveraging a high level of private investment.

To innovative companies, institutes and universities wishing to expand their activities internationally, EUREKA is a catalyst for the finance and support they need to launch and run their transnational R&D&I projects. Those projects are based on two criteria: cooperation between at least two different EUREKA countries, and the final result being a commercially viable new product, process or service.

GET IN TOUCH!

www.eurekanetwork.org/eureka-countries

EUREKA strength lies in its well-established network of national project coordinators (NPCs) representing more than 40 countries and the European Commission.

NPCs act at operational level, running the National EUREKA Offices. They are the direct contact for project participants. NPCs facilitate the setting-up and running of a project and are responsible for project generation, national and international support and follow-up.

EUREKA 
innovation across borders

