

**The EU supports  
researchers to collaborate  
internationally: working  
together they can achieve  
more than they can alone.**

**UNIVERSITIES  
*for* EUROPE**

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# Introduction

Many of today's challenges are global, not national. Collaboration is crucial to generating world-class research, and much of the very best research is done by teams working together across borders. Working together, UK and other European researchers pool their knowledge, infrastructure and resources to achieve more together than they could do alone. This approach means we all benefit from multiple perspectives, complementary expertise and diverse approaches to problem-solving.

The EU plays a vital role in supporting universities to collaborate across borders. By providing a single framework for collaboration, the EU reduces the bureaucracy associated with bringing together players from different countries, all with their own rules and regulations.

Through establishing and nurturing networks of excellence, the EU helps bring together talent regardless of nationality, encouraging innovative approaches and ideas, and solutions which are applicable beyond national borders.

In these case studies we hear from academics why, and how, the EU has helped them to collaborate, boosting the impact and visibility of their research in the process.

# 01 Universal flu vaccine

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## Bringing an end to the annual flu jab

FLUTCORE's aim is to develop a powerful new universal influenza vaccine that could replace the need for the annual flu jab.

FLUTCORE is a consortium of seven partners from four European countries, led by UK-based business iQur Ltd and includes University College London (UCL) and the University of Leeds.

## Access to knowledge and contacts

Dr Mike Whelan is the research director at iQur Ltd and the project co-ordinator for the FLUTCORE consortium.

*“This project wouldn't have happened if it wasn't for the European Union. I say to everyone who asks me, it's the access to knowledge that matters – it's not just about the funding. This knowledge has taken us to the next level.”*

Dr Whelan's consortium showcases the powerful effect working on a continental scale can have. His team includes experts based in Leeds and in Latvia, UCL's bioengineering department, a state-of-the-art genetic sequencing lab in Luxembourg, and world-class clinical testing and manufacturers in Spain.



Dr Mike Whelan

EU support has given Dr Whelan's team access to previously unknown contacts, knowledge and technologies, as well as lending international profile to his research. For example, his genetic sequencing colleagues in Luxembourg approached him after reading the project's updates to the EU.

Dr Whelan is convinced that he wouldn't get partnerships like these if the UK left the EU, even if national funding were available: "We wouldn't get the critical mass," he says.

The scale of the EU makes it possible to manufacture the vaccine on an industrial scale. The UK simply doesn't have the manufacturing base necessary for his plans – and his Luxembourg colleagues are "working at a level we don't have in the UK at the moment".

## Real life impact

Whelan's team is now gearing up to manufacture the universal flu vaccine.

***"This is a project that has real life impact for people's health, but it will also have a positive financial impact on our health service because those annual flu vaccine drives will be a thing of the past."***

***"And for us personally, people are beginning to sit up and take notice of our work. And it was the EU that did that for us."***

## 02 The path to personalised medicine

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Dr Daniele Soria

### Using computer science to help diagnosis and treatment of breast cancer

Personalised medicine is transforming the way we treat diseases like cancer. Doctors are no longer just looking at where in the body the cancer started, but are increasingly using their knowledge of the molecular and genetic make-up of that person's tumour to fight the disease.

The BIOPTRAIN project involved partnerships with Poznan University of Technology in Poland, the Catholic University of Leuven (KUL) in Belgium, and Italy's University of Florence. It looked at ways to interpret the vast amounts of genetic data generated by the decoding of genomes, seeking to unlock the information coded into DNA for use in clinical science.

According to Project Coordinator, Professor Jon Garibaldi of The University of Nottingham, the most important result from the project was that it helped build a multidisciplinary knowledge base in the emerging bioinformatics field. "We brought together researchers from different backgrounds and perspectives and started to form a European approach to the problem, gaining new insights and spreading good practises," he says. "This is the new breed of scientist comfortable in different domains and with a new way of looking at problems that straddle different domains."

One of the project's breakthroughs came at The University of Nottingham, where world-leading breast cancer specialists identified seven different sub-sets of breast cancer.

## Collaboration invaluable

Computer scientist Dr Daniele Soria was one of the PhD students working on the BIOPTRAIN research project and his work was critical to this discovery.

For Dr Soria, the fact that BIOPTRAIN was a European programme was crucial to its success.

He believes that if it had taken place on a national scale, the benefits of the project would not have been possible because cutting-edge science requires multi-disciplinary and international approaches, and researchers who are mobile can share ideas and gain new skills from their overseas counterparts:

***“I and my fellow PhD students were able to work and travel freely to meet with colleagues in Italy, Poland and Belgium, as well as the UK. We shared knowledge, discussed ideas and presented our PhD problems. There wouldn't be the funding to be able to share knowledge in this way and being able to meet face-to-face was invaluable.”***

# 03 European Social Survey

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Dr Rory Fitzgerald

## Understanding attitudes to social issues

The European Social Survey (ESS) is an academically driven cross-national survey that has been conducted every two years across Europe since 2001 and asks people about their attitudes on topics ranging from trust in democratic institutions, moral and social values, to perceptions of crime levels.

## Importance of comparable data

Dr Rory Fitzgerald is the Director of the ESS, which is based at City University London.

This critical research provides an international comparative perspective on emerging social issues. Before the ESS, explains Dr Fitzgerald, work to gather comparable data in a rapidly changing post-Cold War Europe kept running into problems: “They were trying to compare differences across Europe and kept getting stuck. There were big differences from country to country in methodology, question wording, translations procedures and data availability.”

Now the data generated by the ESS is used by a wide variety of people and institutions, including academics, policy makers, politicians and civil servants to better understand the patterns in public attitudes over time and across countries.



## Fundamentally linked

Dr Fitzgerald believes that the international nature of the survey is intrinsically valuable to each country. “You can only really understand what’s going on in your country by comparisons with others,” he says. “Issues like immigration are areas where we are fundamentally linked.”

## Being outside of the EU

It is instructive to see the barriers his Swiss and Russian colleagues contend with, looking into the EU from outside, observes Dr Fitzgerald. Fourteen countries are currently participating in the ESS, including non-EU members such as Switzerland and Russia. However, participation for these countries is not straightforward. Russia participates but only on a temporary basis and Switzerland is having to pay to enter its own research input. “Everyone else is getting European Commission money,” says Dr Fitzgerald, “but not our Swiss colleagues.”

With City University as the host institution for the ESS, the UK is at the heart of this important research infrastructure. Remaining in the EU is the best way to ensure this leadership and prominence is retained. A ‘Brexit’ would create significant uncertainty for the project’s future leadership, and would result in a complicated funding landscape in which the UK benefits less from EU support than partners inside the Union.

# 04 EuroCoord Network of Excellence

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Professor Kholoud Porter

## Encouraging the best HIV research in Europe

EuroCoord is an EU-backed Network of Excellence established by several of the biggest HIV research projects and collaborations in Europe. This pan-European network, with 25 partners from across the world, allows British universities to conduct research on an amazing wealth of international data and to pool expertise and resource with excellent scientists across Europe to achieve medical advances that wouldn't be possible without EU support.

### Collaboration critical to success

Professor Kholoud Porter is Professor of Epidemiology at University College London and leads the EuroCoord network. The EuroCoord network has its roots in a UK-based project set up by Professor Porter in the mid-1990s.

*“Within two years it became obvious that to have any confidence in what we were saying, we needed to collaborate with other countries. After highly active antiretroviral therapy came in, there were new things we wanted to know, like what would be the effects of people living longer with HIV. That needed collaboration at a European level.”*

The EU smoothed the way to set up the network by providing a single framework for collaboration and thus getting rid of the complexity associated with squaring multiple national rules, regulations and legislation, as well as ensuring freedom of movement for researchers between countries. “I was really surprised by how easy it was to set up collaborations,” says Professor Porter.

## Importance of trust

The EU was also crucial in creating trust in her network: “We [the EU member states] have lots of procedures in place, we have an EU directive, a similar approach to ethics, similar health systems. It makes it easier to talk to each other.”

Leaving the EU would put the brakes on collaboration in Professor Porter's field even if the UK negotiates individual agreements, she believes. “We would be in a position where we wouldn't know what data to share. The default, if you're not sure what other countries' laws allow, is to hold off.”

## UK's central research role

This would have a knock-on effect for the UK's excellent reputation in the EU as a leader in science and research. “How can we be taken seriously as being European leaders if we don't seriously count ourselves as being part of Europe? The UK is one of the big players and people want us in their projects. It isn't just that we lead a lot of the research and coordinate it, we're involved in a lot of other people's research. We are seen as an important country to involve.”

# 05 Stardust

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## Protecting the planet from asteroids and space debris



Professor Massimiliano Vasile

The dangers posed by space debris and asteroids are not confined to the realm of science fiction films. The Earth's orbit is littered with tens of thousands of pieces of debris, all capable of inflicting considerable damage on space infrastructure (such as satellites) or even destroying a spacecraft. Stardust, an EU-wide training and research network, is devoted to developing ways to monitor asteroid and space debris and master techniques for their removal, deflection and exploitation.

### Multi-national approach

Massimiliano Vasile, Professor of Space Systems Engineering at the University of Strathclyde, leads the Stardust team.

When he was setting up the project, Professor Vasile knew that the only way he could get a framework to support cross-national research with multidisciplinary teams, across multiple countries, was to go to the EU. “These are challenges that a single country cannot address,” he says, adding that there is little support in the UK to conduct research on asteroids and space research and no support to form large networks like Stardust.

## Uncertain future

The Stardust consortium has its leading team at the University of Strathclyde in Glasgow, and ten full network partners and seven associated partners across Europe. Professor Vasile believes that if the UK left the EU, there would be little prospect of the UK continuing to host the project as an associated country like Norway or Switzerland, in particular because the leadership team at Strathclyde are not from the UK, and would “certainly go elsewhere”.

Leaving the EU would see existing researchers leaving the UK and would put up barriers to recruiting new talent. “Even if there was an equivalent UK-only network, we would need to draw from a Europe-wide pool of talent to be sure that we recruit the best possible candidates for the job,” he says.

## Global collaborations

Being outside the EU could also block the UK from participating in global space engineering collaborations. Membership of a larger bloc increases our visibility and attracts investment in UK science, enhancing our competitiveness in the long run: the EU “puts us in a much better position to partner with the US or any other country outside of the EU,” says Professor Vasile.

## 06 DOREMI

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### Improving older people's quality of life



Dr Mark Scase

De Montfort University is part of the European research project DOREMI, which is developing a fitness tracker and trainer specifically designed for an ageing population. Keeping older people socially active, mentally alert, eating a healthy diet and doing exercise can reduce the chances of age-related health problems. The project team consists of universities and companies from the UK, Austria, Belgium, Italy and Spain with complementary skills in the areas of technology, psychology and healthcare.

Dr Mark Scase, a cognitive psychologist at De Montfort University is involved in developing 'serious games' – games that are fun to play, but where the player achieves something meaningful by playing.

The opportunity to learn from different cultural perspectives has been very powerful in a project like this, says Dr Scase. "We have partners based in different parts of the EU that bring specific skills to the project. One partner based in Spain is developing a smart bracelet that can monitor physiology, movement, position and heart rate. Partners in Austria are developing a reasoning system that collects these data and helps to decide what is most appropriate for the older people taking part."

Dr Scase doubts whether these kinds of partnerships could be arranged if a consortium was based purely in the UK. Even lessons on diet from different parts of Europe – comparing the UK and Italy, for example – have informed the direction of the project.

The cultural mix of the team ensures that the health tracker and trainer are designed to meet the needs of Europe’s population at large and not just a single country.

Working on this cross-national and multidisciplinary project has opened up opportunities that would not have been available otherwise. “It has given us all the chance to work with, and learn from, colleagues in different disciplines, from psychologists, computer scientists, games programmers, economists and older people’s accommodation providers.”

# 07 IDEAL ageing

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## Reshaping healthcare for a healthier and longer life



Professor Mark Hanson

The IDEAL consortium is looking at how early life conditions can affect our health later in life, and the role they play in disease and ageing. The team consists of 16 institutes from eight European countries and includes researchers from the University of Southampton, University College London and the University of Oxford.

### Taking existing work into new territory

Professor Mark Hanson and Professor Karen Lillycrop lead the IDEAL programme for the University of Southampton.

Professor Lillycrop says the programme has “allowed us to work with groups which we had some links with, but now have very strong links with. It has allowed us to do lots of things that wouldn’t be possible otherwise.”

### “Science runs on a combination of collaboration and competition”

“We need to collaborate because science is becoming increasingly expensive and ever more specialised,” explains Professor Hanson. “It’s no longer possible for one group to do absolutely everything in a research programme,”



he says. Working within an EU framework breaks the tendency for unhelpful competitiveness between research groups by encouraging people to work together on problems: “It creates a level playing field.”

It also contributes to wider scientific value: “There have been some novel scientific discoveries from these collaborations,” says Professor Hanson, and the EU’s support has meant that what could have been achieved in 15 years working separately, will be achieved over the course of the five-year programme.

***“And now there is also an enormous resource of tissues, data and information which will lead to future scientific discoveries beyond the life of the programme itself.”***

## **EU breaks down barriers to collaboration**

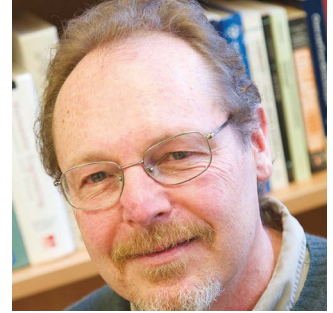
National funding frameworks don’t encourage this kind of overseas collaboration, Professor Hanson explains. “It unfortunately sets up a competitive atmosphere.”

***“It’s difficult through UK-only funding streams to be allowed to work with groups overseas. It’s designed to be used in the UK. So if you have a group in the Netherlands, for example, that has a particular expertise you need and you can’t do yourself, you could work with them, but it’s difficult. So why would they bother to work with you? They’re more interested in getting their local funding and getting on with the job, than waiting around for you.”***

## 08 ENERMIN

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### Helping the personal care products industry be environmentally friendly



Professor David Graham

With EU support, Newcastle University and L'Oréal carried out research that has transformed the way the personal care product industry deals with process waste.

In 2013, UK consumers spent £8.9 billion on personal care products like shampoos, deodorants, and make-up. As with all other industries, manufacturing our favourite brands creates considerable waste. For example, L'Oréal uses as much water as a medium-sized city and its factories expend a significant amount of energy dealing with waste treatment. These problems prompted L'Oréal to work on an EU-funded research project, ENERMIN, with Newcastle University to develop alternate low-energy waste treatment technologies.

Results of this research have significantly influenced personal care product industry practices. A full-scale treatment plant, based on research and development work by Newcastle and L'Oréal, was built in Suzhou (China), which in the first year after start-up reduced CO<sub>2</sub> emissions by 28% and chemical use by 30%. The Suzhou treatment system won the Corporate Water Stewardship Award at the 2013 Global Water Summit, and further systems are planned for other factories.

Professor David Graham is Professor of Ecosystems Engineering at Newcastle University and jointly led ENERMIN. “Colleagues at L'Oréal and I wanted to

pursue a research project that would be academically challenging and industrially important,” he says.

Professor Graham and colleagues had been exploring innovative biological wastewater treatment options at a fundamental level since 2001 aimed at reducing energy consumption. However, third-party support was needed to fund joint and scale-up research with L’Oréal that might lead to industrial implementation. But getting such support was problematic, especially given Newcastle University is in the UK and L’Oréal is based in Paris.

## **EU support crucial**

It was then that Professor Graham spotted a call for research under the European Commission’s Industrial Academia Partnerships and Pathways [IAPP], which help public and private research to work together, with a focus on long-term cross-border cooperation.

This was the breakthrough moment, he says. The IAAP award “was the clincher. It got the ball rolling with L’Oréal”.

The IAPP provided both Newcastle University and L’Oréal with “an ideal platform for doing multinational research that had value for industry and academia ... for studying a fundamental issue that affected all industries, not just personal care products”.

# How can you support the campaign?

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