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MARIE CURIE ALUMNI

September 2019 NEWSLETTER

The MCAA has a new Working Group to facilitate the participation of the association in European research funding proposals.

The MSCA COFUND is a Horizon 2020 instrument for co-funding of ongoing or planned programmes to promote PhD students or post-docs. Therese Lindahl, the Austrian National Contact Point for Marie Skłodowska-Curie Actions, tells us more about it.

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EURAXESS is a European Commission initiative, backed by 40 European countries, that facilitates access to the open labour market for researchers and removes barriers to mobility while enhancing scientific collaboration between Europe and the world. Meet Charlotte Grawitz, EURAXESS representative in Latin America and the Caribbean.

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PARTNER

SCIENTIFIC EXCELLENCE AT THE VIENNA BIOCENTER

In the last month, 2 new ERC Grants have reinforced the scientific excellence at the Vienna BioCenter, with a new total of 51 ERC grants received since 2017.

European Research Council (ERC) Grants are an indicator of top research quality.

TWO NEW ERC GRANTS

Alejandro Burga (IMBA): Starting Grant for the Project TOX-ANT to research selfish genetic elements called toxin-antidote systems.

Johannes Zuber (IMP): Proof of Concept Grant for the Project SLAM-Dx, which aims at the development of a diagnostic platform for probing drug responses in cancer cells.

51 ERC GRANTS IN TOTAL

Since the ERC Grants came to life in 2007, 51 projects presented by Vienna BioCenter scientists have been awarded an ERC Grant, representing a **success rate of 60%**.

European Research Council
Established by the European Commission

Type of ERC Grants at the Vienna BioCenter:

- **24 Starting Grants** for talented young researchers
- **10 Consolidator Grants** for young top researchers
- **13 Advanced Grants** for established researchers
- **4 Proof of Concept**

Vienna BioCenter scientists have raised approximately **€85 million** through ERC Grants to fund cutting-edge research.

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PARTNER

At the moment, 28 of the 96 group leaders currently working at the Vienna BioCenter have received at least one grant from the ERC. This represents approximately one third of all group leaders at the Vienna BioCenter, and half of those who are actively engaged in research.

TOP LIFE SCIENCE RESEARCH CAMPUS IN EUROPE

The Vienna BioCenter is the Number 1 life science location in Austria, performing half of all the top research that is funded by ERC life science grants in Austria.

At the European level, the Vienna BioCenter is one of the leading research locations in molecular biology and biomedicine. The amount of ERC grants compares to that of established and prestigious institutions of the calibre of Institut Pasteur and ETH Zürich.

VIDEO 10 YEAR ERC ANNIVERSARY (2017)

CAREER OPPORTUNITIES AT THE VIENNA BIOCENTER

If you would like to be part of the thriving scientific community at the Vienna BioCenter, check out our exciting career opportunities: Summer School, PhD Programme, postdoctoral fellows, independent Group Leaders, laboratory technicians, research assistants, scientists in biotech and many more.

Vienna BioCenter

MORE INFORMATION: www.viennabiocenter.org/career

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NEWS FROM THE WORKING GROUPS

THE RESEARCH FUNDING WORKING GROUP IS UP AND RUNNING

Funding is a top priority for researchers. We caught up with Gabor Kismihor, who chairs the newly created Research Funding Working Group, to learn more about the support available.

Meet the Board

Chair: Gabor Kismihor;
Vice-Chair: Christian Weber;
Funding Information Management: Yulia Shakalisava;
Research Funding Policies: Fernanda Bajanca;
Proposal Management: Stefan Mol.

The Research Funding Working Group has been operational since the end of 2018. It counts 12 members with expertise in research funding acquisition and management.

"The Board decided that we needed a Working Group to facilitate our presence within EU research projects," explains Gabor.

A TOP PRIORITY

When it comes to research activities, universities and institutions are importantly relying on external funding. Even for leading institutions, the amount of external research funding can be often higher than base funding.

"External funding is very competitive, therefore acquiring funds is an important element of a researcher's CV and component of research excellence," says Gabor.

"Through top-down research funding, researchers can connect to investigations around important and timely societal issues, which can significantly increase the impact and the visibility of their work," he adds.

He also mentions the case of Early Career Researchers who often require complementary funding to complete their three- or four-year project.

OBJECTIVES

The Research Funding Working Group has three main objectives:

- Facilitating the participation of MCAA in European research funding proposals
- Providing information for MCAA members on research funding
- Influencing European policies on research funding.

PLANNED ACTIVITIES

The Working Group plans to represent the MCAA at important events like ESOF 2020 and to ensure

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MCAA's presence in research funding proposals (especially regarding Innovative Training Networks).

What's more, the Working Group will set up a website for both research proposal management and research projects.

COOPERATION WITH OTHER WORKING GROUPS

One priority is to tap the potential synergies with other MCAA Working Groups.

"We are currently working on the methods to facilitate the information flow between the Research Funding Working Group and other MCAA groups and chapters," explains Gabor. "As a start, the Policy Working Group is represented within our Working Group to see how we can exploit synergies. If this relationship works well, we can extend this type of cooperation to other Working Groups.

"We recently created a survey for research funding needs, that was circulated within all Chapters in order to see what they expect from the Research Funding Working Group," he adds. "We currently evaluate the feedback and will come up with a strategy accordingly."

GET INVOLVED!

This new Working Group aims to contribute to an open and transparent European research funding policy. According to Gabor, members should never hesitate to contact the Working Group: "If MCAA members identify problems, issues with regards to funding policy, I'd invite them to contact us, so we can move important cases for our community to a higher level of discussion".

For more information, get in touch with the Research Funding Working Group at wg-research-funding@mariecuriealumni.eu

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NEWS FROM THE CHAPTERS

MEET THE CHAIR OF THE BENELUX CHAPTER

Esther Volz didn't learn about the MCAA until the 2018 General Assembly. She was elected chair of the Benelux Chapter shortly afterwards.

Esther Volz, in her own words

Hi, I'm Esther from Germany. I grew up in a small town full of vineyards close to the city of Heidelberg in the south-west of the country. I moved further south to study bioengineering at the Karlsruhe Institute of Technology. After a research project in Switzerland and an exchange semester in Norway, I knew I would like to move abroad for some time after my studies. Having participated in internships in applied sciences, I figured I am more interested in applied rather than fundamental research. During the last years of my studies, I got very excited about microorganisms and how they can be used to produce all kind of bio-based products. Hence, I was very happy when I was offered to join the Marie Curie Project MetaRNA since it meant that I could go abroad again and do research on microorganisms at DSM, a Dutch multinational life and material science company. Four years went by fast and I am currently busy writing my thesis on the development of new biosensors for the detection of fungal products. Let's see what comes next.

ELECTIONS

Esther heard about the MCAA for the first time, when one of her friends invited her to the General Assembly in Leuven in 2018.

"I honestly got excited about MCAA from the beginning," she says. "I think one main reason for this was that MCAA connects you with researchers from all over the world from many different scientific disciplines which leads to endless opportunities for exciting discussions and a lot of fun."

By coincidence, elections for the Benelux Chapter's board were held shortly after the General Assembly. At first, Esther hesitated to apply,

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as the MCAA was new to her. But she decided to run for the position of chair. And she was successful.

"When I heard I was elected, I felt a huge rush of motivation - not only for my PhD, but also to bring the Chapter forward," she says. "I always enjoyed the planning and organisation of events and am happy that the MCAA allows me to do this."

MEMBERS

The Chapter counts 285 members. However, as the Benelux region gathers more than 1 000 MCAA members, there is a huge potential to increase membership. Esther is planning to set up a mass mailing campaign to encourage potential members to join.

LUXINNOVATION

On 13 June, the Chapter organised an event in Luxembourg, in collaboration with the agency Luxinnovation. It was an informative session about Marie Skłodowska-Curie (MSCA) Actions Individual Fellowships. Esther and Pavlo Bazilinsky, the vice-chair, also introduced the MCAA and the Chapter.

"In total, more than 30 people joined, and we were able to recruit three new MSCA fellows to join the MCAA and the Chapter," says Esther. "During the networking drinks, we learned about common issues and training demands from our fellows in Luxembourg and are in contact with them to plan more events in the future."

'VISUALISE YOUR RESEARCH'

Scientists encounter quite a few challenges when it comes to explaining their research to their friends and family, or even other scientists. A workshop organised by the Benelux Chapter on 25 June proved a unique opportunity to learn how to use visual techniques to illustrate and explain a research project to the general public.

Led by Annett from the Studio VonKatz, the workshop included drawing, visual thinking techniques, storytelling and a final presentation of participants' work.

"About 15 scientists, mostly PhDs, from all over the Netherlands joined and we received very good feedback," says Esther. "It was a very nice and open atmosphere and we learned a lot. As a follow up, we already planned a shorter session on data visualisation together with Annett during the GA 2020 and I am sure more workshops will follow."

OTHER ACTIVITIES

On September 10, an online seminar titled "How do you maintain professional connections over time and space?" was co-organised with MCAA North American Chapter. On September 23, the Benelux Chapter held a session on "The role of scientists in policymaking" that was given by the MCAA Policy Working Group.

JOIN THE CHAPTER!

Esther encourages all potential members to join! "If you want to benefit from our local events and get in contact with other fellows in your region, you should definitely join," she says. "We are also always open to new ideas and happy about everyone who decides to actively contribute to our Chapter. And we always make sure to have some free drinks after our meetings!"

Find out more about the Benelux Chapter
Visit the Benelux Chapter on LinkedIn

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NEWS FROM THE CHAPTERS

A NEW CHAIR FOR THE IRELAND CHAPTER

Meet Sushil Mishra, the new Chair of the Ireland Chapter! Previously a member of the Indian Chapter, Sushil unveils his plans for the future.

Sushil Mishra, in his own words

I am an Indian national, currently working as a Marie-Curie Fellow in Advance Glycoscience Research Cluster (AGRC) at the National University of Ireland, Galway (NUI). In July 2018, I joined the Glycoscience Group of Prof. Lokesh Joshi in NUI Galway (Ireland) and started working on the SUGARSmart project (Smart design of recombinant antibody fragments specific for carbohydrate molecules). My project is about the structure-guided design of antibody fragments to recognise carbohydrate epitopes acting as an allergen or hallmark of malignancy in cells. I am very excited about this project as I am learning experimental techniques that I will also be using later in my research to validate the computational predictions.

FROM INDIA TO IRELAND

Surprisingly, Sushil's motivation to apply for the Chair position of the Ireland Chapter stems from his membership in the Indian Chapter. "I observed that the India Chapter was more active and organised several activities throughout the year," he explains. "I got some stimulus from this and decided to contribute more actively to the Ireland Chapter's activities."

OBJECTIVES OF THE CHAPTER

An upcoming meeting with the vice-chair, Amir Tabakovic, and several other members will pave the way for future activities. "My aim is to identify active members and to involve them to reinforce the MCAA's presence at all other universities in Ireland," says Sushil. We are planning to organise monthly meetings in different cities like Dublin, Cork, Limerick and Galway."

The Ireland Chapter's chair is also planning to campaign on social media to attract new members and to enhance networking.

MEMBERS

The Chapter counts 149 members. According to Sushil, the challenge is to use the potential of these members within the Chapter's activities. "We target 200 members with a focus on 'active' members. We are reaching out to the research offices at the universities and asking them

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to forward our emails to MCAA fellows at their university. I am hoping that our local social events in different cities will help us to identify those members," he explains.

PAST EVENTS

The Chapter offered support to members to attend the event "Scientifically Speaking: Communications Training for Researchers" organised by the British Council in Dublin on 27 August - 6 September.

PLANNED EVENTS

Sushil and his team are also currently liaising with MCSA National Contact Points and Enterprise in Ireland to organise an "MSCA Fellows" event for Individual Fellows.

JOIN!

Jokingly, Sushil was also quick to note that the Chapter offers its members more than just "free pints of Guinness".

"We'd be reaching out to new members by telling them how the Chapter could help them in having a better social life in Ireland as well as their professional development. Knowing other fellows from a different research background and countries will open up opportunities for collaboration in future and job hunting" he says.

As such, Sushil invites all current and past MSCA Fellows to join the Chapter!

INTERESTED?

Contact Sushil Mishra sushilkmishra@gmail.com
Contact the Chapter ireland.Chapter@mariecuriealumni.eu
Follow the Chapter on Twitter @MCAA_Ireland

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NEWS FROM THE CHAPTERS

GREEK CHAPTER'S FIRST ANNUAL MEETING

The Greek Chapter, an official component of the MCAA, is up and running again since 2019. Newly appointed Chair, Eirini Papageorgiou, and researchers from near and far gathered in Athens to discuss about the visions and missions of the Chapter for the upcoming months.

CHAPTER'S CREATION AND MEMBERS

In 2015, 18 Marie-Curie members in Greece took the initiative to found the Greek Chapter with the guidance of the MCAA Events and Networking Group. The Chapter initially organised a flurry of events and activities both for Marie-Curie beneficiaries and the general public, but people's attendance started to decrease over time.

Now, Eirini Papageorgiou – the new Chair of the Greek Chapter (elected in January 2019) – will pick up the torch and continue the work to further promote the Chapter. The aim is to increase the number of members (who currently count 98) and boost participation at future meetings and activities.

The first annual meeting that took place in Athens in July 2019 proved a great opportunity to meet the Greek Chapter members, share opinions and decide on the future plan of activities and events that will further increase the visibility of the Chapter. "We want to

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create a club that someone would find interest in joining – so it has to be both educational and fun," said Eirini Papageorgiou.

CHAPTER'S OBJECTIVES

During a round table session, attendees formed in small groups to discuss important objectives and activities. Eirini Papageorgiou highlighted that focusing on matters that are practical, feasible and visible would be a good start. "We would like to show that the Chapter is present and active, and exploits the services that MCAA offers. We want to be not only a Chapter in papers, but also in practice," she said.

The Chair and attendees agreed on a list of objectives during the meeting. Several main goals are listed below:

- Incorporating active social media channels into the MCAA Greek Chapter marketing strategy to promote events and activities, grow membership and keep members engaged and informed.
- Organising a certain number of local networking meetings each year at which members of the Greek Chapter can gather to chat, exchange ideas, knowledge and experience.

- Making Researchers' Night more interactive and engaging through interesting installations. Visitors will have the chance to discover how research and science contribute to improving everyday life. Kids will also explore, play and learn science in a fun and tangible way.
- Advertising the Greek Chapter through open seminars and workshops especially when the Chapter community grows in number. Topics should include preparation of successful MSCA-IF proposals, CV writing, protection of intellectual property, and career development after the MC fellowship.
- Promoting Science Slams events where scientists communicate their own scientific research work in a fun way.

WHAT'S NEXT

According to Eirini Papageorgiou, this annual meeting is the first of a series of events to follow. Her aim will be to create further opportunities for discussions and networking to encourage members' collaboration. "We are a local hub, not just a group of researchers," she said.

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EVENT

TURKISH CHAPTER ANNUAL MEETING

The Turkish Chapter conducted its annual meeting at İTÜ's Ayazağa campus. Murat Güneş, secretary of the MCAA, told us how it went.

Istanbul Technical University (İTÜ) hosted a crucial meeting for the scientific community in June 2019. Marie Sklodowska-Curie Actions Alumni (MCAA) Turkish Chapter conducted its annual meeting at İTÜ's Ayazağa campus.

Among the participants were Professor Gözde Ünal from the Computer Engineering Department at İTÜ, MCAA General Secretary Murat Güneş, as well as numerous scientists based both inside and outside Turkey.

The main aim of the MCAA Annual meeting was to bring together scientists who are currently running a Marie Sklodowska-Curie project or those who are planning to run one and encourage collaborations among them. The meeting informed participants about events that are organised by the Marie Sklodowska-Curie Alumni Turkish Chapter executive committee and the European Research Council (ERC) grant which many Marie Curie fellows plan to apply for in the future.

Professor Gözde Ünal introduced the Marie Sklodowska-Curie Alumni Turkish Chapter executive committee to conference attendees and provided a summary of events that was organised by the committee. Murat Güneş provided information on microgrants and working groups that can provide support for researchers in Turkey. Emel Topuz shared important topics that were discussed at the the annual international conference of MCAA, such as researchers' mental health, refugee scientists in Europe, and sexism in science.

Professor Yusuf Yağcı discussed qualities that one needs to become a successful scientist and listed both opportunities and challenges for scientists based in Turkey who conduct research on an international scale.

Aslı Vural gave an informative presentation on European Research Commission (ERC) grants and noted that there is an increase in the number of ERC grant projects that Turkey has received. Professor Zehra Sayers gave examples from her research and demonstrated how to intertwine diverse disciplines to create interdisciplinary projects.

After informing participants about his research, Associate Professor Kerem Pekkan shared parts of his ERC grant application and provided recommendations to participants who want to apply for ERC projects.

Finally, Emrah Göker noted that those who applied for ERC should receive administrative support from their institutions. He also discussed the criteria that ERC grant application evaluators look for.

At the end of the event, MCAA discussed what scientists in Turkey should do for better career prospects and how they can have better research opportunities in Turkey.

MURAT GÜNEŞ

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THE WESTERN BALKANS CHAPTER IS UP AND RUNNING!

The Western Balkans Chapter kicked off on 7 June. We caught up with the Chapter's Chair, Radenka Krsmanović Whiffen, to learn more about its upcoming activities.

Radenka, in her own words

I was born and raised in Podgorica, Montenegro and graduated in Electrical Engineering and Electronics at the University of Montenegro. After earning my Masters in Scanning Electron Microscopy at ISUFI, University of Salento, in Italy, I decided to focus on solid state physics and material science. I started my PhD research at University Ca' Foscari in Venice in 2002, and defended my doctorate at EMAT, the University of Antwerp in 2006. After studying in Italy and Belgium, I worked on luminescent nanomaterials in Serbia and France and electron microscopy in Portugal.

I am a current MSCA Individual Fellow in Physics at the ENEA Cassacia Research Centre in Rome, Italy. My project, NanoPyroMat, aims to develop nanomaterials for ambient energy harvesting applications. I am the co-founder and chair of the MCAA Western Balkans Chapter. Outside of work, I am kept very busy by my two young sons.

OFFICIAL LAUNCH

The kick-off event in Podgorica, Montenegro was a great face-to-face meeting of nine founding members of the Chapter, the MCAA Vice-Chair Mostafa Moonir Shawrav as the representative of the MCAA Board, three guests and one journalist. All the members present were proactive and together we generated lots of ideas for future activities. We voted for the board members and defined the Chapter's strategy. The Chapter has national representatives from Serbia, Bosnia and Herzegovina, Montenegro and Albania, who are the go-to contact point for those countries. We hope to expand and cover all the territories in our region soon.

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We were very lucky to have support from our member Branka Žižić, from the Ministry of Science of Montenegro. The same ministry provided the venue and helped us achieve good local media coverage. After the meeting I gave an interview to the Montenegrin daily newspaper *Pobjeda* about our Chapter and the work of the MCAA. Additionally, four of our members spoke to Montenegrin National TV for their science magazine programme, which was aired on their channel in September. These were great opportunities to raise awareness of MSCA opportunities and to help us increase engagement from researchers in the Balkan region.

OUR MEMBERS

We have 60 members. Currently, about 25% of them are active members, so we have achieved a stable and active critical mass of engaged members. We would like to reach 100 members in the next 12 months.

MAIN OBJECTIVES

The Western Balkans Chapter aims to connect and represent MSCA fellows and alumni from the Western Balkan region, with many of them residing abroad and being part of the so-called "scientific diaspora". We see our role as being almost like a pressure group in our region, advocating for best practice in science and research and the adoption of policies and approaches that should help science in the Balkans reach wider European and global standards. A large part of this involves promoting MSCA actions, the MCAA, and Responsible Research and Innovation both to researchers and to relevant stakeholders in the Balkans, including both governmental and academic institutions. We will try to drive greater interest, engagement and participation of the research community in the Western Balkans, particularly in terms of MSCA opportunities, as, unfortunately, the number of applications coming from our part of the world is still pretty low.

PLANNED ACTIVITIES

There are a few things worth highlighting in our plans for next year. The Chapter has applied to hold two sessions at two key upcoming events in 2020: the MCAA General Assembly and Annual Conference in March 2020 in Zagreb and the EuroScience Open Forum (ESOF) in July 2020 in Trieste. We are waiting for the selection results. These would be great opportunities to discuss some of the important issues for the Western Balkans, such as the barriers faced by researchers in terms of career progression or how to improve role of science in decision-making in this part of the world.

We also aim to take part in the European Researchers' Nights in our respective countries and to organise several MSCA and MCAA

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promotional events throughout the year. We are open to holding joint events with other MCAA Chapters and Working Groups and are always happy to work together with other members of the wider MCAA family.

RESEARCH IN THE WESTERN BALKANS

Western Balkan countries are all relatively small and, in many ways, are still in transition politically, economically, and socially. The region has experienced difficult times in the recent past that have slowed down progress in the research and innovation sector and that continue to cause a pronounced “brain drain” from the Western Balkans, which is also a problem for South East Europe in general. There are many challenges to overcome to catch up to EU averages, not only in research but also in creating effective science policy, achieving gender equality and driving public engagement. Sadly, the Western Balkan region does not have a very progressive attitude towards gender relations and equality; there is a lot of rather old-fashioned, discriminatory thinking, both in the workplace and in general.

Regarding research in the Balkans, there are obvious "visible" barriers to effective science, notably the low level of investment in science, the lack of large-scale research infrastructure, and the absence of reliable career pathways for mobile scientists. On the other hand, there are also underreported, "invisible" issues such as workplace mobbing, nepotism, corruption in academia, and entrenched attitudes towards things like career breaks and industrial collaboration. We have had a lot of scandals in academia that have recently hit the region, related to issues like plagiarism and academic integrity. So far, we haven’t seen substantive national or regional initiatives to address these problems, or to drive the significant change in the research cultures or working practices that we need.

JOIN THE CHAPTER!

We strongly believe that better science can lead to better societies. We all want to see the Western Balkans doing better. We hope to see our region playing a full and active part in the European research environment, not through brain-drain, but rather brain gain and brain circulation instead.

Join us and help us open up the European horizons for research in the Western Balkan region. Follow us on Twitter @MCAA_WB or get in touch with the Board via the MCAA portal. We’d love to hear from you.

Contact the Western Balkans Chapter
western.balkans.chapter@mariecuriealumni.eu

RADENKA KRSMANOVIĆ WHIFFEN

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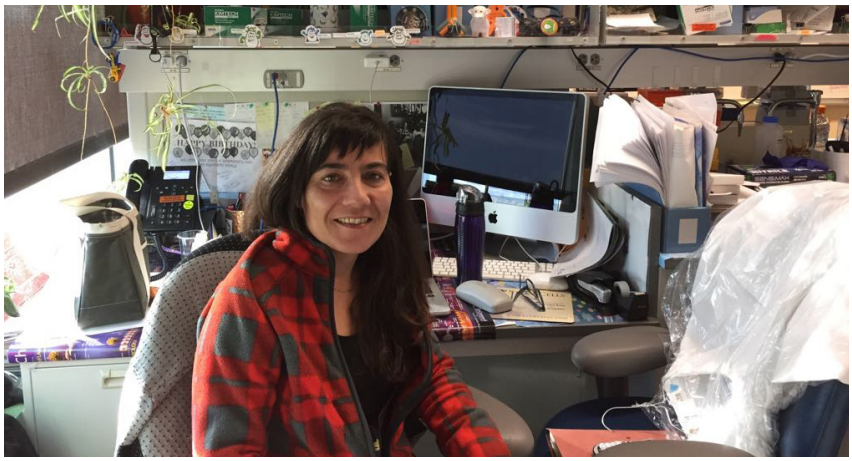
CAREER

CELIA'S STORY: BULLYING IN ACADEMIA

Celia Arroyo-López shares her experience about being bullied by her PhD supervisor and her employer.



"THERE ARE MANY VICTIMS, WE JUST NEED TO BECOME VISIBLE"

Celia Arroyo-López, in her own words

I am from Spain. I earned my PhD in the search for nutritional and medical plants to use in green husbandry to treat gastrointestinal nematodes. Since then, I decided to investigate the potential application of parasitic molecules in the field of biomedicine for the treatment of autism. A part of my PhD was funded by my Marie Curie Sainfoin Project: Healthy Hay (MRTN-CT-2006035805).

Concern about bullying has been growing in the world of academia. PhD students are considered to be particularly vulnerable because they depend on their supervisors for publications and references, according to the *Guardian*. The newspaper published a call for testimonies encouraging academic staff to share their experiences.

Another article published by *Nature* notes that nobody knows how much bullying goes on in science because few people have investigated the issue.

The same article defines bullying as repeated and malicious mistreatment of someone that results in harm. However, it can take other forms of actions, and most of them can fit into a grey zone.

"I consider bullying at the workplace to be threats to co-workers or students, due to their personal beliefs or simply because the abuse of power is just so attractive for a bully," says Celia Arroyo-López. She is a scientist who was bullied by her PhD supervisor.

TYPES OF BULLIES

According to the findings of one study, titled Workplace bullying: aggressive behaviour and its effect on job satisfaction and productivity, people arrive at bully-hood by at

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least three different paths: through personality development, by reading cues in a competitive, political workplace, and by accident. The research describes the typical workplace bullies as "constant critic", "two-headed snake" (passive-aggressive), "backstabber snake", "Jekyll-and-Hyde snake", "no problem, don't bother snake", "screaming Mimi, controller", "gatekeeper" (control freak), "accidental bully", "chronic bully", "opportunistic bully", "serial bully", "narcissist", "cyber-bully" and "substance-abusing bully".

Celia describes her PhD supervisor as a passive-aggressive bully. "He systematically ignored my emails," she explains. "He only replied to higher ranks in the academia, and always justified the lack of his feedbacks to me as: I received nothing."

CONSEQUENCES ON CAREER

It took seven years for Celia to submit her dissertation and she says it was never edited by her PhD supervisor. Consequently, she could not submit it to a journal for publication.

Celia was able to find a job in the United States, thanks to an employer who already knew about her previous situation. However, Celia struggled with other employment-related difficulties.

"She decided to pay me less than the others," says Celia about her employer. "It was not passive bullying, it was an excessively micromanagement, always judging our weight, and our outfits."

GRIT YOUR TEETH

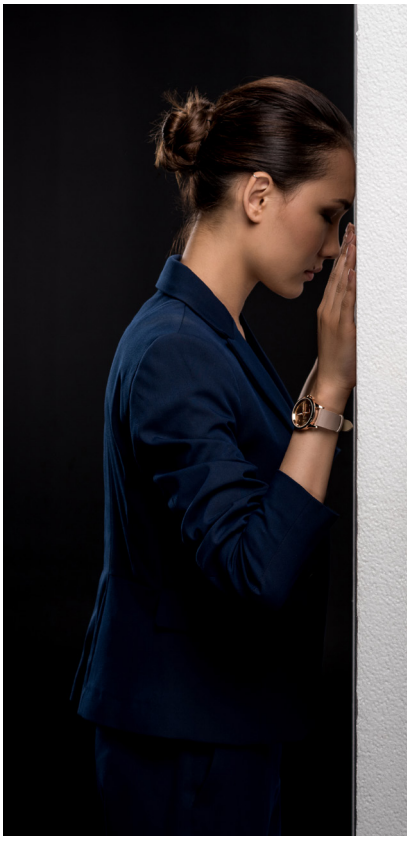
Progress is still slow in tackling bullying in academia. According to Lesley Jones, professor of neurogenetics at the Cardiff University, who published a Letter in the *Guardian*, the victims of bullying in the world of academia rarely report it. They consider it too much of a hassle to complain, so they "put their head down" and "grit their teeth" to get their PhD and leave for new pastures.

"Most of the people I have talked to consider bullying to be a part of our job and it is perceived as normal. As long as scientists are perceived as 'weirdoes' they will behave 'weirdly'. So we have to accept 'they are special," says Celia.

WHAT CAN BE DONE?

For Celia, transparency is key to prevent bullying in any workplace. Here is what she suggests for tackling this form of aggressive behaviour:

- active policies in research and at university;
- independent organisation for surveillance;
- psychological support for victims;
- active involvement from the higher governmental institutions.



"As long as we need recommendation letters, we should either end with the recommendation letters or add complementary letters about the working conditions of our previous employer," notes Celia.

She has also sent a proposal to the European Parliament asking for the creation of a specific organ dedicated to control bullying in research.

"There are many victims, we just need to become visible", she concludes.

Learn more about what the EU is doing to combat bullying
Read more about Celia's case study

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RESEARCH

MSCA COFUND 2019: CO-FINANCING OF DOCTORAL AND FELLOWSHIP PROGRAMMES

The MSCA COFUND is a Horizon 2020 instrument for co-funding of ongoing or planned programmes to promote PhD students or post-docs. Therese Lindahl, the Austrian National Contact Point for Marie Skłodowska-Curie Actions, tells us more about it.

Talking about her role, Lindahl explains: “I am in charge of raising awareness about participation possibilities among potential COFUND applicants, to give advice and support in the proposal writing phase as well as during the implementation of funded programmes.”

The purpose of the COFUND scheme is to foster excellence in researchers' training, mobility and career development, thereby spreading the best practices of the Marie Skłodowska-Curie actions. “This will be achieved by co-funding new or existing programmes that provide international, intersectoral and interdisciplinary research training of researchers at all stages of their career,” adds Lindahl. COFUND can take the form of doctoral or fellowship programmes, which are expected to enhance research and innovation related human resources on a regional, national or international level.

WHO CAN APPLY?

“Legal entities in EU Member States or Horizon 2020 Associated Countries, that fund or implement doctoral or fellowship programmes for researchers are eligible to apply,” confirms Lindahl. COFUND is a

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mono-beneficiary action which means there must be one sole beneficiary that will also be responsible for the availability of the necessary complementary funds. "Nevertheless, collaboration with a wider set of partner organisations, including organisations from the non-academic sector, will be positively taken into account," adds Lindahl. These partner organisations can contribute with innovative and interdisciplinary elements, for example through the hosting of secondments and providing complementary training in research or transferable skills.

Lindahl stresses that, "individual researchers cannot apply for COFUND within the calls of the European Commission but can benefit from COFUND in the way that they apply for positions offered within co-funded programmes". Lindahl adds: "All COFUND positions must be widely advertised, for example on the EURAXESS job portal for researchers."

TIPS ON HOW TO APPLY

Those interested in applying for the COFUND scheme, should refer to the Guide for Applicants. Lindahl explains: "This is a guidance document that provides all the necessary information about the funding scheme and takes applicants step by step through the application process." The Guide also contains information about how applicants should structure the proposal, on the evaluation procedure and where applicants can seek further support.

"It is also important to consult related parts of the MSCA Work Programme 2018-2020 in order to understand the policy objectives and overall aims of MSCA in general," notes Lindahl, who further adds, "all relevant documents can be found on the Funding & tender opportunities portal of the European Commission. It is strongly recommended that applicants get in touch with the MSCA National Contact Point in the country concerned at an early stage of the proposal preparation."

Additionally, applicants should bear in mind that the description of the research discipline or area makes up only a minor part of the proposal. "Applicants are asked to provide information primarily on administrative issues, for example about the selection process of the researchers to be funded, about appointment conditions and the management of the programme," emphasises Lindahl. For this reason, people who have that kind of knowledge should be involved when drafting the proposal. Applying organisations must also be aware that, as the name indicates, the MSCA COFUND scheme funds only parts of the total budget for the implementation of the respective programme and that matching funds are needed.

MORE INFORMATION

For detailed information and advice on how to apply, visit Marie Skłodowska-Curie Actions.

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BOOST YOUR RESEARCH CAREER WITH EURAXESS

EURAXESS is a European Commission initiative, backed by 40 European countries, that facilitates access to the open labour market for researchers and removes barriers to mobility while enhancing scientific collaboration between Europe and the world.

As one of the largest networks globally that helps researchers find work, develop their careers and prepare for the move to another country alone or with their families, it involves over 1 500 people working in more than 550 support centres in Europe.

These welcome researchers and help them integrate in the culture of the host country, accompany them throughout their career path and point them toward sectors and disciplines where their talents can be best employed. Over 40 national portals with country-specific information about living and working as a researcher in the respective destinations provide the EURAXESS network with a strong online presence.

EURAXESS Worldwide, the international arm of the network, is present in 8 locations around the world that cover 16 countries and bring scientists with a European background in contact with nationals originating from the countries they are based in and now work in Europe to help them connect or stay connected with their home base.

In my case, for example, I represent EURAXESS in Brazil and other Latin American and Caribbean countries (LAC).

WORKING WITH ALUMNI

Part of our task is to promote EU funding such as MSCA and the opportunities offered by the European Research Council (ERC).

To do so, there is nothing more efficient than inviting former and current fellows to share their experience and tips with their peers. A speech by a local researcher who secured an EU grant is always more inspiring than a formal talk on MSCA complexities!

Together with my EURAXESS Worldwide colleagues, we consider you as ambassadors of the EU programme, and additionally of the European Research Area.

In some locations, Worldwide representatives have even provided support so that MSCA alumni can create a local chapter of the association and explore regional synergies.

Such activities have earned us, as EURAXESS Worldwide representatives, Honorary MCAA Membership in 2018.

Our collaboration is not only about disseminating funding opportunities. With MSCA, the European Commission brought innovations into researchers' training and career development. Thanks to our good connections with local stakeholders, EURAXESS Worldwide strives to introduce innovative methods or ideas to science ministries and local funding agencies. As MSCA fellows, you are best positioned to advocate in favour of the benefits of doctoral training in Europe or closer and more extensive cooperation between academia and industry, just to name a few. In this context, our role is to connect the dots and create opportunities for the discussion to arise.

EURAXESS SUPPORTS YOUR NEXT CAREER MOVE

But EURAXESS has a lot more to offer you.

1. The EURAXESS Jobs database is the perfect tool if you are either looking for or offering:

- a job position related to research
- a grant
- hosting offers from organisations seeking to attract international talents (see how to publish offers for free here).

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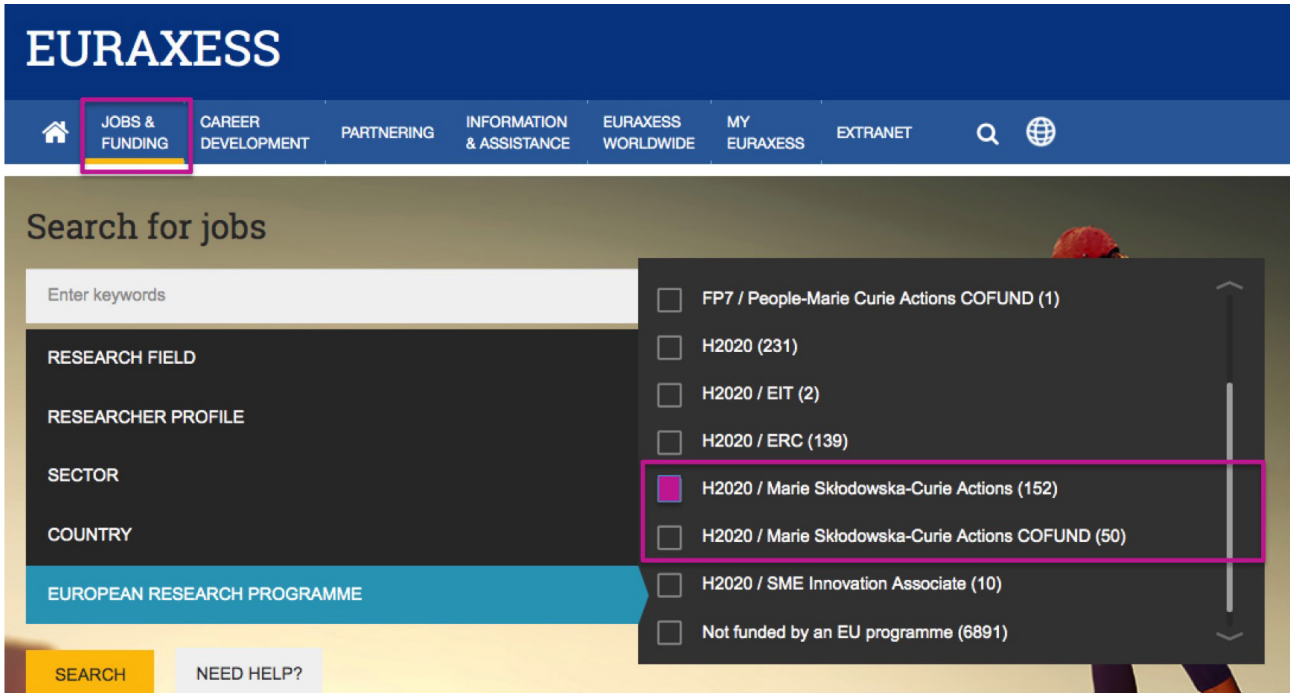

Did you know that all PhD and post-doc positions funded by MSCA are advertised on EURAXESS Jobs?

As individual researchers you can also publish your CVs and receive online notifications when a position matching your profile is published.

2. Are you considering leaving academia to work for industry? Or launching your own start-up? Test your skills, get trained and optimise your career path with the help of EURAXESS Career Development resources or personalised assistance from EURAXESS Career Development centres.

3. Did you find the job of your dreams in a **new European country**? Don't panic, there is always a EURAXESS support centre near you to provide information and assistance! Feel free to ask for help by email or phone and they will assist you to turn your relocation into a smooth and positive experience. You'll certainly save time, energy and money asking for their free-of-charge support.

4. Finally, if you want to increase your international collaboration, use the EURAXESS Partnering tool and look for:

- partners to join a consortium and apply for EU funding,
- researchers for recruitment panels,
- or even entrepreneurs to launch your start-up.

Remember that EURAXESS is also a networking instrument, hence we strongly encourage you to express your interest in collaborating with other registered EURAXESS users.

To use all these functionalities, register FOR FREE on the EURAXESS Portal: https://euraxess.ec.europa.eu/

And do not hesitate to contact your EURAXESS Worldwide representatives in ASEAN (focus on Singapore, Thailand, Indonesia, Malaysia, and Vietnam), Latin America and the Caribbean (LAC, focus on Brazil, Argentina, Chile, Mexico, and Colombia), China, India, Japan and South Korea, North America (US and Canada).

CHARLOTTE GRAWITZ

EURAXESS representative in Latin America and the Caribbean (LAC), brazil@euraxess.net

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REVOLUTIONISING THE SUBTITLING RESEARCH LANDSCAPE

The Marie Skłodowska-Curie IF project SURE finished in 2018, but its results on subtitling sparked controversy that continues to this day. MSCA research fellow and principal investigator Agnieszka Szarkowska explains.

Subtitling facilitates language learning, linguistic diversity and multilingualism. But to be useful for viewers, subtitles have to meet certain quality criteria. SURE addressed the need for subtitling quality and defined subtitle quality indicators in terms of speed – how fast subtitles appear and disappear – and line breaks – how to best arrange text in a subtitle to be readable.

"We found that when watching content in English, most viewers managed to follow subtitle speeds higher than are now recommended on the market," says Szarkowska, an associate professor at the University of Warsaw's Institute of Applied Linguistics. "This has implications on how subtitling is done."

Research involving eye tracking experiments, questionnaires and semi-structured interviews was carried out at University College London's Centre for Translation Studies, a leading audiovisual translation institution.

REVISITING OLD TRUTHS, BRINGING SUBTITLING INTO THE 21ST CENTURY

"We know that many people are now able to read faster, compared to the 1980s when most studies on subtitle reading were conducted," Szarkowska notes. SURE showed the need to update subtitling standards and perform up-to-date research, stressing the importance of replication.

The project will impact end users in various ways. For researchers, it demonstrates the need to do studies on important aspects of audiovisual translation, even if other studies were done in the past. "The field is changing," comments Szarkowska. For viewers, language service providers and broadcasters, outcomes may translate into better quality subtitles. "For instance, we know what types of line breaks facilitate smoother processing, and it's up to broadcasters to implement these results so that viewers can benefit from better quality subtitles."

Results were met with much controversy from some professional subtitlers and researchers. SURE

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prompted discussions on subtitling speed, findings that continue to be hotly debated.

The essence of interlingual subtitling (translated, as in English to Spanish, not English to English) is text condensation. “You can’t fit in subtitles everything that’s being said for two reasons,” explains Szarkowska. “One is time constraints, people need to be able to read the subtitles, and subtitles need to be synchronised with dialogue. The other is space constraints, there are only 2 lines of text, about 40 characters each. With fast speech rates, condensation is inevitable.”

THE NEED FOR SPEED

“But how much do you need to reduce and condense?” she asks. This depends on many factors, one being the so-called reading speed. This is the pace with which subtitles are displayed on screen. It’s usually measured with characters per second (cps). Traditionally, in many subtitling countries like those in Scandinavia, the reading speed has been low: 10-12 cps. The lower the speed, the more the need to condense.

With the arrival of Netflix, TED and other new players, reading speeds have gone up. “It begs the question: What is the optimum speed?” Szarkowska adds. “This, of course, is impossible to answer, it’s like the holy grail of subtitling. It depends on factors like who the audience is, the genre and topic difficulty.” Overall, many viewers in the study said they thought interlingual subtitles were often “inaccurate” because they didn’t fully reflect what people said. This stems from excessive text condensation.

According to Dr Szarkowska, a lot of viewers, particularly the young, can understand the original English dialogue and compare the text in the subtitles with the original. They can see that a lot has been removed, and many even think too much. The eye tracking study showed that contrary to what is said, many people could comfortably follow the speed of 16 and 20 cps. This goes against most current market practices.

Condensation is necessary in subtitling, but the speeds of 10-12 cps were set in the early 1980s. People read faster today, and Szarkowska’s research gives some evidence of this. “To conclude, I believe the speeds could be raised to 16 cps without harming viewers. On the contrary, many viewers may appreciate it if subtitles were more accurate. However, professionals may take this to mean that subtitles would be translated word for word, which isn’t what they have been doing since they believe subtitling is an art. They have a point of course, and there’s a danger in that, too.”

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AI TAKES MCAA ENGAGEMENT TO NEW HEIGHTS FOR THE GREATER GOOD OF SOCIETY

How can the MCAA be fully sustainable, while maximising its positive impact and becoming socially relevant? This is the vision of Stavros Skouras, who conceived the idea of an ambitious project to make this happen.

How did the project MCAA conSensus develop?

I view conSensus as the natural next step in the evolution of evidence-based policymaking and public engagement with science in general. The initial idea was based on my experience in the EU4Facts Conference and the MEP-Scientist Pairing Scheme in 2017. During these events, I realised the urgent need for a scalable system enabling policymakers to easily solicit expert opinions. This can be achieved by consulting a large body of scientists and scholars through an online system that allows evidence-based policymaking to actually be data-driven. This is the essence of the project.

However, the project is also adapting dynamically. In collaboration with the NewHoRRizon project for example, we are exploring the idea of using conSensus as an online platform for citizens and schoolteachers in particular to reach out and ask questions to scientists and scholars. In practice, both of these functions, as well as many others, could be efficiently served by a common system.

What will be the overall impact and benefits of conSensus?

One of the main motives for developing this new AI-crowdsourcing platform has been the protection of public opinion in the post-truth era. This is becoming increasingly relevant with the advent of new technologies like Deepfake, for example.

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We hope that by consulting a large number of experts, we'll be able to discern fact from fiction and truth from malicious attempts of demagogy.

Another benefit relates to the MCAA itself that relies on external funding. To preserve its existence and ensure its financial autonomy, the MCAA may have to rely on a subscription scheme that would make many members unhappy. By using conSensus instead, if all members commit to devoting one hour per year on providing their expertise to serve society, we could have a viable business model to ensure the self-reliant sustainability of the MCAA.

Finally, I strongly believe that providing such a service would give the MCAA an important role in society that goes beyond simply being a tractable network of fundees. In this sense, conSensus would offer a higher purpose for the MCAA and an important incentive for membership.

What is your role and contribution to conSensus?

I came up with the idea and set up the conSensus Task Force within the MCAA Policy Working Group so that MCAA members with the required interest and know-how can form a group to implement the project. I coordinate the Task Force activities and ensure the project progresses.

What is the ultimate objective?

Overall, the aim is to develop a service that MCAA provides to various stakeholders, thereby supporting MCAA on a financial level, while at the same time providing a channel for experts to contribute to important matters and public affairs. This should contribute to an overarching purpose of widely-recognised and well-appreciated value for the MCAA within society.

What will be the key results?

Implementing a fully functional version of the AI system will be the most important milestone. Following that, we will need to perform several tests to identify the best-use cases on multiple levels, from ensuring alumni engagement to maximising positive societal impact.

I expect that if conSensus is successful, it will probably be adopted by other organisations and become a standard way of managing the assessment of facts and contributions by experts in modern societies.

What is the latest news?

We recently met an important milestone by fully specifying the software architecture. We also resolved some technical issues, including the mechanism for accessing publications that is required for conSensus to perform its functions. Now that the system is fully specified and these initial challenges have been overcome, the next step is to secure the budget necessary for a professional implementation.

How can MCAA members contribute?

If there are people willing to actively help in software development,

fundraising or public outreach, please contact me to get involved in the Task Force. More importantly, conSensus can only be as strong as the pool of scientists and scholars that participate. I encourage everyone to take 20 seconds, reading this, and use the following link to submit their email and ORCID number, so that we can soon test the beta version of the system.

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A BATTLE FOR SURVIVAL BETWEEN BACTERIAL PATHOGENS AND THEIR VIRUSES IN THE HUMAN BODY

Bacterial viruses (also known as “phages”) are the viruses that infect bacterial strains. Such viruses are amongst the most abundant entities on planet Earth. As phages do not attack human cells, they are being reconsidered as a natural cure against antibiotic-resistant bacterial pathogens.

As the life cycle of phages involves a bacterial cell for their production, they influence the microbial world significantly. Because of their unique property of infecting and ultimately killing bacterial species (a process called “lysis”), they are being researched for their lytic potential, or their ability to induce lysis, against many deadly bacterial pathogens (Figure 1). Since their discovery – before antibiotics – bacteriophages have played a significant role in shaping the field of molecular biology and are now being examined anew for their role in what is known as bacteriophage therapy, the application of phages to treat different bacterial infections.

THE NEED FOR BACTERIOPHAGE THERAPY

Considering the global concern over the growing resistance of bacteria against antibiotics, the use of bacteriophages as therapy has received great attention, especially as it appears to offer an excellent way to combat multidrug-resistant (MDR), extensively drug-resistant (XDR) and pan-drug-resistant (PDR) pathogens. Bacterial pathogens may develop resistance to bacteriophages over a period of time due to the presence of immunity provided by CRISPR-Cas (Clustered Regularly Interspaced Short Palindromic Repeats) system, a genetic modification system that provides immunity against foreign genetic materials. A possible method of countering this could be the use of bacteriophages’ lytic enzymes; moreover, there is no evidence that bacterial strains have developed resistance against such enzymes. Hence, it seems that synergistic approaches for targeting such drug-resistant bacterial pathogens can provide the best solution ([1, 4]).

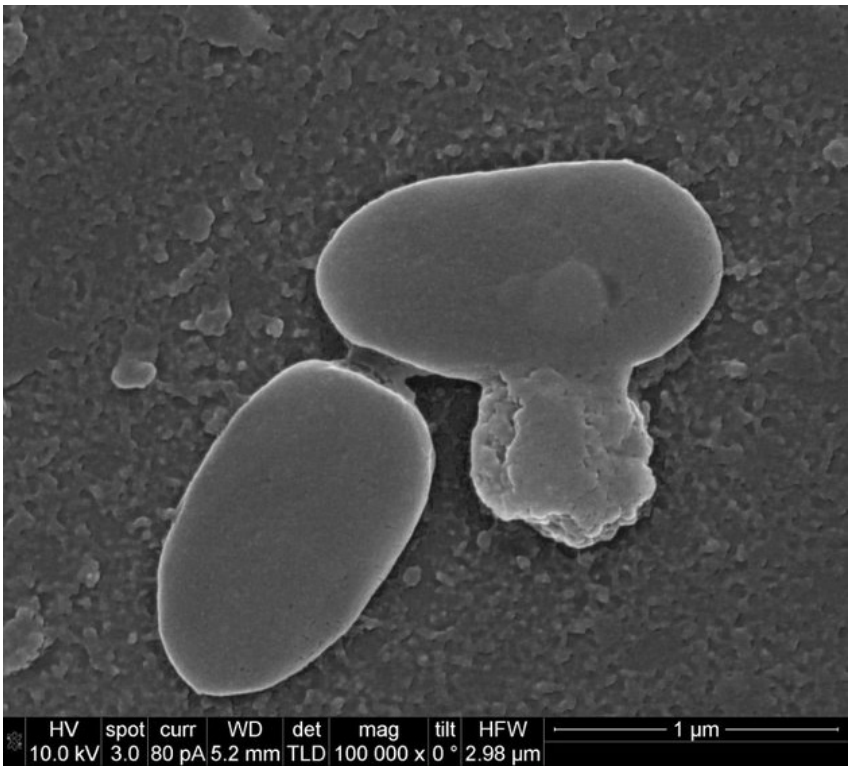

Figure 1:
Representative image of natural bacterial lysis by bacteriophage infection.

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There are definitely many advantages of using phages over antibiotics, but a phage-antibiotic synergy seems to be an essential strategy in case of chronic infectious diseases associated with cystic fibrosis. For developing effective phage-using therapy, it is of critical importance to screen for and select phages from different clinical and environmental sources in order to avoid "site-specific evolution" among the phage-microbe community. In addition, such selective phage lytic enzymes can provide an additional advantage to support effective treatment strategies in the near future.

Mutating bacteriophages to target resistant pathogens in humans was recently reported ([2]), clearly indicating their safe applicability. But it is necessary to also consider the environmental impact of such released phages, as this particular application may lead to the co-evolution of the phage-microbe community even further, in unprecedented ways – or as one might describe it, "mutating the mutators". Likewise, natural phages can evolve and be explored for targeting antibiotic-resistant bacteria. Overall, isolating new lytic phages (Figure 2) is a lot more efficient than modifying one ([1]).

PROJECT BACKGROUND

In our ongoing project, we are isolating different bacteriophage strains from clinical and environmental samples, and testing them against pathogens isolated from patient samples, targeting health-threatening biofilm-forming microbes, commonly involved in many infections, for their in-vitro and in vivo studies. Bacteriophages seem to be more robust towards previously unencountered bacterial hosts rather than those with which they reside. It was observed during our in vitro bacteriophage therapy studies with Pseudomonas aeruginosa (strains PAO1, P14, P56, PAET1, and PAET2), Mycobacterium abscessesus (strains 390S, 390R, BE96S, BE96R, BE48S, BE48R, 44196S, 44196R, BE03S, BE63S, and BE82S), and Escherichia coli (strains E2348/69, MG1653, LF82, and CFT073) that uses of bacteriophages isolated from different clinical and environmental samples had different outcomes (Figure 2). We tried to isolate phages from clinical samples (sputum, urine, and saliva) of infected patients in order to target biofilm-producing bacteria that cause chronic pulmonary infection leading to cystic fibrosis or chronic obstructive pulmonary disease (COPD).

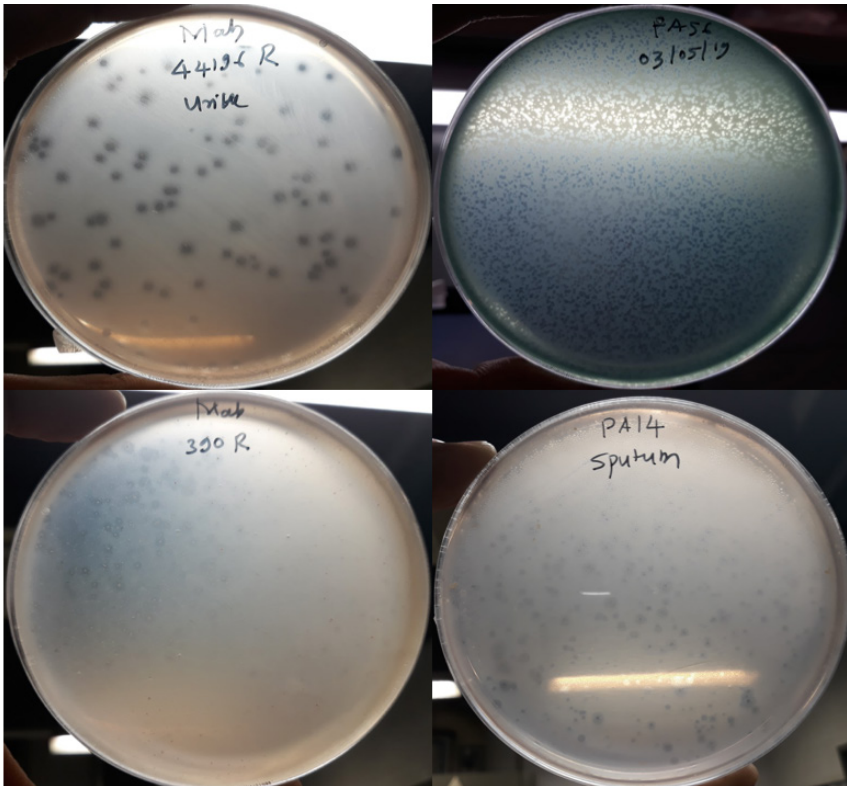

Figure 2:
Representative images for isolated bacteriophages against Mycobacterium abscessesus rough type strains (Mab 44196R from urine and Mab 390R from sewage) and Pseudomonas aeruginosa strains (PA 14 from sputum and PA56 from sewage).

Surprisingly, we found that phages isolated from clinical sources were less susceptible towards their clinical bacterial counterparts, resulting in less or no plaque-formation through the plaque assay method used to isolate viruses. This technique shows the number of infectious particles, as each virus produces a circle of infected cells called a plaque. On the contrary, the phages isolated from sewage sourc-

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es where highly virulent towards these hosts, indicating that bacteriophages available at the source of infections probably provide phage immunity through co-evolution ([3]).

Moreover, the sewage phages which do not share such immunological history end up infecting the pathogens. These findings suggest that phage-host adaptation and evolution is "site-specific" and to encounter highly infective phages against pathogens we must screen different clinical samples and/or environmental samples to get desired results. In our case, enriching the phages isolated from the infection site and their reintroduction also provided a suitable approach for effective phage therapy.

CONCLUSION

We would like to conclude that bacteriophages can be harnessed for their natural antibacterial potential naturally through single or a cocktail of different lytic phages, phage lytic enzymes ([1]), antibiotics and/or synergistic combinations of them all to overcome the antibiotic resistance ([4]). Also, development of such timely approaches will be helpful to normalise therapeutic treatments for different chronic infections and to successfully develop state-of-the-art treatment therapies for antibiotic resistance in the near future.

ACKNOWLEDGEMENT

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NEW USES FOR OLD DRUGS: THE MAGIC OF NANOPARTICLE WRAPPING

Most people in the world have had a friend or a family member who has been diagnosed with or suffered from cancer. This should not come as a surprise: 1.93 million people died from cancer in Europe alone in 2018.

The disease types differ between adults and young people. In adults, the most common types of cancer are lung, colorectal, breast and pancreatic cancer. In children and teenagers, on the other hand, lymphoma, brain cancer and osteosarcoma are most frequent.

Of young people's cancers, osteosarcoma is a bone tumour disease that affects mainly children and adolescents, with a second peak of incidence showing up in adults over the age of 50. In the former group, it usually occurs in the long bones such as femur and tibia, while in the latter it localises mainly in the skull, jaw and pelvis.

Current treatment options for osteosarcoma include surgery and chemotherapy. In surgery, which is preferably used, the tumour is completely removed, if possible. In contrast, chemotherapy is used to reduce the tumour size and eliminate metastatic cells which may spread from bones to other parts of the body, such as lungs. Thanks to the implementation of chemotherapy in the 1970s, the survival rate of osteosarcoma has improved substantially, reaching 65 % in the first 5 years after cancer therapy. However, when it becomes metastatic, spreading from bone to distal tissues of the body, survival rate drops to 20 %. This number has remained unchanged in the last 30 years. That's why novel approaches are needed to develop new therapies.

Unfortunately, the development of novel drugs from scratch takes a lot of time and money, and osteosarcoma is not so prevalent a disease as to move big pharma companies to assume such a costly effort. There is, however, an alternative that looks more appealing: drug repositioning. This is based on recycling an already available chemotherapeutic agent, from one disease to another. It is a relatively rapid and cost-efficient approach, as much of the preliminary work – such as biocompatibility studies, manufacturing and authorities' approval – is already done. My PhD project is

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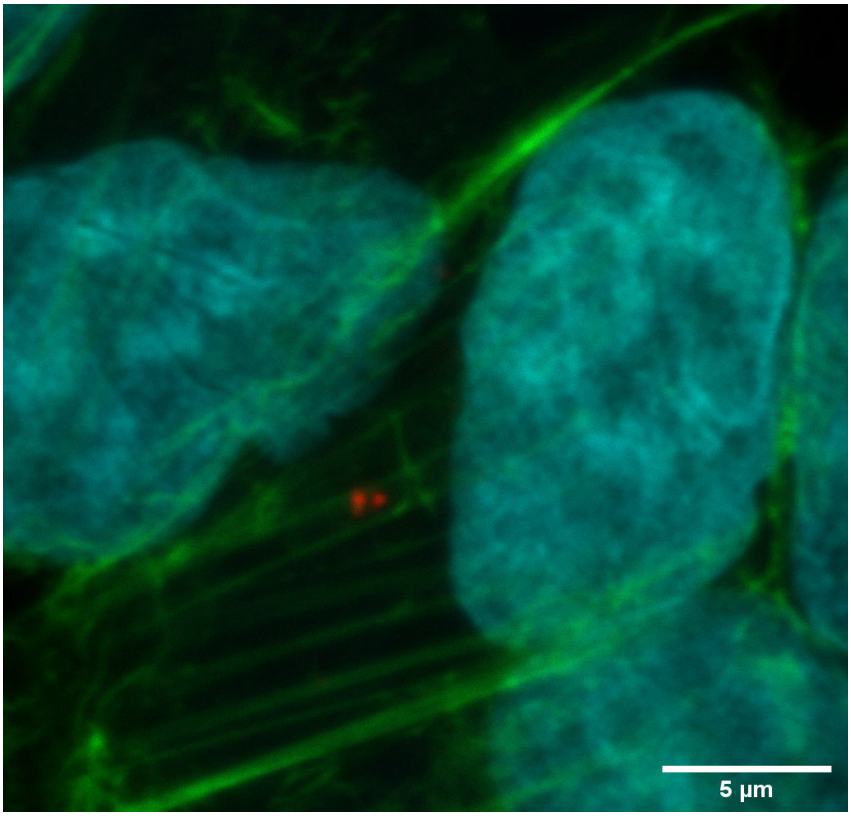
thus focused on repositioning drugs from other cancer types toward the treatment of paediatric osteosarcoma. But as such an approach is not as simple as screening drugs of other cancer treatments for osteosarcoma, we have introduced another factor: nanotechnology.

As is well known, the main drawback of chemotherapy is the production of undesirable, serious side effects. Nanotechnology can help ameliorate these repercussions, and we intend to use it as the main focus of our approach. Nanoparticles are tiny atoms or molecules of different materials that have a size span between 1 and 100 nm in diameter (1 nm = 10-9 m). They have been used in human crafts unwittingly for thousands of years. For example, stained glass in the windows of mediaeval cathedrals contains gold or silver nanoparticles that infuse the windows with different colours, depending on particle characteristics such as size and shape.

Recent advancements in nanotechnology have broadened our understanding of nanomaterials and how we can use them to improve the quality of people's lives. Their use has attracted much attention in cancer treatment, as many nanoparticles are biocompatible and, by acting as vehicles and vectors in drug delivery, may also have the ability to reduce the toxicity and side effects of chemotherapeutic agents. Nanoparticles can be tuned up in order to perform different functions. Their surface can be chemically modified, for example, to direct them specifically toward the tumour site, or at least toward the tissue with the tumour, reducing undesirable side



effects in other tissues as well. Surface characteristics can also protect them from the immune system, and help them survive kidney cleansing, thus extending their time in the blood stream.

A particular quality of nanoparticles makes them especially attractive for the delivery of cytotoxic drugs: they can respond to selected stimuli. Nanoparticles can be designed in such a way that they will only release drugs in response to changes in pH, changes in temperature, presence of blue light, or the presence of a magnetic field. This offers the unique possibility, for the first time in cancer treatment, of directing treatment to destroy the tumour cells and leave others intact. If we focus on one selected stimulus at the tumour site, nanoparticles circulating in the blood stream will guard their toxic cargo until they reach the exact site of the stimulus – that is, the tumour – leaving other tissues safely alone.

In conclusion, nanotechnology can help us reduce dosages and increase the targeted action of cancer drugs, making chemotherapy more efficient and less life-disturbing for the patient. For these reasons, the combination of nanotechnology with drug repositioning is a promising candidate for the treatment of osteosarcoma, and we believe it will be incorporated in the preoperational treatment regime of this type of cancer.

LILIYA KAZANTSEVA

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DIRECTING OMICS-BASED CHRONIC DISEASE PREVENTION FOR THOSE WHO NEED IT MOST

Omics technologies have delivered a wealth of tests for chronic diseases such as cancer and cardiovascular disease. The EU Marie Skłodowska-Curie-funded project PRECeDI is making sure these are going to benefit those in society who are less likely to avail of high-tech personalised medicine.

The advent of advanced ageing in society is unfortunately accompanied by symptoms of chronic disease. Whittling away at life quality, resulting disabilities can be improved by disease prevention when applied throughout life, not just when disease manifests itself.

In an interview, Professor Stefania Boccia, PRECeDI project coordinator, explains the importance of the work which has received positive attention from the EU and end users. There is also very encouraging feedback through social media and a corresponding increase in personalised medicine.

Specifically, the PRECeDI project is cited as an example of the most recent Success Stories from EU Research and Innovation as recognition of how PRECeDi has managed to involve healthcare professionals, authorities and researchers. It has also been featured on the European Commission's CORDIS website.

"On a very positive note, I received an award from the International Consortium Awards for Personalised Medicine ICPerMed for the outstanding results of the PRECeDi project and I am going to present the results during the 2nd ICPerMed workshop in November 2019 in Madrid," she says. "A total of 38 proposals were submitted and I am one of the eight to be selected to give a poster presentation."

The following is the full interview with Stefania Boccia.

What problem does PRECeDi tackle? What need does it serve?

Chronic diseases such as cancer, cardiovascular diseases and Alzheimer's disease impose a burden on society as a whole, from patient to healthcare authorities. There are a large number of patients worldwide and we would endeavour to engage them in pursuing a healthy lifestyle, moderate alcohol, take in a healthy diet and increase exercise. To date, preventive care currently uses a one size fits all approach, so that more innovation is needed in this context.

The PRECeDi project has focused on genetic and genomic applications for the prevention of chronic diseases, aiming to define a framework for their introduction in healthcare systems. There are available today genetic tests that detect inherited germline sequencing that predispose individuals to inherited forms of chronic disease such as cancer or cardiovascular diseases. Although for most of them, clinical utility has been demonstrated, their implementation in healthcare practice is lagging behind (e.g., BRCA testing for hereditary breast cancer, or mismatch gene repair mutations for Lynch Syndrome).

On the other hand, genomic testing that uses millions of single nucleotide polymorphisms (SNPs) to produce a so called "Polygenic Risk Score" has recently captured an enormous attention from the scientific community and the media, without robust demonstration that their use can produce a clinical benefit, the so-called "clinical utility".

Although I feel very optimistic about the future, the PRECeDI project has focused on how genetic and genomic testing could be incorporated in current healthcare practice, based on the available evidence, and who should pay for these programmes.

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What are your main responsibilities as project coordinator for PRECeDI?

Organisation of secondment of 50 researchers in a 3-year programme turned out to be a huge undertaking. There is a lot involved to ensure that the participants can benefit as well as the host institution. Not only that, but their colleagues who stayed in the normal place of work, as not all candidates could participate due to economic restrictions, benefit from feedback. This was quite challenging as the correct candidate had to be selected to build a unique output and communicate their knowledge to the project so PRECeDi output would reflect their experiences gained during the secondment.

What is the ultimate aim of the PRECEDI project?

The ultimate aim was to inform policymakers of the steps to integrate genomic knowledge from, for example, omics biomarkers into health improvement for the whole population, not just the more privileged in society. Media personalities such as Angelina Jolie

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are doing their best to raise the level of awareness of the general public to genetic disease testing, the key example being breast cancer predisposition from the BRCA gene and her resulting double mastectomy. However, to reach all in society, policymakers must be aware of how to translate this knowledge into better healthcare for every level so members of the public will go for health checks and appropriate follow-ups as a lifelong procedure.

What will be the most significant achievement or output?

The most important achievement is the embodied in domain five of the PRECeDi recommendations, to identify organisational models for the provision of predictive genomic applications. To guarantee the use and sustainability of existing and new genomic applications in practice, it is important to include education of professionals, and the Italian coordinator of PRECeDi has developed educational programmes that have been taken up by some 3 000 Italian GPs.

We reported this example to our PRECeDI partners as a best practice example of capacity building. These include how to conduct and interpret genomic tests and how to use them in the field. Another relevant pillar for capacity building is to reach citizens in the lower economic brackets who are potential victims of inequality when it comes to omics science and its incorporation into healthcare. These people may not have the resources and fall outside the insurance net so may not be able to avail of the latest advances in genomic testing for preventive and personalised medicine.

PRECeDI Domains	PRECeDI Recommendations
Domain 1: Identification of biomarkers for the prevention of chronic disease.	**R1.** Personalized interventions for the prevention of chronic diseases require robust evidence of efficacy and/or effectiveness of the new technology when implemented in health care.
Domain 2: Economic evaluation of predictive genomic applications.	**R2.** In addition to what reported in R1, a comprehensive evaluation of the value (outcomes/cost) of the new technology should also include evidence on the social aspects, and context-related dimensions to better support the clinical decision-making process. Genetic or genomic applications with evidence of efficacy, effectiveness and cost-effectiveness should be implemented in clinical and public health practice.
Domain 3: Ethico-legal and policy issues surrounding personalized medicine.	**R3.** The era of genomics requires that we clarify and validate the obligations and responsibilities of the research community, research participants, and the general public including patients through collaboration and dissemination of high-quality ethical, policy and legal analysis.
Domain 4: Sociotechnical analysis of the pros-and cons of informing healthy individuals on their genome.	**R4.** A dedicated effort is necessary to stimulate further implementation of evidence-based interventions in health care, such as testing of family members in cases of hereditary cancers or cardiovascular diseases.
Domain 5: Identification of organizational models for the provision of predictive genomic applications.	**R5.** The integration of genomic sciences in other medical specialties should be promoted through new delivery models involving different healthcare professionals and new professional roles, in order to guarantee the use and sustainability of existing and new genomic applications in practice.

What are some notable results that have been achieved so far?

The PRECeDI project focused on the five fundamental aspects that must be addressed for the implementation of the omics sciences in prevention: the identification of biomarkers and their use based on the best evidence of effectiveness and cost-effectiveness, ethical legal and policy aspects in personalised medicine, sociotechnical analyses and identification of appropriate organisational models, as well as the training of all health professionals, policymakers and citizens. From the scientific domains of the project, five recommendations have emerged that describe the operational framework within which all the new technologies based on the omics sciences can be introduced in health prevention.

Implementation of the recommendations will benefit citizens, patients, healthcare professionals, healthcare authorities and industry and ultimately seek to contribute to better state of health for Europe's citizens.

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What are the overall benefits of PRECeDi?

The fellows have benefited enormously from both a personal and professional point of view. They received a chance to work outside their normal environment and make collaborations that will stand them in good stead throughout their future careers. In particular, researchers who were seconded into industry benefited from experience in a non-academic environment. When they came back, the consensus of opinion was that they had no idea previously what went on outside the academic environment.

What is the expected impact of PRECeDi?

Personalised medicine has become a reality through the use of biomarkers and increasingly sophisticated technologies in the diagnosis and treatment of diseases. However, this is not the case in the field of chronic disease prevention where instead the impact in terms of health gain and sustainability of health systems has enormous potential. Chronic diseases are the main cause of morbidity and mortality in Europe, and between 40 % to 80 % are preventable as they are attributable to four main risk factors, namely smoking, alcohol, inappropriate diet and physical inactivity.

Recently the European Commission organised a seminar entitled 'Incorporating innovation in healthcare systems: digital innovation and the value of prevention'. This underlines the high level of expectation on the innovative potential that the omics sciences together with the digital ones can have in the field of health prevention, making it more effective and cost-effective.

What is the latest news about the project?

On the basis of the achievements of PRECeDi, we, with 17 partners, have applied and secured further Marie Curie funding to take us through the next 4 years with the ExACT (European network staff eXchange for integrAting precision health in the health Care sysTems) project.

ExACT will consolidate the partnership among collaborating institutions in the form of joint research and innovation activities across the following five domains of precision health.

Integration of Big Data and digital solutions into the health care systems;

Designing and promoting innovative citizen engagement models;

Education of healthcare professionals and leadership;

Health Technology Assessment and Health Outcomes Research in precision health;

Ethical-legal, social, organisational and policy issues

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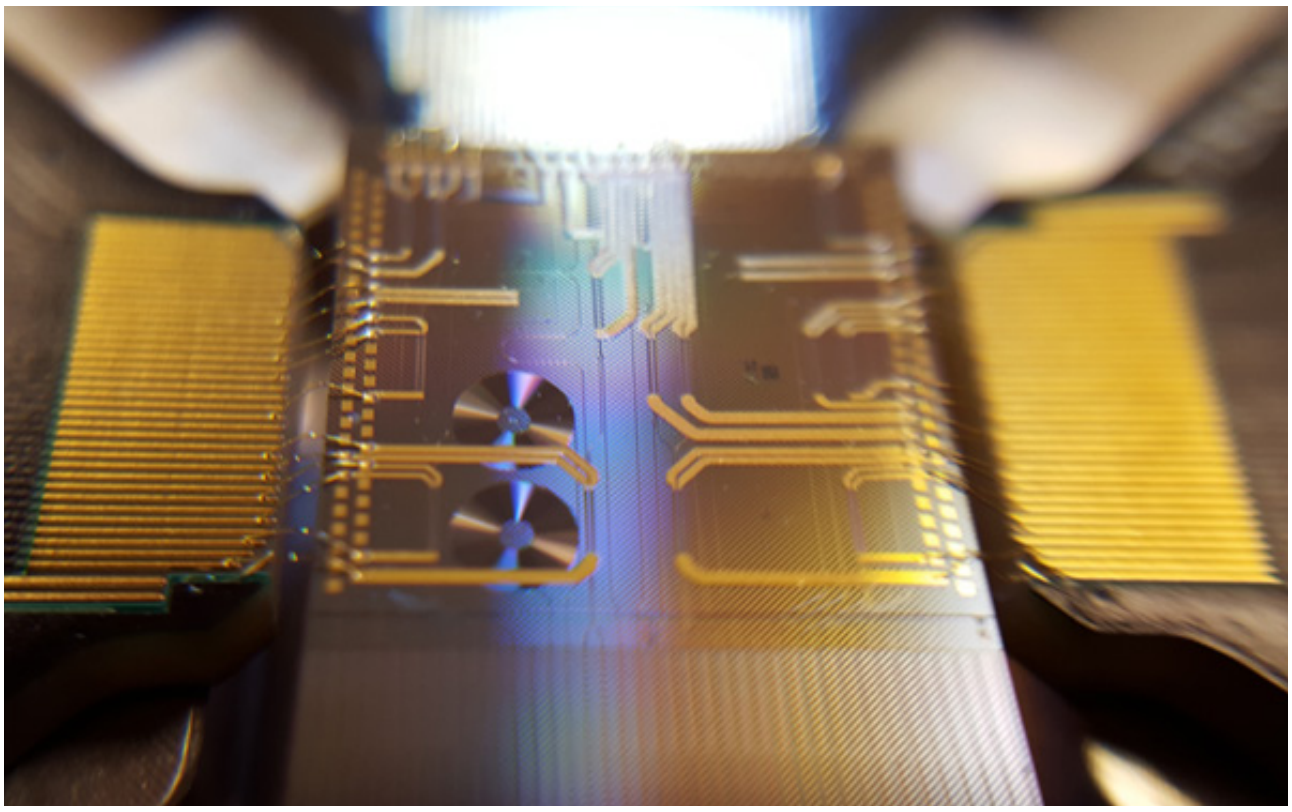
ON-CHIP COLOURED LIGHT SOURCES UNLEASH THE POWER OF QUANTUM TECHNOLOGIES



Photon sources are one of the most important enablers for the development of quantum technologies, with researchers seeking to control and harness photon properties. The DC FlexMIL project developed flexible on-chip light sources, a significant step forward in this direction.

The DC FlexMIL project, a Marie Skłodowska-Curie Individual Fellowship, focused on the development and control of novel integrated light sources for applications in both classical and quantum technologies. It merged fundamental scientific investigations with recent advances in integrated photonics to reach its goals. The three-year project concluded in December 2018.

As a recipient of this individual fellowship, Michael Kues benefitted from the opportunity to spend time at the INRS-EMT in Canada and the University of Glasgow in the UK. The opportunity to share knowledge and ideas with international colleagues was central to the achievements of the project. Currently, he is an appointed professor at the Leibniz University of Hannover, continuing his research on compact on-chip optical quantum systems.

MICRORING RESONATOR BASED LASER

The first notable achievement of DC FlexMIL was the development of a mode-locked laser with a mi-

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croring resonator as its cavity, generating very narrow-bandwidth laser pulses.

"Most mode-locking techniques introduced in the past mainly aimed at creating increasingly shorter pulses with broader spectra. Little progress has been achieved so far in producing mode-locked lasers generating stable narrow-bandwidth nanosecond pulses," notes Kues.

Capitalising on recent advances in nonlinear micro-cavity optics, the project team successfully produced the first pulsed passively Kerr mode-locked nanosecond laser, with a record-low and transform-limited spectral width of 105 MHz – more than 100 times lower than any mode-locked laser to date. With a compact architecture, modest power requirements, and the unique ability to resolve the full laser spectrum in the radio-frequency domain, the laser paves the way towards full on-chip integration for novel sensing and spectroscopy implementations.

ON-CHIP LIGHT SOURCES EMITTING SINGLE PHOTONS

Along with using the microring resonator for classical laser concepts, the project team also used it in the quantum domain to realise novel light sources at the single photon level, opening up a new avenue of investigation.

"We used the microring resonator to generate – through the non-linear frequency conversion process of four-wave mixing – on-chip quantum frequency combs. These light sources comprised of many equally-spaced frequency modes enabled us to generate multiple entangled qubit states of light," explains Kues.

This is the first time anyone has demonstrated the simultaneous on-chip generation of multi-photon entangled qubit states. Until now, integrated systems developed by other research teams had only succeeded in generating individual two-photon entangled states on a chip.

"Multiple qubits can be linked in entangled states, where the manipulation of a single qubit changes the entire system, even if individual qubits are physically distant. This property is the basis for quantum information processing, aiming towards building superfast quantum computers and transferring information in a completely secure way," adds Kues.

ENTANGLED PHOTON STATES OF HIGHER DIMENSIONS

Another important aspect of the project research was the dimensions of the entangled system. A qubit is two-dimensional system, for example a 0 and a 1. Instead of being limited to just two levels, qudits (with a 'd') can exist in more levels, 0, 1, 2, and 3 for example. For every added level, the processing ability of a qudit increases. But how is this relevant to quantum computing?

To reach the processing capabilities required for meaningful quantum applications, it is necessary to scale up the information content we can process. "Recent research claims that 50 qubits are needed for realising practical quantum computations. However, a large number of qubits does not necessarily translate to a leap in computational capability. There are issues with how well connected those qubits are," outlines Kues. Therefore, instead of increasing the number of qubits, another research avenue consists in maintaining a smaller number of qudits, each able to hold a greater range of values.

By exploiting the frequency degree of a photon, the researchers succeeded in generating entangled qudit states in an integrated format, where the photon is in a superposition of many colours. With each frequency (colour) representing a dimension, the team reported the realisation of a quantum system with 100 dimensions using two entangled qudits each with 10 levels.

An attractive feature of this achievement is that it was done using inexpensive, commercially available components. This means that the technology can be easily adapted by other researchers, potentially heralding a period of very rapid development in the field.

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FUNDING

APPLY FOR ITN GRANT WITH SUPPORT FROM THE MCAA

The Horizon 2020 Marie Skłodowska-Curie Innovative Training Networks (ITN) call is now open! Send your application by 14 January 2020, 17:00 (Brussels time). You can also receive some help from the MCAA!

WHAT IS IT?

ITN supports competitively selected joint research training and/or doctoral programmes, implemented by partnerships of universities, research institutions, research infrastructures, businesses, SMEs, and other socio-economic actors from different countries across Europe and beyond.

WHAT'S IN IT FOR ME?

If you intend to send your application, keep reading! The MCAA can help you with dissemination efforts and with training your Early Stage Researchers.

HOW DO I ASK FOR SUPPORT?

Please contact the MCAA Research Funding Working Group by 1 December 2019 at:

wg-research-funding@mariecurierealumni.eu

This official MCAA Working Group focuses on the involvement of MCAA in funding proposals for the benefit of MCAA.

More information about the call

More information about the description & conditions

More information about the MCAA Research Funding Working Group

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Any request concerning the newsletter, including suggestions about new topics and articles, should be sent to news@mariecuriealumni.eu.

INSTRUCTIONS FOR SUBMISSION

We welcome articles on any activity related to MCAA, local chapters, initiatives, events and so forth.

We especially welcome articles on MSCA projects, where one can either provide a general overview of a project or present initial/mid/final results.

Articles should be max 750 words, written in a clear, lay language, and possibly provide one or two images (copyright-free and high definition).

Articles should be sent to news@mariecuriealumni.eu.

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