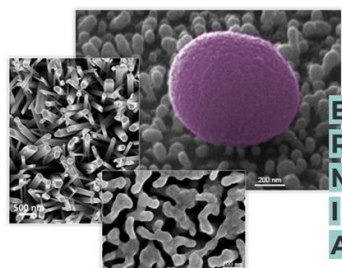


BIOREMIA Newsletter

1/2021



BIOfilm-
REsistant
Materials for hard tissue
Impant
Applications

BIOREMIA is an EU Horizon 2020 Marie Skłodowska-Curie European Training Network on biofilm-resistant biomaterials for bone-related implant applications.

Biomaterial-associated infections (BAI) caused by bacterial biofilms are a major cause of implant rejection. BAIs are difficult to treat, and in most cases, the final outcome of a

BAI is removal of the implant. Since antibiotic treatments are controversially and ineffective for biofilm the best infection control approach is to develop novel preventive measures, for instance by acting on the implant material itself. The key idea behind this project is to inhibit microbial biofilm formation by developing biomaterials and coatings with enhanced antibacterial & antifouling functionality that will result in improved biological acceptance of bone-related implants.

This approach requires highly skilled researchers who have a deep understanding of antibacterial biomaterials, their fabrication and properties, and possess the necessary skills to convert knowledge and ideas into better medical devices that are expected to improve patients' quality of life and mitigate the economic burdens to health systems. BIOREMIA will provide top-level multidisciplinary skills to 15 Early-Stage Researchers through an ambitious research and training programme in the area of biofilm-resistant biomaterials.



Kick-off meeting / Dresden, Germany / January 2020



BIOREMIA project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 861046

BIOREMIA IN NUMBERS



- 11 Beneficiary and 6 Partner institutions from 12 countries
- Training of 15 Early Stage Researchers
- Project duration: 1.01.2020-30.06.2024
- Project budget (EC-H2020-MSCA-ITN-2019): 4,029,973.56 EUR

www.bioremia.eu





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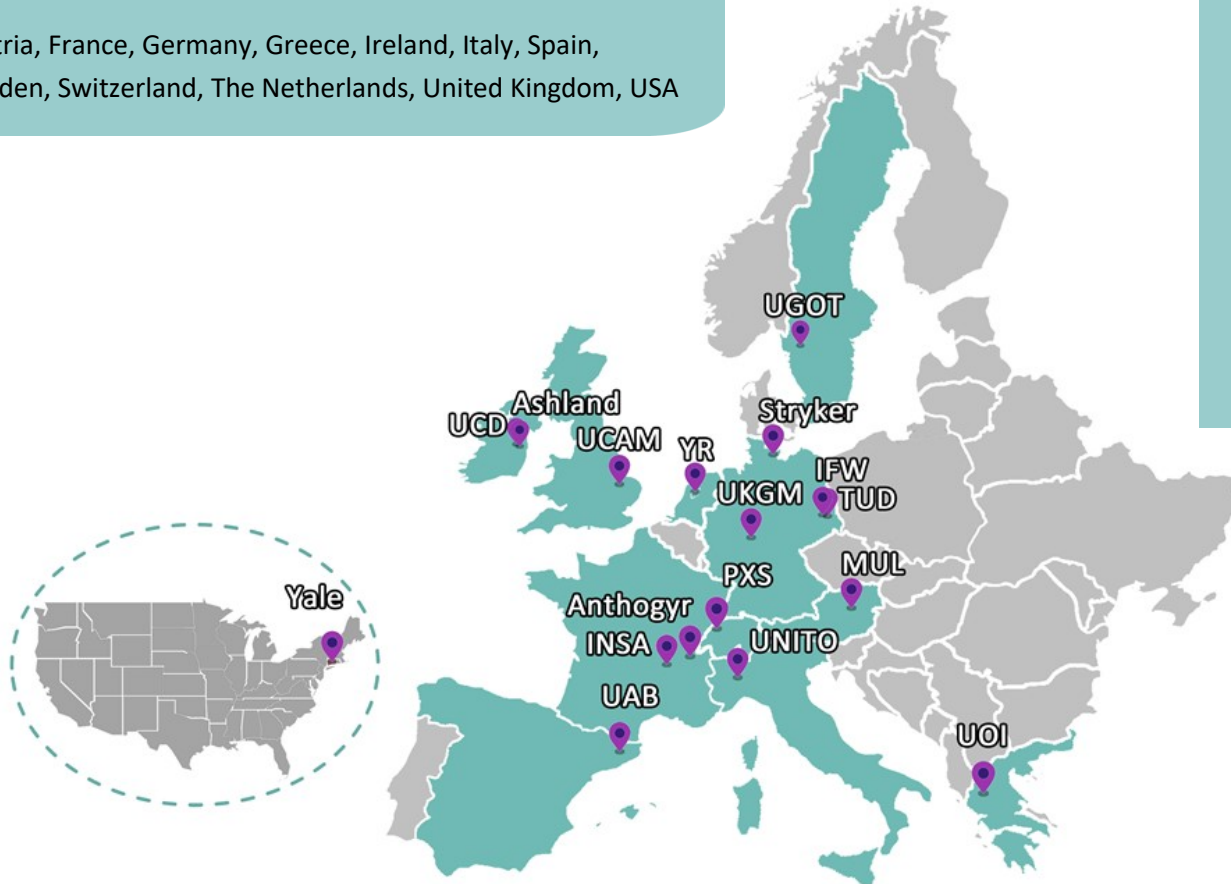


BIOREMIA CONSORTIUM

The project spans across 12 countries and comprises 17 organisations (**11 Beneficiaries** and **6 Partners**, from academic and non-academic/industry sectors) to support the research work of 15 Early Stage Researchers (ESRs). The young researchers are recruited by beneficiary institutions and will have access to the combined research strengths, training expertise and resources of various research-intensive universities and companies. The project coordinating institution is IFW Dresden, based in Germany.

BIOREMIA INSTITUTIONS' COUNTRIES

Austria, France, Germany, Greece, Ireland, Italy, Spain, Sweden, Switzerland, The Netherlands, United Kingdom, USA



ACADEMIA

Goteborgs Universitet (UGOT)

INSA Lyon (INSA)

Leibniz Institut for Solid State and Materials Research Dresden (IFW)

Montanuniversität Leoben (MUL)

Technische Universität Dresden (TUD)

Università degli Studi di Torino (UNITO)

Universitat Autònoma de Barcelona (UAB)

University College Dublin (UCD)

University of Cambridge (UCAM)

University of Ioannina (UOI)

Yale University (Yale)



INDUSTRY & SMEs

Anthogyr SAS (Anthogyr)

Ashland Specialties Ireland Ltd (Ashland)

PX Services SA (PXS)

Stryker Trauma GmbH (Stryker)

Yellow Research BV (YR)

The University Clinics of Giessen & Marburg GmbH (UKGM)



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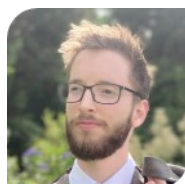
BIOREMIA EARLY-STAGE RESEARCHERS

<https://www.bioremia.eu/early-stage-researchers>



Yannick Fortouna

ESR 1 project: Antibacterial coatings of metallic surfaces: From ab-initio to large scale molecular dynamics simulations
Host: University of Ioannina (UOI), Greece
Supervisor: Prof. Christina Lekka



Tim Kreuz

ESR 6 project: Antimicrobial Bioactive Composites with controlled Resorbability
Host: University of Cambridge (UCAM), UK
Supervisor: Prof. Serena Best, Prof. Ruth Cameron



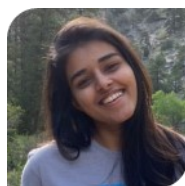
Adam Turner

ESR 11 project: Material induced inhibition of biofilm formation
Host: University of Gothenburg (UGOT), Sweden
Supervisor: Prof. Margarita Trobos



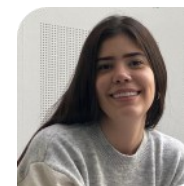
Ludovico Andrea Alberta

ESR 2 project: Low-rigidity beta-type Ti-based alloys with intrinsic antibacterial and anti-biofilm properties
Host: Leibniz IFW Dresden (IFW), Germany
Supervisor: Assoc. Prof. Mariana Calin



Kirti Tiwari

ESR 7 project: Design of antimicrobial mechanism of metallic patterned hydrophobic surfaces produced by dealloying and plastic flow deformation of metallic glasses
Host: University of Turin (UNITO), Italy
Supervisor: Prof. Paola Rizzi



Paula Milena Giraldo Osorno

ESR 12 project: Interplay between inflammation and regeneration and its modulation by surface and bulk composition of metallic materials
Host: University of Gothenburg (UGOT), Sweden
Supervisor: Prof. Anders Palmquist



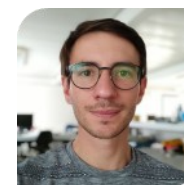
Aleksandra Bartkowska

ESR 3 project: Fabrication and characterisation of dense and porous Fe-Mn-(Ag,Zn) based alloys with enhanced antibacterial performance for biodegradable implants applications
Host: Universitat Autònoma de Barcelona (UAB), Spain
Supervisor: Prof. Jordi Sort



John Michael Ahmed Escobar Hernandez

ESR 8 project: Aqueous electrodeposition of hydroxyapatite and Ag NPs-HA and ZnO-HA composite films with antifouling performance
Host: Universitat Autònoma de Barcelona (UAB), Spain
Supervisor: Dr. Eva Pellicer



Juan José Londoño Rueda

ESR 13 project: Bactericidal properties of precious metal-based glassy alloys: an industrial design approach towards a novel class of anti-biofouling materials
Host: PX Services SA, Switzerland
Supervisor: Dr. Andreas Blatter



Fei-Fan Cai

ESR 4 project: Fabrication and functionalization of hierarchical micro- / nano-patterned bulk metallic glasses
Host: Montanuniversität Leoben (MUL), Austria
Supervisor: Prof. Jürgen Eckert



Marina Roshchina

ESR 9 project: Oxidative stress effects, corrosion and electrochemical response of new metastable Ti alloys with bacteria-killing oxide-based coatings
Host: Leibniz IFW Dresden (IFW), Germany
Supervisor: Dr. Annett Gebert



Yohan Douest

ESR 14 project: Minimally-invasive dental implants with improved microbiological safety from Ti-based BMGs
Host: Anthogyr SAS, France
Supervisor: Dr. Nicolas Courtois



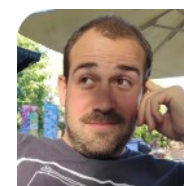
Miguel Brito Costa

ESR 5 project: Optimisation of biomechanical behavior and deformation mechanisms of antibacterial glassy alloys
Host: University of Cambridge (UCAM), UK
Supervisor: Prof. Lindsay Greer



David Zermeño Pérez

ESR 10 project: Sustainable manufacturing of anti-fouling and antibacterial bioresorbable PEG-polymer coatings for metal surfaces of implantable medical devices and nanotube-based drug delivery system
Host: Ashland Specialties Ireland Ltd. (Ashland), IE
Supervisor: Dr. Udo Greiser



Sebastião Maria Mollet de Barros

ESR 15 project: Impact of implant coatings on osseointegration and biofilm prevention
Host: Stryker Trauma GmbH, Germany
Supervisor: Dr. Robin Büscher



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OVERVIEW OF BIOREMIA WORK PROGRAM

- BIOREMIA is structured in 8 work-packages (WPs): the first four are dedicated to research activities for designing, synthesising, characterising, and testing various bio-film-resistant materials and coatings for bone-related implant applications. They include 15 individual ESR projects. The remaining four WPs are related to training (WP5), dissemination (WP6), management & IPR (WP7) and ethical issues (WP8).
- The BIOREMIA training programme is based on exposing the ESRs to a stimulating interdisciplinary scientific and professional environment. All ESRs will participate in Network-wide meetings/events designed to complement the local research training.

Research

Biofilm-resistant materials & surfaces



Training Meetings

Scientific & transferable skills courses

**WP1**

Material design & Innovative processing

WP2

In-depth characterisation of materials

WP3

Biocompatibility & Bacterial testing

WP4

Gateway to industry

15 ESR projects

INITIAL ORIENTATION WORKSHOP

Research methodology, characterisation techniques and reporting scientific results / UAB (Spain), October 2020

BIOREMIA WINTER SCHOOL

Biomaterials & Antibacterial technologies / UCAM (UK), February 2021

OPEN SCIENCE WORKSHOP

Implant-related infections: clinical and translational aspects, biofilm pathogenesis and osseointegration / UGOT (Sweden), June 2021

1ST INDUSTRIAL WORKSHOP

Material development from lab to marketable medical devices / Anthogyr (France), January 2022

BIOREMIA SUMMER SCHOOL

Nanomaterials and Nanotechnologies for the prevention of bacterial biofilms / UOI (Greece), August 2022

2ND INDUSTRIAL WORKSHOP

Commercialisation of research outcomes / Ashland (Ireland), December 2022

BIOREMIA FINAL CONFERENCE

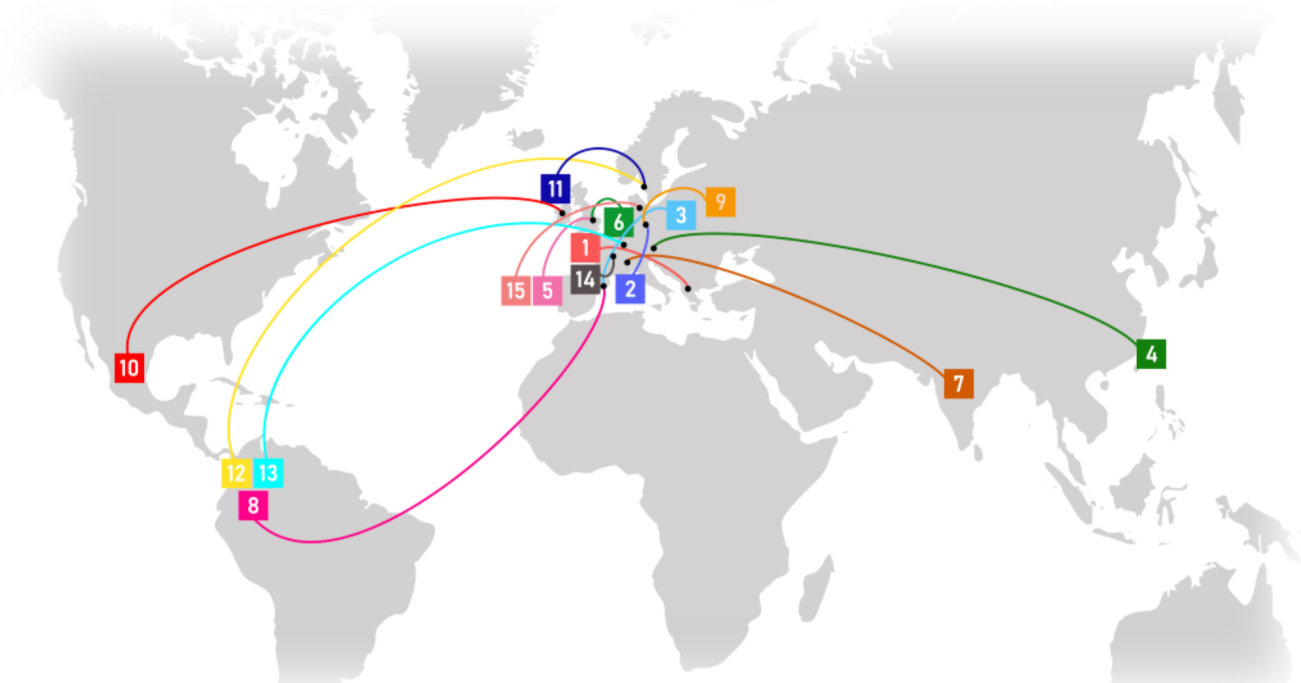
Overview of the BIOREMIA achievements & Final Reporting / IFW (Germany), July 2023



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OUR INTERNATIONAL YOUNG RESEARCHERS TEAM & THEIR JOURNEYS



ESR 1 Yannick Fortouna: from France to Greece

ESR 2 Ludovico Alberta: from Italy to Germany

ESR 3 Aleksandra Bartkowska: from Poland to Spain

ESR 4 Fei-Fan Cai: from Taiwan to Austria

ESR 5 Miguel Brito Costa: from Portugal to UK

ESR 6 Tim Kreuz: from Germany to UK

ESR 7 Kirti Tiwari: from India to Italy

ESR 8 Michael Escobar : from Colombia to Spain

ESR 9 Marina Roshchina: from Belarus to Germany

ESR 10 David Zermeño Pérez: from Mexico to Ireland

ESR 11 Adam Turner: from UK to Sweden

ESR 12 Paula Giraldo : from Colombia to Sweden

ESR 13 Juan José Londoño : from Colombia to Switzerland

ESR 14 Yohan Douest: from France to France

ESR 15 Sebastião Barros: from Portugal to Germany

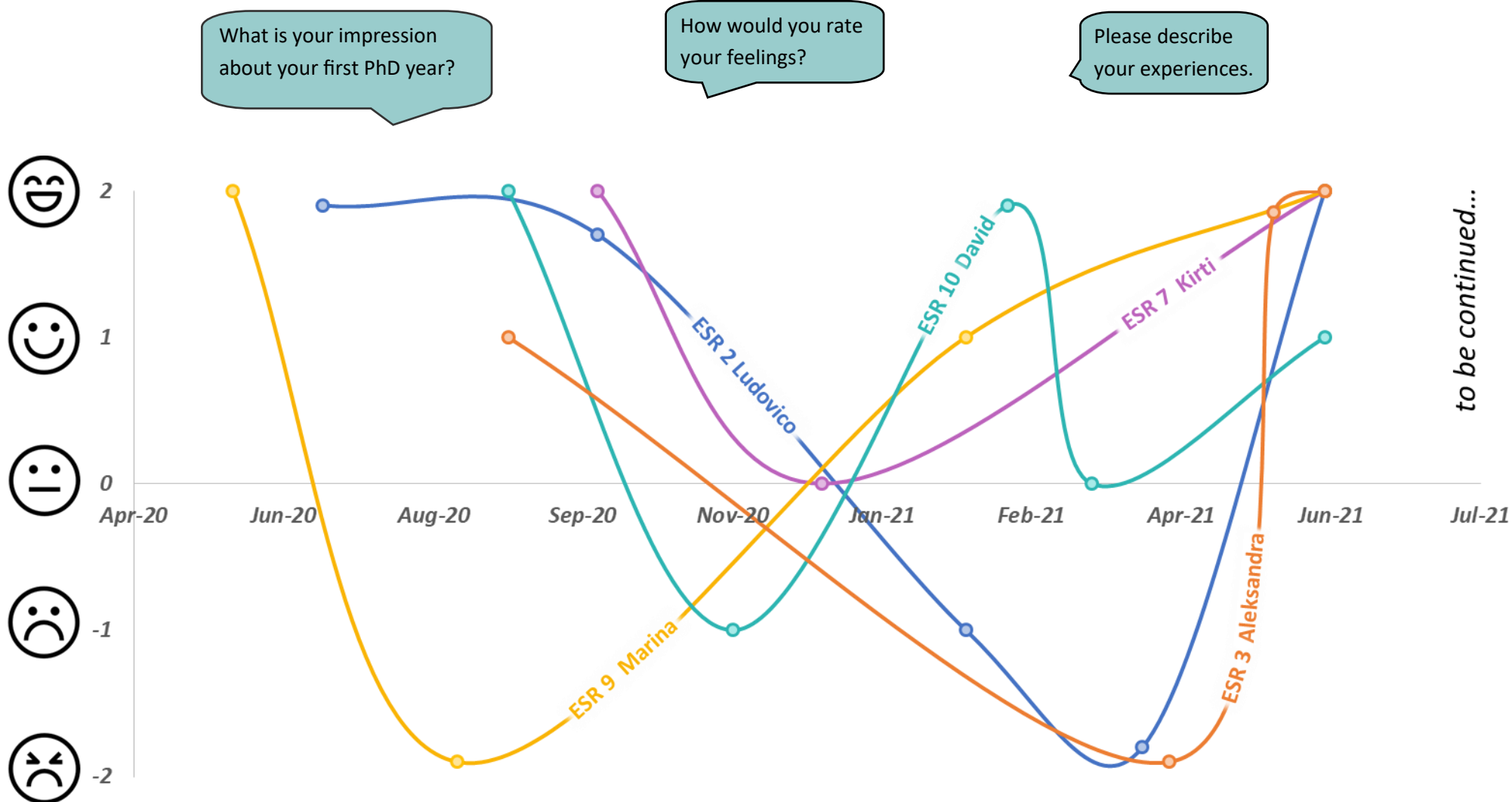


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06

We asked the ESRs....

Marie Skłodowska Curie: "One never notices what has been done; one can only see what remains to be done"





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Ludovico Andrea Alberta

ESR 2

IFW Dresden, Germany

July 2020

I was thrilled to start my new life in Germany, it was summer and the Corona situation here was still under control, so life was normal. I was able to meet new people and make new friends. I explored the surroundings of Dresden, went hiking and day trips.

September-
October 2020

In autumn I started to meet (unfortunately only virtually) all my BIOREMIA colleagues spread all around Europe and this was amazing. I felt so lucky to give a start to working relationships with such highly motivated and interesting people. Within a short time, we got to know each other, and even though we haven't met in person yet, I feel already close to them.

January-
February 2020

I struggled a bit during winter. Days were extremely short, it gets dark very early in the afternoon and apart from working, there was nothing else to do because of the hard lockdown. There were no chances to meet new people or to enjoy a dinner out.

March-April 2021

The first year of PhD was (and is) kind of frustrating: there are way too many things to do and to learn, with neither amazing nor astounding outcomes. This ends in the accumulation of high amounts of stress. I started to feel all this after 7-8 months. Finding a good work/life balance is essential, so having time for other activities was and is the only way to stay healthy and is vital for long-term success.

June 2021

I am happy that summer is just around the corner.



Aleksandra Bartkowska

ESR 3

Universitat Autònoma de Barcelona, Spain

September 2020

I was really happy to start my PhD in Barcelona and to get to know the city. The situation with coronavirus was stable so I was able to meet some people and visit many beautiful places in Barcelona. On the other hand, the Spanish bureaucracy happened to be very annoying and stressful, but I managed to get all the documents needed.

March-April 2021

I started to feel homesick and as the situation of coronavirus in Europe was still bad, so I couldn't travel to my country. Apart from that, my experiments weren't working as well as I wanted, which caused even more stress and frustration. To feel better, I started to play padel and tennis, and I understood the importance of out-of-work activities

May 2021

After the state of alarm in Spain finished, the restrictions have been loosened and I was able to travel and have a better work/life balance. I even managed to visit my best friend in Sevilla after almost one year apart! Apart from that, I was accepted for the EUROMAT'21 conference as a keynote speaker, which gave me a lot of motivation to do my experiments

June 2021

I just came back (vaccinated!) from a short holiday in Poland, where I managed to finally see my family and friends, so I feel very happy and motivated to work. And the summer is already in Spain!



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Kirti Tiwari

ESR 7

Università degli Studi di Torino, Italy

October 2020

My starting month of PhD was great, exciting and overwhelming as I was getting acclimated to a new place. I met my colleagues and learned about work culture in the department and lab. I felt welcomed and inspired meeting everyone working in the department. The first month I received training for using various instruments and learned how to perform various experiments from my seniors

December 2020

There were a few ups and downs however the one which is worth mentioning is the time when my research slowed down due to COVID restrictions. It was difficult to plan everything as I could not go to lab every day and it was getting difficult to finish my experimental studies.

June 2021

My greatest moment was when I received an award for best e-Poster design in the BIOREMIA open science workshop. I'm making some progress in the research and I'm able to learn a lot with the help and support of my supervisor and colleagues.

Overall, my 9-month experience in PhD taught me to be patient and well prepared to expect anything in research. Also, any result, good or bad is important to note because it teaches a lot for future experiments and studies. I'm still learning from my mistakes, and it is helping me since my first day in PhD.



Marina Roshchina

ESR 9

IFW Dresden, Germany

June 2020

After a one-year unsuccessful search for a PhD position, hundreds of emails and dozens of responses like "We will contact you soon" or "There are currently no open positions/funding. Please, call us next year", I finally received the long-awaited "We are glad to invite you in our group!". It's not only a PhD position but also a participation in a large international project with leading scientists in the area of biofilm-resistant materials for bone-related implant applications. This is the best that could happen to me!

August 2020

I am completely depressed. This is my first experience of moving to a new country (Germany). Despite the constant support of relatives, adaptation was not without stress and anxiety. Everything worries me: I can't understand a new topic, the first experiments failed, the daily combination of 4 languages causes a headache, and a difficult political situation cut me off from home (Belarus). Naturally, all this negatively affected my health.

February 2021

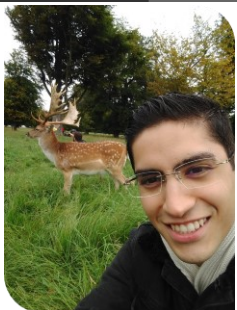
There is still a lot of work ahead, but in general, the situation has changed for the better: the first results are obtained, new methods are mastered, among PhD students, I found new friends, I also got experience in teaching at the university, and I see dreams exclusively in German. This is definitely a success!

June 2021

Summer is my favorite time of the year, Corona-Lockdown is weakened, besides, my social circle has greatly expanded due to my acquaintance with the Belarusian diaspora in Saxony.



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David Zermeño Pérez

ESR 10

Ashland Specialties Ireland Ltd., Ireland

September 2020

It was exciting to start a new adventure doing an industrial PhD in a new country (Ireland) and to meet new professionals working in the areas I am interested in (drug delivery and bioresorbable polymers). I knew it was going to be challenging to work and study at the same time but have a lot of benefits like networking and acquire new knowledge/skills from both academia and industry.

November 2020

The COVID situation during the whole 1st year. Arriving in a new country in "normal" times is challenging, if you add the COVID to that formulae everything becomes even more challenging, acquiring any government document, visa, travelling, emergency taxes, health tests, finding a GP (general practitioner), everything becomes harder.

February 2021

I have had a lot of opportunities to talk to great people in industry and academia, I was able to speak with the global Research & Development (R&D) executives and even introduce my project to Ashland Chief Executive Officer (CEO) and Chief Technology Officer (CTO), it was a very nervous but exciting experience.

March 2021

The Covid restriction and vaccination are underway, therefore more things and opportunities are opening, it is challenging to understand the new health, government, travelling systems in the new country but I am researching and understanding it at best as possible. I am planning to do my Irish driving license exam, to be able to visit and spend more time in academia and industry, and even visit new institutions within Ireland, while doing my PhD, keep working and helping BIOREMIA in mini-projects.

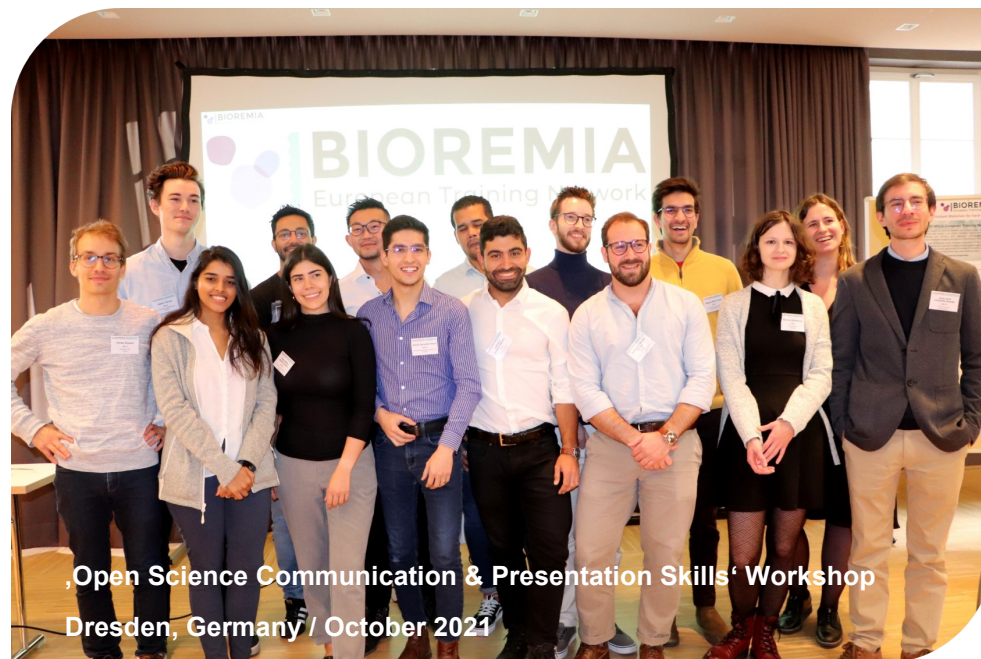
June 2021

The hardest part for me was to find a GP during a pandemic coming from Mexico in a new country, most of them were full and some of them were only viewing people virtually, I have to admit that has been the hardest thing to understand for me, the local Health System...and I still don't understand it fully, but I will, I promise.

ESRs activities on BIOREMIA social media platforms

Since the pandemic began, the young researchers have learned to network and build relationships virtually via online training meetings & workshops and engaging on social media platforms.

- BIOREMIA ESRs have created lovely videos to introduce themselves, their education and research background, their aims and ambitions. Go have a look on the [ESRs websites](#) and let them introduce themselves to you!
- In order to promote their research in the BIOREMIA project in their country of origin each ESR has made a short video in their mother language acting as an MSCA-ETN Ambassador. Watch the BIOREMIA [YouTube channel](#) and let the ESRs explain their work to you!
- Visit our [Instagram](#), [Twitter](#) and [LinkedIn](#) accounts where the ESRs will post regularly photos and updates on themselves and their work within the project. Follow us online for an insight into the life as a BIOREMIA ESR and updates on training and research.



'Open Science Communication & Presentation Skills' Workshop
Dresden, Germany / October 2021



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BENEFICIARIES



UNIVERSITY OF
CAMBRIDGE



UAB
Universitat Autònoma
de Barcelona

PX SERVICES
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PARTNER ORGANISATIONS



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INSTITUT NATIONAL
DES SCIENCES
APPLIQUÉES
LYON

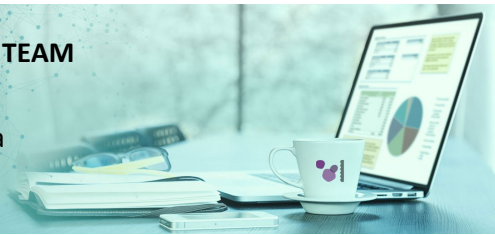
UKGM
UNIKLINIKUM GIESSEN UND MARBURG



Yellow Research 

NEWSLETTER EDITING TEAM

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Aleksandra Bartkowska
Marina Roshchina



www.bioremia.eu



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