



ISSUE 3: April 2021

NEWSLETTER

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Letter from the Editors,

Supramolecular chemistry has been one of the most emergent fields in chemistry in the recent years. Latest progress have led to a shift in focus, from understanding the basic concepts of molecular encapsulation to pursuing the controlled uptake and/or release of molecules with the aim to identify and develop new applications in several fields such as drug delivery, catalysis or functional materials.

In this third issue we include a fascinating interview with an industrial chemist, Christian Lerner, who works as principal scientist at Hoffman-La Roche. We are sure young scientists will find his words of great value. We want to thank him for sharing his experiences with us.

We have also included within this issue the resumes of the secondments from two of our ESRs.

Finally, we are very aware of the mental burden connected to a PhD project, intensified due to the global pandemic. In this light, the last part of this issue contains an article written by Daniel Sanchez about mental health related to PhD and Covid-19; along with a personal and very encouraging letter from one of our ESRs, Cristina Mozăceanu.

Editors of this issue:



Daniel Sanchez
(ESR 5)



Santiago Pons
(ESR 2)



Arturo Llamasi
(ESR 6)

Interview with Christian Lerner

In this section we want to introduce Dr. Christian Lerner, principal scientist at Hoffmann-La Roche (CH).

Dr. Lerner kindly accepted to answer to our questions in the frame of this interview. His advice may be specially interesting for us since finding out about successful scientists career paths and learning from them is a way to help us to identify future steps in our careers.

Tell us your course until enter in the industry and what made you choose industry instead of academia.

As a high school student in the Southern part of Germany, I got very curious about understanding more about what holds together nature, mathematics and computers. At some point I got fascinated about chemistry and started reading natural science books, what started as a hobby became a dream to study Chemistry one day. After finishing school, and 15 months of civil service, I started as an undergraduate in Chemistry at the University of Freiburg (Germany).

A turning point for me was the opportunity to perform an internship in medicinal chemistry at Roche after the intermediate diploma (Vordiplom, now bachelor's degree). Synthesizing molecules with an application to mediate suffering of patients and potentially save lives

was extremely motivating to me so my next dream was to work in this area one day. This deep impression lasted and after the diploma in chemistry I got the opportunity to work on a Ph.D. in Medicinal Chemistry at ETH Zurich in collaboration with Roche, which I complemented with a postdoc in the synthesis of natural products for use as antibiotics against life threatening infections at Harvard University. I was part of a small, committed team of postdoc and Ph.D. students that succeeded in developing a new process for the synthesis of tetracyclines.

We were able to publish in Science and a startup company was founded (Tetraphase Pharmaceuticals). At this stage, I had to make a choice between staying in academia, participating in the startup or searching for a job in industry. The main reason for me to join industry and in particular Roche was the very good impression and network that I had obtained during my internship and Ph.D. and my desire to work in interdisciplinary teams on projects with potential application in medicine. While I had experienced during my Ph.D. and postdoc the very important fundamental work that can be done in academic settings, I believed industry offered the capability to bring it to the next level and ultimately to patients. Now I enjoy very much supervising students myself for the very well organized Roche Internships in Medicinal Chemistry (RiCH program, next.roche.com/rich), that I highly recommend to passionate students.

What do you like the most about your job and what do you find most challenging in it?

To work in an area which has the potential to mediate suffering and potentially save lives is most motivating for me. We are experiencing during the COVID-19 pandemic how disruptive and devastating diseases with unmet medical need can be and how important it is to find efficacious treatment options. I have the feeling that with my colleagues we can contribute to make a difference. The scientific questions and multidisciplinary work in international teams across the globe are very engaging.

As we are working on unsolved medical problems, the most challenging in my eyes is that a lot of what we are trying even with huge efforts, won't work and only a very small fraction of projects will lead to a new drug on the market.

I would not recommend this job if you get very easily frustrated or want to work on products that will easily and fast enter the market, but if you enjoy every success that brings you a step further and have the endurance, in my opinion it's at the same time one of the most challenging and most rewarding professions.

Tell us about a time you "failed" and what you learnt from that.

Failure is in the nature of performing scientific experiments. Many hypotheses that I had,

reactions that I have tried and whole projects I have worked on failed. The art is not to be discouraged and continue the fight to solve the puzzle. One of the most difficult aspects that I had to get a good sense of is how much to be persistent and continue to work on an idea or project to solve the problems and when to judge that it's the right moment to give up and work on the next challenge.

How do you envision the future of chemical/pharmaceutical industry?

While a lot of progress has been achieved in medicine, the number of severe diseases with unmet medical need is still significant. I believe that the pharmaceutical industry will have a bright future to work on these important problems. There is a fascinating flow of new technologies, for example machine learning and AI, evolving which is helping to push the boundaries.

How important do you think it is for scientists in academia to collaborate with industry?

While outstanding work in academia can be done without industry collaborations, in my experience there are many opportunities to work together.

From an academic point of view, this can give opportunities to work on a project that could have a significant application and complementing resources and technologies on both

sides. It can be a great opportunity for learning and networking to work on a project with industry collaboration, but I wouldn't say it's mandatory in order to achieve outstanding academic results and find a job.

Could you give a piece of advice to young researchers who want to begin a career in industry?

First of all, follow your passion. Work on what interests you, be always curious and open for change, keep that high motivation.

If you already know that you want to work in a specific area, in my eyes it is very helpful and sometimes needed to perform a Ph.D. or Postdoc where fundamental skills in the area can be obtained. Let me give you an example: it could be difficult to get a job in medicinal chemistry with a Ph.D. in astrophysics, on the other hand a solid foundation and practical skills in synthesis or method development are very helpful. On the other hand, in a large research based company like Roche there are always areas into which one can develop your skills over time.

Which are the things that get your attention when reading a CV/letter of application?

We read all applications very carefully.

An advice I can give is the following: imagine we switch roles, I apply together with ten other applicants and it's your task to make a choice

– who would you invite to an interview. For me, two questions are important to answer when I read an application:

- If I offer the applicant the job, will my new colleague be able to contribute given on the job trainings in an appropriate time?

Do I get a sense about the motivation and passion for the job. Difficult to judge, but do I get a sense that my new colleague will enjoy his new tasks and work environment ?

As we always work in teams, building a network of good personal relationships is very important, if you can get well across not only technical but also soft skills, it can be very helpful.

On a more specific level, from the point of view of accessing to Industry would you recommend to do a Postdoc after the Ph.D.?

It highly depends on the area. I would see a Postdoc as first work experience in research solving problems outside of the Ph.D. with the opportunity to learn more about other cultures/ languages, and acquire technical skills. For work in research, it's not mandatory but can be helpful, depending on the position that you apply for. There are also great ways to contribute and develop without a Ph.D. What we try on our end is to make the best match between the job description and the application.



Christian Lerner obtained his diploma in chemistry at the University of Freiburg (Germany), and he also had the opportunity to perform an internship in medicinal chemistry at Roche.

He obtained a PhD in Organic and Medicinal Chemistry at ETH Zurich, in collaboration with Roche. He further complemented his formation with a postdoctoral position working on the synthesis of natural products for use as antibiotics against life threatening infection at Harvard University. After that he then joined Roche in 2005. He worked on a variety of projects in different disease areas and led big international project teams in the area of infectious diseases. Beginning of 2020 he became a group leader in Medicinal chemistry .

He has a strong interest in molecular modeling, use of technology (e.g. parallel chemistry,

machine learning) and data analysis in research (Certara D360, spotfire, MOE, pipeline pilot, various incentives to develop new tools). Also, he is supervisor to a variety of apprentices, graduate apprentices and master students of the RiCH program, while being as well highly engaged in public relation activities for high school classes and university students, collaborating with the visitor center and university marketing.



Exterior view of the Roche Tower in Basel, Switzerland. Credit: *Taxiarchos228 - own work, FAL.*
<https://commons.wikimedia.org/w/index.php?curid=43728683>



Networking within NOAH: Secondments

Secondments are key factors in PhD student's research project once they allow the ESRs to gain knowledge and training in others fields of chemistry. Here we present some testimonies of our colleagues and their experiences.

Chiara Mirabella

I carried out my academic secondment at Freie Universität Berlin, in Prof. Schalley's research group. There I had the opportunity to characterize supramolecular imine bonded capsules and the forces involved in host-guest complexes using mass spectrometry.

Thanks to this experience, I learnt how to use a mass spectrometer to perform basic measurements but also more advanced experiments such as IMS and CID MS. In this way I could totally experience and appreciate the differences between an organic synthesis lab and characterization lab. This allowed me to widen my chemical background embracing instrumental and analytical chemistry applied to supramolecular chemistry, via a hands-on approach.

Despite COVID-19 pandemic I explored and enjoyed most of Berlin and its wonderful parks and snow-covered landscapes. In addition, it was a good opportunity to create collaboration with NOAH members and strengthen friendships between NOAH ESRs!



Santiago Pons

This year I had the opportunity to go on my first secondment at ISOF-CNR in Bologna, under the supervision of Dr. Barbara Ventura. There I had the opportunity to characterize the arene-ruthenium complexes synthesized at UniNE through photophysical and photochemical studies. I received training in techniques and areas such as absorption and emission spectroscopy, emission quantum yield and lifetime determination, electrochemistry (cyclic voltammetry and square wave voltammetry) and transient absorption.



It was a nice chance for networking with other scientists and I had the opportunity to work with Daniel Sánchez (ESR5) and Pedro Ferreira (ESR1). Even if there were many restrictions due to covid-19, we also had a chance to discover the city of Bologna and everything it has to offer!



By Velvet - Own work, CC BY-SA 4.0,
<https://commons.wikimedia.org/w/index.php?curid=94396715>

NOAH EVENT


PAST EVENTS

School of electrochemistry, photochemistry and photophysics of organic, inorganic and hybrid materials. October 26th – 29th 2020

The school of Electrochemistry, Photochemistry and Photophysics of Organic, Inorganic and Hybrid Materials was organized in collaboration with INFUSION project (Ref. H202-MSCA-RISE-2016 GA 734834). Twelve different speakers participated in the school with lectures on absorption, emission spectroscopic techniques, energy and electron-transfer processes, fluorescence microscopy and photochromic and luminescent materials and devices, among many others. The school had also two practical sessions in which the students were trained in association constants determination using spectroscopic tech-

SCHOOL OF ELECTROCHEMISTRY,
PHOTOCHEMISTRY AND PHOTOPHYSICS OF
ORGANIC, INORGANIC & HYBRID MATERIALS

NOAH-INFUSION JOINT ONLINE SCHOOL (OCTOBER 26-29TH 2020)

 Nicola Armadori National Research Council Bologna	 A. P. De Silva Queen's University Belfast	 Alberto Credi University of Bologna	 Jorge Parola University of Lisbon	 Barbara Ventura National Research Council Bologna	 Ilse Manet National Research Council Bologna
 Francesco Paolucci University of Bologna	 Serena Silvi University of Bologna	 Mirco Natali University of Ferrara	 Enrico Rampazzo University of Bologna	 Paola Ceroni University of Bologna	 Filippo Monti National Research Council Bologna







2nd Supramolecular Chemistry day – Twitter Poster competition and Flash presentations, October 22nd and 23rd 2020

This year the 2nd Supramolecular Chemistry Day had a special format: a Poster competition held 100% on twitter social media. We had the participation of 28 young researchers working on the field of supramolecular chemistry from quite different perspectives presenting their research in a virtual poster session. They shared their research with other participants and engage in scientific discussion with other participants and twitter users. #SupraChemDay

EVENTS 2020-2021

UPCOMING EVENTS

School of kinetic and thermodynamic characterization of supramolecular complexes

SEPTEMBER 20th-21st 2021 – Berlin

		
3rd NOAH SCHOOL SCHOOL OF KINETIC AND THERMODYNAMIC CHARACTERIZATION OF SUPRAMOLECULAR COMPLEXES SEPTEMBER 20-21st 2021 – On-line free registration		
	Monday, Sep 20, 2021	Tuesday, Sep 21, 2021
08:45	Welcome	
09:00	Prof. Kate Joliffe Determining Binding Data	Prof. Christoph Schalley Mass Spectrometry in Supramolecular Chemistry
09:50	Prof. Pablo Ballester Introduction to Isothermal Titration Calorimetry	Prof. Kevin Pagel Ion Mobility Mass Spectrometry
10:40	Break	Break
11:10	Dr. Larissa von Krbek Multivalent and Cooperative Binding	Prof. Christoph Schalley Mass Spectrometry in Supramolecular Chemistry: Case Studies
12:00	Lunch Break	
13:30	Prof. Yoram Cohen DOSY-NMR Spectroscopy in Supramolecular Chemistry	

The 3rd NOAH school will be held in Berlin in September 2021. NOAH member will be able to attend personally to the event. External audience will be able to follow the lectures on-line.

Register for free and join us!



PhD, Mental Health and Covid-19

By Daniel Sánchez Resa

When googling about mental health and PhD some questions from users arise:

- ⇒ How stressful is getting a PhD?
- ⇒ What difficulties do you expect to encounter during PhD?
- ⇒ Should I quit my PhD?

In my case I didn't google any of that, I had it very clear from the beginning of my career that I would like to get one. Only after some time immersed in working on it and living abroad that I started wondering about how this experience would affect my mental health. From Twitter I started learning from other people that anxiety and depression are nowadays alarming common among PhD students and that little sensibilization is spread around Academic institutions (and society in general).

The pandemic just added unnecessary stress to daily life for all of us. On top on working in our projects and trying to stay focused, there were other important concerns. Traveling became very challenging if we wanted to come back to see our relatives and friends (great support groups for the stability of mental health), travel restrictions and new rules were behind the corner, tests before going to the airport... In the end, every time that we would like to travel, we didn't know when we would be able to see our families again.

Regardless to say, I would like to state our privilege as MSCA researchers with a dignified salary and the security of our jobs regardless the pandemic.

The main information that we can find about mental health and PhD is given by Nature and its PhD poll they do every year published in an article called *PhD Poll reveals fear and joy, contentment and anguish* (Nature, 2019, 575, 403).

Their poll comes from more than 6.300 early-career researchers from every part of the globe and the full spectrum of scientific fields. This year was the first one that they included direct questions about mental health, showing the state of higher education students.

Some respondents made some statements:

"The academic system is very traditionalist and still frequently penalizes those who lie outside the norm" (US)

"Help us make science more humane!" (Finland)

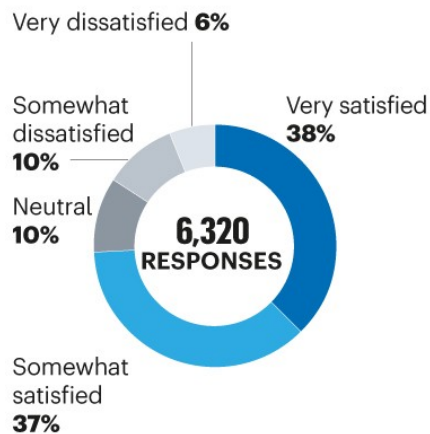
The poll revealed that 36% of students have sought help for anxiety or depression because of the PhD studies and one third of them sought help from places other than their institutions and other 18% sought help at their institution but didn't feel supported.

Luckily, mental health awareness is growing as Sara Oswald (lead author of the US survey study) states that *"Admitting that you're struggling"*

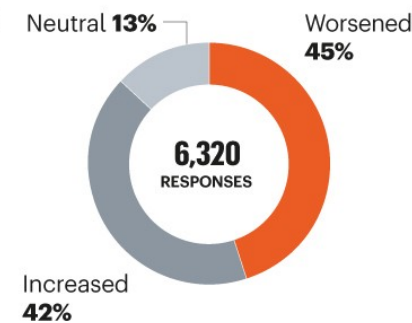
SUSTAINED SATISFACTION

A majority of respondents are still glad they decided to pursue a PhD, although the attitudes of some have worsened over time.

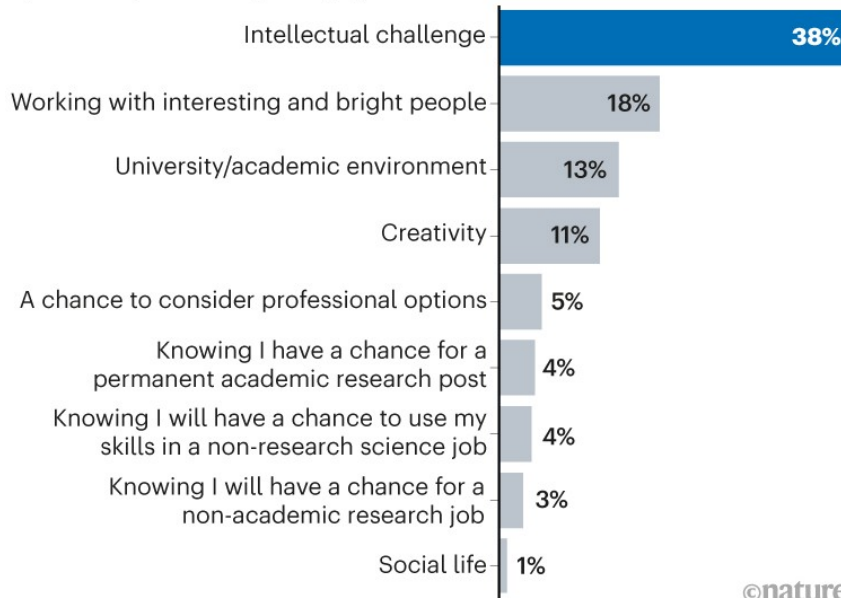
Q: How satisfied are you with your decision to pursue a PhD?



Q: Since the start of your graduate school experience, has your level of satisfaction increased, worsened or remained the same?



Q: Overall, what do you enjoy most about life as a PhD student?



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gling doesn't carry the stigma that it did 20 years ago."

In addition, they remark that of respondents that asked for help regarding mental health, only 26% said they got real assistance at their institutions. Almost 10% wanted help at their university but none was available. Oswald stated that "Access to service is an issue, there are not enough counsellors and resources available for everyone who needs them, and that's a global issue."

Other great concerns are job prospects and difficulty maintaining a work-life balance. Nearly 40% of respondents were unsatisfied with their work-life balance. Specially PhD students that have families to support.

Regarding the satisfaction, nearly 75% were satisfied with their degree of independence from the 27% of people stating that were extremely satisfied. 67% were satisfied with their overall relationships with their principal investigator. Among the satisfaction,

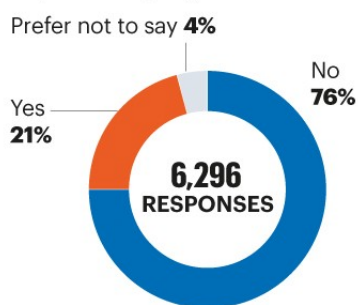
setback and complains also appear, 45% of those said that their satisfaction levels fell as they got deeper into their programme.

Also expectations play a major role, almost 40% of respondents said their programme didn't meet their expectations. Sverdlik (Dr Stud. 2018, 13, 361), that carried out a similar investigation, said that "If students knew that most of the people around them feel like impostors, if they knew that their satisfaction was going to de-

BAD BEHAVIOUR

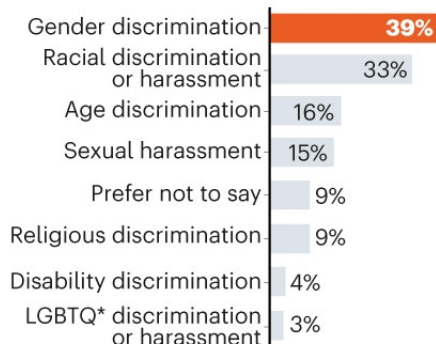
Instances of harassment and gender or racial discrimination remain distressingly commonplace. The most frequently reported perpetrators are supervisors.

Q: Have you experienced discrimination or harassment in your PhD programme?



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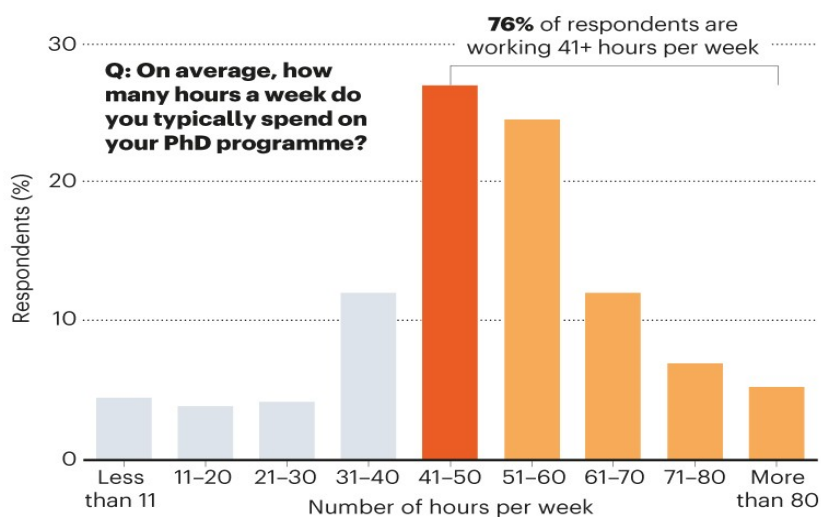
Q: If yes, which of the following have you experienced?



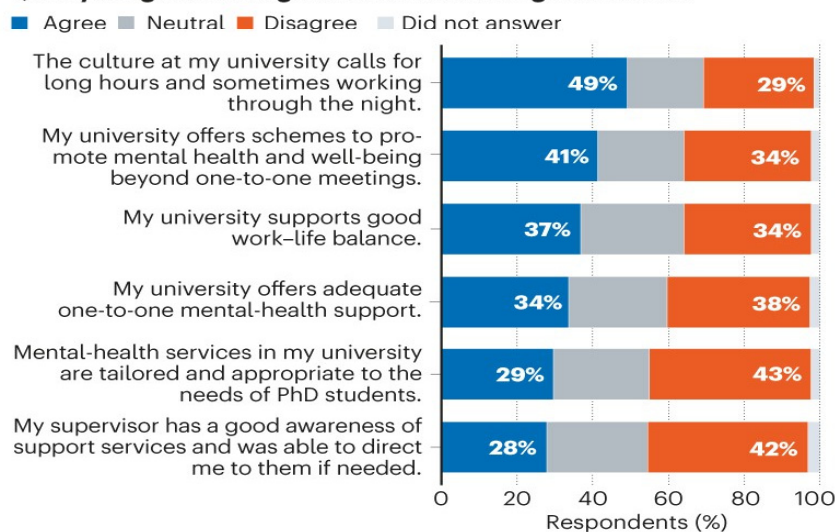
*People from sexual and gender minorities.

OVEREXTENDED AND STRESSED

Long hours in the laboratory and other demands have taken a toll on PhD students' well-being and mental health.



Q: Do you agree or disagree with the following statements?



36%

of respondents have sought help for anxiety or depression caused by PhD studies. One-third of them sought help from places other than their institution, and 18% sought help at their institution but didn't feel supported.

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crease as they go through the program, they could at least prepare for it."

Finally, the poll also covers hurtful behaviors that can demoralize students. 21% of respondents said they had personally experienced harassment or discrimination, and same proportion experienced bullying.

In conclusion, they state that the majority of students are satisfied but that close atten-

tion should be paid to the significant percentages of people seeking mental health counselling to treat anxiety and depression, besides from people being harassed in the workplace.

From this survey, I believe, that we can extract that all working institutions should be paying more attention to its individual's mental health situation since productivity depends on it. Besides, we should look to a future where

work-life balance really matters.

In another editorial called *A cry for Help* (Nature, 2019, 575, 257) they don't focus just the solution on institutions providing mental health support. We must recognize that mental ill-health is a consequence of an excessive focus on measuring performance. They state that funders, institutions, journals and publishers must take responsibility for.



The green ribbon is the international symbol for the mental health awareness. By wearing a green ribbon you can show your support for the mental health of your colleagues or loved ones.

Green ribbon by Alejandra Jimenez from Pixabay "https://pixabay.com/users/rosanegra_1-432510/?utm_source=link-attribution&utm_medium=referral&utm_campaign=image&utm_content=1699384"

By Wokandapix at Pixabay - <https://pixabay.com/photos/mental-health-wellness-psychology-2019924/>, CC0, <https://commons.wikimedia.org/w/index.php?curid=76348157>

A reflection about Mental health related to my PhD life and the COVID-19 pandemic

By Cristina Mozăceanu

With the pandemic still dominating the world, each person has felt and is still feeling the effects of its grip over the past year. Besides the physical symptoms, an often overlooked and stigmatised topic concerns the psychological aspects observed when living and working around it. In light of this, I would like to share a few of my experiences and feelings as a person and EU student living in a post Brexit Britain with all nearby borders closed due to the pandemic.

Currently, I am in the third year of my PhD and completing it to the best of my abilities has always been my priority. However, since the pandemic started and under extended conditions of isolation, the increased necessity to acquire lab results, to write up my thesis/publications, and to complete numerous administrative tasks greatly

enhanced internal and external pressures, which heavily impact my work-life balance. Additionally, until recently, the uncertainty of my contract extension and alternative funding sources used to represent another stress factor to my already strained life. Whilst on an external placement as part of my contract last year, I found my depression and anxiety issues exacerbated tenfold. Struggles with the impostor syndrome, feelings of being isolated, loneliness, grieving of missed work opportunities and a lack of social activities, the inability to travel and to spend time with my loved ones, all together had and still have a significant weight that I bear on my shoulders every day.

Despite these overwhelming feelings and experiences, perseverance and tackling these seemingly insurmountable topics taught me a few invaluable lessons learnt on a long and challenging path of self-discovery and self-development. The slow chaotic process of adapting to the

situation, finding or creating new opportunities, learning about one's limitations, facing, fighting and ultimately taming inner 'beasts' are fascinating rich stories engraved in one's heart, mind and body. Along with sadness and other negative feelings, I finally reached a point where I can see beauty in my path, and I wholeheartedly encourage others in finding theirs.

Obtaining a PhD degree is no easy task, but during these times I highly recommend recognising and celebrating all the small achievements observed on the course. I will end this piece of reflection with a quote which I, and no doubt thousands of others, have found beneficial to continuing on one's healing path:

"If we could change ourselves, the tendencies in the world would also change. As a man changes his own nature, so does the attitude of the world change towards him. We need not wait to see what others do."

Mahatma Gandhi

Upcoming events

3rd NOAH School	September	2021
SupraBio 2021		
International Symposium on SupraBiomolecular Systems, 7th edition	May	2021
International Conferences on Noncovalent Interactions	July	2021
International Symposium of Macrocyclic and Supramolecular Chemistry	August	2021



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Partner Organizations



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