

PEOPLE & IDEAS

# New investigators in the time of the COVID-19 pandemic

Melina Casadio  and Dan Simon

**JCB checks in with newly independent cell biologists and learns about their experience running a lab during the COVID-19 pandemic.**

The COVID-19 pandemic has massively impacted all aspects of our lives in 2020. While we at JCB fully support the measures taken around the world to limit the spread of the virus, we also regret the impact on the scientific research community. The cancellation of scientific conferences and lack of in-person networking opportunities and informal discussions has been a particular challenge. In this People & Ideas, we check in with newly independent cell biologists and ask them about the challenges, priorities, and needs that the pandemic has highlighted for them. This article is part of a series that is meant to amplify the work and experience of early career researchers during the pandemic and to introduce them (again) to our readers. In this first installment, we contacted investigators who started their labs at the cusp of the pandemic: Ghazal Ashrafi, Maria S. Ioannou, Mélanie Laurin, Grant Schauer, Shiori Sekine, and Lovorka Stojic.

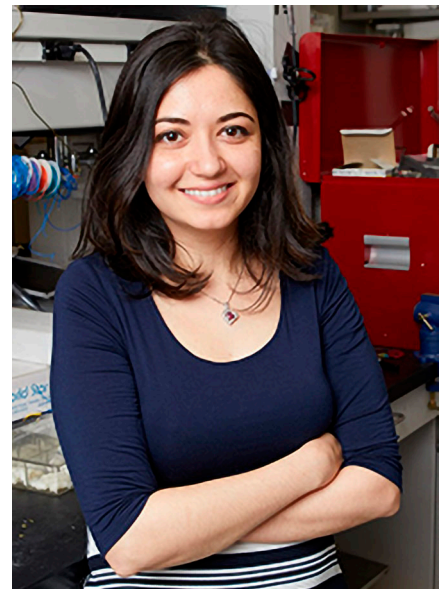
## 1. Tell us a little bit about your research. What's your lab focusing on?

**Ghazal Ashrafi (GA), Washington University in St. Louis:** My lab studies the mechanisms of metabolic regulation at nerve terminals and their impact on synaptic transmission. We use a combination of optical imaging and biochemistry to tackle these questions.

**Maria S. Ioannou (MSI), University of Alberta:** My research is focused on understanding how coupling lipid metabolism between neurons and glia regulates neural

activity and health. This includes figuring out the mechanisms of lipid transport from neurons to glia during cellular stress, its implication in various neuropathologies, and the fate of glial cells after consuming lipids.

**Mélanie Laurin (ML), CHU de Québec-Université Laval Research Center, Canada:** In my lab, we focus on understanding the molecular mechanisms that orchestrate skin morphogenesis and how the deregulation of these processes can contribute to skin cancer progression. We are particularly interested in the contribution of Rho GTPase signaling networks in these contexts. Due to their ability to modulate cytoskeletal dynamics, Rho GTPases have emerged over the years as key regulators of morphogenesis and tumor progression. Still, many family members and their regulators remain understudied, and elucidating the function of these complex protein networks in vivo remains an important challenge. To tackle this, we take advantage of in utero lentiviral injection, a tool developed by my previous mentor Dr. Elaine Fuchs, which enables us to rapidly and genetically modify skin progenitors. This technology opens the door for high-throughput functional studies in vivo that we combine with protein network analysis using cell culture approaches. Altogether, our work aims to unravel new function for understudied Rho GTPase network components and to provide key understandings of the molecular mechanisms that organize the first step of organogenesis.



Ghazal Ashrafi. Image courtesy of Ghazal Ashrafi. <https://www.ashrafilab.com/>.

**Grant Schauer (GS), Colorado State University, CO:** We study the molecular mechanisms of eukaryotic DNA replication with an emphasis on how replication forks bypass obstacles. Because they are often mutagenic and can lead to chromosomal abnormalities, blocks pose an existential threat to the cell. Watching one molecule at a time, we want to discover the details of how the replication machinery recruits and works with auxiliary machines to deal with these obstacles.

**Shiori Sekine (SS), University of Pittsburgh, PA:** My lab is interested in understanding how mitochondria sense damage and trigger the

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Maria S. Ioannou in the lab. Image courtesy of Brian Marriott. <https://ioannoulab.com/>. Twitter: @ioannouLab.

appropriate stress responses. Particularly, we are focusing on the stress-dependent regulatory mechanisms of mitochondrial proteolysis and import machineries to uncover their roles in stress signaling. We are also trying to establish original tools to identify a novel mitochondrial stress signaling pathway.

*Lovorka Stojic (LS), Barts Cancer Institute (BCI; Queen Mary University of London, UK):* My group is interested in RNA-mediated mechanisms, particularly the roles of long noncoding RNAs (lncRNAs) in cell division, and how changes in lncRNA regulatory networks contribute to genome instability and cancer. We use live cell imaging, genomics, proteomics, and functional cell biology—technologies that have dramatically boosted our understanding of how lncRNAs operate and how they regulate fundamental cellular processes. But we still have a lot to learn, particularly about how specific functional domains and structural elements within lncRNAs relate to their functions.

**2. In March and April of 2020, many countries imposed restrictions, such as school closures, and asked non-essential workers to stay home. Can you tell us about your experience during these shutdowns?**

*GA:* I started my lab in January 2020, so by the time the shutdown happened, we were just beginning to do some basic experiments. As a result, we did not have any data to analyze over the shutdown period, and my lab does not do any computational work, so we were not productive at all during this time. Without childcare, it was very difficult to do any meaningful work at home, but I still managed to submit two or

three small grant applications during this time!

*MSI:* Working from home during the lockdown was not easy with a toddler. When daycares closed, we teamed up with friends who have a child similar in age to ours and alternated days babysitting. Even though we were not able to work full time while at home, we could work more, and it was better for our mental health and for the children. Luckily, we had finished collecting the data needed to resubmit our manuscript right before the shutdown. But the nature of our work does not generate large datasets that require significant time to analyze. So, moving projects forward once we were home was not possible. I used my time to work on grants and an invited review with one of my students. To try to keep the rest of the lab engaged, we started having more frequent journal club-style lab meetings. This was a good way to develop my trainees' knowledge in the field that I think everyone enjoyed. Although I am sure they were much happier when they returned to the lab!

*ML:* Fortunately, my close family has remained healthy so far. After spending six years in New York City as a postdoc, I arrived in Quebec City in January 2020 with a well-defined plan. Organizing my lab space and getting experiments going was top of my priority list. My plan also involved building a social network outside of work, making sure that I exercised and planned break activities such as going to the theater, even though I didn't know anyone in the city. Throughout my training, I had come to realize that these were key requirements for my mental health. One aspect that is often neglected when we reflect on the challenges of opening a new lab is that it often comes with a major relocation for the new investigator. The move from city to city can be highly isolating, as we don't make new friends the same way we did when we were kids! Having dealt with previous periods of depression, notably after relocating to New York City, I recognized that this would be a highly triggering event for people with mental health concerns. It is established that a major geographical move is one of life's biggest stressors, so it is crucial to take this into account when we start our labs and ensure that our wellbeing is also calculated as a priority.

As you can imagine, when the lockdown started in March 2020, my plans suddenly became unrealistic. I ended up making a new plan that was filled with opportunities that I had not initially envisioned. I wrote a review with a new member of my lab and collaborator, which turned out to be my first independent publication and opportunity to train. I also capitalized on this time as a unique opportunity to have an early start on writing a grant that was not due until the fall, which allowed me to get constructive feedback from colleagues. I joined online workout classes from home, and I started various art projects to nourish my mind. Several colleagues, who are now friends, also reached out to make sure I was not too isolated during the lockdown. Importantly, reminding myself that the situation is temporary has been useful, and I continue to adapt my plan to the health guidelines we are asked to follow.

*GS:* My wife and I started our new labs in the fall of 2019. When the lockdown started and the schools shut down in the spring of 2020, the biggest challenge for us was childcare for our then kindergartener. Fortunately, we were so used to divvying up responsibilities equally that we handled that part relatively seamlessly (though probably with a little less sleep). Also, research was just starting to come along at a fast pace for both of us, so the lockdown took some wind out of our sails. But the timing wasn't terrible for me because I was able to split the days with my senior lab tech; she would come in mornings and work on cloning projects, and I'd come in afternoons and work on building our homemade single-molecule microscope. Having that time alone to focus on instrument building without distraction from other lab members was helpful. I don't usually like working from home, so I was able to sneak into the office and work on manuscripts, etc. I am incredibly lucky to be a recipient of the NIH K99/R00, the "Pathway to Independence" award. This has allowed me to focus on the research during these critical first years instead of worrying about how I'm going to pay the bills for the first few years.

*SS:* I started my lab in 2019, so the COVID-19 pandemic began while my lab was still in its first year. I was in the stage of exploring projects to find the direction I wanted to take my research. There were a lot of experiments I needed to try at the

bench, so I was very sad when my research institution was closed. It was very clear that I didn't have enough data to start writing a manuscript, so during the lockdown period I decided to organize my data from the past year and think about a grant application strategy. In hindsight, this was a good opportunity to contemplate the direction of my research. Of course, it is important to apply for a large grant and publish your first original paper as soon as possible, but there is another thing I think is very important for young PIs to prioritize. We must find the seeds of projects that we can continue to explore and expand with persistent curiosity for decades to come. When we do bench work, we encounter a lot of detailed questions. It is important to find answers for these one by one, but sometimes it is also necessary to zoom out to see the whole picture of our research and pull out the big question. I think this was something our mentors excelled at and tried to pass on to us, but it is important to realize the need in our own labs to flexibly switch between both perspectives and not get lost in the many different paths ahead. Through my work as a PI so far, I realized that this can be very challenging. The COVID-19 pandemic took me away from bench work and disturbed my plans a lot. But now, when I reflect on that lockdown period, I realize it reminded me the importance of having the time to ask myself, "What is the biggest question for me?"

**LS:** The early stages of group leadership are very challenging as you are confronted with scenarios and situations you are not familiar with and generally were not prepared for during graduate school and postdoc training. The pandemic has made this phase of our careers even more complex. Nobody really prepares you to run a lab during a global pandemic and lockdown! No surprise that this historical moment is the most challenging part of my career, not only from the professional but also human perspective. Group and individual meetings are not just about science but also about motivating our young colleagues and supporting them in any way we can, which is even more important during challenging times.

After joining the BCI in October 2019, I hired a PhD student and postdoc who joined my lab in February 2020. I was really looking forward to starting new experiments, "playing" with my new microscope

for live cell imaging, welcoming a new student from France in March, and making discoveries. All of a sudden, this all got frozen. The new student had to return to France after only two weeks with the group, the microscope could not be delivered, and even completing a single qPCR experiment became a challenge.

Having just started, we did not have any data to analyze, so the lockdown impacted our progress significantly. It has been very difficult (and still is) for bench researchers. I realized very quickly that my newly established lab would not be able to make the progress I envisaged, and the objective became to maximize the lockdown time in any possible way. So, our lockdown consisted of regular group meetings and journal clubs discussing future experiments. The BCI had weekly departmental seminars, and, in addition to that, I decided to have regular RNA meetings with other PIs working on different aspects of RNA biology. As a member of the wider QMUL Epigenetics community, we also participated in epigenetics group meetings. All these meetings helped my lab members integrate into the institute's daily life (albeit virtually) and feel less lonely. I encouraged my lab members to attend seminars relevant for their work—from cell cycle, epigenetics, and RNA meetings to computational and imaging workshops. I tried to be innovative and make the most of the time that could not be used for basic research. As a cell biologist, I often don't have time to explore computational biology, so lockdown was an ideal time to do that. It provided the time for me and my postdoc to write our first review on lncRNAs in cell cycle and genome stability, and for me to submit a grant application. As junior PIs, we are under pressure to obtain external funding and perform well. Although I managed to submit funding applications, the lockdown did impact grant submissions for me and many other scientists. Due to COVID-19, many grant interviews were cancelled, and funding became even more limited. Many cancer charities in the UK, which do an amazing job to support a large part of the UK's biomedical research, were profoundly affected by the pandemic. Sadly, it will take some time for medical research charities to recover. Although it all might look dark and gloomy, there are also positive effects of this lockdown. We can organize our work differently, travel less, and still



Mélanie Laurin. Image courtesy of Mélanie Laurin. <https://www.mlaurinlab.com>.

experience the full joy of meetings. Virtual platforms have given us an unprecedented power to reach out to colleagues and collaborators in different geographical areas, although, clearly, virtual meetings cannot replace the pleasure of face-to-face human relationships.

On a personal level, I found it very challenging to run my newly established lab while working from home and home-schooling two kids at the same time. My husband is a medical doctor and often had long hours in the hospital, so most of my daily work involved taking care of two very active boys. It became normal having kids in the background of all our Zoom meetings. I think that female researchers, especially those at early career stages, were affected the most by this pandemic. The best we can do is to encourage other scientists to share their experiences, be kind to each other, and understand that we all need to be flexible.

I was also aware of the negative impact of the pandemic on mental health and the importance of mental wellbeing during the lockdown. This pushed me to do something new: running. It started as a personal challenge, but I soon realized I could have made much more out of it. I decided to raise money for cancer research with my running at <https://www.justgiving.com/fundraising/Lovorka>. Initially, I was on my own, but soon after, several colleagues, students, and postdocs joined in this adventure. I am very



proud that, in a few months, the “BCI running team” raised more than £3,000 for cancer research: <https://www.justgiving.com/team/RunningforResearch>.

### 3. If your institute completely shut down and all lab work had to stop, were you able to preserve reagents and strains?

GA: We did not have any animals at the time; other labs that did were given some limited time to maintain their lines. However, because of the furloughs in the animal facilities, there were instances that animals were lost.

MSI: We were expected to shut our labs down completely at the beginning of the pandemic. For my lab, this lasted three months. We were very fortunate that we did not lose any significant reagents as a result of this. Our lab depends on timed pregnant rodents delivered weekly, and we were able to cancel our orders. As for my colleagues' work, the animal facility at the University of Alberta continued to operate throughout the entire pandemic. Because of their hard work, many precious long-term experiments and transgenic strains were saved.

ML: During the first wave of the pandemic, my lab completely closed its doors from March to May 2020, after which we returned to work with very well-defined measures to prioritize everyone's safety. As of now, meetings are still held via Zoom, and we encourage people to perform activities such as data analysis from home whenever possible. To ensure that I can both train my young team and progress in our experimental plan, I decided to focus on in vitro experiments with realistic timelines. I explicitly communicated to my team that they need to prioritize staying home if they have any doubts about symptoms. I don't want them to feel they are compromising experiments by staying home. When you add people that are waiting for COVID-19 test results, this creates a lot of stop and go during experiments and makes precisely planning complicated experiments difficult. To alleviate this situation, I put emphasis on teamwork, and I make myself available to finish experiments when required. Given the conditions, we are proud of every small advance we make.

GS: Luckily for me, I work on yeast, which is basically “cell biology lite” because



Grant Schauer and school mascot Cam the Ram at Colorado State University. Image courtesy of Grant Schauer. <https://www.bmb.colostate.edu/about/people/person/?id=75F98310FD4098BD74C8B881A2330D03>.

the cells are so robust. As long as my freezer stays cold, we can store glycerol stocks and revive them whenever we need. Also, during the initial lockdown, I was in the middle of a few protein preps that I was able to surreptitiously wrap up without losing material.

SS: Since my lab mainly uses cultured cells, we could quickly preserve frozen stocks for every cell line. Our mouse experiments were just beginning, and only a few mice were housed. Genotyping became possible from the latter half of the lockdown, so we fortunately did not have much trouble maintaining them.

LS: The BCI was closed from March to July 2020, and we did not have any access to labs and offices. Thus, we were not able to perform any wet-lab experiments. During this time, the BCI preserved all reagents and strains without major effects on animals. In mid-July, we finally were able to go back but with a very strict and restrictive 4-hr shift pattern. I was amazed to see enthusiasm from students and postdocs working on benches, after four months of lockdown, trying to do their experiments with this limited amount of time. In mid-October 2020, we had the “luxury” to extend to a 6-hr shift pattern under the UK government's one-meter+ rule. Obviously, this means that we are still very far from being able to work at 100% capacity, but this will increase the safety of everyone working in the lab. My group members have to work in different shifts to minimize the potential impact on the group of self-isolation in case of confirmed COVID-19 infection. This means

that members of my group never actually meet in the lab, which is kind of crazy!

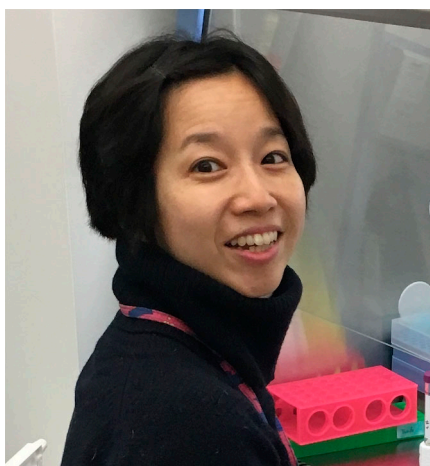
### 4. How are your lab and institute approaching training and recruitment during the pandemic?

GA: We only started allowing undergrads back this fall, but given the lingering safety concerns and the reduced number of undergrads on campus, it has been difficult to recruit them, and I have significant reservations about having them in the lab. I would say one of the most difficult challenges of COVID for my lab has been the obstacles it created for recruiting, including hiring freezes, difficulty to provide in-person training, etc. To give you an example, I had to rescind an offer to a postdoc I had spent months recruiting due to a combination of travel restrictions and the new H1B visa limitations. I had also lined up a very talented undergrad as a summer student, but she was never able to join the lab.

MSI: Once we were given permission to reopen our labs in June 2020, my graduate students immediately returned to work. By July 2020, undergraduate students doing senior projects returned. Fortunately, my lab space can accommodate all my students and staff and we did not have to work in shifts. However, we had to implement strict scheduling for each space to make sure room capacities were respected.

My biggest challenge now is hiring. An extra person risks exceeding current room capacity limits. There is also the matter of training new hires, which will require close contact with myself and other members of my lab. This is something I want to avoid given the increasing number of COVID-19 cases in Edmonton, Canada. I will wait to see whether additional restrictions are placed on labs by the university. The risk is that interesting projects are put on hold, which is unfortunate.

ML: Recruiting of my first graduate students has definitely been my biggest challenge. Highly motivated and qualified international students choose to enroll each year in the research graduate programs we offer at Université Laval, and these students represent a large fraction of our cohorts. The uncertainties associated with the COVID-19 pandemic regarding visa applications, border closures, and possible future lockdowns have significantly compromised their recruitment. I had to turn down highly



Shiori Sekine in the lab. Image courtesy of Shiori Sekine. [https://profiles.dom.pitt.edu/faculty\\_info.aspx/Sekine7046](https://profiles.dom.pitt.edu/faculty_info.aspx/Sekine7046).

driven candidates because it was impossible to plan their arrival in the near future. Similarly, I had a candidate who had to cancel joining my lab and turn to other options closer to home because the process was too uncertain. This situation is unfortunately very generalized among early career investigators. The institutions in Canada and Quebec seem to be mindful of this situation, and hopefully we will see new policies that facilitate scientists working internationally in the midst of this unprecedented situation. If we continue on for several months in this manner, it will likely translate into a decrease in our productivity and fewer trainees graduating from our labs, both of which are important criteria for successful research program and faculty promotion. This will have to be considered in how the progression of early career scientists is evaluated. Some avenues to support new investigators might include that initial recruitment contracts be extended, that new startup funds be provided by universities, or that we ensure the strong presence of young investigators in future international meetings to promote them.

GS: I have continued to train students, even though it's been a bit more challenging with scheduling and trying to minimize lab occupancy. For undergrads, I have been staggering their schedules. I haven't noticed much of a change in recruitment. People seem to really want to do research—or anything, really—right now.

SS: The labs in our institute are now allowing undergraduate students to work and

graduate students to do their lab rotations. I heard that COVID-19 has reduced the number of postdoc applicants, especially from overseas. It is a really hard time not only for recruiting labs, but also for postdocs who want to do research outside of their home countries, which hurts my heart. Personally, I'm not in a hurry to expand my lab. I currently still have a lot of time to do bench work myself, so I'm focusing on laying a rigorous foundation for my research project with my research technician who has reliable experimental skills.

LS: Unfortunately, the plans I had for my postdoc to learn a new method in a laboratory abroad had to be postponed. Masters and undergraduate students, who generally do their lab practice during the summer, instead completed a dissertation thesis in the summer of 2020. Despite a largely normal student/postdoc recruitment process at the BCI, I have to push the start date of Masters students back to late 2021 to focus my resources on training my current lab members.

### 5. What has been the biggest challenge thus far in setting up and running your research program? Have you been able to get support from researchers at your institute or other mentors in the community?

GA: The challenges are numerous, and the fact that we no longer have any meaningful social interactions with colleagues limits our ability to seek help. I only got to know a handful of my colleagues before the pandemic and I tend to reach out to them still. I cannot really name any significant form of support or help from the institution other than extending the tenure clock. My sense is, on the one hand, all labs are trying to survive, and on the other hand, more senior PIs who are in leadership positions may not appreciate the unique challenges that new PIs face.

MSI: Another challenge of setting up a lab has been managing the administrative responsibilities. For example, learning hiring procedures, writing animal protocols, navigating ordering systems, and negotiating quotes from vendors on major equipment. It can be quite daunting and takes up a lot of time. Now add the pandemic to the mix and I must keep up with evolving guidelines set by the University, write and rewrite safety protocols for working in the

lab, and deal with delays on important reagents. These issues are not unique to new investigators, but it is still a challenge. Another unexpected challenge has been with ordering major equipment. I am preparing to purchase a microscope. But it has been challenging to arrange for demos. Some companies halted demos due to travel restrictions. Also, the microscope, and therefore the demo, will be in a smaller room. This makes it difficult for a company representative to train my staff on their system.

I am extremely grateful to have several mentors both within my institute and beyond who have helped and supported me in my first years of starting my lab. They have given me sound advice on how to get started, read over my grants, and helped me navigate important decisions as they come. I am indebted for all their help and hope that one day I can pay it forward and help the new hires who come after me.

ML: Again, the recruitment of graduate students has been one of my main challenges, but it also has been more difficult to establish a lab culture. Getting to know your new team via Zoom can be quite limiting, and colleagues certainly don't interact over coffee to troubleshoot experiments when working from home is encouraged once experiments are completed. However, I do believe that my team will come out even more tightly knit after experiencing these initial difficulties during our first year.

Since the beginning of this crisis, I have been even more grateful for my colleagues. They provided infrastructure, support, and help in many ways. From the first signs of the pandemic arriving in Quebec, our leadership team quickly assembled a safety committee that was mandated to set guidelines and procedures to ensure the safety of all the members of our institution. I also had several colleagues reaching out personally to offer help with assembly of grant applications since the experimental plan I had laid out for myself was significantly slowed down and compromised. One colleague even made sure that my samples would be prioritized for analysis by a common platform over his own experiment to speed up my research and help me collect preliminary data. My grants were reviewed by multiple colleagues who all shared constructive feedback. Altogether, the collegiality I experienced since joining definitely reinforced my decision of choosing the CHU de

Québec-Université Laval Research Center to establish my lab.

**GS:** Our lab work itself hasn't been affected too much. For me, the biggest challenge has been a disruption of a normal, in-person support network. I thrive on social interactions and in seeking advice and stimulating discussions from colleagues. Unfortunately, scheduling a Zoom chat just isn't the same as knocking on your colleague's door to see if they want to chat over coffee or a beer. Having just moved to a new city, I was feeling a bit isolated even before the pandemic, and I was just working up to throwing a get-together at my house for people in my department when the lockdown started. I am lucky to be in a friendly, supportive department, so every time I've reached out, it was no surprise that people were extremely supportive. But it's obviously tough because we're all going through this together, too. I have been able to keep in contact with my colleagues and friends around the world, but I am really starting to miss the subtle but important dynamics of in-person, maskless communication.

**SS:** I think the biggest challenge COVID-19 brought us is that we have lost opportunity for in-person discussions at academic conferences and seminars. In fact, I have lost the opportunity to give an oral presentation at a conference scheduled for March. As many of you are aware, the number of oral presentation slots for young PIs can be limited, so every chance we get to speak is very precious. In that sense, I attended the Young Mito conference in 2018 in Kyoto, Japan (meeting report at PMID: 30273445). This conference was organized by young researchers, and the presenters were also researchers at similar stages. A few established senior PIs in the field of mitochondrial research also participated as plenary lecturers. It was a very exciting conference due to the active discussions among early investigators and the encouraging comments from the established senior PIs. Financial support is the biggest issue for such young researcher-driven academic conferences. However, through virtual seminars, we may create a good opportunity where young researchers from all over the world can get together at a significantly lower cost. Of course, it would be great if some funding opportunities would support us to organize it in the form of in-person discussions in the future. There are not so many people in a



Lovorka Stojic in front of the Barts Cancer Institute. Image courtesy of Lovorka Stojic. <https://www.stojiclab.com>. Twitter: @stojic\_lovorka.

typical young PI's lab, and every project is based on their own ideas, so missing these chances to obtain different perspectives from other researchers can lead to narrow thinking. Luckily for me, my husband is also a cell biologist, and he is currently a PI at the same research institute as me. Therefore, fortunately, we can discuss our research at length, which is really helpful in keeping both of our minds positive during the lockdown.

**LS:** The biggest challenge has been the difficulty in training and supervision of my lab members while not being present in the lab. I found it challenging to teach my PhD student how to perform immunofluorescence and mount the slides being two meters away. Likewise, training my postdoc to perform RNA FISH via Zoom has been a real experience. This is clearly not ideal, yet the challenge was met. From a practical point of view, a 4-hr shift pattern often does not allow enough time to perform cell biology experiments, thus, for a while, we were limited in what we could do.

The one thing that the pandemic has boosted in the people working in the Institute is a touching sense of belonging to a large family. I was amazed by the availability and enthusiasm of all researchers in the lab to help peers and colleagues during this difficult time. This has been particularly beneficial for me and my new lab members,

who have received precious support from everyone around. Likewise, group leaders met for a morning cup of coffee and an evening glass of wine on Zoom to share challenges and successes. Everyone realized how important it is to connect and share their daily experiences, at a time when in-person social interactions were not possible. It was a coincidence that several early career researchers started their labs at the same time as me, and we all realized that we were all cycling in a strong wind.

## 6. Any advice for cell biologists at a similar stage of their career?

**GA:** I think we are all used to having a certain level of control over our lives and careers, and we have looked forward to achieving research independence as a PI. In a way, COVID has pulled out the rug and reduced our agency. This is really difficult to handle when you calculate how much these unforeseen circumstances might, in the long run, hurt the career you have worked so hard for. I wish I had sage advice to give, but the only thing I can say is to try to live in the moment and take it day by day. It is very hard to achieve grand visions right now, but it may be gratifying to make little things happen in the lab. I have found that doing experiments these days helps me calm down, because ultimately that's what I enjoy most about science.

**MSI:** Before the pandemic, my advice would be to keep doing experiments as long as you can! This was the advice given to me before I started. Plus, I love being at the bench and find that projects move faster when I am working alongside my trainees. I also recommend finding good mentors. They can make a world of difference in starting a lab. Mid-pandemic, I think it is more important than ever to be mindful of your mental health. Maintain some degree of work-life balance. Your work will be better for it.

**ML:** I think the best advice anyone can have these days regardless of your career stage is to have empathy for the people around you. This means empathy for your colleagues who may not be meeting deadlines because they are juggling family duties, empathy for your students who might be struggling with mental health issues, and importantly, empathy toward yourself when you might not be able to resolve all the problems you are facing. These are not



normal times, and granting ourselves some understanding will help us rise to meet the many challenges we are facing. One of the qualities that define us as scientists is our ability to bounce back and be creative when we face adversity. We constantly optimize protocols when experiments fail, we come up with a plan to address reviewers' comments, and we try again and again when a grant is not funded. I believe scientists are highly equipped to face these difficult times and to come up with creative solutions that will ensure the safety, wellbeing, and progress of our students and team members through these challenges and into the future.

**GS:** Launching a lab can be daunting; just take it one day at a time and don't underestimate your own stress. Stress can be motivating at the right levels and destructive at the wrong levels, so it's important to take some downtime for yourself, too. Whenever I start to notice that I'm distracted by the

news, or social media, etc., I take that as a sign that my brain wants some time to meander. So, if you feel distracted, or unmotivated, try to take a step back and give yourself some non-guilty free time for hobbies and other things you like to do. Otherwise, you'll be trying to work without full intent and attention, and that's just counterproductive.

**SS:** The lockdown was the longest I have been without touching a PIPETMAN since I started my research. I remember when our institute reopened, I woke up my cells and said to them "Oh, long time no see!" and was very happy to be back. I felt the same excitement as a student starting experiments for the first time. I was so grateful to be back in the environment in which I could do research again. The thing I appreciate most about cell biological research is the whole new perspective it gives you on the life around you. You can see the molecules working hard in cells under the microscope

or on the immunoblotting, and importantly, you can extend that to what is happening in your body now at this moment. Their existence has supported our lives since we were born in this world, yet there are still many things left to be discovered. Cell biologists are given the opportunity to reveal them through our own ideas. I have been struggling with a lot of issues every day, but I'm encouraging myself to enjoy the chances I've been given.

**LS:** My advice is to not be afraid to ask for advice or help from your colleagues or peers. We are all together in this boat and people want to help if they can. Optimism and positive attitude are very important in this moment. Let's not forget that, thanks to the admirable effort of colleagues working on vaccines, this dramatic historical moment will soon end, and we will all be able to look back at it as we often think about a bad nightmare. We all need to keep going in small steps and get ready to run soon.