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JeffPost

(Empowering Postdoctoral Careers)

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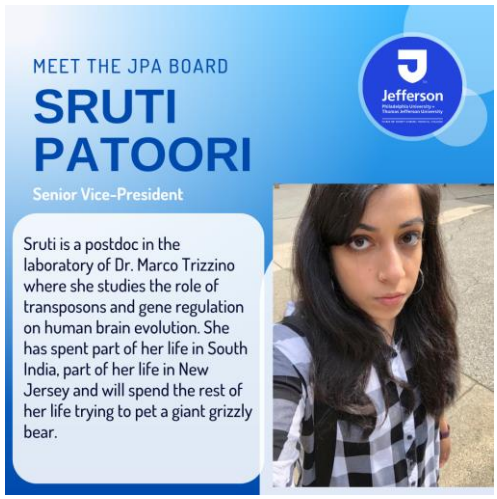
Meet the ***2021-2022 JPA executive board*** members! The JPA has been actively executing social hour, Technical Skills Seminars Series (TSSS), and many other activities, with participants from various departments of Jefferson. We will continue to conduct events both remotely and in person until at least the end of the academic year.



Women in STEM: the point of view of our PIs

As the JPA VP of Communications, I interviewed two TJU Assistant Professors, both in charge of proficient labs and both representing young women pursuing an academic career: **Elise Fouquerel**, appointed in the Biochemistry and Molecular Biology Department, and **Elena Blanco Suárez** in the Neuroscience Department. Here, we learn about their path in Academia, their struggles, and how female science faculty think about their careers.

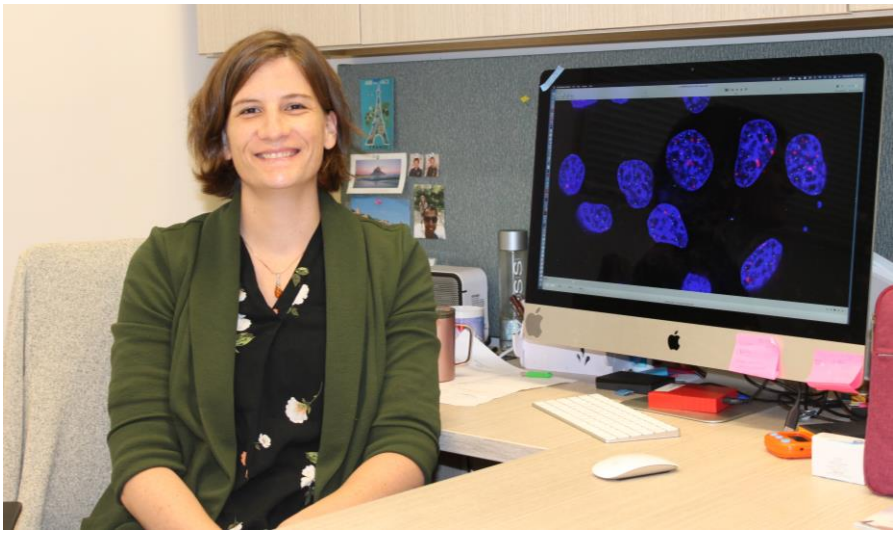
Dr. Elise Fouquerel - Department of Biochemistry and Molecular Biology

Could you briefly describe your major research interests/current projects?

My laboratory studies the mechanisms by which genome stability is preserved upon oxidative stress exposures. We are particularly interested in understanding the roles of DNA repair enzymes PARPs in repairing oxidative DNA lesions at telomeres and centromeres, genomic loci crucial for genome stability.

What is your scientific background?

I started my scientific journey in Strasbourg, France, as a Master student in the DNA repair and replication fields, studying PARG enzyme roles in these processes. I pursued my Ph.D. in the same lab under Dr. Valerie Schreiber's supervision. PARG is a glycohydrolase that hydrolyses the poly(ADP-ribose) synthesized by PARP1 upon DNA damage and replication stress. I uncovered that PARG activity is as crucial as PARP1's to ensure DNA repair completion for replication fork restart. I defended my thesis in 2011 and joined Dr. Robert Sobol's laboratory at the University of Pittsburgh as a Postdoctoral fellow. There, I uncovered how PARP1 enzyme hyperactivity leads to metabolic defects and cell death, linking DNA repair process with cell metabolism outcomes. After 2 and a half years, I decided to join Dr. Patricia Opresko's laboratory for a second postdoc to expand my knowledge in the telomere field and merge it with my expertise in the DNA repair and PARP field. It allowed me to mature an independent project that was later awarded a K99/R00 pathway to independence award in 2016. This award and project paved my way to my independent position as an Assistant Professor at TJU.



How important is your research topic for science development or society?

Oxidative stress is linked to many human diseases such as cancer. Understanding its impact on our genome will help counteract its deleterious effects on human health.

Moreover, PARP inhibitors are widely used in cancer therapies but can trigger some resistance. Our research on the specific roles of PARP in preserving telomere and centromere integrity during oxidative stress will contribute to the development of alternative and more targeted cancer treatments.

What are your biggest achievements, and what are your biggest failures?

I think being awarded a K99/R00 was one of my biggest career achievements because it helped me to reach my goal of leading a research lab. On the other hand, I don't think I have had big failures or at least I don't see them like this because we always learn a lot from "failures" and they eventually lead to something good.

After completing your Ph.D., what was your experience finding your first professional position?

I found it rather easy because I met my first Postdoc mentor, Dr. Sobol, in an international meeting where I had the occasion to talk with him about my Ph.D. work that I was going to defend a few months later. It made my application to his laboratory more straightforward, and I did not have to go through an extensive interview process.

Did you find that being a woman either positively or negatively impacted your search?

So far, I have not felt discriminated as a woman in science. I was fortunate to be mentored by both women and men who supported me and encouraged me in my career regardless of my gender.

Of course, I faced some comments such as "you are too ambitious for a woman" during my Ph.D. but this only motivated me to go further and follow the path I had chosen for myself without paying attention to these interferences.

Did you experience networking between women scientists?

Yes, definitely. More and more conferences now have dedicated time for empowering women in science during which we can share and benefit from experiences with other women in the field. For example, the EMGS (Environmental Mutagenesis Genomics Society)—of which I am member since 2015 and now an executive board member—has a dedicated "Diversity, Equity and Inclusion" committee that works to support all members of the scientific community irrespective of culture, gender identity, or race. Among the activities organized by this committee is a 'women in science lunch' where we can hear from more experienced woman scientists about their career path but also how they manage their private and professional lives. I think this is important to have these open discussions to find solutions and improve gender equality.

What is the situation of gender equality in your working field? What do you suggest for a better implementation of gender equality in science?

The telomere field has actually a lot of woman scientists, but this is a rather small field and of course there is still a long way to go to reach gender equality in science. I think one key to a better gender equality is for women who fight for it to be supported also by the men around them, colleagues or family members. Gender equality should be a battle in which everyone should play a role.

What inspirational message would you give young women investigators to inspire them to pursue an academic career in STEM?

The path to academia is bumpy but women before us paved the way and we need to pursue their work to inspire other young women to follow this path. Thus, it is important to keep the passion for science alive and persist in your choice. Finding the right people to look up to and who genuinely support you is one key to a thriving career in academia.

Dr. Elena Blanco Suarez – Department of Neuroscience

Could you briefly describe your major research interests/current projects?

The brain has an incredible ability to adapt to different circumstances. It's what is called "plasticity." In my lab, we are interested in studying the molecular mechanisms that trigger plasticity after stroke. In particular, we want to understand how astrocytes, a special cell type in the brain, contribute to post-stroke plasticity. We focus on the interactions between astrocytes and neurons to discover new ways to manipulate them and turn them into therapeutic targets. We want to use astrocytes to the advantage of the brain, to boost plasticity after stroke and give the brain an extra push to be able to completely recover.

What is your scientific background?

As an undergrad, I worked in a microbiology lab. Then I worked in a cardiovascular lab and moved to a diabetes lab to do my master's thesis. It wasn't until grad school when I got passionate about neuroscience research. I think working in different labs dedicated to different kinds of research helped me understand the importance of having an integrative approach to my science, and try my best to collaborate with others to see and understand the big picture.

How important is your research topic for science development or society?

We study astrocytes, a cell type that has been a bit neglected over the years as most research focused on neurons. There is no doubt that neurons are crucial for the proper function of our bodies, but it is important to take into account that neurons don't work "alone," that there are other cell types in the nervous system and in the body that influence neuronal function. Our approach emphasizes this. Everyone's topic of research has great potential to impact our current knowledge, but it needs to be put into perspective, as I said earlier, into the "big picture." For that, you need to take into account other cell types, systems, and disciplines that may help you build and understand the problem you are addressing—in our case, stroke recovery.

What are your biggest achievements, and what are your biggest failures?

I'm proud of how far I've made it in academia. I'm also proud of having been able to build a career outside my home country, Spain, through effort and hard work that granted me scholarships to pursue this pathway. None of my parents or others in my family were scientists, STEM professionals, or academics, so I had to figure it all out by myself. I'm also the first one in my family to migrate, and being so far from home is very hard. The support I got and continue to get from my family through the years is invaluable, and the mentorship from other professors, senior researchers and peers in my field has been instrumental to my success. I'm proud I have not given up despite many difficulties, and I know I'm always doing my best which I think is my biggest success. On the other hand, I have experienced and still experience failure on almost a daily basis! I think it is a big component in science, but I don't consider any of those failures "big" because I always try to learn something from them, to better myself. It is important to acknowledge failure, but you can't let it linger and stop you. "Fail, learn, improve"—that's my motto.

After completing your Ph.D., what was your experience finding your first professional position? Did you find that being a woman either positively or negatively impacted your search?

I always knew I wanted to go to California. I know it sounds lame, but I was a bit obsessed; all my favorite music and books were by authors from California. After my Ph.D., I knew I wanted to try and advance in academia, rather than go straight into industry (which was my plan B). A lot of people warned me about how competitive it was, and how hard it was going to be. But regardless of those comments, I started applying for postdoc positions across California. I interviewed in a bunch of places, and some told me I was "not good enough." I think it had nothing to do with being a woman, but more about being unfamiliar with the US academic environment. I did my Ph.D. in the UK and I barely knew anything about the US system. I didn't let the rejections get to me, and I persisted. In fact, I ended up getting a position in the first institution that I interviewed at, the Salk Institute in San Diego, CA, where I stayed for six years. I had an amazing experience there. It was hard work, but it made me a much better scientist.

What have you seen as changes (major or minor) that have happened in terms of women in science? For example, opportunities for advancement, funding, tenure, salary differentials, etc.?

At least now there is acknowledgement of the differences, sometimes outrageous, between women and men at the workplace and specifically in STEM careers. I think there is a lot of talk about diversity, equity and inclusivity, but the reality is that there is still much to do. It is not going to happen overnight, so we need to keep working hard at it and not let it just be a fad. It is not enough to say "I'm an ally," and tweet things, but then do nothing substantial in your day to da, and in your workplace. And this goes not only to gender inequity, but the inequity that affects all the others underrepresented in science. Not everyone in science looks like Bill Nye (sorry Bill), and I think most people, inside and outside science, realize this now. Change is slowly happening and I'm hopeful for the future and the new generations of scientists to come.

Did you experience networking between women scientists?

I think networking with other women researchers has been absolutely critical for me to continue in science. Finding other women in the field that have been successful and persistent was an inspiration for me. I still reach out to many women in STEM, and I am always asking them for their advice and their experiences. I make sure to have a diverse pool of mentors though – for example my Ph.D. advisor is a man whom I still have regular contact with and who gives me great advice and guidance. But I definitely appreciate having role models that I can identify with, and whose experiences (especially when talking about obstacles) are more similar to my own. That's why I love having women and immigrant scientists as role models.

What is the situation of gender equality in your working field? What do you suggest for a better implementation of gender equality in science?

I feel like there are a lot of incredible women scientists in the field of Neuroscience, and particularly in the field of Glial Biology. I think it is key to have role models, women who are at the forefront and who future generations can identify with, think to themselves "that could be me." My science teachers during middle and high school were mostly women, so I grew up totally unaware of the gender imbalance in STEM. I actually thought biology and chemistry were female-dominated. It only became obvious that less women were represented in sciences when I reached college level and beyond. And I must say that the difference grows bigger the more you advance in your career. Empowering young women and showing them that science is accessible to them is key, and I think that can be achieved by increasing the diversity of role models.

What inspirational message would you give young women investigators to inspire them to pursue an academic career in STEM?

If a STEM career is where your heart is, and you feel passionate about it, don't let anything to stand in your way. Don't be intimidated. The thing that helped me the most was finding role models, mostly women, but also male scientists, who were very supportive and honest with me. I ask for help when I need it, and that's nothing to be ashamed of or something that makes you less appropriate for the job. Never hesitate to reach out and find the support you need to keep moving forward and achieve your goals.

Democratizing Biomedical Research: By the People, For the People

By Ankita Srivastava and Santosh Kumar Yadav

Biomedical research is the "scientific democracy," research which is by the people (biomedical researchers), for the people (patients), and from the people (volunteers). The focus of basic scientific research in life science is to unravel the novel, indispensable molecules and signaling mechanisms driving cellular processes, yet these research orientations do little to focus on applied research to human subjects or clinical trials of the diseased. The need for applied research added a new discipline in the scientific research field in biomedical research, which involves biomedical researchers working in the healthcare sector for disease diagnosis, evaluating the effectiveness of treatment by using samples from the patients, and helping in modern medicine development (1). However, biomedical research is severely affected by inadequate data availability, lack of awareness among patients, and their unresponsiveness towards biomedical research (2). In this well-connected world, there is, unfortunately, a vast disconnect between the patients and the biomedical researchers, which has accounted for a decline in biomedical research progress.

There are some fundamental problems and challenges for biomedical research (Figure 1).

1. Availability of patient data to the biomedical researcher: Due to lack of awareness, the patients are not willing to provide their data for research (2).

2. The research focus: This is primarily governed by the interests of big biomedical and pharmaceutical companies or a highly privileged class of people rather than focusing on the research with direct feedback from a wide range of patients and diseases. (3). The low and middle-income countries (LMICs) account for 85% of the world's population compared to developed countries, hence disease prevalence and burden. However, a disparity exists in the research budget allocation, and in scientific publications between the developed and LMICs. (4,5)

3. The disconnect: This exists between researchers working on the bench and the patients needing new therapeutic and diagnostic device development in biomedical research.

4. Biased research: Research focused on hypothesis rather than result-based research tends not to publish negative data (6). The biases on only reporting positive data and not sharing and publishing negative data is a major setback in applied research progress.

The challenges mentioned above for biomedical research boil down to the "disconnect" between the researchers, medical practitioners, patients, and volunteers. If we can bridge this gap, we can add real meaning and strength to biomedical research. Connectivity and interaction are the key players accounting for the success of biomedical research. An outstanding example is the very recent, unprecedented pace of vaccine development for COVID-19. Why did it take so little time to produce the vaccine? Well, the combination of scientific advancement, focused research, data availability, collaboration between academic researchers and pharmaceutical companies, and, of course, the volunteers that participated in the vaccine development clinical trial programs all accelerated the research process. The COVID-19 pandemic hit us hard and yet allowed us to expand our horizons. Within a year of a new virus attack on humanity, the scientific collaboration and the interactions with the public helped to develop advanced diagnostics, drug discovery, therapy, vaccine development, health services, and novel solutions to reduce health inequities. Other efforts to fight the pandemic have included educating the public using virtual platforms for scientific press briefings, using scientific personnel for mass media education, and providing scientific explanations of the need for social distancing, mitigation, and mask mandates.

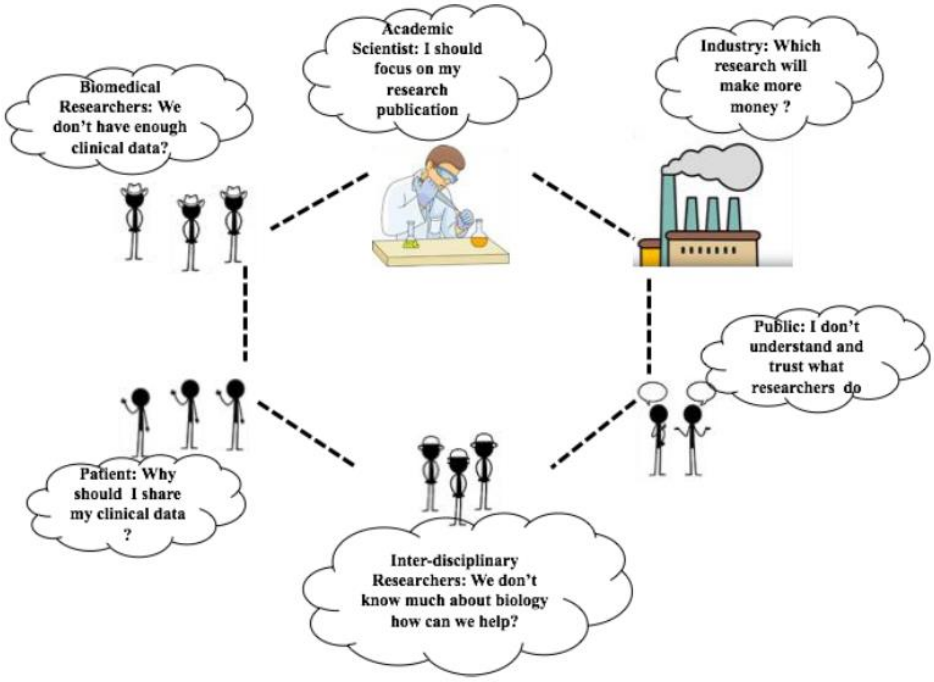


Figure 1: Schematic representation of the disconnects impeding biomedical research progress.

Our idea for advanced discovery to support and benefit society is to bridge the gap between biomedical researchers and patients. The last decade has been a boom for digital platforms and has revolutionized the world, allowing us to connect across countries easily and in situations where in-person interactions may prohibit meetings to exchange knowledge and ideas. The key is to leverage the potential of digital advancement for advertising and informing the general audience across the world about ongoing biomedical research. This will promote trust in the "researcher-patient" relationship, leading to the participation of patients in biomedical research studies as well as their willingness to provide critical and essential clinical samples to researchers.

We need to focus on science communication, providing simplified content to a general public to allow them to easily understand and comprehend biomedical research and recent progress. An example from our everyday life is the streaming channels for movies, sports, history, animals, and others. We need to include a streaming channel for advancements in biomedical research. Daily news shows could highlight the importance of biomedical research to better relate to the common public. Blogs and podcasts are important forms of communication that exist for all other fields, but there's no such resource for biomedical research. Social media is a handy platform to spread the awareness and importance of biomedical research. We need to create content that can be easily communicated and understood by the general audience, who will provide feedback in the form of their trust in biomedical research. The scientific journals should have a special scientific video content release every month to share their field's progress with the common public. To educate those with either scientific or non-scientific backgrounds, more educational and video content should be available on internet browsers, YouTube, and social media platforms like Twitter and Facebook. There should be blogs and forums where the input is received in the form of polls from the public, and biomedical research should be focused on current health and Medicare issues. The open public platforms will bring transparency to the system and help eliminate biased research, thus slowly shifting the paradigm from more money, more data, more publication to more needed, applicable, and beneficial research.

The current pandemic has opened a new era of virtual meetings, enabling participatiion in meetings, conferences, and seminars across countries with no physical travel. The potential of virtual meetings should be used as an opportunity for biomedical research. By organizing a virtual workshop for the general public, biomedical researchers and patients can interact in an informal manner and understand each other's problems. Patients can share their experiences and needs with the researcher and vice versa to help biomedical researchers develop better diagnostic kits and novel approaches for therapeutics. These kinds of seminars and conferences will help connect and focus biomedical researchers on the problems in the field.

Finally, the current situation and the challenges faced by biomedical research can be compared to the global warming threats to our planet. It is not my problem or your problem; rather it should be "our problem." We need collaboration between researchers, data sharing, interaction, and educating the public. Together as a team, we can reimagine a healthier and happier world for the generation to cherish. "Together, we can!!"

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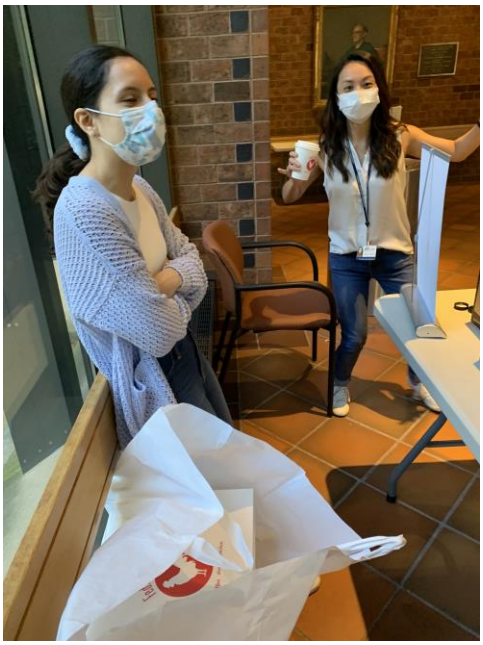
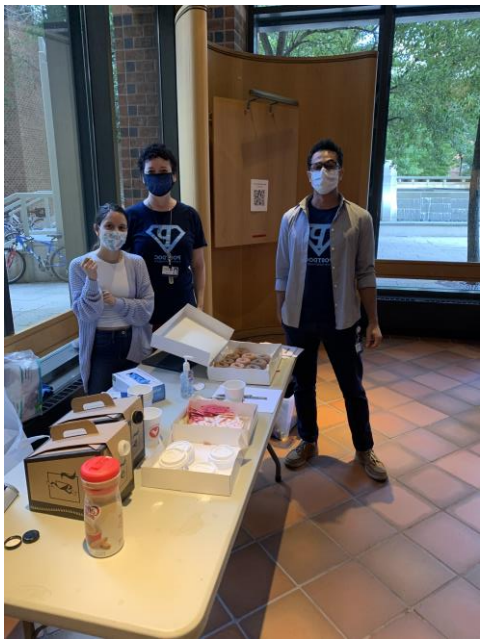
National Postdoctoral Appreciation Week (NPAW) 2021

As part of a long tradition for the Jefferson Postdoc Association (JPA), we spent a week celebrating in appreciation of the hard work done by the Jefferson postdoctoral community. In September 2009, the National Postdoctoral Association (NPA) started sponsoring NPAW. In 2010, this week was officially recognized by U. S. House of Representatives. Every year this event is celebrated in various institutes in North America. As per NPA data, in 2018 108 Institutes in USA, Canada, Germany and UK participated to develop 432 events to recognize and appreciate the work done by postdoctoral fellows. This year the event was celebrated on September 16-20 at Thomas Jefferson University.

Every year, the JPA has been organizing events throughout the week, using various themes to help make the events memorable and enjoyable for their fellow colleagues.





JPA board members and Jefferson postdocs enjoying one of the many social events organized by JPA

Call for Stories for JeffPost:

Postdocs, graduate students, and PIs interested in showcasing the following should contact the JPA:

- Technologies or services in labs at Jefferson for postdocs and the research community at Jefferson
- Research stories from Jefferson laboratories
- Articles related to Jefferson's actions associated with improving the life of postdocs and students
- Postdoc achievements

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