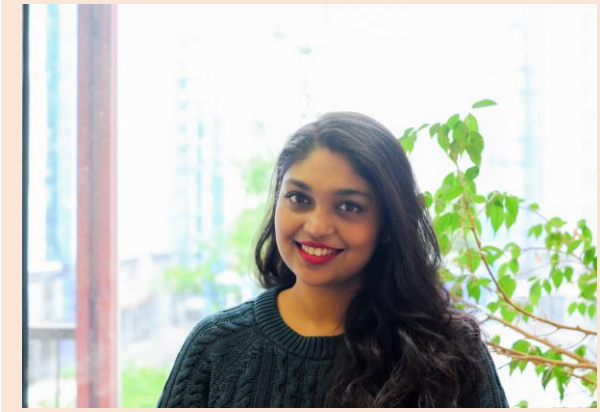
Meet the Researcher: Vanessa Xavier



Graduating with a Diploma in Biotechnology from Singapore Polytechnic, Singaporean Vanessa Xavier went on to pursue her Bachelor's in molecular biology from The University of Western Australia at its Singapore Campus. This allowed her to take up a position as a research assistant at the A*STAR Institute of Chemical and Engineering Sciences in simultaneously. Vanessa then decided to move to Paris, France to puruse her Masters studies in Cell and Stem Cell Biology at the Sorbonne Université Campus Pierre et Marie Curie. During her Masters studies she completed 2 internships at the Institute Curie in Orsay, France and the Erasmus Medical Centre in Rotterdam, The Netherlands respectively. Vanessa is currently enrolled in the 4th and final year of her PhD at the University of Geneva in Switzerland. For the duration of her PhD candidacy, she is a fellow of the REMIX Marie Skłodowska-Curie Initial Training Network which covers research in mitochondrial gene expression.

Vanessa, please **tell us a little about yourself. Where are you from, and what is your research background?**

I am a Singaporean, currently based in Geneva, Switzerland, where I am a PhD candidate at the University of Geneva, in the lab of Prof. Jean-Claude Martinou. My research path has been slightly meandering, but it has always been about studying molecular mechanisms. I've been interested in many areas of biological research and have worked on projects involved in cancer treatment, mechanisms of oncogenes, induced pluripotent stem cells and mitochondrial genetics.

You have recently started your PhD research as a Fellow on the MSCA ITN REMIX. Can you say a few words about this training network?

*The REMIX (**Re**gulation of **Mi**tochondrial gene e**X**pression) network that I am in, is a consortium of laboratories across Europe.*

The broad scientific aim of the project is to understand different facets of mitochondrial genetics, through the various expertise of these labs. For example, the projects span from mitochondrial DNA replication, mitoribosome structure, to RNA processing. It is also a highly collaborative environment where we are regularly present progress reports on our data. REMIX also organizes various scientific workshops, seminars and provides courses on coding, scientific writing, and data visualisation.

What does your PhD project involve?

My project broadly involves studying the RNA granules within Mitochondria. Mitochondria are specialized organelles which carry copies of a small genome and expresses and regulates its genome and genetic products very differently to the genome in the nucleus of a cell. The processing of its RNA products is still not fully understood and a subject of ongoing study. In this effort, the Mitochondrial RNA Granules (MRGs) were newly discovered, dynamic membraneless structures which are complexes of RNA and protein. My lab has published pioneering work on these granules, showing that they are dedicated sites of RNA processing and mitoribosome assembly. To further our understanding of MRGs, I am focusing on their function in cancer cells where the mitochondrial function is greatly altered.

ITN REMIX
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As a PhD student in a MSCA-ITN, you are not only carrying out your own research project, but you will also complete research stints abroad. Can you share with us about your PhD journey so far and what the next year looks like?

The research stint or 'secondment' is a mandatory part of REMIX. We are obligated to carry out a part of our research in either a fellow lab within the network or an external relevant lab. I chose to perform my secondment at the Institute of Genetics and Molecular Medicine in Edinburgh, Scotland in the lab of Dr Ashish Dhir. He recently published a seminal paper on a further novel type of RNA granule in the mitochondria, that was linked to what I am working on. Just when we did not expect RNA granules to get more complex! Due to the funding of REMIX and Dr Dhir, I was able to spend 2 months in his lab. After previously having been in touch with him for a year and only having discussions online, the chance to work with him in person was incomparable. During this short time, accessibility to the facilities available in his institute to carry out experiments helped me gain key data that I needed to propel my project further

The end of this secondment marks the start of my final year, which is a daunting thought. However, I have a much clearer plan on how I want to publish my results and defend my thesis in a way that did not seem so tangible before.

What prompted you to pursue your PhD as part of a European ITN?

Studying MRGs was an appealing prospect as it was exciting to investigate something so new yet fundamental that was not in our textbooks yet. However, when I was considering my PhD application, I had never worked on a research project involving mitochondrial biology before. The fellowship of this project under the European ITN was, therefore, the main factor that tipped the scales in favour of accepting the position. I knew that I would be able to attend major conferences, which can be a struggle for many labs to fund their PhDs attendance. This also includes workshops, annual REMIX meetings and the secondments. I quickly realised that I had a golden opportunity that most PhD candidates only dream of!

How would you explain the advantages of doing a PhD as part of a European MSCA-ITN to our research community here in ASEAN?

I would say there are 2 main advantages. Firstly, the European community is tightly bound and highly collaborative, seeking experimental partnerships outside your institute or the country is commonplace. This is the culture that MSCA-ITN fosters by providing the multiple opportunities that I have mentioned. I believe scientific research is a communal activity and there are multiple anecdotes and examples of extremely successful collaborations between labs. Especially with a high density of excellent research institutes in Europe, being a researcher in Europe gives you accessibility to getting in touch with the right people who could progress your research.
Secondly, the culture and approach to science and open discussion are extremely different from what I had experienced in Singapore and possibly the ASEAN region. Personally, I have felt that there was a hierarchical barrier as a young student in Singapore to voice out my thoughts or to be bold enough to ask questions to more senior scientists that I was not familiar with. The experiences I have had within the MSCA-ITN have alleviated that feeling with time. During seminars or conferences, we were obligated to ask questions first before any of the group leaders, creating a fertile environment for discussion. There are also multiple informal sessions within our yearly conferences where it feels extremely natural to interact with everyone present. Not only is this a great way to discuss your work in a relaxed manner but it is crucial for networking.
By applying to a MSCA-ITN, you have already one foot in the door into an environment of excellent research and opportunities which will allow you to present your work regularly and gain the feedback and collaborations that could lead to a fruitful scientific career.

Can you tell us a little about the application process?

The application process has been slightly varied for all of us within REMIX. I applied directly to the University of Geneva's PhD

programme and during this process learned about the MCSA-ITN fellowship that was offered for the position in my laboratory.

Do you have any tips you would like to share with prospective applicants here in ASEAN that may consider applying to an opening on a MSCA-ITN?

From my experience, there are many paths to a MSCA-ITN fellowship. The most straightforward would be to regularly check the MSCA website for openings. Also, I would encourage them to contact the project manager of the network for further information. Usually, they would also have updated information on the availability of openings within a network and other details not found on the main website.
On a personal note, I would also encourage applicants to demonstrate their adaptability to various research environments. For example, my 2 different internships outside of my home university in Paris was an indication of this within my application. Although this may not be feasible for everyone, showing your potential range as a motivated researcher will go a long way.

As a researcher, which goals and ambitions do you have for your future career?

Coincidently, it was during a recent conference that was partly organized by our REMIX coordinators, that I attended a panel discussion on scientific editing. Editors of the journals from Nature publishing and Cell press were invited to speak to PhD candidates about their experiences as an editor and the publishing process on a whole. I had been tossing the idea of going into scientific publishing for a few years now, but I was more resolved after having the chance to speak to the Editors personally. I loved the idea that they were involved with different fields of biology and that they showed a deep commitment to scientific integrity and publishing robust, novel data. These qualities of their job resonated with me and cemented the idea of a future in publishing for myself and a possible alternative from a traditional research position.