

Talitha Müller



Give us a brief introduction about yourself.



My name is Talitha Müller. I am currently near the end of my PhD in Clinical Science and Immunology under the supervision of Prof Jonny Peter and Prof Edward Sturrock; and I just finished my 4th year of Medicine at UCT. I come from the Eastern Cape and have been living in Cape Town for the last 8 years while studying. I was homeschooled throughout my school years – and contrary to popular belief, it wasn't a socially isolating experience at all. I think one of the most valuable lessons my parents taught me while growing up, was how to discover new information for myself. Their memorable motto was: "If you don't know, look it up!" – and that has stood me in good stead. Although some days that becomes, "If you don't know, design a good experiment!"

I loved science and biology from early on, and when I completed high school by doing my A and AS levels, I managed

to attain the highest grade in SA for A level biology. I came to UCT in 2016 to start my MBChB, and I soon got excited about the possibility of embarking on the Intercalated Program (the UCT CSTP), to combine my love for people and my passion for science.

It feels a bit odd to put it in, but other major accolades would be, best student in the first year of the MBChB in 2016, Dean's Merit List 2017-2018, and UCT Vice Chancellor's Excellence Award Scholarship for my Master's in 2020.

Congratulations on being one of the recipients of the 2023 annual scholarship by the Skye Foundation. How did you get to hear about and what advice do you have for other postgraduate students on the lookout for funding options?

Thanks! My supervisor encouraged me to apply, and I saw the advert for the scholarship on the faculty mailing list. My advice would be – Apply, apply, apply! That, and read your UCT emails.

I have always had a mixed response to funding applications, with some rejections, but also some successes – I think it's mostly about taking every reasonable opportunity and applying as widely as possible. It's best to look proactively for funding calls – for example, on UCT's funding noticeboard, and ask your supervisor(s) for opportunities. It can be a lot of effort to apply for funding, but in the end it is worth it. As one of my mentors wisely said, "If you don't ask, you won't have." That, and don't be discouraged if you get some nos. If you ask enough times, someone is bound to say 'Yes!'.

You are part of the Intercalated MBChB-PhD track under the UCT CSTP (Clinician Scientist Training Program). How did you reach the decision to be part of a joint 2-degree program?

The CSTP was advertised in my second year of Medicine, and I was immediately interested in doing a full-time Honours in Medical Science after my third year of MBChB (the CSTP allows

for different levels of postgraduate study), before returning to 4th year Medicine. I was drawn to the program because of my love for science/discovery and interest in medical research since my high school days. However, I did not seriously consider embarking on a PhD at the time. Things only started to change during an opportunity of extended clinical exposure in the GSH Allergy Clinic, where I was enthusiastically shadowing the team for about a month. My current supervisor, Prof Jonny Peter (head of the Allergology Division), approached me – only a 2nd year at the time – and asked me if I wanted to do a PhD in his lab... He thinks big and is great at mentoring, and so that question was the start of broadening my career/research horizon.

What have been the up and downsides of usually having to tackle two degrees at the same time.

A significant reason that I decided to do a PhD in the middle of my medical degree was so that I would not have to do two degrees at the same time. I am the first woman (2nd student) in the faculty to take 4 years for full-time research in the middle of my MBChB. Most other students in the CSTP who wish to start a master's either do one concurrently over the last 3 years of their MBChB, or they wait until they finish their medical degree before formally continuing with research. I saw that it is very intense to be concurrently registered and decided instead to commit to the longer degree time, to do a full-time Masters and upgrade to PhD. This was a great decision, and it has been a really good experience for me. Like all PhDs, mine has taken longer than I originally planned and so I have spent the last year doing both degrees. It has been a challenging journey this year, particularly with having to put many things that I value and love doing on hold for the year. But it has been made possible through incredible support from my husband, family, my two great supervisors, and ultimately Jesus giving me the strength to see it through.

And since the undergraduate academic year finishes in November, I now finally have the time to throw all my weight into publications and the final parts of my PhD.

You mentioned that your PhD research is interdisciplinary. Care to tell us more about the focus of your research topic?

I am studying the effect that COVID-19 disease has on the renin angiotensin system (RAS) and its links to the immune response to COVID-19, across the spectrum of disease severity from asymptomatic infection to critical disease. The RAS is best known for controlling blood pressure, and along with a related system (the kallikrein kinin system) it has an important role in mediating chronic disease processes (either as organ protective or detrimentally), as well as interacting with the immune system. To determine how the RAS is dysregulated, and how this is linked to the immune response, we recruited a cohort of about 170 patients from Groote Schuur Hospital during 2020 and 2021, and obtained a variety of biological samples from them, blood and DNA. I then measured various enzyme activities and peptide levels in the blood of these patients. Our aim is to identify biomarkers that characterise and predict COVID-19 disease severity and outcome. A second arm of this interdisciplinary project is to link these pathophysiological mechanisms to genetic variants in our South African cohort.

What impact do you see your research work having in the field of Immunology and in the field of Medicine?

I hope that our work can help the scientific and medical community understand the pathophysiology of COVID-19 better, and particularly how important physiological systems like the RAS are interlinked with the immune response to infectious disease. We are also joining other researchers in the faculty and on the continent in making an important contribution to COVID-19 research from Africa, which is insufficiently covered but highly important due to the different genetic makeup of

the population – especially when it comes to these particular systems.

In terms of Medicine, it would be great if our findings could be taken forward and a clinically relevant biomarker panel developed to help predict COVID-19 disease progression, since it doesn't look like COVID-19 is going to leave the global scene any time soon.

I do not know if it is too early to tell, but are there any fields of medicine that you feel more inclined to specialize in or merge your PhD research with?

It is a bit early, as I still have two years of study and three years of working before, I can make any decisions on specialising. So, I am keeping my options open.

However, I am refining my longer-term research interests, which has been an exciting process. I am very interested in studying the integration of the RAS and related physiological systems with the immune system, particularly at the interface of chronic disease (like hypertension) and infectious diseases. I think that there is still a lot we don't know about the immune and immune-modifying functions of these physiological systems, and I would love to be part of discovering that in my future career!

Times are a bit more progressive than they were several years ago when it comes to support for female doctors, and more women in science, especially in academic research spaces. What support have you benefited from as part of the UCT CSTP and what do you think may still need to be addressed?

I have been very well supported by my course convenors, particularly by Prof Arie Katz who convenes and oversees the UCT CSTP, as well as by my two excellent supervisors, Prof Jonny Peter and Prof Ed Sturrock. They have been great mentors and very supportive of flexible working options (e.g. remote working from abroad at times as appropriate for the degree stage) and my exploring of different career options, while

encouraging me to push forward with my work outputs. I have really felt that they are on my side with my studies, and they have been available and approachable whenever I had concerns or needed guidance. I think especially having a primary supervisor who is a clinician scientist himself has been very helpful in navigating the return to Medicine – both in terms of the administrative processes, but also in terms of realistic expectations of my progress during dual registration.

I think one area that still needs to be addressed more is the support for family life as a woman in science. One of the best things that happened in my life while pursuing my PhD full-time was that I was able to get married. With that comes the desire to eventually start a family, and I think particularly with the extension of the medical degree time (from a total of 6 years to a total of 10), there should be more conversation about the normalcy of maternity leave if desired, and work arrangements that are compatible with caring for children. This conversation has not come up yet in my case, but I think that investing in family life should be considered a normal part of a graduate student's life, as it is in some other countries. Instead, I perceive the expectation that one should only have children at a nearly "advanced maternal age" in one's mid-to-late 30s when finished with our educational obligations – especially since, as another researcher pointed out, there isn't really a finish line when it comes to research in academia. In general, it feels like having a family is often seen as a career disadvantage, when it is such an advantage in life. I believe that to invest in family life and to be happy and well supported at home is a career advantage, as it makes for a more sustainable career, and I would love to see women supported to do this if they desire to.

What words of wisdom do you have for graduate students that are interested in having careers in medicine and as researchers?

I think the first thing is to find good mentors, academics and clinicians that you can look up to. From there, find your passion and invest in it; remember that the kind of supervisor you have is more important than your project topic. Keep an open mind, especially in the beginning and allow yourself to explore different areas, even ones you are not necessarily familiar with or drawn to immediately as you might be surprised by what interests you may develop within a passionate environment. I will say that having an MBChB is an advantage when it comes to conducting clinical research, so it is something to consider if that is your interest. However, there are many different ways to reach a goal, and that is only one of them. Be interested, show up, and reach out to researchers whose work interests you. That way, opportunities are likely to come your way to further your training and career.

What do you enjoy the most in Cape Town and feel everyone should get an opportunity to be part of once they are here.

The mountain! I never tire of seeing the natural beauty of Cape Town so close by and so accessible. There is a lot to do in Cape Town, for people of every interest, so one is unlikely to be bored. But for me personally, I love that an escape in nature is only a short drive away.

Interview by Vanessa Muwanga