

Practicum Pods Episode 31: Nana Yansane

Episode Transcript

Interviewer: Aydin Linzey

Interviewee: Nana Yansane

[INTRO]

[00:00:00] **Aydin:** Hello everyone. Welcome to the Global Disease Biology Practicum Pods. In this podcast series, we will be talking about practicum projects with current and former GDB students. All students in the major are required to complete a practicum project before graduation. This project involves students finding a faculty mentor, conducting research under the mentor's guidance, and turning their research experiences into a publishable scientific manuscript. Tune into Practicum pods to learn more about research, mentors, and the GDB practicum experience.

[TRANSITION]

[00:00:48] **Aydin:** Welcome to the pod. I am your host, GDB Peer advisor, Aydin Lindzey. I use he/him pronouns. Today I am joined on the show by the lovely Nana. Nana, would you like to introduce yourself and share your practicum title with us?

[00:01:02] **Nana:** Hey Aydin. Yes. Thank you. My name is Nana Yansane and my practicum title is "SQR Expression Maintains Intestinal Hypoxia Which Prevents Facultative Anaerobe Growth in the Murine Gut".

[00:01:16] **Aydin:** Awesome. Well, thank you so much for joining us Nana. How are you doing?

[00:01:20] **Nana:** I'm doing great. Thank you so much for having me. How are you doing?

[00:01:23] **Aydin:** I'm doing pretty well. Thank you for asking. So your title sounds very long, but exciting. So I'd like to dive more into that. So in that vein, can you tell us a little bit more about your topic and why does this topic interest you?

[00:01:37] **Nana:** Yes, so my practicum was done in the Bäumler lab in the medical microbiology and immunology department at the UC Davis Genome Center. I focused on how the gut stays hypoxic, meaning really low in oxygen, and how that hypoxic

environment is essential for normal gut homeostasis. So I've been focusing specifically on a protein in intestinal epithelial cells called Sqr, which stands for sulfide quinone oxidoreductase, how it helps maintain intestinal hypoxia, and its role in the body. Sqr works by detoxifying hydrogen sulfide and consuming oxygen at the same time. And we're trying to see how this sqr-mediated hydrogen sulfide detoxification would stimulate mitochondrial oxygen consumption. So hydrogen sulfide is naturally fermented in the gut, but it can be toxic in higher levels. So sqr helps by detoxifying it while also consuming oxygen in the same process. It's a pretty important protein because when it's not working or it's deficient, oxygen can build up in the gut, and that's not what we want because the gut is supposed to be hypoxic. So higher oxygen levels are unfavorable because they promote the growth of facultative anaerobes, and a reduction of obligate anaerobes, which are what we want.

Essentially, sqr is a really important, valuable post-derived mechanism. We need to keep our micro- our microbial ecosystem balanced, and it sort of sets the stage for which kind of bacteria will grow in our intestines. I did all my research on mice, but studying how the gut maintains a hypoxic environment is pretty important to understanding how dysbiosis occurs. Dysbiosis and imbalance in the gut microbiome could also be associated with, like, inflammatory bowel diseases such as Crohn's disease or ulcerative colitis and understanding how oxygen levels are related can help identify possible therapy measures.

This topic interested me a lot because we know that gut health is really connected to our overall health, and I like understanding how metabolism helps shape our microbiome. I've always been interested in gut health and have considered it to be like a really big component to our normal function, and I do remember taking our GDB 103 course, where we covered the microbiome in people, plants, and animals, and focusing on the function of host microbial communities and the relationships with health and disease and found it really relevant to the research I've done, so I really gained a lot of interest over time.

[00:03:59] **Aydin:** That's fantastic. I, I love the plug for GDB 103. I also took that class and I think it's really fascinating stuff and it sounds like your research is cutting edge and I'm, I'm really excited to hear about it. Thank you for sharing. So how did you find your practicum mentor and what resources helped you the most as you searched for a faculty member to conduct research with?

[00:04:24] **Nana:** So, during the winter quarter of last school year, so in winter 2024, I was in the process of looking for a practicum mentor and had already sent multiple emails out. um, as a first year transfer, at the time I was still getting emails from like residential advisors and the transfer center about like different campus events, and one of them I noticed a flyer for a presentation that would be done by Dr. Bäumlér, the PI of my lab, on

the like benefits and details of undergraduate research. And I recognized his name in my search in- in my search for a practicum mentor and decided to attend because I did recall that his lab was focusing on microbiology and immunology, which was something I was really interested in at the time. So I decided to attend the presentation and after it I approached him and the grad student he presented with and just expressed my interest in the focus of the lab and potentially joining and also like the practicum project. The conversation went pretty good. So he told me to email him and then things kind of started from there. He- Dr. Bäumler is the PI of the lab, though I did all of my research under the guidance of an amazing postdoc, Dr. Anaïs Larabi, basically tagging onto her current project and focuses. There were, there was a lot of cold emailing professors and PIs of labs while looking for a practicum mentor, and I got like some responses and some were not responded to, which I was a little upset about in the moment, but- and I did have an interview actually, aside from the one with the Bäumler lab and was extremely interested in their research as well, but I found that the Bäumler Lab's focus was more aligned with my interests. But, um, I did appreciate the conversation I had with Dr. Larabi as well during the interview, and it was clear that she was really willing to help me with the practicum and creating a manuscript when it came down to it.

So for resources, I kind of just like recommend like keeping an eye out for these types of presentations promoted through flyers and emails from either like housing, the career center, and I know the GDB advising team sends like weekly emails as well that include like the occasional job opportunity and just kind of like keeping up to date with PIs and having like a thorough search.

[00:06:22] **Aydin:** Absolutely. I, I really appreciate you talking about how going up to the PI and in person is, it's a very effective strategy, and cold emailing does work, but it's more difficult and it can be a little, I would say, a disappointing sometimes, maybe. But I am, I'm glad that you had a great experience with your PI and as a first year transfer as well, it is, it's difficult for us to find research so quickly, so, um, congrats. That's awesome.

[00:06:56] **Nana:** Thank you.

[00:06:56] **Aydin:** So moving along, what type of research did you engage in? Was it virtual or in person?

[00:07:02] **Nana:** So, all of my research was in person. I did start out as a general student lab worker for several months to learn where everything was in the lab and understand like the way they function. So I learned how to make basic things such as agar plates and antibiotics, regents, and like the preparation of commonly used lab materials. Once I got more familiar with the lab, I began learning more specific research techniques under the

guidance of Dr. Larabi. And my research was very hands on experimental, which exactly what I wanted. So some types of research- I started out with, like, immunofluorescence staining of mouse tissue section. Specifically like the ileum, the cecum, and the proximal colon to detect proteins and hypoxia. I also did some DNA extractions for 16S RNA sequencing to study bacterial composition, performed PCR, I helped with necropsies for tissue collection and did serial dilutions of fecal samples for plating and colony counting. So very like microbiology lab.

Aside from wet lab work, I got some experience with dry lab work as well. That looked like analyzing images of stain slides and making charts with programs using data grabbed from the images, and creating graphs of collected genotyping data. I am still in the process of all the dry lab work as I started typing my manuscript, but both experiences give like a well rounded view of my research process.

[00:08:23] **Aydin:** Sounds like a lot of interesting techniques that you may be able to use further down the line. Kind of in line with that, do you think that you're going to continue with this research as you go forward in life?

[00:08:33] **Nana:** I do think so. I've gained more of an interest in the actual research aspect of everything, the like physical work, and I really enjoyed it. So after graduation, I do hope to continue working in the lab, either like doing research with someone else in like time before continuing in education or in like industry work, kind of learning how that environment is. But I'm definitely thinking of continuing these types of research activities.

[00:08:58] **Aydin:** Fantastic. Do you think that you'll be going to grad school as a result for that kind of work, or do you, you're going to use your bachelor's first?

[00:09:08] **Nana:** I plan to use my Bachelor's first for at least a year, but grad school is definitely something that I'm planning for, um, at least taking like a year off to kind of see what I'd like to do in like the fields. And then, yeah, grad school for sure. I'd love to conduct my own research.

[00:09:25] **Aydin:** Okay. Perfect. That's fantastic. Glad to hear that. Uh, so my next question going along, it sounds like you were doing some experimental data and your typical research was focused on these tech- lab techniques, microbiome analysis. Right. What was your relationship with your overall mentor. I know you said you've worked with the postdocs, but um, with your mentor, did you see them frequently? Did you work with them at all, like in person or on the writing aspect of your report?

[00:09:56] **Nana:** Um, with my mentor, like on record the PI of my lab Dr. Bäumlér, he's kind of like, um, someone who overlooked everything in the lab and kind of like checked in

on research grad students and post docs were doing, so I didn't have regular meeting with him aside from the general updating on like my practicum experience and like reaching out to the advising team to like let them know that I would be working in his lab with someone in his lab. And so I considered my mentor to, and the person I worked more with, to sort of be the postdoc I was working with, Dr. Larabi, and I had a great relationship with her I think. She was incredibly knowledgeable about like the gut microbiota and interactions that occur and she made learning more about the complex topic, and all the different lab procedures, really approachable. For help with writing, I definitely reached out to her when it seemed like it was time to start writing, and when I was clear that I had enough data to start typing up portions, just the methods and the backgrounds, and I asked about formatting and structure and I was able to get great advice on where to start and how to approach writing everything up. The meeting was like honestly a huge help because it was a bit nerveracking thinking about actually sitting down to start writing, and just having that open communication really helped me feel more confident moving forward in the actual typing of the manuscript. So I did keep in contact with her about things like that. And then throughout the process and research.

[00:11:16] **Aydin:** Oh, wonderful. Okay, so your relationship with your mentor sounds fantastic and I'm so glad that you had that experience. Generally, most of our students have a really wonderful relationship with their mentor and they get a lot of help and support throughout the whole process, which is the whole point of this GDB practicum. So I have one final question for you, Nana. What was your favorite part of the GDB practicum experience?

[00:11:40] **Nana:** That is a good question. My favorite part may have actually been seeing things that I had learned in past courses show up in a real research setting. I was able to recognize concepts I'd learned about in courses such as gene expression, biochemistry and microbiology, and also GDB 103 and also some restricted electives that I'd taken, like immunology. So it was really cool coming across topics I'd only learned about in an academic setting in a lab environment, specifically, like understanding metabolic pathways and microbial interactions. And seeing how those topics apply to real research made everything feel more meaningful and like the process of taking classes and my time here at UC Davis, and it did really help me understand material on a bit of a deeper level. That's basically what my favorite part was. I think I just, I loved the connection.

[00:12:26] **Aydin:** Wonderful. I, I think that there's a stereotype that we don't have as much connection between learning and the job or the experience in real life, so it's wonderful that you had that continuity. I think that GDB does have a wide breadth of knowledge that teaches, and so I think that can, we can learn a lot from that and apply it to our real life.

[TRANSITION]

[00:12:52] **Aydin:** Well, thank you so much, Nana, for chatting with us about your GDB practicum experience. Our students are so excited to hear about these projects and learn how to approach research in a large university setting. You can visit gdb.ucdavis.edu to access the rest of the podcast in a series, or you can find us on Spotify. If you like listening to Practicum Pods and have suggestions for future topics for the pod, please let the GDB advising staff know at gdb-advise@ucdavis.edu. Thanks everyone, and have a great week.