

Lalita Ramakrishnan, PhD Microbiologist



Microbiologist **Lalita Ramakrishnan, PhD**

Place of Employment:
University of Washington
Type of Research:
Tuberculosis infection
Model Organism:
Zebrafish

Zebrafish are naturally susceptible to tuberculosis. Because their genes are fairly easy to manipulate, we can create some zebrafish that are susceptible to TB and some that are resistant to TB. Zebrafish are also good model organisms because they are transparent, so we can watch the infection process develop.

Careers in the Spotlight: **Microbiologist**

What do they do?

Microbiologists study microbes: bacteria, viruses, fungi, and protists. Dr. Ramakrishnan is an expert in tuberculosis, a type of bacteria that infects almost of third of humanity worldwide. She also studies immunology, including the body's reaction to or defense from microbes.

What kind of training is involved?

Most Microbiologists who run their own lab have a Bachelor's degree and a PhD (which is usually 5-6 years of research training). However, each lab often employs scientists with diverse backgrounds, including people with Associate's, Bachelor's, and Master's degrees.

What is a typical salary for a Microbiologist?

Associate's degree: \$35,000/year (\$17.50/hour)

PhD, Full Professor: \$100,000/year or more (\$48.00/hour)

Source: Bureau of Labor and Statistics

1. Where did you grow up?

I grew up in a small town in India called Baroda. The name of the town has now changed to its Pre-British name, Vadodara, which means City of the Banyon Tree.

2. What do you do (i.e. what career or field are you in, what is the title of your position)?

I am a Professor of Microbiology and Medicine at the University of Washington. Mostly I do research in tuberculosis, train students and Postdoctoral Fellows (which are people with a PhD who are looking for further training). I also spend a small part of my time as an infectious disease doctor.

3. How did you choose your career? When did you first know this is the career you wanted?

No, I wouldn't say that I always knew that I wanted to do this. When I grew up in India, I was a pretty good student, but I wasn't particularly good at one thing versus another, so the default in my community was to go to medical school. This was based on your class rank order in school, not like here in America where you have to do lots of stuff specifically to get in to medical school. But I was unhappy in medical school. I was unhappy seeing all of the disease and poverty, and lots of rote learning, which is what medical school in India was like back then. I decided to get a PhD after medical school, so I got a scholarship for a PhD program here in America, in Immunology. Then I did a medical residency related to Immunology, and then went back to research.

4. Did your family support your decision to pursue your career?

I have a feeling – my parents were both scientists. I think my dad was pretty keen on having a doctor in the family, because this was a big deal. My brother went in to physics. I actually thought about going in to physics, too, but I wasn't as good at it as my brother. So I stayed at home and went to the local medical school, but when they saw how unhappy I was, they supported the change to research.

5. What is the highest level of education you have?

PhD

6. What is the highest level of education reached by other members of your family?

Both of my parents have PhDs. We are a family of PhDs! My mom is an Experimental Psychologist, and went to McGill. My brother, Venkatraman Ramakrishnan, recently won the Nobel Prize in Chemistry, along with Thomas Steitz and Ada Yonath, for having shown what the ribosome looks like on the atomic level, and how it functions.

7. What is the salary range for a person in your position?

It varies a lot, depending on where you do your research, whether you're in the College of Arts and Sciences, or associated with the medical school, but you usually start around \$80,000-\$90,000 per year (\$38-\$43/hour). There's no cap, and some researchers probably make in the high hundreds of thousands.

8. What do you like most about your job?

Well, I think two things: First, I love the sleuthing aspect of it and the puzzle solving. Second, I like interacting with young people. I interact with a lot of smart young people!

9. What do you like least about your job?

I dislike a lot of the bureaucratic work, scrambling for money for research, and also if things with personnel in the lab aren't going well, that is unpleasant, but that doesn't happen much.

10. What's an abbreviated day-in-the-life of your job?

It's been a long time since I worked in the lab myself. It's a pity, but that's how it goes! Much of the actual day-to-day lab work is done by laboratory technicians, graduate students, and postdoctoral fellows ("Postdocs"). Depending on when it is, like now, I'm working on writing a paper [for a scientific publication], which is based on five years of lab work. It's a complicated story, so I spend a lot of time on that. I talk to everyone in the lab, see what they're doing, see if they need help. Lots of meetings with students and Postdocs, to see if they need help. I do lots of reading, writing, and talking to people, some administrative stuff. I sometimes give formal lectures to classes, maybe 16-20 hours per year.

11. How would you describe how you use bioinformatics in your work? If you don't use bioinformatics directly in your work, how has bioinformatics impacted your career field?

Our work has been impacted tremendously by bioinformatics. We study tuberculosis (or "TB"), so the fact that in 1998 the sequence of the organism, *Mycobacterium tuberculosis*, was published has been an unimaginable boon. I study TB in zebrafish as a model organism, and the zebrafish genome has also been sequenced, so when we make mutations in the zebrafish or TB, we know exactly where those mutations are, and we can see if they have an impact. The impact of this on our work is just huge.

12. Do you have any recommendations for students who are interested in entering your field?

As you proceed in life, it will become clear to you if something is not right for you. During undergrad in college and beyond, know yourself, and know that what you want and need will be constantly changing. Value

serendipity! [Serendipity is when you make a fortunate discovery when you are looking for something unrelated, like Dr. Ramakrishnan going to medical school, only to discover that she really wanted to work in research.]

13. What are your favorite hobbies?

Very simple ones. I like to ride my bike, run, garden, read and cook.

Resources:

- Dr. Lalita Ramakrishnan's Homepage:
<http://depts.washington.edu/immunweb/faculty/profiles/ramakrishnan.htm>
- To learn about **job prospects** and **salary information** for Biological Scientists, including Microbiologists, visit the US Bureau of Labor Statistics: <http://www.bls.gov/oco/ocos047.htm>
- The American Society for Microbiology has career information for students:
<http://www.asm.org/index.php/education/career-resources.html>