

## **Medical student research opportunities with Leelabati Biswas [Podcast]**

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# AMA UPDATE



## AMA Update

### Medical student research opportunities with Leelabati Biswas

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## Featured topic and speakers

In today's AMA Update, Leela Biswas, an MD/PhD candidate at Rutgers Robert Wood Johnson Medical School, is this year's AMA Research Challenge winner, which comes with a \$10,000 grand prize sponsored by Laurel Road. She discusses medical student research grants and funding, tips for finding a mentor, and more about her winning research: "Decoding Pregnancy Loss, Validating a Novel Genetic Biomarker of Poor Egg Quality." AMA Chief Experience Officer Todd Unger hosts.

Watch 2022 AMA Research Challenge finals.

Read Leela's "Validating a genetic biomarker tied to miscarriages" research submission.

## Speaker

- Leela Biswas, an MD/PhD candidate, Rutgers Robert Wood Johnson Medical School

## Transcript

**Unger:** Hello and welcome to the AMA Update video and podcast. Today, we're joined by Leela Biswas, an MD/PhD candidate at Rutgers Robert Wood Johnson Medical School, in New Brunswick, New Jersey, and also, this year's winner of the AMA Research Challenge event, which I had the pleasure of hosting, just a few days ago. We're going to talk to her about her research journey and what it feels like to be a winner of the \$10,000 grand prize. I'm Todd Unger, AMA's chief experience officer, in Chicago. Leela, welcome.

**Biswas:** Hi, Todd. How are you? Great to see you.

**Unger:** I'm great. I bet you're feeling pretty good. It was kind of a good week for you. Huh?

**Biswas:** Yes, an excellent week, very exciting.

**Unger:** Well, congrats again on winning the \$10,000 grand prize for the AMA Research Challenge. That's provided by our friends at Laurel Road. Thank you, Laurel Road. Before we dive in, I thought it'd be fun just to watch that moment you won. How does it feel to be the winner of the 2022 AMA Research Challenge with a grand prize of \$10,000?

**Biswas:** I'm shocked. Oh my goodness, my heart is beating really quickly. Wow. I'm very surprised. I was anticipating a lot of questions and I was excited for a follow-up discussion on the research, but this is really great news.

I'm very flattered, because the research from my colleagues, in both the semi-finals and the finals, was outstanding. I was in just an incomparable group of exciting clinicians and student researchers. So I feel very lucky to be selected as the winner. I'm very flattered. Thank you so much.

**Unger:** That was really fun. That was a great reaction. As you know, winning the AMA Research Challenge, it's a big accomplishment.

There were 1,200 entries for the event, which is a record. And then you were selected by an elite panel of judges—Dr. Kirsten Bibbins-Domingo, Dr. Sanjay Desai and Dr. Clyde Yancy—to win this year's Research Challenge. Did you think you were going to come out on top of that?

**Biswas:** Well, it was an amazing field of competitors, from the semifinalists all the way down to five incredible finalists, ranging in research from resuscitation devices to AI detection of pancreatic cancer. It was absolutely spectacular. So I was amazed to be selected, just because the field was so spectacular. If you haven't watched it, check it out. It's amazing.

**Unger:** Now, you said, you've got an extra long amount of school and training. It sounded about 40 years that this money is going to come in handy. Is that right?

**Biswas:** Yeah. Yeah. So it's an eight-year program. So so many expenses associated with that, and I know Laurel Road is very familiar with that experience for a lot of students. And so this will be really helpful in helping to move that along and so I can become a physician scientist. Get to residency, get to fellowship and then make it over the final hump. And hopefully, have a faculty position and do some more meaningful research that changes patient care.

**Unger:** Well, one thing you said was, the reason you entered the challenge was to get different perspectives and feedback that really crossed specialty. This is a multi-specialty event, of course. Tell us more about that and why it was such an important motivator for you and piece of research in general.

**Biswas:** Yeah. Medicine is an interdisciplinary profession by its very nature. Every person is made up of so many different organ systems, as we know from just the preclinical curriculum, and all of those continue to interact for the rest of a person's life. And as we go along, the medical care team is led by physicians from many, many, many different disciplines, and it's important that we can all talk to each other.

And the field that I'm in, it's certainly fertility and obstetrics, but it's also precision medicine, and precision medicine crosses every discipline. So it was really important for me to see how other physicians and other fields thought about my research.

The way they think about their clinical problems is different from the way another physician might and so those perspectives really enhance the kind of research that we're doing. The more physicians can talk to each other, discipline to discipline, the better patient care is and the more that we can do for patients.

**Unger:** Now, every great piece of research starts with a really great, interesting, important question. What were you trying to solve with this?

**Biswas:** Yeah. So right now, the only biomarker that we have for a woman's egg quality, how good her eggs are in terms of chromosomal abnormality, is maternal age. But there are patients who have poor quality eggs at the optimal age window. So right now, patients think, late 20s, early 30s, great time to get pregnant.

And for most people, it is, but there are people who don't fit that paradigm. And they try to get pregnant for a year, then they end up in the IVF clinic. They go through an IVF cycle and they find out that, even though on paper clinically they look great, their age is perfect, that 80%, 100% of their embryos are chromosomally abnormal and that's devastating. It's so expensive. It's emotionally taxing.

And so we want to change that paradigm. We want to take a huge step back, before people are trying to get pregnant and say, can we identify people who are not going to do well in advance? And then that information will allow clinicians and physicians and the patients to work together to design a care plan that actually optimizes pregnancy outcomes from the get go, rather than trying and failing and not knowing what's going on. We're empowering patients and physicians to make more personalized decisions.

**Unger:** Leela, the way that you just described it is really compelling, because I'm sure that waiting time, when somebody's figuring out, this is not going as planned, that is really painful. So what you're saying is very meaningful and the science is what the judges really circled in on. We said it was very compelling. What was unique about your approach in doing this work?

**Biswas:** It is devastating. You're totally right, Todd, and that's why we were excited about this question. We wanted to make changes for patients. And in terms of the science, there were a couple of things that were really unique about the way that we did this.

So this is an NIH-funded project, led by my PI, Karen Schindler, and our collaborator, Dr. Jinchuan Xing and they took a couple of really interesting approaches in terms of designing the experiment. So one is we're focusing on patients who are clinically normal, clinically look great, but have this puzzle of a problem. So like I said, they're coming into clinic and they seem totally normal, but then things are not working out after trying for pregnancy.

And so by taking a population that we don't ordinarily think of as having a disease in the first place, we're able to actually look at people in a more personalized way and so that was really unique here. We're really digging into what makes me, me and what makes you, you and how that affects our health care in general and our health throughout our lifespan.

And then another thing was the experimental design. So here, we took genomic or genetic information from patients and then we brought that into the laboratory. And we were able to do an efficient screening using cells in a dish, but then we all know that cells in a dish aren't people and they aren't even full organisms.

So we were able to do that efficient screening and testing of variants and cells in a dish and then bring that back and test it rigorously using a whole organism, so a whole mouse model, which is the more expensive piece.

So we were able to do really robust science, while being really efficient and smart about it. And I think that was elegant about the study and that's what the judges appreciated. And ultimately, it makes it more translational and more able to be rapidly translated into the clinic, and that's what we're excited about.

**Unger:** What do you think would be the long-term impact here, if you could identify a marker like this? How is that going to change things going forward?

**Biswas:** Yeah. So what I think is that we will be able to identify and validate variants like this long term.

I think this is an identifiable genetic basis of a real phenotype and in the clinic, my hope that is whenever we're able to fully translate all of this to the clinic, whether it's this variant or other variants, that patients well before they're interested in conceiving would come in and get a genetic test, which is just a blood test, that would give physicians and patients insight into how a patient's eggs are likely to perform long term. So it's not just maternal age.

Maternal age is important, but bringing in that genetic piece from the beginning, so that people can plan their reproductive future. It's about empowering patients, empowering physicians with all of the information, so that they can make decisions that actually optimize the pregnancy outcomes from the get go. So early genetic testing, rather than trying and failing and then being devastated.

**Unger:** Now, it sounds like you had tremendous support from some terrific mentors. What's your advice to other medical students out there who they don't know where to start? How do you get connected with mentors in this to help jumpstart your research career?

**Biswas:** Yeah. It can be really tricky and intimidating, when you're in school and you want to get into research, and you just don't know where to begin. So I think a couple of things are at play. So one thing is be open to opportunities. Sometimes, you'll get emails or see a news report about a PI that's really interesting to you.

Don't be afraid to cold-email people and reach out. Send them your resume. Tell them why you're interested and say, "Hey, I don't have a lot of experience, but I'm enthusiastic to learn and eager to jump into the lab or into your clinical research project. Is there any way that I could help out?"

I think just taking opportunities and then also being open to serendipity. So I have my wonderful, amazing PI in the laboratory and she is my key research mentor, Dr. Karen Schindler. But then I also have other mentors that I've gained through just going through medical school and being open.

So, for example, I recently did a course in Woods Hole, up in Massachusetts, at the storied marine biological laboratories, which is amazing. And there, I got to meet another clinician scientist mentor, Dr. Elizabeth Taglauer, who's been mentoring me in terms of career planning and being a physician-scientist and moving through this process.

And so you have to be open to all the different opportunities that are out there. Take opportunities when they come and just be enthusiastic. Be excited and when you get knocked down, got to stand back up and keep trying.

**Unger:** Well, Leela, obviously, research doesn't turn out the way you think it will all the time, and that get back up, dust yourself off and keep testing, that's really important. Obviously, lots of challenges in starting a career as a physician-scientist and the Research Challenge is the way that AMA is really trying to help folks out there get that career started. Is there any other way that the AMA can help students like you get their research careers going?

**Biswas:** Yeah, absolutely. The AMA is nationally, and perhaps internationally, known as the most robust physician advocacy organization in the nation. And in terms of the advocacy, they can do for increasing residency slots, so that we can produce more physicians.



The more physicians that we have in general, the more physician-scientists we can have as well. Every physician has questions that they identify in the clinic, has curiosity and can do some kind of research in some way, whether it's basic research, translational research, clinical research, small, big, it doesn't matter. Every physician is poised to move science and medicine forward for the betterment of patients.

In addition, advocating for more NIH funding. So funding from the National Institutes of Health is critical for doing medical research. These kinds of studies are extremely expensive, and we need to invest in both basic and clinical research to keep moving medicine forward.

I think those are really important, and then as a student, I think joining the AMA, connecting with other physicians, gaining some of that professional development skills and doing things like the Research Challenge. Taking opportunities to develop your research, learn how to present, gain feedback other people, other disciplines, so important, so impactful. So those are things that the AMA is doing and can do in the future as well.

**Unger:** Well, I hope we played a part in launching your obviously exciting career as a physician-scientist. I just want to say congratulations again on your accomplishments and thank you again to Laurel Road for sponsoring the \$10,000 grand prize for a second year in a row.

I'd just like to encourage everybody out there, all you medical students, residents, international medical graduates, interested and jumpstarting your research career, do what Leela did and make sure that you submit your research proposal for next year's Research Challenge.

Also, if you want to see how it's really done well, take a look at the Research Challenge, which is up in full on AMA's YouTube channel. You can see all of the presentations, all the judging and see exactly how it goes. And everyone, thanks for joining us today. You can find all our videos at [ama-assn.org/podcasts](https://ama-assn.org/podcasts). Thanks for joining us today and please, take care.

**Biswas:** Thank you, Todd, and thank you to Laurel Road and all of the viewers.

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