FUTURUM
PODCAST

Dr. Bumsoo Ahn

In this podcast, **Dr. Bumsoo Ahn** from **Wake Forest University School of Medicine** discusses the excitement of making new scientific discoveries, how trial and error can be useful both in the lab and in our career journeys, and how his experiences serving in the South Korean army have shaped his life and career.

Break the podcast down:

00:57: Hello Bumsoo! Welcome to the Futurum Careers podcast. How are you today?
I'm doing great. Thank you for having me.

Thank you for coming on. So, I start these podcasts with three quick-fire questions, just so we can get to know you a little bit better. The first question is, what's your favorite place to travel to?
South Korea. My kids are very close to their grandparents, so every summer our entire family visits South Korea.

And the next question is, what's your biggest fear?
Oh, my biggest fear would be disease. Still being alive, not being able to do things that I was doing before.

And the last question is, if you could be any animal, what animal would you be and why?
I would like to be any bird because they can freely fly around. That freedom and the breeze in the air, I think that would be great.

01:50: So, you're a mitochondrial biologist and you're exploring new ways to treat sarcopenia. Could you explain to our listeners what sarcopenia is and a little bit about your research and how you're working on that?
Sarcopenia is the loss of muscle mass and function, and it impacts mobility and independence in older adults. I'm very interested in how mitochondria play a role in the mobility decline in sarcopenia. Mitochondria are the main source of energy, as we know, and they're also the main place where the free radicals and reactive oxygen species are produced that cause damage to proteins. So, we use dysfunctional mitochondria and look at how they protect against or accelerate sarcopenia in animal models. And we also look at data from human studies and try to connect the animal findings to humans.

In addition to looking at the role of mitochondria in sarcopenia, we are also interested in interventions that enhance muscle mass. Unacylated ghrelin has been shown to promote muscle growth in animals, but it has not been tested in aging contexts. So, in the past three to four years, we were studying unacylated ghrelin to see if that enhances muscle growth. We also found that it enhances mitochondrial bioenergetics.

03:20: Great. So now if we can talk a little bit about your personal career journey... When you were growing up, you played a lot of sport, so how did that influence your career ambitions or your career trajectory?
Yeah. Like you said, growing up, I was involved in a lot of physical activities. At one point, I wanted to be a soccer player, but I didn't have an opportunity to do that. I was always curious when I exercised about my heart beating faster and my muscles growing bigger, and also when I stopped exercising, my heart didn't become normal right away, it takes some time [to slow down], and why is that? I had these questions growing up, and so I went to college in South Korea and took classes in exercise physiology. And I wanted to study further, so that's how I came to the United States to graduate school.

In the Futurum brochure, you mentioned that you spent a few years in industry before you went back to university and academia. Could you tell us a little bit about what you learned from that experience?
Yeah. My industry experience had nothing to do with physiology or academia. I was a consultant, and so I was the person who was making sure that the business owners are in agreement with our policies and things like that. So, I guess the biggest lesson that I learned from that experience, I would say, is I learned that I really wanted to come back to academia. It was a great company, I worked for them for three years, but at the end of the day, the ownership of my work is with the company, not with me. And that was the main driver of returning to work in a lab. I have

the ownership of my findings, my papers, my grants. And so, I realized that I wanted that, and I only knew that by working for the company.

And when you came back to academia, how did that feel? Were you excited? Were you nervous? Were there challenges in terms of getting back into the swing of things?
I was nervous because three years is not short, it's a long time. But I also found it exciting. America is a different country from South Korea. It's culturally very different, it has a different language. And I had also been away from the academia environment for a long time. So, it was nervous but also exciting.

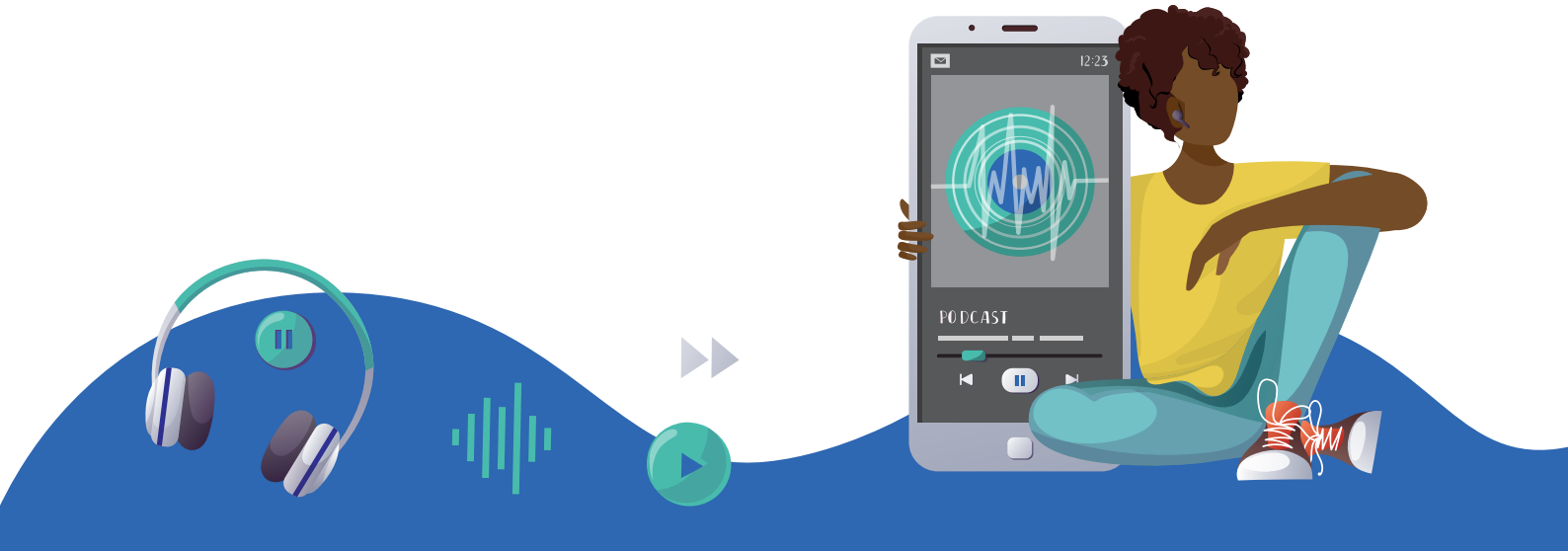
05:50: And since then, throughout the rest of your career, what other challenges have you faced along the way and how have you overcome them?
Yeah, so I would say the project that I'm working on, the ghrelin study [has been challenging]. As a postdoc, I was working on this hormone, ghrelin, which is known as the hunger hormone. So, it's known to increase appetite. That's the acylated ghrelin. And that's actually what I was first interested in studying, because as we age, we lose appetite. And increased nutrition and food consumption would help grow the muscles. And that was actually the first idea that I had for this grant. So, the acylated ghrelin binds to a receptor in the brain that increases appetite. We used a drug that activates this specific receptor that increases appetite. And when we did the experiment in animals, we actually found the opposite of what others have reported. It actually increased not much muscle mass, but fat mass. It increased body weight. And fat is known to impair contractile function of muscle. So, it was actually opposite to our hypothesis. And the foundation was already funding my study, and after that funding, I found these results. So then I went back to the literature and found that muscle cells with acylated or unacylated ghrelin enhance muscle growth. And unacylated ghrelin does not increase appetite, so there is no increase in fat gain. And then we did this study and that's when we found this exciting data. So that was a big challenge, but it turned out great.

07:31: I guess part of the fun of being a scientist is being able to explore these questions that no one knows the answer to, and seeing where that path leads you.

So, for young students who are considering getting into a career in STEM or a career in medicine, how can they find practical opportunities in the field to get experience that will help them in their career?
To work in a lab, I think that's really good for them, because they will learn what it is like to run experiments, and trial and error, and how good they are. So, it's to test their passion for science and to figure out whether they like this type of research. By experiencing; I think that's the best way. Maybe the only way. So, try different labs. There are some basic science labs, clinical research labs, data science labs. The approach to science is very different. Even studying the same... for example, aging biology, these people will have very different approaches. So, I would recommend doing these voluntary activities either during the semester, and I also know that there are some summer training opportunities nationwide. So, I think tapping different lab experience. I think that would be the best way to go about it.

So there's an element of trying a few different things to see what fits for you. I guess it's kind of like in experiments, when you're trying to find the answer to these questions, you have to try a few different approaches before you find the answer. And I guess it's the same with a career. You're not always going to make the right decision straight away.
Yeah. It's like trial and error. Not just in life experience, but lab experience too, right? Trial and error is not seen in the literature. We don't discuss what failed. And we get to see the successful experiments only. It's hidden, but it's a really important part of science. Actually, maybe eighty to ninety percent of the time spent in the lab is trying something, and it didn't work, and figuring out how to make that work. Being able to do that is very important. So, trying one lab and it didn't work... Maybe you are a better fit in a different approach.

09:48: Now I want to ask you about something that you mentioned in the Futurum brochure from back when you were in South Korea, when you did your army service. You mentioned that you had to do some parachute jumping, and I wondered if you could tell us a little bit about that, because that sounds like quite the experience!
Army duty in South Korea is mandatory. So, in the first place, I never wanted to go to the army. I love my country, but whether I want to serve for two years and two months at a time is a different question. Within the army, there's a special force team. A team whose duty is very high. And because of that, there is the parachute jumping. So, it's mandatory. Every single person in the special force team has to do it. And they show a video – I don't know why they showed this video. The people get hurt as they land because the impact is about jumping from a two-floor building. So, you're not going to die in a very safe landing, but when it gets windy, it becomes higher and higher. Third floor, fourth floor... So, like I said, as I was growing up, I exercised a lot, and I wanted to keep doing it (I still do a lot these days). So, I was very worried about not being able to do the things that I love. And I remember because of these fears, I cried a lot on the night before my first jump. But I did it. And after, I want to say five or six attempts, I began liking it.



After watching that video of people getting hurt in the landing, they asked us whether we want to drop out from this. And I wanted to raise my hand. But nobody from that room, out of forty people, nobody raised their hand. So, I didn't. The reason why I cried is because I didn't raise my hand. But at the end of the day, I liked it later on, and it was safe, and it became a good memory. So yeah, that's the story.

And is there anything you've learned from – not just that experience, but from your time in that mandatory service in the army – is there anything you've learned from those experiences that still impacts your life today, or that you still use to help you in your life?
Yeah. Army service is difficult because of the lack of liberty. You don't have control over your schedule. And in the team where I was, there were forty people you have to live with. Forty other people in one big room. So, I would say the freedom. Because I was deprived, I would say everyone in the army will be deprived from freedom. So, I learned how important it is to have that.

12:42: So that desire for freedom, did that influence at all your decision to move from South Korea over to America?
I think one of the best decisions that I made in my life so far is going to a different country for a career that I chose. It was a great choice because I learned a lot about myself, which I wouldn't have known back in South Korea. And so, I would encourage, for students who have a reason to go to a different country: go for it, because you learn about yourself. Until I came to the United States, I was living with my parents. So, I was not fully independent. But when I came here, I learned to take care of myself by cooking and shopping and all that, which helped me start taking care of myself. Also being independent. So that was a great experience for me.

For any students who might also be moving for their next step, going from high school to university and moving city or moving country, do you have any advice for how they approach moving into a different place and a different community and a different culture?
The cultural difference, that's a huge learning. And the language barrier is probably the greatest challenge for many people. So, they should do their best to mingle with other people. That's the best way: to socialize with these people and learn their thinking and learn their culture.

14:17: I think that's really good advice. Do you have any final advice you want to share, or anything that we haven't spoken about that you wanted to mention?
I'd like to mention that growing up in my twenties, I tended to think a lot before I did something, whether this would be a good thing for me or not, and spending a lot of time doing that. So, I would recommend students to jump into what's most interesting to them at the time, and whether that's the best thing or not, they will find out later. And if that's not the best thing, then they can move on from there. And they have that experience. So, instead of spending too much time thinking about it, jump into different experiences, and these will be the dots in their life. And if they are creative enough to connect the dots, that will make their experience very strong.

Great. Thank you very much for chatting with me today, it's been a pleasure.
Thanks so much for having me, Joe.

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