

Alexandra Magold

Good morning, Science.

Alexandra Magold

My name is Alexandra Magold, and today's guest is Jack Szostak, Nobel Prize Laureate of 2009. And PI to Jennifer Doudna, herself a Nobel Prize laureate of last year. This podcast is about passion and what better person to ask than someone who has already received the highest honor, someone who is in a position where they can basically do whatever they want, and someone who still does research, tackling amazing questions such as the origins of life itself. I am delighted to be able to talk to Jack Szostak today.

Alexandra Magold

When do you feel the best doing your work? What's the nicest part?

Jack Szostak

I think it's definitely talking to people in the lab when there's some new puzzle or new result, something exciting to think about. That's definitely the best part of doing live research, I think.

Alexandra Magold

Yeah. So you've been able to tackle questions of enormous scope, and you also have probably amazing means. And I've just wondered, what are limitations that are getting on your nerves?

Jack Szostak

I don't think we have any of the sort of typical limitations. I mean, the thing that limits us for making progress is just coming up with new ideas. Right. You just always have to be thinking about things we have. Yeah. The lab is great at this - lots of smart people. They come from different backgrounds. We have all the sort of equipment and supplies we need pretty much, but you know we're tackling, I think, a pretty challenging problem. You know, how life got started? So, the barriers are usually conceptual.

Alexandra Magold

That's really interesting because I saw your presentation at SEED and synthetic Biology. And I also saw the three different questions that you like. And having gotten my PhD in neuroscience, of course, I love that you do care about the mind. And so I'm wondering if you were able to make a synthetic cell, how far do you think that would translate into the question of mind and consciousness and things like this? And might we be able to fix creativity?

Jack Szostak

Oh, my God.

Alexandra Magold

You know, might you be able to fix the own problem?

Jack Szostak

I think for what we're trying to do is really understand how you go from chemistry to very simple Bio the real kind of hallmark of success. And in my opinion, would be to get a system going that can start to evolve like can really, you know, it can basically become more complex and more adapted to its environment through Darwinian evolution. And so that's not directly related to things that are much higher level, but I do think that evolution is the key to a lot of these larger scale problems and including the origin of the mind.

Jack Szostak

I mean, it's something that evolved, and I think it's something where we need to pay more attention to our evolutionary ancestors and try to learn how the mind evolved not just in one magic step, but you know in a series of steps. Maybe someday will understand.

Alexandra Magold

Yes. You mentioned there might be several things going on in parallel that allowed life to to get started?

Jack Szostak

Yes.

Alexandra Magold

So I was thinking about limitations, and I wondered maybe it's time. And so if you had a time machine and you could come back, I don't know, let's say 200 years, a thousand years from now, what would be the first question? You would look up, what would you Google what's thing you really want to know? Where would you like to skip ahead in the book and see what's going to happen?

Jack Szostak

So, of course, I guess the obvious thing is I want to see, like, how did people figure out how to reconstruct the entire pathway from, you know, the beginning of planet formation all the way through the evolution of

complex life. But on the other hand, I wouldn't want to cheat that way, right. I mean, it's so much fun figuring it out, but I wouldn't want to have someone just tell me the answer.

Alexandra Magold

That actually brings me to the next question, because I was wondering, I personally, I love the hunt. But of course, I only hunt because I want to know what the answer is. And so I wondered what parts you enjoy. And, for example, you mentioned it, who are people you really have your best ideas with? Who do you like to talk to?

Jack Szostak

Right. Well, yeah. I like to, you know as I said before, I enjoy talking to people in my lab because they're like doing the experiments to test ideas that we talk about all the time. But also, the thing that I really love about this field is that it does have a very, very broad range. And so by talking to astronomers and planetary scientists and evolutionary biologists, you know, it's a great and highly motivating way to learn more about all these subjects. And then sometimes, you know, you come up with new ideas by talking to someone with a very different perspective.

Jack Szostak

And and sometimes those conversations lead to unexpected collaborations, which can be really a lot of fun. I mean, just one example, I've collaborated with a very close colleague for years now who happens to be a professor of astronomy, and we had a kind of essentially a joint student. So if you'd asked me ten years ago, would I ever think I'd have an astronomy student in my lab, it would have said, that's ridiculous, and it actually ended up being an extremely productive collaboration.

Alexandra Magold

That's amazing how did you meet each other.

Jack Szostak

We both had an interest in how life got started. My colleague more from the point of view at the time, I guess, of exoplanets. And the question of is their life out there or only here. And we, of course, from more the earth centered and laboratory experiments point of view. But it's definitely a shared interest. And over the years have brought together I think a lot of people who share that interest coming from different starting points. I think that's one of the things that makes you feel so much fun.

Jack Szostak

You really get to stretch and learn a lot of new things.

Alexandra Magold

Definitely. That's one of the things that I love here. The Institute that I work at, we literally have actually astrophysics in the same building as bioengineering. And so you just meet the most amazing people in the elevator.

Jack Szostak

Are you in PME?

Alexandra Magold

Yes. I love how interdisciplinary science has become. And I'm wondering, what field would you like for more people to actually join your group? Which field do you think is still not aware enough of how much potential there could be?

Jack Szostak

I don't know. That's a little hard to say. Over recent years, my labs become much more chemistry oriented. And for the problems that are our main focus right now, it's a lot of chemistry to very different aspects of chemistry. But I can see coming up that we're going to need to know a lot more about kind of engineering approaches, I guess. Everything from micro fluidics to designing reactors. If you ever actually get to make protocells that can grow and divide, basically, machines that are able to cultivate them. So that's a challenge that'll be coming soon, I hope.

Alexandra Magold

Yeah. I always wonder. So my mentor is a biochemist. And when I told him, oh, no, I studied molecular medicine, and now nobody knows what it is. And he said, no, don't worry. When I started, people said, what are you, a biologist or a chemist? What do you want? And so I'm wondering, do you think there will be an interdisciplinary study course in the future? That right now we just cannot see it. That would kind of tackle what you're working on, you know?

Jack Szostak

Yeah. Well, I hope so. I mean, I'm definitely already. I mean, I have done some teaching here on origins and sort of courses that cover everything from the physics to the chemistry to the biology. And I think that kind of approach, it's kind of obvious for Origins, but I think it's really important for molecular medicine as well. I mean.

Alexandra Magold

Yeah, absolutely. Well, if you don't see the snow, when then?

Jack Szostak

I don't know if you ever look at Xkcd, right. But there are some good ones about, the fact that we're traveling through time.

Alexandra Magold

We do.

Jack Szostak

The future - we'll be there soon enough.

Alexandra Magold

I really appreciate it. I promised five minutes. I did my best to keep it short. This was phenomenal. Thank you so, so much. And I do hope that maybe sometime we'll meet each other in person.

Jack Szostak

Yeah. That would be great.