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GRAD SLAM

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A P P E A R A N C E S

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C O N T E N T S

P R O C E E D I N G

MS. ISAAC: Good morning, everyone. How are you? Good morning. Welcome to LinkedIn. All right. We're excited. We're ready. Are you ready? Nice. That's what I'm talking about. That's an audience with students who are pumped, excited, ready to go, and ready to win. Welcome to LinkedIn. Before I get started, my name is Nicole Isaac. I manage US Public Policy at LinkedIn. We are super excited for the fourth Grad Slam competition and the third time that we're hosting this competition at LinkedIn.

I just wanted to call out a few individuals who have really been instrumental in making this happen. Of course, Pres. Napolitano and the UCOP team, as well as Pamela Jennings who've really been driving this for several months. Katie Ferrick and Orlando White on our Community Engagement Team, super thrilled that they are part of our LinkedIn family and working to ensure that our engagement across San Francisco and the entire Bay Area community is strong and successful.

And really quickly, why are we here today? So we are here because LinkedIn's vision is to create

economic opportunity for every member of the global workforce, all three billion individuals. Why does that matter? It matters because of all the work that you're doing as educators, all of the work that you're doing as students, all of the work that we're doing collectively to ensure that we are contributing to our communities and we're contributing to our overall environment for a sustainable place by which anyone can access resources needed to thrive in our society.

So I am incredibly excited because a part of this vision, as you know, we talk about this often at LinkedIn, it's, it's really the way in which we are mapping the digital economy and the educational organizations. All of the institutions of education are a critical part of this.

Right now, on LinkedIn we have over 60,000 institutions of education on our platform. We have over 550 million individuals and our goal is to figure out ways in which any individual anywhere around the world can understand not only what is their dream job, but how can they go to the University of California to access that dream job. What are the classes that

they'll need to enroll in for purposes of having that job not only today, but tomorrow? And we believe in lifelong learning more than anything else at this company.

So I am personally incredibly excited to have you all here on behalf of our company, on behalf of our team, and just a tremendous welcome from all of us. With that, I'm going to turn it over to Pres. Napolitano, who, as you know, is the 20th president of the University of California. She became the first woman to serve in this role in 2013, and as president of the University of California, she leads a system with ten campuses, five medical centers, three affiliated national laboratories, and a statewide division of agriculture and natural resources.

As you know, she is an incredibly distinguished public servant, is the former Secretary of Homeland Security under Pres. Obama, and two-term governor of Arizona. Please join me in welcoming Pres. Napolitano.

PRES. NAPOLITANO: Welcome to Grad Slam. Whoa. It is my pleasure to be with you today to serve

as your MC for the systemwide Grad Slam finals. This is a competition that was begun in 2015 and it is an honor to be here for the 2018 competition. I'd like to thank our host, LinkedIn, for once again providing space and support for Grad Slam, for their partnership with the University of California to make this competition a big success.

You know, the University of California is a research university. We are in the business of creating new knowledge and discovering research solutions for big global challenges. But the general public isn't always aware of the breadth and depth of the UC research enterprise or how this work affects the lives of every single Californian.

I know as president of the university I have prioritized making basic research more understandable, accessible, and exciting to the world beyond the classroom or the laboratory. And that's especially important today because, as many of you know, the future of federal research funding remains uncertain. We need to continue to urge policymakers in Washington, DC to invest in basic research because it is key to our

nation's scientific, technological, and economic advancements. And that is so very, very important.

So Grad Slam plays a key role in highlighting the broad societal significance of research at UC, whether that's researches, research on diseases like cancer or diabetes, or agricultural research that helps us feed the world, or energy research that will reduce carbon emissions and their impact.

The ten graduate students who you will hear from today are already champions at explaining their research to the public in engaging dynamic and understandable ways. They have proven that they know how to explain complicated research to those who do not conduct it and they are well on their way to becoming public intellectuals and ambassadors for research. Those are talents that our country needs so much today.

Now it is time to meet our five distinguished judges. You can read their brief bios in the Grad Slam program, but I'm going to ask each of them to spend a minute to introduce themselves to you. So we'll begin with Guy Berger. So Guy, you want to stand and...

MR. BERGER: Thanks, Gov. Napolitano or Pres.

Napolitano. I'm Guy Berger. I'm LinkedIn's chief economist. I head LinkedIn's economic research team. We're doing lots of cool projects like skills gap analytics that I'm looking forward to all of you gradually discovering over the coming years. I got the research bug actually -- I got my PhD in econ in an east coast university I won't name, but the, my research bug was initially caught at UCSD where I was, I majored in econ and in math. So this actually being here and supporting Grad Slam is very near and dear to me and to LinkedIn.

PRES. NAPOLITANO: Thank you. Karen Duderstadt.

MS. DUDERSTADT: Good morning. I'm Karen Duderstadt. I'm currently at the Office of the President as the UC Chair of the Coordinating Council for the Graduates Association. So this is gathering of the, of representatives from ten campuses and looking at the quality of graduate programs. My other hat is that I'm a faculty member in the graduate division of UCSF in the School of Nursing, and I also have a clinical practice here in San Francisco at Zuckerberg

San Francisco General. Thank you.

PRES. NAPOLITANO: Lark Park?

MS. PARK: Good morning, everybody. I'm Lark Park. I am a UC regent and a proud graduate of UC Berkeley back a while ago. In my day job I work for Gov. Jerry Brown as a policy advisor and I'm super excited to be here because early in my career I was a reporter for venture capital and life sciences and technology starts ups. So I'm really looking forward to hearing what's going on in the field of research. Thank you.

PRES. NAPOLITANO: Thank you. Neil Chase.

MR. CHASE: Thank you. I'm Neil Chase. I'm the editor of the Mercury News and the East Bay Times, graduate of a midwestern university that I won't name, but sometimes known as UC Ann Arbor. I may, I'm a Bruin dad. Just wrote my last check to, to UCLA for tuition and very happy to be here. Thanks.

PRES. NAPOLITANO: Great. Julia Avilla.

MS. AVILLA: My name is Julia Avilla. I go to Gateway High School and I'm a senior there and I'm an incoming freshman at the Elliott School of

International Affairs at the George Washington University in Washington, DC. I'm the vice president of my school's debate club, which just won Chapter of the Year for all of Northern California. And I'm a Bay area student leader for the movement against gun reform. I have and will continue to work with state legislators to get proper gun reform and I would like to pursue a career in public service and social justice, but not before I go to grad school.

PRES. NAPOLITANO: Excellent. Thank you all. We are so pleased that you all, all five of you have agreed to participate as judges today and I'm glad as well that we have for the first time Julia, a high school student as a judge. And in the audience about 30-some-odd of Julia's classmates from Gateway High School are over here. So welcome them. A public charter school that is truly a gateway to college.

Since the school was founded in San Francisco 20 years ago, 96% of its graduates have gone on to college. So you go, Gateway. Yeah. And there is one more special judge. All of you, whether you are with us here physically today or watching on livestream

online, our audience will have an opportunity today to participate in Grad Slam. Once again, we will present a People's Choice award along with the winners selected by our judges' panel.

After the presentations have concluded, we'll provide instructions on how you in the audience, those who are here and those watching online, can vote. So keep track of your favorites and help choose the People's Choice award.

Now the research these graduates students are about to present to you represents years of hard work. But there's no harm in having a little fun while we celebrate their great effort. So please as I welcome each one to the, to the stage for their presentation, give them a warm welcome.

And so without further ado, I'm going to welcome our first contestant, Jessica Noll from UC Riverside.

MS. NOLL: All right. So you're in class, those who go to class, and you forgot to do the homework again. So you turn to your classmate to ask for help and you realize you can't speak. Your face is

drooping. You reach out in a panic and you find that you can't move your arm either. So what's going on? You're having a stroke. So while you may be focused on your arm or even your face, what's really going on is in your brain. So what is a stroke exactly?

A stroke is a block often caused by a blood clot or a hemorrhage, which is a bleed of an artery within the brain. It is currently ranked as the fifth leading cause of death and the leading cause of adult disability. About 800,000 cases occur every year in the US alone and about four will occur just during my talk to you today.

The major issue with stroke is that you have your initial area of damage, but this begins to grow and expand in just a couple hours following your stroke unless treated immediately. Unfortunately, there is only one treatment for stroke and this is called tissue plasminogen activator, or tPA, which actually dissolves the blood clot causing the stroke. But this unfortunately puts you at a risk for hemorrhage, which is internal bleeding and most likely death if used over four-and-a-half hours after your stroke occurs.

But that sounds like plenty of time, right? Like half of a *Lord of the Rings* movie? Yeah, yeah, yeah. Unfortunately, it's not. So most patients don't actually come into the ER as soon as they start seeing symptoms. But for the sake of this argument, let's pretend that you do come into the ER as soon as you realize you can't speak and you can't move your arm. Now you have to be diagnosed as having a stroke with lengthy, time-consuming tests.

By the time you get out of these tests, you're most likely outside of this window. And because of this, only 2 to 5% of patients are actually treated and this should terrify you.

So I actually plan to change this by looking at the blood and markers within the blood to development a timeline for stroke. So I've analyzed 50,000 blood markers from zero to six hours after stroke occurs and so far I have found three represented by BM 1, 2, and 3 that show unique patterns that could ideally be developed into a rapid blood test similar to how a pregnancy test or a urine test works that could, you put some blood on one end of the essentially test

strip and it reads the levels of these blood markers and tells you if you're having a stroke and how long it's been since your stroke occurred.

So in this case it's been two hours since the stroke occurred, which is plenty of time for treatment. If this could be represented and implemented within an ER, this could dramatically increase the amount of patients who are being treated in the first place and hopefully save many lives because, who knows, it may be someone you know. It could be you. So thank you.

PRES. NAPOLITANO: Congratulations. Now that we're done with our spontaneous photo, so tell us a little bit about you. When, when did you first begin to think of going into research such as this?

MS. NOLL: I've always been interested in medical research and that's what brought me to UCR. But in terms of neurological issues and medical development, I didn't get into that until later through my first year of schooling at UCR. And I realized how, how dangerous these issues really are and how little known is, actually known about them 'cause the brain is not very well understood. And it's scary.

PRES. NAPOLITANO: Yeah, yeah.

MS. NOLL: So it definitely needs to be researched.

PRES. NAPOLITANO: Right, right. So why don't you tell us something about you that your thesis advisor doesn't necessarily know?

MS. NOLL: Oh. Well, I'm talking to the public, so. He probably shouldn't know that I'm also interested in cancer research. Just in general.

PRES. NAPOLITANO: You're going to specialize between stroke and cancer?

MS. NOLL: No. He, I'm very interested in stroke, but cancer also fascinates me.

PRES. NAPOLITANO: Yeah, yeah. And where, where do you see yourself going? Where do you see yourself in the next five to ten years?

MS. NOLL: Well, I'm only a second year, so probably still be here.

PRES. NAPOLITANO: This grad research takes a while, doesn't it?

MS. NOLL: It's this going to be a while.

PRES. NAPOLITANO: Yeah. Where'd you grow up?

MS. NOLL: Chicago area. Also, Northwest Indiana.

PRES. NAPOLITANO: Yeah, yeah. You have brothers and sisters?

MS. NOLL: Too many, yeah. Three.

PRES. NAPOLITANO: Oh, my gosh. And did any of them make their way to California too?

MS. NOLL: They're much younger than me. So they're actually in college right now still in Indiana.

PRES. NAPOLITANO: Yeah, yeah. That, that's great. I'm going to ask you to think about hosting a dinner party.

MS. NOLL: Oh.

PRES. NAPOLITANO: And --

MS. NOLL: That requires work.

PRES. NAPOLITANO: Yes. And do you cook?

MS. NOLL: Oh, yes, yes.

PRES. NAPOLITANO: Okay. So you're really hosting a dinner party, not like me where you pick up takeout. Plot, give us the table. Give us three people that you would have at your dinner party --

MS. NOLL: Out of anyone in the world?

PRES. NAPOLITANO: Anybody in the world. Alive or dead. The dead won't eat much, but...

MS. NOLL: Well, in the case that's all, they're all dead. That's a good question. You should have prepared me for this. Probably Ellen Degeneres because she's amazing and I respect her a lot. I feel like everyone's judging me.

PRES. NAPOLITANO: Yeah, only these five, so.

MS. NOLL: Well, in that case. Those three. No. Probably as tacky as this sounds, Ghandi. Like I really do respect him and his peaceful movement even though he did have some issues, but. Yeah, we could talk about that at dinner. I'm going to go, I'll just say Beyoncé because she's amazing.

PRES. NAPOLITANO: Yeah. And that sounds like an amazing combination, Ellen Degeneres, Gandhi, Beyoncé. That would be an amazing dinner party. All right. Thank you, Jessica. Congratulations. Now I'd like you to welcome our second contestant to the stage, Yiqi Cao from UC San Francisco.

MS. CAO: Our bodies don’t always know what's best for us and they can get especially confused with

medical implants. For example, if you've got a clogged blood vessel in your heart, the doctor will insert a stent. It's a mesh metal tube that opens the vessels back up to restore blood flow and prevent a heart attack. So when you deploy the stent, the pressure against the vessel does some damage to your tissue. But the problem is not with this minor injury.

The problem is with your body's attempt to repair it. It sends cells marching to the inside of the vessel, and when they see the stent, they're just shocked into a frenzy. They start moving quickly, dividing quickly, and making a lot of proteins like collagen. And then this mess of cells and proteins form a scar that just narrows the vessels again once more threatening a heart attack.

Because of this complication, one in ten patients need to get a new stent within just one year. The goal of my thesis research is to keep the vessels open after stenting. Some people do this by using drugs to just kill off the cells, but that wipes out the healthy cells too. So we need a less destructive method.

My strategy is to change the surface of the stent to physically slow down the cells and that's because cells just like you and I are sensitive to changes in the terrain. Imagine that you're on a freshly paved road. It's easy to move around quickly or start running. But if you're walking on stepping stones in a river, you got to watch where you step and that can slow you down.

So the paved stent, the flat stent is like the paved road where cells are highly active, moving quickly, dividing quickly, and making a lot of scars. So I changed the surface to be more like these stepping stones. To do this, I took titanium, which is a common material for implants, and I dipped it in a chemical cocktail that I formulated.

When I zap it with electricity, the surface builds up and etches away in a specific pattern that results in an array of tubes standing upright. They kind of look like nano rigatoni pastas. And a thousand of these fit side-by-side on the width of a single human hair. And on these tubes the cells can only walk on the rim, but not the empty space in the middle. So

now traversing the stent is like traversing nanometer-scaled stepping stones.

And incredibly I found that this surface slows the cells down. On these nano tubes, the cells would divide more slowly and they'll make less scar tissue. So with this simple change in the surface, we can convince our body to please just give the stent a better chance at preventing heart attacks. Thank you.

PRES. NAPOLITANO: All right. So while the judges are doing the judging, we're going to have a little conversation and I'm going to ask you when did you first get the idea that you wanted to go into this type of research.

MS. CAO: Yeah. So I think when everyone's little, you just really want to do something important, but you really don't know what. So a lot of times when I was in high school and middle school, I volunteered a lot. I volunteered a lot at women shelters and nursing homes. And when I discovered in my AP Biology class that you can find a cure for a disease, you'll have such a bigger scalable impact and I really enjoyed the class. So from then on, I realized I really would love

to contribute to curing or treating some disease.

PRES. NAPOLITANO: Where did you grow up?

MS. CAO: I was born in China, but our family's in Virginia. So also from the east coast.

PRES. NAPOLITANO: All right. So you made the east-to-west transition?

MS. CAO: I did. I did.

PRES. NAPOLITANO: Yeah, yeah. Brothers and sisters?

MS. CAO: No. Just me.

PRES. NAPOLITANO: Just you. Yeah, yeah. Where do you see yourself in five, ten years?

MS. CAO: That's a good question. I think I'm still open to a lot of paths. I would really love to work on something closer to a product to, yeah, continue my goal of curing or treating diseases.

PRES. NAPOLITANO: Yeah, that's, that's great. Tell us something about yourself that your thesis advisor doesn't know.

MS. CAO: What does she not know? I don’t know. Well, my thesis advisor's really great and she's watching right now. So yeah, that, that's a really

hard question. I think Jessica handled that one really well. Yeah, we, I think we do communicate a lot and she encourages us to, to have good work-life balance. So it's not like I have to say that she can't know that I'm ever leaving the lab or anything like that.

PRES. NAPOLITANO: Yeah. What do you like to do in your spare time?

MS. CAO: In my spare time I think living in the Bay area, it's real easy to have a lot of outdoor opportunities. I love going hiking and camping. I've also taken up aerial silks. I'm trying my hardest on Sundays. But I don't think circus is really a viable profession for me. Far better, so far better at this stuff.

PRES. NAPOLITANO: So you like doing the trapeze thing or...

MS. CAO: We have a trapezist, but mostly it's the silks. So there's two fabrics hanging from the ceiling and you do certain wraps and inversions. So it's really fun.

PRES. NAPOLITANO: Whoa.

MS. CAO: I'm not very good at it.

PRES. NAPOLITANO: So I'm going to ask you the same question I asked Jessica and I want you to -- and I'm not going to ask the same question to all of you. Okay. You know. Don’t be thinking ahead too much. But you're hosting a dinner party and you can have three guests alive or dead. Who would you invite to your dinner party?

MS. CAO: I mean I think a, I think a dinner party's a great idea. If you'd like to come, Pres. Napolitano, welcome, welcome to bring your family. Have some dinner, yeah.

PRES. NAPOLITANO: So that's one.

MS. CAO: Okay. You want to plus two? Yeah. So who else would like to come? I think we have (inaudible).

PRES. NAPOLITANO: No. No, no, no. You're not getting out that easily. Round at the table.

MS. CAO: Okay. Round out the table. So I'd love for you to attend.

PRES. NAPOLITANO: I accept.

MS. CAO: Excellent, excellent. One of my role models is my engineering professor from undergrad,

Dr. Dana Alzi (ph). He is a really fun person to talk to. He's extremely creative. So I would really love for him to be there as well. And lastly, I have a lot of admiration for my circus, my like silks instructor. I think she's very different than the other guests, but I think that I just love her outlook on life. She's always down to try anything. So I think she'd be a great guest to have as well.

PRES. NAPOLITANO: Oh, that's, that sounds great and maybe I can learn how to do silks too.

MS. CAO: Great. Yeah.

PRES. NAPOLITANO: All right. Thank you very much.

MS. CAO: Thank you so much.

PRES. NAPOLITANO: So please welcome to the stage our third contestant, Alana Ogata from UC Irvine.

MS. OGATA: Last Thanksgiving my uncle had a sudden pain in his side. We thought he just had too much turkey. But when he went to the doctor's office, he was diagnosed with stage 4 kidney cancer and began treatment immediately. We've come a long way in the battle against cancer. There's huge advances in

treatments that give us a lot of hope, and yet all too often we hear stories of an unexpected diagnosis that comes too late when these treatment are no longer effective.

And I believe this is because today cancer testing only takes place in a doctor's office and unless you have a painful symptom, many of us don't have the time or money to go. As a result, we don’t get routinely tested for cancer, which is the best way to get an early diagnosis.

The earlier you catch cancer the more curable it is and that's why I'm developing a technology that will make early cancer detection available to everyone. And at UCI we're working hard on a cancer censor that you can use at home for a personal diagnosis. And it works by detecting proteins.

Proteins are naturally found in your urine, but when a cancer tumor is present even in the early stages, your body responds by producing an excess amount of protein. As an analogy, if protein are fish and your urine sample is a lake, too many fish could mean you have cancer. Our challenge is to accurately

count the number of fish in a given lake and we've designed an electronic sensor to do just that.

This sensor is composed of a conductive polymer material that can catch proteins. So when it's tested against an unknown sample, it'll produce a protein count for you and the resulting electronic signal can distinguish between someone who's healthy or just someone who's at risk for cancer.

Now there are specific proteins that correspond the different types of cancer. For example, too much salmon in a lake can mean you have prostate cancer, too much trout can mean breast cancer. Our first prototype is for bladder cancer, but the ultimate goal is to have a single chip with many sensors to detect different proteins so you can be tested for all types of cancer simultaneously.

And in order to get this product into your hands, I'm continuously improving the device to be small, simple, and fast. Here's an image of my current design. It's about the size of a penny, inexpensive to make, and the electronic signal can go straight to your smart phone. From the comfort of your home, you could

take the test and get results within minutes.

This technology wasn't available in time to save my uncle, but with more research we can give everyone the power of a routine cancer test. We can catch cancer early and we can beat it every time. Thank you.

PRES. NAPOLITANO: Thank you, Alana. Okay. So when did you first get the idea that you would go into this type of research?

MS. OGATA: I didn't plan on it at all going into graduate school. I had a wonderful undergraduate advisor who was doing solar cell research and I was positive that's what I wanted to do. So I went to grad school looking for any lab doing solar fuel research and I ran into Reg Penner, who's my professor now. And he told me this project and he sold me on it. And I've been doing it ever since. Yeah.

PRES. NAPOLITANO: Yeah. That's great. And, and where, where do you see yourself in five, ten years?

MS. OGATA: Out of graduate school. And I'm not sure I'm looking -- I would like to look for a job

-- I think entrepreneurship's such an exciting time right now. They have incubators. They have all these things to help startups. So that's kind of where I see myself.

PRES. NAPOLITANO: Right.

MS. OGATA: In five years.

PRES. NAPOLITANO: Right. Getting into that entrepreneurial ecosystem.

MS. OGATA: Yeah.

PRES. NAPOLITANO: Yeah, yeah.

MS. OGATA: It's exciting.

PRES. NAPOLITANO: Yeah, it is. Where'd you grow up?

MS. OGATA: I've from the Virginia area also. I'm right outside Washington, DC and I've pretty much lived there my whole life. There was like a three-year period where I lived in Manila in the Philippines.

PRES. NAPOLITANO: Uh-huh.

MS. OGATA: But, yeah, east coast.

PRES. NAPOLITANO: Yeah. So how did you make your way to California?

MS. OGATA: My research advisor in college

suggested graduate school and I wanted to try out the west coast and west coast also has really great schools. So I'm pretty much all UC applications.

PRES. NAPOLITANO: Good choice.

MS. OGATA: The weather's nice, yeah.

PRES. NAPOLITANO: Yeah, yeah.

MS. OGATA: So.

PRES. NAPOLITANO: Now what do you like to do in your spare time?

MS. OGATA: I really like cooking on a daily basis.

PRES. NAPOLITANO: Uh-huh. Well, we may have a dinner party question here.

MS. OGATA: Yeah, I love cooking. If I have time to cook a proper meal, that's just the best thing for me. And, and fitness. Yeah. I'm a fitness instructor. So --

PRES. NAPOLITANO: You do like Pilates or --

MS. OGATA: I do. That's a good guess. Yeah, I do Pilates and Zumba. So.

PRES. NAPOLITANO: I've never actually figured out Zumba, but I know that, you know --

MS. OGATA: I'm sure -- everyone can do it. Yeah.

PRES. NAPOLITANO: We can get everybody in here to do it maybe. No, no, we're not going to do that. Just chill down. Okay. So, since you do like to cook and you like to make a proper meal, I will give you the dinner party question. So you have a table with three guests. Who would you like to have? And they could be alive or dead.

MS. OGATA: Okay. And I admit I've sort of thought about it while sitting down.

PRES. NAPOLITANO: Yeah, yeah. So unfair advantage.

MS. OGATA: But my three grandparents who are not alive anymore. I was kind of young. You know, I never really got to talk to them and not until you're older you realize you could have learned a lot.

PRES. NAPOLITANO: Yeah.

MS. OGATA: So I have three grandparents I would bring back.

PRES. NAPOLITANO: That would be, that would be great. And, you know, as you are doing your work

and doing your research and spending a lot of time in the lab, I assume, do you have a favorite snack food? You know, how do you fuel up when you're there?

MS. OGATA: Oh, man. These questions. Well, you don't -- you can't eat in the lab. So there's a lot of safety stuff. So, you know, I'm dehydrated and hungry a lot of the time because once you're in there you can't eat or drink anything. My favorite snack is probably french fries. We have this terrible cafeteria, but they have, you know, cheap french fries. So, yeah, we'll go over there.

PRES. NAPOLITANO: You know what? I love them too. I like -- I got, I got to tell you I still think McDonald's french fries are the best.

MS. OGATA: Yep.

PRES. NAPOLITANO: So that is, that's shameful. I'm shameless, but, you know, its there.

MS. OGATA: It's good, yeah.

PRES. NAPOLITANO: Yeah. It's good. So thank you for much.

MS. OGATA: Thank you.

PRES. NAPOLITANO: Good luck. I'd like to

welcome to the stage our fourth contestant, Tooka Zokaie from US Davis. Tooka.

MS. ZOKAIE: Let's say you were to wake up one morning and you were in pain. I'll be more specific. It's part of your digestive system. You want to call your usual physician, but you know they won't be able to help you for they don’t have the proper knowledge. The options you have are too expensive and insurance won't cover the type of doctor you need to see.

And if I were to tell you I can see this part of your digestive system right now, would you believe me? For those of you grinning in the room, you may be showing me more than you realize. You can say that is the mouth of the problem, access to oral health.

In modern healthcare, the human body is mainly maintained by two people, the individual themselves and their doctor. When someone has access to a primary care physician, they have their head, eyes, ears, nose, and throat checked. But something was skipped in this screening that can show if someone has diabetes, an eating disorder, or needs HIV testing. This is the oral cavity, which is usually saved for dentists to

address and is not a medical doctor's concern.

But a plethora of diseases can be detected from regular oral cavity screening. Even if a physician wanted to check for dental-related issues, they currently lack the proper training to do so. Now 90% of American have access to a physician with their medical insurance, but 40% lack dental coverage. My research aims to bridge the gap between medical and dental care by incorporating the oral cavity into the primary care screening.

Now my research was to design the interprofessional training which would allow a concrete way for physicians to help patients who typically do not have access to dental care still be protected from oral cancer, infections, tooth decay, and more.

Now creating an education model is essential in training professional students to prepare them for their work, technical training. The goal is not to make physician students bite off more than they can chew, but to have enough information to swallow. With this new model, more patients can access basic oral healthcare and education regardless of having dental

insurance.

Now that's something to smile about. Thank you. I can go on and on. I love hobbies and just trying new things.

PRES. NAPOLITANO: Yeah. So tell us also something about yourself that your thesis advisor doesn't know. What's a Tooka secret?

MS. ZOKAIE: A Tooka secret? I am a Yelp Elite foodie. So I don’t think he knows because, you know, we're in oral health and, you know, good eating and staying healthy, dietary counseling, but I don’t think he knows how much I like to explore the Sacramento/San Francisco food scene.

PRES. NAPOLITANO: Yeah, yeah. And it's quite the food scene, isn't it?

MS. ZOKAIE: Oh, yeah. Farm to fork.

PRES. NAPOLITANO: Yeah, yeah. Yeah. So you were probably scoffing at my mention of McDonald's.

MS. ZOKAIE: Oh, no. I'm an In-N-Out girl personally. I am from California after all.

PRES. NAPOLITANO: Yeah, yeah.

MS. ZOKAIE: So.

PRES. NAPOLITANO: I like them too, I must say.

MS. ZOKAIE: Yeah.

PRES. NAPOLITANO: Too much, I suspect. When did you first begin thinking of yourself as doing grad research like this?

MS. ZOKAIE: Yes. So it is funny because I do both this type of grad research and community-based research to make sure information I'm creating and giving to these audiences are appropriate. So I didn't think that I would do both types of research simultaneously and it originally began actually because I was doing nutrition research in my undergraduate work and I really wanted to do something with oral health.

I was originally predental and I saw that there was this gap in access and it was when I came across the School of Nursing iFLOSS program while volunteering at clinics that I fully became immersed in trying to bridge the gap, as I said, and make the mouth back in the body.

PRES. NAPOLITANO: Yeah, yeah. So, so do you -- you must work with a lot with dentists in your work

then?

MS. ZOKAIE: I work a lot with physicians actually. So a lot of my work is with physician assistant students at the Betty Irene Moore School of Nursing. And my PI is actually the physician assistant director for that program. So it's not so much working with dentists as it is making the oral health aspect part of other professional curriculum like nurse practitioners, medical doctors, physician assistants.

PRES. NAPOLITANO: Bridging that gap, as you say.

MS. ZOKAIE: Yeah.

PRES. NAPOLITANO: Yeah.

MS. ZOKAIE: Not working with dentists so much.

PRES. NAPOLITANO: Right, right. And, and where do you see yourself in five or ten years?

MS. ZOKAIE: I really hope to establish this dental integration into medical care. I hope to continue working with that. When I first came into this field five, six years ago, I was actually, I noticed the gap in care. That's one reason I left the

predental group. And it was in seeing this change happen so rapidly and awareness of the importance of oral healthcare for whole body health that I hope to continue to be part of this movement and see it change in policy, in HMO groups, and in training.

PRES. NAPOLITANO: That's great, great. Okay. Well, congratulations.

MS. ZOKAIE: Thank you so much.

PRES. NAPOLITANO: Thank you. Now I'd like to welcome our fifth contestant to the stage, Nicholas Root from UC San Diego.

MR. ROOT: I study a neurological phenomenon called synesthesia using data from multiple languages. Three minutes, three questions. What is synesthesia? Why multiple languages? Why should you care?

When most of you look at the text on this slide, you see it written in blue, but for about 2% of you it all looks like this. Synestheists experience letters of the alphabet as having a consistent color. Now by consistent I mean a few things. Consistent across space. So if your S is purple here, it's purple there. Consistent across time. So if your H is burnt

sepia today, it'll be the same burnt sepia in two years.

Finally, intriguingly, consistent across people. For example, most synestheists say that the letter A is red. Why? A is for apple and apples are red. A is a warm sound. Red is a warm color. A is the first letter of the alphabet. Red is the first color of the rainbow. You could go on and on and on.

Now the problem with thinking like this is that each of these theories makes the same prediction. A is red. And so you can't tell them apart. But then I realized they only make the same prediction in English. In Dutch A is for ape and apes are brown. In Spanish, A sounds like ah. In Korean, A is not the first letter of the alphabet. G is.

So I went and found some synestheists and it turns out Dutch A is still red. Spanish A is still red. But Korean G is red. And so by studying synesthesia in multiple languages, I can start figuring out the rules. For example, A is red because it's the first letter of the alphabet. Great. So hopefully some of you just find that interesting. But the rest

of you, the rest of you might wonder why we bother studying something that's so rare and basically benign.

Well, we can use synesthesia to study something that's much more fundamental. See, in the brain synesthesia happens when the letter area and the color area get wired together by accident and we can use this accident to our advantage. Here's how.

Scientists know a great deal about how the color area is organized, in part, because they can study it in monkeys. We know comparatively little about how the letter area is organized, in part because monkeys can't read.

Now I can't go sticking an electrode in a human brain, but with synestheists I wouldn't have to. I can just ask them what color their letters are and use that to study the letter area. So in this way synesthesia is a window into the brain that lets us literally see how the brain thinks about reading. Thank you.

PRES. NAPOLITANO: All right. Thank you, Nicholas. What first got you interest in synesthesia?

MR. ROOT: Well, when I was in high school I

read a book that included a chapter on synesthesia and it just so happened that that book is written by my current advisor.

PRES. NAPOLITANO: So that's kind of nice. A little parallel.

MR. ROOT: Yeah. There was a, there was a nice little meandering root to get there, but --

PRES. NAPOLITANO: Yeah.

MR. ROOT: Yeah.

PRES. NAPOLITANO: Yeah. So did you, does your advisor know that his book inspired you to get into this research?

MR. ROOT: He did after I was asked that question at the UC finals of Grad Slam. But before that, he did not.

PRES. NAPOLITANO: So news for him.

MR. ROOT: Yeah.

PRES. NAPOLITANO: So what else would be news for him about you? What, what doesn't he know about you that --

MR. ROOT: He, I sometimes do impersonations of him when I, when I lecture for him in his class

sometimes.

PRES. NAPOLITANO: So can you give us a sample?

MR. ROOT: No, I cannot.

PRES. NAPOLITANO: Then the whole audience can enjoy it.

MR. ROOT: Take brain damage and mental function in UCSD and maybe you'll get to see it.

PRES. NAPOLITANO: And where do you see yourself in five or ten years?

MR. ROOT: I would really like to teach. I, I like nothing more than seeing students' eyes looking and it's nice to, to know that people can actually come out of class and be excited if you try hard.

PRES. NAPOLITANO: Yeah.

MR. ROOT: And I, I want to try to do that.

PRES. NAPOLITANO: Yeah. What are you helping to teach now?

MR. ROOT: So the main class that I teach is called Psychology of Consciousness, that basically just steps through all of the different ways in which people have studied what consciousness is and what visual

awareness is. That's my favorite.

PRES. NAPOLITANO: Yeah, yeah. So what can you tell us in two sentences or less about the psychology of consciousness?

MR. ROOT: There is no one thing consciousness. I went to sleep and I started dreaming, and then I realized that I was dreaming, and then a little bit later I woke up. Like three different things just happened there that we might call consciousness, but they're not the same thing at all.

PRES. NAPOLITANO: Yeah, yeah. That was more than two sentences.

MR. ROOT: That was like a one long run-on sentence to come.

PRES. NAPOLITANO: What do you like to do in your spare time?

MR. ROOT: I love to cook.

PRES. NAPOLITANO: Okay. We got a lot of chefs --

MR. ROOT: It's a potluck, everybody.

PRES. NAPOLITANO: Maybe there's some kind of correlative relationship between cooking and being a

successful grad student.

MR. ROOT: Getting ingredients, right, in order.

PRES. NAPOLITANO: Yeah, exactly, exactly. Anyway, thank you. Congratulations.

MR. ROOT: Thank you so much.

PRES. NAPOLITANO: And now I'd like to welcome our sixth contestant to the stage, Mengya Tao from UC Santa Barbara.

MS. TAO: Seventy years ago, seventy years ago, a chemical named PHMG was introduced as ingredient for the humidified disinfectants. Sadly, today over 1,000 deaths are suspected to be linked to the use of a chemical in this application. You may wonder why this tragic event happened. Well, it turned out that PHMG has never been tested for inhalation toxicity on animals.

You may have also assumed that all of the chemicals in our consumer products are safe, right? Unfortunately, among the 80,000 chemicals on the market, only 1% have been tested because testing a single chemical costs thousands of dollars and requires

at least 3 to 12 months. On a multiplied base, by the 140 million chemicals registered so far, I don't have to convince you how expensive and time-consuming this would be.

So how can we understand the environmental and human health impact of those chemicals more efficiently? This is the question I'm trying to address in my research. My team has spent the past four years tracking this challenge by developing a chemical risk assessment tool. Our tool uses a big data infrastructure and a state of automation learning models.

This tool is able to tell you how a chemical will be used, how much will be released to the environment, where it will go over time. How much exposure humans and the ecosystem will receive. And finally, how harmful it will be.

With minimal information and in a matter of minutes we're able to evaluate the risk of the chemical to humans and the environment. Currently we're validating our tool against well-studied chemicals. For methyl chloride, a chemical used in paint

strippers, our tool indicates that. It poses substantial risks to human health and a long risk to the ecosystem. Although our assessment takes only ten minutes, the results correspond perfectly with a long-term study performed by the US Environmental Protection Agency.

And the most exciting to me is that our tool will soon be publically available online. Imagine regulatory agencies using our tool to assess every existing chemical on the market, product manufacturers using our tool to identify safer ingredients, and the chemical industry using our tool at the earliest design phase to avoid hazardous chemical ever entering the market.

I hope that this tool makes a tremendous change to our world, our health, and our environment. Thank you so much.

PRES. NAPOLITANO: So will you tell us a little bit about yourself? How did you get interested in this topic?

MS. TAO: Yes. So I was an environmental science major undergrad. I studied my undergrad in

China, Shanghai, Jiao Tong University. So I was trained actually to be engineer. We had basic books on the math, physics, chemistry, and the lab work. And then I, I got a chance to, as an exchange student, to pull into the university when I was a junior.

So I was exposed to a more diverse field at that time. I decided to have a graduate school experience in the United States. So, and then apply for grad school (inaudible) management at UCSB. Got accepted and at that moment I got experience, exposed to a variety of topics and I took class called Life Cycle Assessment. That's the story.

And two – and my advisor, I have two advisor. One of my advisor, Prof. (inaudible) who taught this class. I was so amazed by the powerful tool to analyze the environmental impact from cradle to grave from raw material extraction to manufacturing, transportation use, and the disposal phase to analyze the pollution emission and the overall impact to the environment and health.

And then I apply for his PhD. And then he got this project before I got accepted. And then I've

since then study on the project for the past four years.

PRES. NAPOLITANO: Oh, that's great. And, and where do you see yourself in five or ten years?

MS. TAO: I really wish I could stay in academia. This is my passion. And also, I think researchers sometimes can be dreamers. So we can do something really applicable to our field. And also, we can build the future world maybe in 10 years or 20 years. So I feel my passion lies in academia to do research, but also depend on the opportunity when I graduate.

PRES. NAPOLITANO: Yeah.

MS. TAO: I'm also open minded to other opportunities.

PRES. NAPOLITANO: Yeah, researchers can be dreamers. That's it. That's a great, that's a great kind of motto for this competition actually. What do you like to do in your spare time? If you have any, by the way.

MS. TAO: Yes. I'm a little bit workaholic, a little bit. I do work and enjoy my time. So I after

all the work, I will join my husband to go to a ballroom class and then we come back, continue working. Or, or I -- Monday and Thursday are ballroom dancing. Tuesday and Wednesday are my ballet dance, which is a totally different category. But just enjoy those one hour, like really relax and then to be away from work and then just enjoy the life.

PRES. NAPOLITANO: Yeah. So we've had Zumba, we've had Salsa, now we have ballroom dancing. So, and we have a lot of cooking. So maybe cooking and dancing are correlative to research.

MS. TAO: Could party together.

PRES. NAPOLITANO: Great, great parties together.

MS. TAO: Yeah.

PRES. NAPOLITANO: Tell us something about yourself that your thesis advisor doesn't know.

MS. TAO: I, yeah, I thought about this question. Yes, I, I kind of a dreamer and daydreamer, honestly. So there was one time one of my advisor is from Mexico. So I pass Aleta's (ph) Taco, is, my advisor told me before like it's a really authentic

Mexican food. So that, I drove by the Aleta's Taco, thought about my advisor, and then think about him and then think about my graduation day, those are like pictures. And then he and another advisor, someone they will like hoot (sic) me together. And then they will tell me I did a wonderful job during her PhD and that have so many publications, one nature, one science. That's a dream. Maybe not --

PRES. NAPOLITANO: That's a great dream. Congratulations.

MS. TAO: Thank you.

PRES. NAPOLITANO: So now please join me in welcoming to the stage our seventh contestant, Marisa Stevens from UCLA.

MS. STEVENS: Who are you wearing? We hear celebrities being asked this question frequently on the red carpet. While seemingly a superficial inquiry into fashion, a celebrity's response speaks volumes about their style, professional connections, and wealth. And it's not just celebrities with carefully crafted images.

People in general are concerned with how they

portray themselves, and more importantly, how they are perceived by others. One way we build our social selves is through things, things we own and can display to our peers. Part of our motivation to do this is to construct social identity, and part is to create social competition.

I'm sure some of you wear a ring on your left hand to signal that you're married. That's social identity. And maybe on your drive here today, you saw someone behind the whole of a Tesla while you were in your Prius. That's social competition. Materials help define who we are and who we are not and my research aims to understand how individuals use materiality to construct social identity.

But I probably don’t study the types of objects you think. I study the funerary materiality of Ancient Egypt. The Egyptians spent a lot of time preparing for death. Their tomb equipment included food and drink, furniture, clothing, jewelry, makeup, statuary, coffins, papyri. While the Egyptians believed that these items were necessary provisions for the afterlife, the interment of such items also acted

as a form of social display and competition.

Egyptian coffins, for example, were the same as that Prius and Tesla today. They both get you from Point A to Point B whether that's from home to work or from this world to the afterlife. But it's the quality of the transportation that's key to that social competition.

My research focuses on funerary papyri like the *Book of the Dead*. Most Egyptologists only study these documents for their religious value, but their social significance is critical for understanding the people behind the papyri. So I studied these documents and recorded the names of over 500 Egyptians, plus details about their families, careers, wealth, and status.

My research brought back to life a group of Egyptians who lived 3,000 years ago and demonstrates that they felt the same anxiety and pressure to navigate the social world as we do today. By learning from the past, we as a society are better equipped to understand our own motivations to construct social identity through what we drive, what we buy, and what

we wear. So who are you wearing today and why? Thank you.

PRES. NAPOLITANO: So I, I have to ask how did you get the idea for this research?

MS. STEVENS: I, I was always interested first in ancient Egypt. But then secondly about social identity and social history. I consider myself to be a social historian. And I went to UCLA. My advisor was working with a group of 21st Dynasty coffins and it just so happened that this group of people that own these coffins, about 800 or so individuals, had all of these funerary papyri as well.

And so I thought what a great way to truly understand an ancient population on, on the individual level. That rarely happens in the archeological record. And so I was able to really look at these individuals, learn their names, understand something about them, and I think that's really important.

PRES. NAPOLITANO: Yeah, yeah. And, and when did you first get the idea that you wanted to be a social historian?

MS. STEVENS: I've always had one foot in the

humanities and one foot in the social sciences. It seems with my education as an undergrad I double majored in history and sociology. And the two I think really complement one another. So I've, I've always sort of straddled both fields and I think that's really important. I think the more you can learn interdisciplinary, the better.

PRES. NAPOLITANO: Yeah, yeah. And, and so how do you construct your social identity? Like what do you shop for?

MS. STEVENS: What do I shop for? I, you know I, I would have to say, so one interesting thing that I shop for a lot are concert t-shirts. I love music. I love going to concerts and I always get a concert t-shirt every concert I go to. I have this collection, right? And so I think that really speaks to my identity about how much I love music and, you know, I, I enjoy going to these places and it creates a nice memory of them.

PRES. NAPOLITANO: Mm-hm. And, and you like going to concerts. What else do you like doing in your spare time?

MS. STEVENS: Cooking.

PRES. NAPOLITANO: All right.

MS. STEVENS: I do.

PRES. NAPOLITANO: Cooking is the way today so far.

MS. STEVENS: I, I do. I really, I love to cook. I love to listen to music, you know, all those things.

PRES. NAPOLITANO: Yeah, yeah. So I'm going to bring back the dinner party question. So you have a dinner party, you can invite three people alive or dead. You obviously are dealing with the dead. So you might have some ideas there. But who would you include at your dinner party?

MS. STEVENS: So, so I thought about this question obviously as we're over there taking notes, right, about what you're asking. I love the Beatles and I want all four and you're telling me three. And I can't pick. I refuse. I refuse to pick. I can't. So I don't know. One of them will have to sit on my lap or all have to stand. I, I don’t know, but I, I can't, I can't pick.

PRES. NAPOLITANO: You know, when I was, when I was a little girl -- I love the Beatles too and, and, and they used to sell Beatles bubblegum, like baseball cards, but they had cards for the Beatles inside and I had quite the collection. I don't know whatever happened to it, but you know, it was there. But anyway, congratulations.

MS. STEVENS: Thank you so much.

PRES. NAPOLITANO: All right. Join me in welcoming to the stage Joe Charbonnet from UC Berkeley.

MR. CHARBONNET: This year like most years, a huge winter storm hit the Sun Valley in Los Angeles and it looked like this. There are no storm sewers in that area. So every time there's a big rain, the streets turn into rivers. City officials rush to direct this water out into the LA river and then to the sea. Especially for communities of color, storm water is a huge nuisance.

But this problem is really ironic in places like LA where they spend millions of dollars importing their water from across the state and country. And this irony isn't lost on our city leaders with water

shortages all across the west, fresh water literally falling from the sky starts to look pretty darn good.

But there's a problem. Storm water is contaminated with herbicides and pesticides, metals from our brake pads, and yes, even dog poop. That's why I've invented Man-Sand Filtration Media. Now it's not called Man-Sand because it refuses to stop and ask for directions, but because it's made with a naturally occurring mineral called manganese oxide that can actually remove contamination from water.

You see, 30 or 40 years ago soil scientists figured out the manganese oxides can trap and destroy certain chemicals, but I've done experiments to develop a media that can actually remove pollution from water. You see by coating sand with manganese oxide, it's like giving it super powers. Endocrine disruptors like BPA are oxidized and toxic metals like lead are absorbed like a sponge.

And these incredible abilities are rechargeable, meaning once the Man-Sand reaches the end of its life, it can actually be regenerated without having to be dug up, saving cities tons of money.

All across the west cities are building these aquifer recharge basins to capture and save storm water. Now usually these systems are filled with plain old sand to filter the water. But Man-Sand could fit into these systems just like the conventional sand and use cutting edge chemistry to remove the pollution and make this water into a viable local resource. This research is culminating with field sites researching along side utilities from Sonoma all the way to, yes, the Sun Valley.

Man-Sand will help to liberate places like Southern California from imported water which uses 5,000 gigawatt hours of energy each year as it's pumped up and over a mountain range. By turning what was pollution into a natural low-cost solution, Man-Sand will help cities save their rain for a sunny day.

PRES. NAPOLITANO: All right. So now comes the, the really tough part, you know, the Q&A. Where did you get the idea for Man-Sand?

MR. CHARBONNET: Yeah. So it's something that the soil scientists recognized for a long time and they said, oh, isn't this interesting for the cycling of

transition metals in soils and no one had really thought to say, wait, we can use this as an engineered system as well. And so I'm fortunate to work with a great advisor and we sort of looked at the data and said, wow, there's real potential here.

PRES. NAPOLITANO: Yeah, yeah. And you work closely with your advisor, I assume?

MR. CHARBONNET: I do, yeah.

PRES. NAPOLITANO: Uh-huh. And so tell us something about yourself he doesn't know, he or she doesn't know.

MR. CHARBONNET: I would say that he doesn't have to wear the hat. I know that he's going bald.

PRES. NAPOLITANO: Oh, okay. Now it's out online. So, yeah. Our former graduate student. Where do you see yourself in five or ten years?

MR. CHARBONNET: I'd like to be a professor, maybe a university administrator, maybe, you know, president of a big university. I don't have any connections.

PRES. NAPOLITANO: There are days when I would trade you, yeah, yeah. And, and, you know, when you

were growing up, did you see yourself going into environmental engineering and research?

MR. CHARBONNET: Yeah, yeah, yeah. My mom is a science teacher and so I grew up in a household where science was just inculcated in us in Florida. And so she got us, I know, one time into insect collecting, like really hardcore pinning them up with the Latin names and all of that stuff. And one time we were being babysat and a Palmetto bug got into the house, which I don't know if you know what a Palmetto bug is. It's like a Florida cockroach. It's like --

PRES. NAPOLITANO: Yeah, they're big, right?

MR. CHARBONNET: If a cockroach snorted bath salts, that's a Palmetto bug, right? And so the babysitter is running around trying to squash the Palmetto bug and my sister and I have our butterfly nets out and we're like, no, you have to preserve sample integrity. From a young age we were just trained to have this appreciation for science and inquiry in the natural world around us.

PRES. NAPOLITANO: You got to tell us what happened with the Palmetto bug. Did you save it?

MR. CHARBONNET: It, it made a wonderful addition to the collection.

PRES. NAPOLITANO: What do you like to do in your spare time?

MR. CHARBONNET: I actually like to brew beer. So you all bring the food and I'll bring the drinks.

PRES. NAPOLITANO: Okay. I think we're putting together a pretty good dinner party here. Yeah. You brew it at home?

MR. CHARBONNET: I do, yeah.

PRES. NAPOLITANO: Yeah, yeah. So is it any good?

MR. CHARBONNET: Oh, yeah. I think it's really funny. People will like think, oh, this is homemade beer. What is it going to taste like and then they drink it and it tastes like really good beer, so.

PRES. NAPOLITANO: Yeah, yeah. Have you named your beer? Is it a --

MR. CHARBONNET: Yeah, I try to give them, you know, seasonal funny names.

PRES. NAPOLITANO: Uh-huh, uh-huh, like --

MR. CHARBONNET: Well, see, I shouldn't have

said that 'cause now you put me on the spot here. Let's see. So we, we made a Norse style of beer. So we named it after Harald Bluetooth who was the guy that united the Norse countries and who Bluetooth technology is named after. So then we could put the Bluetooth symbol on all of our labels for that beer.

PRES. NAPOLITANO: Very, very, very cool. All right. We'll send you back to brew some more beer.

MR. CHARBONNET: Thank you very much.

PRES. NAPOLITANO: Thank you. Now welcome to the stage our ninth contestant, Portia Mira from UC Merced.

MS. MIRA: Many of you may wonder why antibiotic resistance is something you should worry about. I'll give you four reasons why you should. First, antibiotic resistance is a worldwide problem. Currently twice as many people die from antibiotic resistant infections as HIV. And if this continues, more people will die from antibiotic resistant infections than from cancer by the year 2050.

Second, antibiotic resistance is expensive. The United States spends over 20 billion dollars

annually in excess healthcare costs associated with antibiotic resistant infections.

Third, antibiotics are the most common unnecessarily prescribed drug. In fact, up to 50% of them are not even needed.

And last, antibiotics are not only given to humans, but to livestock as well. And this is to promote growth and to prevent disease, but resistant bacteria can remain in the meat of these animals if it's not cooked properly. So it's no wonder why antibiotic resistance is such a big deal.

So what can we do about this? Well, we can't depend on the development of new antibiotics because bacteria have proven that they will become resistant to anything that we throw in their path. There's also this other idea of antibiotic cycling, which is a lot like crop rotation in which hospitals will rotate through antibiotics over time.

For example, they'll use antibiotic A for one month, rotate to antibiotic B for one month, and back to antibiotic A. And the goal of antibiotic cycling is that resistance to each antibiotic will decrease over

time.

Previously hospitals have randomly selected the antibiotics in which they cycle and this has not been effective. But what I have been able to show through my research is that antibiotic cycling still has potential if only we cycle through antibiotics that are structurally similar.

And so what I've done is measured bacterial growth across multiple antibiotics, and using these data with mathematical models I've identified treatment plans throughout 16 resistant strains of *E. coli* with a 60 to 100% probability of returning to wild type, which is a more treatable type. So what this means is that we can use the antibiotics that we already have to push bacteria in reverse making the infections they cause more treatable.

And this is the best part. In collaboration with Dignity Health in Merced and Anna Siegal at UC Berkeley, using my data we have shown that resistance to two antibiotics has significantly decreased since 2013.

So is there hope? Well, based on my results I

definitely believe there is. And by using the antibiotics that we already have, we can work at reversing antibiotic resistance. Thank you.

PRES. NAPOLITANO: X marks the spot. Yeah.

MS. MIRA: Yes. Yes. Thank you.

PRES. NAPOLITANO: All right. That's great.

MS. MIRA: Yes.

PRES. NAPOLITANO: So where did you first get interested in studying antibiotic resistance?

MS. MIRA: Well, I've always been interested in the medical field and I've always loved learning and in my last year as a graduate, undergraduate, I didn't know what I was going to do with my life. I'd say it was a midlife crisis, but I was only 24, so I can't say it was a midlife crisis. And --

PRES. NAPOLITANO: A young life crisis.

MS. MIRA: There you go. Yes. And so I was coincidentally taking a class, Mathematical Modeling for Biology, with the dean of natural sciences at the time, or MESA, and he had asked me what I was doing after I graduated, and I said I don't know and he goes have you thought about grad school. And I look at him

and I'm like what is grad school. I don't know what it is.

And so he explained it to me and he said that he had an advisor that was looking for an undergraduate researcher in data, to analyze data, and he introduced me to my advisor, Miriam Barlow, and I just fell in love with the research because antibiotic resistance and any type of bacterial infections are very relative in the clinic. And so I just feel like this is the perfect place for me because it is kind of behind-the-scenes-work with things that are really prevalent in the hospital.

PRES. NAPOLITANO: Yeah, yeah. So where, with a real-world impact.

MS. MIRA: Exactly. Yeah. Yeah.

PRES. NAPOLITANO: Yeah. Yeah. So I've asked this of the others, but I'm curious. Where do you see yourself in five or ten years?

MS. MIRA: So I just defended my dissertation exactly one week ago.

PRES. NAPOLITANO: Oh, great.

MS. MIRA: So I, I am -- thank you. So I've

got a postdoc lined up at UCLA with Pamela Yeh. And so in five years, in five years I hope -- well, maybe five or ten, between that, that time frame, I hope to be a faculty with my student up here on the Grad Slam stage and me back there rooting for them.

PRES. NAPOLITANO: That's great. What do you like to do in your spare time?

MS. MIRA: Spare what?

PRES. NAPOLITANO: Spare --

MS. MIRA: Okay. So with three children at home, I don't have spare time at all.

PRES. NAPOLITANO: Oh, my.

MS. MIRA: And if I do have a moment to myself, I usually just fall asleep and my husband can attest to that. Outside of that, I mean outside of playing with my kids and, I mean, vacation time, we like going camping, just staying at home and relaxing really.

PRES. NAPOLITANO: How old are your kids?

MS. MIRA: Oh, I've got a seven-year-old. I've got a two-and-a-half-year-old. And the newest member of our family is my nephew, who is seven months.

PRES. NAPOLITANO: Wow, wow.

MS. MIRA: Yeah.

PRES. NAPOLITANO: So that is quite a bit.

MS. MIRA: I don't, I don't, yeah.

PRES. NAPOLITANO: So spare time is kind of a --

MS. MIRA: It, it doesn't exist in my life.

PRES. NAPOLITANO: Not -- doesn't exist.

MS. MIRA: No.

PRES. NAPOLITANO: No, no. Tell us something about yourself that your thesis advisor doesn't know.

MS. MIRA: Okay. I tried to cheat and I texted her and I asked her what do you not know about me because we -- she is absolutely amazing. We're so close. But because I have kids at home, maybe she doesn't know how much time it takes to try to get a two-and-a-half-year-old to eat his dinner. And so every night we're struggling with him trying to bribe him with everything we can to get him to eat his dinner. My favorite color? Green. Is there no one else?

PRES. NAPOLITANO: Well, you know what? We'll

take that and wish you all the best.

MS. MIRA: Yeah. Thank you.

PRES. NAPOLITANO: Congratulations on your dissertation defense.

MS. MIRA: Thank you. I appreciate it.

PRES. NAPOLITANO: And our tenth and final contestant, welcome to the stage Kimberley Kanani Bitterwolf from UC Santa Cruz.

MS. KANANI BITTERWOLF: So how's the weather? Yeah, that's probably one of the most boring questions in the world. That is rather apt because if it weren't for us humans burning fossil fuels left and right, this would actually be a truly boring period of time for our planet. See, earth has seen some crazy stuff.

Like there was this one time when all of Siberia became covered in mega volcanoes and they plunged our planet into a nuclear winter. And then a few million years later India went and did the exact same thing. Or there was this other time when frozen methane from deep within our oceans started leaking up into the atmosphere increasing our global temperatures and acidifying our oceans. And I hope that last part

sounds familiar.

But the thing is, is that we would do very well to learn from events like these in our planet's past. The question, though, is how do you all know I didn't just make those up? Well, if you were so inclined you could read all about those events and more in earth's underwater libraries. These are called sediment cores where you have the youngest sediment at the top and the oldest sediment at the bottom. And chronicled away in these layers are all of earth's major events over the past millions and millions of years.

The thing, though, is they're not written in English and they're not written in Spanish. No, they're not really written in any language that we generally speak on a day-to-day. No. Instead they're written down with chemistry, specifically the chemistry of salts. But I'm not talking about boring table salt, sodium. No.

Our planet's history is much better recorded with rare salts such as the five that I studied for my Ph.D. thesis at UC Santa Cruz. Specifically, lithium,

magnesium, calcium, strontium, and barium. I studied the behavior of these five salts and the input that make our oceans salty in the first place, namely rivers and groundwater discharge.

Now rivers we all know and love these, right? We raft down them. They eventually lead out to the ocean. Groundwater, though, that one is a tad more cryptic. See, we know that we pump it out of the ground to drink as we heard about earlier, but the thing is, is that it too similarly to rivers flows downhill, but just through the ground and leaks out into the ocean. And both of these inputs translate the happenings of our continents and our atmosphere into chemical signatures, and they translate them out to the ocean where they're deposited for us to read all about for millions of years.

So in a nutshell I study the chemistry of rivers and groundwater now to improve our reconstructions of our planet's past and better our forecast for earth's climatic future. Thank you.

PRES. NAPOLITANO: So what first got you interested in studying these, these different kinds of

salts?

MS. KANINI BITTERWOLF: Actually it started off in environmental science because my mom works at a botanical garden and I wanted to spend time with her on the weekend. So I would go into work with her and I started working with different ecosystems in the natural environment back home in Hawaii and it gradually turned into environmental chemistry.

PRES. NAPOLITANO: Oh, wow. And, and yeah, in, in your research what has been the most unusual or unexpected thing that you've discovered?

MS. KANANI BITTERWOLF: I've been really surprised with how kind everybody around the world has been. Part of my research requires me to cold e-mail people in all countries around the world and ask them for groundwater samples, which is a very intimidating thing for me to do, but everybody has been so warm and welcoming to this random graduate student e-mailing them saying please can I have a sample of your groundwater. And they've been so kind so I --

PRES. NAPOLITANO: I've, I've never gotten an e-mail like that. Yeah.

MS. KANANI BITTERWOLF: I'll ask you for some San Francisco water.

PRES. NAPOLITANO: Yeah. And where do you see yourself in five or ten years?

MS. KANANI BITTERWOLF: Well, I would love to be back home on Kauai working as an environmental educator, specifically Director of Education at the National Tropical Botanical Gardens would be wonderful, or a professor at Kauai Community College since we don't have a four-year university on my home island. So I would really like to be that resource.

PRES. NAPOLITANO: Yeah. Yeah. So be an educator of some sort.

MS. KANANI BITTERWOLF: Definitely.

PRES. NAPOLITANO: Yeah. So what about you do you, would, would your thesis advisor find surprising?

MS. KANANI BITTERWOLF: I don't think that she knows that I used to work at an Italian deli. And I used to make sandwiches using the garlic bread instead of the normal bread 'cause I thought it tasted better.

PRES. NAPOLITANO: You know, with that thought I think we're all getting close to lunch and getting

hungry. So, and with all our cooks among the contestants and our dancers and just our great researchers, so thank you. Congratulations.

MS. KANANI BITTERWOLF: Yeah.

PRES. NAPOLITANO: All right. So that concludes the contestant presentations. Let's give it up for them. They were all terrific. All right. Go Grad Slam. So my part of the program is over and I'm going to turn the podium over to Provost Michael Brown to get us to the tape. Michael.

MR. BROWN: Thank you, Pres. Napolitano. And thanks to our student competitors for their outstanding presentations. They were great, weren't they? Now, well okay. Now on to the awards. We will announce the People's Choice Award, the third-place award, a second-place award, and a grand prize winner who -- and the grand prize winner will receive the Slammy. Yeah, the Slammy.

All of the presenters were extremely impressive and so we know this was a difficult task for the judges. And we, we thank everyone who took the time to, to cast a vote, to go online and cast a vote,

and we now can announce the systemwide People's Choice Award.

This award -- are, are we ready? Okay. I just wanted, just wanted to check. I tore the envelope. The People's Choice Award for 2018 goes to Mengya Tao from UC Santa Barbara Campus. That is awesome.

All right. Now to the third-place award. The third-place award goes to Portia Mira, UC Merced. Awesome. No, no. Thank you. And the second-place award, I hope I'm saying the name right, is to Yiqi Cao, UC San Francisco. I thank you.

And now -- I know it's kind of awesome. I'm grabbing the wrong thing. The first-place winner 2018 Grad Slam, winner of the Slammy, Joseph Charbonnet, UC Berkeley. Okay. But let's, let's give another hand. They were all exceptional.

Now this is the fourth annual Grad, UC Grad Slam and we have a perpetual plaque to award. And this time it goes to Dean Fiona Doyle, UC Berkeley. And, yeah, Dean, Dean, Dean Doyle, come up. Your, your student wants to take a picture with you.

On behalf of Pres. Napolitano and all of us at the Office of the President, we want to thank our wonderful LinkedIn partners for hosting this Grad Slam here at these beautiful downtown San Francisco facilities. Can we give them -- and there is so much that they do to support this event. I mean we had a wonderful repass of the videos and the, and the camera work and, and just making the facilities available to us.

We, we, we really so thank you for this and your investment in graduate education at UC. We couldn't ask for better partners and we appreciate all of that work. And I know it's more than one person. It's, it's been many, but thank you.

There are far too many people to mention by name, but I do want to acknowledge a few, a few, few others. And they wanted me to make sure I mention these at, at, at LinkedIn. Nicole Isaac, and she, she welcomed us earlier. She had to go, but we, we, we, we thank her.

Guy Berger for, for working hard on that voting. Man, that, that was a difficult job. I know

it was. And, and you, Katie Ferrick, thank you so much. You go ahead. Stand, stand up. Yeah, you all. Yeah. Let, let, let them see you. I, I know you don't do this for the honor and the glory even though it belongs to you, but, but, but, but thank you. I, I, I know the, the wonderful team, but thank you.

A great big thank you to all of the folks at the University of California, Office of the President for all the time, effort, and energy you have spent on making this event happen and make it such a success. There are many hands, heads, and hearts that have been given to make this work, and as it's been said, you know, it takes a village to do great things. It takes all of us working together.

And I do want to thank our marketing communications team. Oh, oh, you -- see, they, they always want to be giving. You, you all look on your chairs. On your chairs there are bags with swag. They want you to have your bag with swag. Your swag bag. So grab your swag bag. Don't leave it here.

And also, I want to acknowledge our UC Leads High School students. I failed to make mention to you.

Are, are, are you here? UC Leads. UC Leads. All, all you all supporting our, our, our, our scholars, thank you. Yeah. Yeah. That's right. Because you never know get, get every bit of this if you can.

But also let me thank our graduate studies dream team. Lissette Limb (ph), where are you? Yes. Lissette, she's in the back there. Sandra Wolf (ph), yes. Pamela Jennings. Oh, yeah. Oh, yeah. They work hard to make this event happen, but I know it's a labor of joy 'cause I can just see it on your faces, so.

And I finally want to thank each of you for joining us at this very special event. We appreciate your wonderful support and great energy on behalf of graduate education at UC. We hope that you will take that energy and insight from today and help highlight the importance of -- I, I don't know if everybody fully appreciates what Janet said earlier.

This is a research university. Academic graduate education is key to the engine that is the research engine of the university as a source of discoveries. You were getting, we were just getting a, a glimpse of the wonders that come out of the work of

graduate students under the mentorship of their, of, of their, their professors here and they, and we probably could look deeply to -- many of you all are working with undergraduate students, aren't you? And, and involving them in research activities and enriching their lives that way. It is part of what makes UC so very special. So, so take that with you. Don't lose that, and let other people know about it too.

I, I thank you. See you next year.

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6/25/18 Penny Knight

DATE Penny Knight