

Now is the greatest time to be in it

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Daylon James is an associate professor at Weill Cornell Medicine in New York, where his work focuses on reproductive biology and cell-based approaches for treating infertility. Arun Sharma is an assistant professor at the Cedars-Sinai Medical Center Regenerative Medicine Institute, and his lab works on modelling cardiovascular diseases and developing cell-based screening platforms for drug toxicity. Many of us also know them as the hosts of the Stem Cell Podcast. Here, we ask them about the podcast and discuss their view on the stem cell field and science communication.



postdoctoral fellowship at the Department of Genetics at Harvard Medical School, and I thought it was just a great opportunity to chat about science, stay up-to-date with stem cell biology by recapping papers, and connecting with amazing scientists from around the world on our interview segment. It's been an amazing journey and exceptionally rewarding professionally and personally.

How demanding is hosting such a popular podcast dedicated to a fast-evolving field? How long does it take to prepare one episode?

DJ: It is difficult to put a number on the amount of hours each episode takes to put together, but between reading, scripting and recording, 10 is a fair guess. Arun and I take the most time fleshing out a script that will really bring out the full story behind each guest's life and research focus. It is important to note, however, that a whole team of people at STEMCELL Technologies handles the brunt of the production, including research and scheduling of guests, editing of bloopers, and management of the social media and broadcast infrastructure. We are only the voices of a larger cast of characters who bring the show to life, and we get the best part of the deal, which is the experience of chatting with the people who move the field.

AS: Episode prep has become easier over time and typically each episode takes a few hours to prepare. Like Daylon says, we have a great team of people behind us at STEMCELL Technologies helping with creating, editing and distributing the podcast. As we are both academic principal investigators in our day jobs, the contribution of these people is crucially important and allows us to really focus on science and interview preparation.

How do you choose your guests from such a vast field?

DJ: There are no formal criteria for guest eligibility, but given the title, it is safe to say that the guests have a unique perspective related to stem cell biology that our listeners may find interesting. That encompasses a broad range: from Peter Lengyel, the brew commander at

What inspired you to become scientists and how did you decide to turn to the stem cell field?

DJ: My interest probably took root after I read a science-fiction series by Octavia Butler. It was about aliens called the Oankali that have the ability to manipulate the genome (in real time) of any organism. This was in the late 1980s and less than 30 years after Watson, Crick and Franklin solved the structure of DNA. After reading those books, whenever anyone asked what I wanted to be in life, my answer was 'a genetic engineer'. I was lucky to have parents who encouraged my self-invention and one thing led to another. I started my doctoral work with Ali Brivanlou at The Rockefeller University in New York, whose passion for deciphering the mechanisms of human development was contagious. He created a safe space for us to derive and work with human embryonic stem cells in experiments that were pretty challenging and controversial at the time.

AS: Growing up, I was fascinated by the concept of regeneration in animals. I thought it was amazing that some reptiles could grow back entire tails and limbs after injury, and I remember a school project about Dolly the sheep. I was a huge science-fiction fan, and these possibilities of regeneration and cloning

were something I wanted to dive into. But it wasn't until my undergraduate years that I fell in love with stem cell biology, and it was the advent of induced pluripotent stem (iPS) cells that really got me into the field in a more serious, career-based context. I learned about iPS cells in my developmental biology course in college, and it blew me away that you could take a small sample of someone's skin, turn it into a stem cell, and from there, generate heart cells, brain cells and so much more. It was like science fiction becoming science reality!

How did you end up hosting The Stem Cell Podcast?

DJ: Like many things in my life, I was just in the right place at the right time and I was the beneficiary of the imagination, creativity and hustle of my closest friend in science, Chris Fasano, who started the podcast with Josef Ganat, one of his former lab partners. I had been on the show as a guest a couple of times, and when STEMCELL Technologies acquired the podcast in 2016 and Chris and Josef stepped away, the job of co-host came to me.

AS: I joined The Stem Cell Podcast as a host in 2019, after listening regularly over the years. I've always been a huge advocate of science communication. There was an opening for a new host when I was finishing my first

Kings County Brewers Collective; to John Gurdon, Nobel Prize winner; to Ubaka Ogbogu, lawyer and bioethicist.

AS: Our guests are typically selected by the production team at STEMCELL Technologies, but we provide our input on potential guests based on our own networks and scientific interests. For example, a favourite episode of mine was chatting with astronaut Kate Rubins, with whom I worked on a stem cell project aboard the International Space Station, investigating the effects of microgravity on iPS cell-derived cardiomyocyte function. The STEMCELL Technologies team does a great job selecting guests from industry and academia with a broad range of professional and scientific backgrounds. We try to make it a point of emphasis to highlight junior trainees as well. One of my favourite things about doing the show is getting to know the person behind the science on our interview segments. Everyone has a unique backstory to share.

Why do you think The Stem Cell Podcast is so popular, and which type of audience do you believe to be the greatest fan of the podcast: students and postdocs or principal investigators?

DJ: It is difficult for me to put the size of our audience into context when the metrics for mainstream podcasts are in the millions of listens a day, but I am gratified and humbled that we have a consistent niche audience that is responsive and passionate about the same things as us. My intuition (backed by not quite scientific surveys) is that our audience skews toward trainees that have long monotonous hours grinding at the bench or in cell culture. This is a great audience, in my opinion, because they have their whole careers ahead of them and I like to think that they may be exposed to something on the show that helps direct their path.

AS: I think the podcast has grown in popularity for several reasons. First, the team at STEMCELL Technologies does a tremendous job marketing the show through social media channels, the website, and various newsletters. Plus, we think the podcast also serves the need and desire of the scientific community for an accessible way to stay current and connected with science. There's a ton of great stem cell science and many quality publications out there, and it's not always easy to connect to people outside of your own institute (especially for trainees). So, perhaps the podcast



can help distil science and make prominent scientists more accessible to anyone. I'd also like to think that Daylon and I do a decent job turning complex publications into informative (and entertaining) paper roundups and interview segments that any biologist can feel comfortable listening to. Based on the numbers and listener feedback, our biggest audience is definitely stem cell trainees and students (undergraduate, graduate and post-doctoral level). This makes sense given many scientific trainees of the current, tech-savvy generation are podcast fans in general, and are active on social media. For that reason, we always try our best to highlight trainees in interviews, papers and social media. I feel so fortunate to be a part of something that is valued by our field and simultaneously provides an educational benefit to stem cell trainees.

How important do you believe it is to communicate science and why?

DJ: I think it is critical to communicate science, but perhaps more importantly, I think our job, as a collective of scientists, is to communicate the science in different ways. I'm not talking about alternative facts, but alternative fora; different platforms that highlight innovations and their effect on health, while also showcasing the lives of those that are propelling the field or those the science is impacting. There are so many ways to appreciate our field.

AS: In an age of active social media where anyone (science-trained or otherwise) can provide insights and input on any topic under the sun, I believe it is crucial for scientists to convey

their work and the work of their field appropriately and accurately to the general public. Part of this is to dispel misconceptions of scientists as a homogenous group of anti-social loners, but these days it is also important to combat scientific misinformation online, as we regularly saw during the COVID-19 pandemic. This responsibility in science communication is not one we take lightly. But you don't have to be a podcast host to communicate science accurately and appropriately. All scientists should do their part!

Do you think that, as a scientific community, we are effectively communicating science? Is science communication a skill you try to teach your mentees and, if yes, how do you do that?

DJ: I think we've had a lot of growing pains in our field in attempting to convey the excitement and potential of the science without overpromising or oversimplifying. Sometimes the scientists have no control over what journalists may do for clickbait, but I myself often fall into the trap of oversimplifying, just so I can get a spark of recognition from the glazed eyes of a non-scientist at the cocktail party that made the mistake of asking what I do. More and more, I find myself underscoring what something is not more than what it is. It is important to be clear in a field that is so fraught, but I do notice that guests are increasingly guarded with their thoughts and words, and I think that is unfortunate but perhaps necessary.

AS: I think that we are certainly doing better than we have in the past. Academic and industrial entities alike are taking science communication extremely seriously these days. For example, STEMCELL Technologies has an entire science communication division, tasked with not only communicating their own company's science appropriately and accurately, but also creating content such as the STEMCELL Podcast and various scientific newsletters that are helping stem cell biologists stay in touch with the field. Similarly, academic institutes and independent scientists can rapidly and accurately communicate scientific advances through digital and social media, which probably has been the greatest positive development for science communication (in spite of its imperfections). Science communication is definitely a skill I try to teach to my mentees and trainees, since few scientists work alone in a silo anymore,

and everyone can be a better communicator. I specifically emphasize to my trainees that public speaking and written communication is just as important as the scientific aspects of their training. In the modern scientific world, science communication has never been more important, given the presence of social media alongside the more traditional means of science communication, such as publications and conference presentations.

Have the podcast and the exposure to different areas of the stem cell field that comes with hosting it helped you with your own research in any way?

DJ: I don't think I would be as invested in my own work without the interactions I have had as a co-host of the podcast. Imagine being in the room (or on the zoom) with Marie Curie while she was right in the middle of it. Making a personal connection with scientists in the middle of their greatness is really inspiring.

AS: The podcast has absolutely been beneficial for my own research and scientific career. As a junior independent investigator, I'm not too far removed from my own days as a trainee, and I feel like I still have so much to learn about the stem cell field in general, since it's so broad. Prepping for the podcast forces me to expand outside my comfort zone and explore areas in stem cell biology that I wouldn't otherwise read about. This has definitely made me a better scientist overall and much more informed about other subdisciplines within stem cell biology. In addition, being able to interview and become friends with dozens of stem cell biologists around the world has greatly expanded my professional network, leading to other speaking opportunities, new collaborations, and a greater overall visibility in my field.

What do you think has been the most impactful achievement within the last year and what do you consider to be the

greatest challenge in the stem cell field right now?

DJ: This is a no-brainer and no doubt on the lips of everybody in the field – synthetic embryos. The culmination of so much work and a pivotal advance that encapsulates the great potential of pluripotent cells, but also illustrates the limitations of in vitro tissue engineering. But whether we are talking about synthetic embryos or pancreatic islets, vascular perfusion of tissues is fundamental to organogenesis. A multitude of cell-based therapies will find their way to clinical application in decades to come, but to really model the scale and complexity present in embryonic tissues or organs in vitro, some means of vascular perfusion must be developed. Bioengineers, get to work!

AS: I am personally most excited about the area of early mammalian embryo modelling, which has been growing rapidly over the past couple of years and holds tremendous potential for understanding the 'black box' of human development. The work of scientists such as Jacob Hanna, Jun Wu, Nicolas Rivron and Miki Ebisuya (who have been recent guests on our show) have demonstrated the ability to rapidly and reproducibly create advanced models of early embryo development (blastoids, fully stem-cell-derived synthetic embryos, gastruloids and so on), enabling high-throughput studies of mammalian development in ways that were impossible 10 years ago. However, I believe that these technical advancements are also coupled with the greatest overall challenge of emerging biotechnologies: how do we balance rapid scientific advancement with proper bioethical evaluation of new biotechnologies, such as early embryo models, that hold the potential to impact science and health policy on a global scale? We saw this challenge manifest in the genome-editing field recently, when CRISPR-based genome editing was used to modify human embryos that were ultimately carried to term. The resulting uproar sent shockwaves throughout the

global scientific community and the general public, and I think that moving too fast in human genome editing gave the field a black eye. This is a situation I want to avoid in stem cell biology, which certainly has already had its own share of ethical conundrums over the past decades.

Do you have a message to share with our readers and fans of The Stem Cell Podcast?

DJ: My scientific training started at the beginning of the boom in pluripotent stem cell research, so I have seen first-hand the startling progress in the field and had the pleasure and honour of reporting on that with the podcast. But, as Arun and I say all the time on the show: now is the greatest time to be in it. Like mechanical engineering and computer science before it, stem cell biology is graduating to the next phase of development. And as therapies and related technologies become ubiquitous, pathways for application of your passion and expertise are ever-expanding.

AS: I just want to say thank you! Hosting The Stem Cell Podcast has been one of the highlights of my professional career. It's so humbling and heart-warming to hear positive feedback from regular listeners of the show. We recently did a meet-and-greet session at the ISSCR 2022 annual meeting in San Francisco, and many people told us that they enjoyed listening to the show while doing cell culture, commuting to work, and so on. Given the growth of the show, being a co-host isn't a responsibility I take lightly, as we want to keep providing accurate and informative scientific insights into the stem cell field at the highest possible level. Daylon and I love doing what we do, and we hope that we can continue to be a staple of the stem cell community for years to come.

Interviewed by Stylianos Lefkopoulou

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