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NPDC 21

Panel Discussion – Collaborative Research Practices

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>> PROFESSOR DAME JANET BEER: Good afternoon, everyone. I'm Janet Beer, and I'm the Vice Chancellor of the University of Liverpool and it's a privilege for me to chair today's panel on collaborative research practice. Before we begin, a couple of general housekeeping notes. The session is being recorded and will be made available on the NPDC21 pages next week and any questions you have can be asked via the Q&A function. It gives me particular pleasure to chair this panel session because it reflects what is at the heart of our research and impact strategy here at Liverpool, our people.

Creating the right environment and supporting our researchers at every career stage while we continue to build on our strong record of partnerships and collaborations. Professional researchers across the country are represented by those of you in attendance today, and you're increasingly seeking to work in teams and in partnerships with one another within departments and universities and across universities and indeed across countries.

This collaborative practice contradicts the outdated misconception of the lone researcher hidden away in solitude and many of you will have heard dame Ottoline Leyser speaking about this outdated notion earlier this morning. Speaking directly to recognise this advancement in research culture, I'm delighted that the National Post-Doc Conference panel consists of an action oriented and solutions focused discussion about team science and team-based approaches to research and development and how we can both celebrate and contribute to the collaborative work being undertaken across UK universities.

We have with us five distinguished panellists who I will briefly introduce before the panel begin.

Firstly, I would like to warmly welcome my dear colleague, Professor Julia Buckingham, CBE, Professor Buckingham has had a long and distinguished academic career, following appointments at Charing Cross and Westminster Medical School, Imperial College, London and head of the department of neuroscience and mental health, head of the Centre For Integrative Mammalian Physiology and Pharmacology and Pro-Rector, she was appointed Vice Chancellor and president of Brunel University London in 2012. She was appointed as CBE in 2015 for services to biology and education and elected to a fellowship of the Academy of Sciences in 2019. Former roles include president of the British Pharmacological Society, President of the Society for Endocrinology, member of of the Sykes Commission, chair of SCORE, editor of the Journal of Neuroendocrinology, chairman of Bioscientifica, Limited, trustee of the Royal Institution, Royal Society of Biology, and STEMNET and the governor of St. Mary's Calne, she has just finished her term of office as president of the universities UK but continues working in and on behalf of the sector as director of Imperial College Health Partners, chair of the The Concordat Strategy Group, supporting the career development of researchers and chair of the steering group undertaking the review of the Athena SWAN gender equality charter, and she has recently taken up office as the chair of the institute of cancer research. No, she never sleeps.

Second, I would like to welcome Dr Annette Bramley, director of N8 Research Partnership. Annette joined the N8 Research Partnership as director in January 2018 and priestly worked for for the Engineering and Physical Sciences Research Council and brought to us in the N8 tremendous knowledge and experience from a career that spans numerous senior positions.

She will probably be best known to the research and business communities in the north from her role as head of health care technologies, where she had particular success in galvanising multidisciplinary research collaborations between researchers and between funders.

She also brought to the N8 strong experience of organisational change having played a prominent role in the successful transfer of EPSRC's grant services to a shared service centre including the implementation of a new IT system. Her other roles in EPSRC have included head of mathematical sciences, complexity science and engineering. Annette is also an artist and student at the Royal School of Needlework, graduating last year with a certificate, and is now studying for the diploma, her work has been exhibited across the UK, and she feels that her love for both the arts and sciences is one of the reasons that she's so passionate about multidisciplinary research and bringing people together to address real-world challenges.

I'm also delighted to welcome Dr Karen Salt, deputy director in UKRI, strategy directorate, with over 28 years' experience working within communities, and governmental bodies an expert on systems and transformative change, she has managed large research teams and collaborated on a number of research projects, including those involving community members as active researchers, and those exploring the governance of technology deployed for the public good. Now, based in UKRI she is the deputy director for R&D culture and environment, a policy area that brings together teams working on ethics, research integrity, research and innovation culture, equality, diversity, and inclusion, and open research.

She is also the senior level policy lead within UKRI on trusted research, leading an integrated programme of work to lead international partnerships. A sought after thought leader and speaker Karen works closely with senior leadership across government, academia, civil society and industry, and contributes to numerous international initiatives focused on embedding inclusive policy making.

In addition, the panel will also greatly benefit from the insight and experience of Dr Edward O. Pyzer-Knapp who is IBM's global lead for AI enriched modeling and simulation with a particular focus on the development and exploitation of these techniques for accelerated materials discovery. He has broad, cross-disciplinary research interests spanning IBM's three pillars of bits, classical computing, neurons, AI, and qubits, quantum computing. He has also more than 50 papers and conference proceedings as well as three book chapters and a textbook on deep learning for the physical sciences which will be published this year. He is also the visiting professor of industrially applied AI at the University of Liverpool and serves as editor-in-chief of the journal applied AI letters which has a focus of real world applications of AI including in the physical sciences domain and last but very definitely not least it's also my pleasure to introduce Dr Joshua Kaggie, Dr Kaggie is a MRI physicist and previous president of the postdoctoral society of Cambridge. He was involved in organising the 2019 National Post-Doc Conference, he is originally from Utah having come to Cambridge in 2015 following his Ph.D., since then he listened an RA and recently an SRA.

His research involves creating new methods enable higher MRI throughput and detecting atomic resonances such as deuterium for cancer imaging. Each of the panellists is going to have a give a brief response to a question, how can collaborative lesson help us transcend disciplinary and institutional boundaries, what does good collaboration between universities, funders, nationally and internationally, look like? And having said all that, I will now pass over to Julia.

>> PROFESSOR JULIA BUCKINGHAM: Well, thank you, Janet for that very kind introduction, and good afternoon everybody. It's a real pleasure to be with you this afternoon. And what a hugely important topic we're going to be discussing as we seek to solve the many challenges the world faces. I'm going to start by talking about what I think the key ingredients are about good collaboration based on things I have learnt by being directly involved in collaborations, watching other people and on occasions having to troubleshoot problems. For me, I think there are three key ingredients and the first is is a shared vision and purpose, the second is people and culture and the third is communication I could add funding as well, but since we are talking about fund he used to, I've left that one out. Let's think about a shared vision and purpose. In my view, there has to be a reason to collaborate, a common purpose with a clearly articulated goal and agreed plan and above all a shared passion for delivery. And that passion is absolutely vital, simply telling people to collaborate generally doesn't work, certainly in my experience.

And there are many, many different ways of starting collaborations, often a funding call is quite good but aside from funders, I think they range from direct approaches from one party to another to a casual conversation between researchers at a conference. They can all work as long as you are all on the same page.

And that takes me to people and culture. And collaboration, of course, means people working together. People with the right mix of knowledge and skills, transcending barriers to work together, everyone pulling in the same direction and that, of course, means the culture of us, a team, not me, and my agenda.

Not always easy!

Now, this is a very personal view, but to me a strong team needs leadership and that leadership needs to be inclusive and to inspire openness, trust and creativity and very importantly, a culture of mutual respect but every individual, whatever their role has a voice and feels listened to and has the opportunity to thrive, both personally and professionally.

So we need supportive behaviours which respect, embrace, and celebrate our differences and enable people to develop as individuals and progress through their careers.

Now, as we collaborate across disciplines, across institutions, across countries, the breadth of our diversity in our teams becomes much broader. That, of course, is a real strength. But it brings some different challenges.

We have to understand a broader spectrum of cultural differences, and we have to embrace each other's perspectives and drivers, and develop that sense of a common purpose and a common language. Industry is very different from academia: Engineering is very different from political sciences. And every country, of course, has its own unique and very special culture. All things to be treasured but all things to be embraced.

Which brings me to my third point: Communication, and frankly, we can't do enough of it. It's vital in developing mutual understanding and trust, and to smoothing those boundaries across disciplines, institutions and organisations and countries opinion it's vital to solving problems, and it's vital to preventing those little niggles which will always emerge growing from a little niggle to a major problem. So to go back to the first question, how does research help us transcend these boundaries, it's, again, about having a shared ambition to solve a problem. To coin a phrase, there are many different ways to skin a cat. If you can get people together to talk about a problem and how you might solve, the boundaries begin to melt away, very creative ideas spring from diversity of thinking and diversity of approach.

It's probably easier to start with something small and tangible but those small things can snowball very quickly. If you have a culture where people are talking about their research and most enthusiasts do it, let's face it, sometimes they do it too much but it does attract the interest of others, it sparks ideas, more people want to tango, and off you go! That's certainly my experience but people have to want to do it, and if people don't want to do, I don't think collaborations will ever work. So I'm going to finish on that note and hand over to Annette.

>> DR ANNETTE BRAMLEY: Thank you, Julia.

And can I echo Julia's thanks to the National Post-Doc Conference for inviting me to take part in this panel. It's a subject which I am absolutely passionate about, and I could probably speak about an hour about just on my own. So I just want to pick up where Julia left off around the potential for collaborative multidisciplinary research to transcend boundaries.

And one of the things that this type of research does is it allows us to look at complex, wicked and ill-defined problems, which we can't solve on our own and we can't solve with just one discipline and we do need to bring a multiplicity of ideas and perspectives to the problem. It helps us address what we call groupthink.

So that's in a sense why. And that helps us to get to the underlying success factor, which I think is shared values.

We don't need everybody to collaborate with everyone else on everything. What we need to do is bring together groups that share values, want to work together, and I'm sure you all know that collaboration doesn't just happen because you put people together, or because they are in the same room.

Collaboration happens because people make a conscious effort to work together.

And that means that they need to be able to share: Share knowledge, coordinate their language and their activity, and to share power and control. And some of that, as we have already heard today, can be uncomfortable in a hierarchical organisational structure such as we often find in academia. But these multidisciplinary, interinstitutional collaborations often help break down some of those structures and when we create the right kind of enabling environments, we allow a more diverse range of people, particularly early career researchers and they can bring real novel insights to these challenges by looking at them through a different lens.

For me, a key success factor if we are looking at what does good collaboration look like, is collaboration that's based on relationships.

That for me makes collaboration not an end goal but an ongoing practice.

Collaborations that work play to partners' strengths and they add value to every individual partner.

They recognise that knowledge comes in different forms and that academic knowledge or disciplinary knowledge is just one form of knowledge or of output.

And for good relationships, you need to have repeated engagement. And that means not just coming together once. That means coming together again and again to learn each other's languages, to develop your own language the only thing build the trust that Julia was talking about. So key feature for me is trust and psychological safety as Ottoline spoke about earlier today.

So I'm going to hand over at this point to Dr Karen Salt for her perspectives on this question.

>> DR KAREN SALT: Greetings, everyone. I am delighted to join the conference and to be a -- participate on this prestigious panel and to be supported by excellent interpreters and others who are really helping us ton as accessible as we possibly can as a conference community.

I'm really pleased to be able to tackle a question like this that's been put before us, as many of you will know more may have heard, I talk about collaboration and connectivity in multiple domains and ways, thinking about it from research project design all the way to thinking about governance and power sharing amongst communities and sets of people but I'm going to try to focus my responses to really thinking a lot about research in this talk and so I've got a few things I want to walk you through in my short bit of time that I've been allotted. And I think the first one for me is really a acknowledgment that research at its -- by its very nature is collaborative.

I find it quite striking that we don't acknowledge that often at the very start. You can't do research -- you can do it as an individual researcher per se but you need some stuff. You need a system, often that's around that. You might need a bit of infrastructure, whether or not that might be support financially or a place to meet. It doesn't necessarily have to be an institution but there might need to be some set of tools or things or people that you encounter, much less thinking about the folks who have played such a massive role in the research and innovation role in academia like of our health and safety officers who have brought us back into our buildings or plant managers or archivists who have been able to get information to a whole range of researchers who may not have been able to travel to various archives and locations.

That is part of our community. Those folks are part of our system, and I think when we understand and recognise that our mentors that are a part of this, our peer reviewers are a part of this, our colleagues down the hall are part of this, you start to realise that to do research, we need to collaborate and we need to associate and we need to do more than just be in the room with other sets of people. We have to depend upon each other, we support each other, we boost each other, and we should hopefully want to nurture each other no matter what we are doing in this system.

And I recognise that quite a lot of this is a challenge. It's not thinking utopic, I'm thinking of practical places to lean into that thinking. I started thinking about thinking of our system as a collective knowledge economy, what if we started to imagine our system is one where aware of a collective and my benefits and creations and discoveries and ideas actually are depended upon having you, having a set of people to engage with, to challenge, critique, to change ideas with.

And I think of this in a more informal way, which is a little bit of what I've been describing as well as a more formal way where we might be setting up more long-term collaborative engagement and interactions really thinking about the production and the materials and the ideas that we are putting together.

We have really got some information from both Julia and Annette about these more kind of formal partnerships. These aren't necessarily financed, but they are formalised, people are coming together and finding some connectivity or shared purpose with their work. I've got four things to add to the table of what Annette and Julia have already talked about in terms of what would "good" look like.

And I think these are kind of fundamental, often, to thinking about partnering and collaborating and working together with others. The first one is value!

It might seem an odd one to put into the mix, but I think there is something really about recognising how do the various participants within any sort of collaboration value the contribution of others?

And then being very explicit with that value, which could connote the different types of recognition for the work that people might be doing. All the way through to what people might get out of this, because not everyone wants a of paper, it is not everyone wants to give a talk or get a grant with these collaborations. So what is the value of that connectivity and partnership? Is it the production of new tools, ideas, new business models? It could actually have a whole range of different possibilities that might come out of this, but it's really unpacking the value and signaling the value of everyone's contribution is really quite important.

I won't spend time talking about engagement. I think both Annette and Julia have given a little bit already to think about what does engagement mean. I would just emphasise that it is crucial that it is sustainable. It doesn't necessarily mean that it's already financed but it's sustainable. Because no one wants to partner with someone when they're fleshed with cash and then they disappear and they don't want to interact or to be poached or essentially brought into something to give of their knowledge or information but not be valued. We want to break that extractive as opposed to generative partnering. My last two are going to be really quite critical.

The one that Julia briefly mentioned about funding is one I want to circle back to around financing because the financing is not necessarily about going out and getting a grant per se but it's really starting to think through, if you are going to have a formal relationship, how do you set up your finances for those partners?

How do you really make sure, thinking back into whatever finance office you might be connected to, how are those relationships and partnerships and plans and payment schedules are actually set up?

These are really the back room type things of collaborating and partnering but thing often break relationships amongst different sets of folks where these sorts of finances are crucial and this takes me to my really crucial last one and it's one that we have touched upon briefly within the panel but equity really has got to be part and parcel of the conversation. What does an equitable partnership look like? What can you bring to that table? How do you keep that centred around that equitable relationship and recognise at certain points of time where you might have to step back and allow others to shine or cede control to others in the relationship? I hope this gives you a little bit of things to think about, and I'm certain it's going to genre questions from various folks and I'm going to stop with the rest of my time now something hand over to Ed.

>> DR EDWARD O. PYZER-KNAPP: Hi there. Thank you very much.

So one of the -- first of all, I would like to say thank you. Thank you for being invited, to be on this fabulously wonderful panel. And thank you for also taking the time to listen to me.

One of the downsides of being on such a well established and experienced panel is that by the time you get to the end, which I am almost at, many of the good points have already been taken and, therefore, whilst I do not want to repeat, I do want to reemphasise certainly some of the excellent points that have been mentioned before. Most if not all of the world's most pressing and most challenging problems are multidisciplinary and by that very nature, require multidisciplinary teams to solve them. And in order to cross disciplines successfully and sustainably, it is necessary to have good collaboration.

And one of the key underlying features of that collaboration must be a shared sense of purpose, and a shared vision of success.

Now, this shared vision both of purpose and success does not necessarily require a shared view as to how that success is going to be achieved.

Everybody in a team brings their own strengths, their own character and their own view, and making sure that that is nurtured is essential.

A strong knit team needs to enable everyone to feel safe: Safe to share their views, safe to criticise but also safe to agree.

And good leadership in that team must use all of the available information to make good and strong decisions diversity is, of course, absolutely essential, as we have seen in, you know, recent times. And that diversity is -- covers many boundaries, diversity of thought. Diversity of experience. Diversity even of motivation.

As we have heard, not everybody is motivated by papers, by conferences or by money. But making sure that everyone in a team while pulling forward for their shared purpose is motivated in the way that is most meaningful to them is a key factor in enabling the longevity and sustainability of that team.

And, of course, as has been said before, it goes without saying, that good and strong communication is, of course, necessary as well.

Strong communication does not necessarily only mean volume of communication. And by that, of course, I don't mean shouting. I mean frequency of contact.

But in addition to talking regularly to each other, the quality of that communication is essential, as we know so much is transmitted in those in those microexpressions, how we move our body and how we interact with our teammates. And the requirement for a successful team is to build up a shared language both verbal and nonverbal that makes that communication as seamless as possible.

My final point will be to say that all teams are a collection of relationships and relationships don't start by suddenly deciding to shoot for the moon.

But maybe start with smaller interactions as trust is built and momentum is gained and that snowball effect that we see again and again is allowed to take its natural course.

And the teams that are provided and built through that process are surely capable of achieving what they set their hearts to. And throughout all of this, research is a key strand which enables that shared motivation, that shared purpose but most of all that shared language that I have said I believe to be the keys to building, creating, and executing successful teams.

And with that, I will hand over to Josh. Thank you very much for your time.

>> DR JOSHUA KAGGIE: Hi, much like Annette, I could talk quite long on collaboration and how it influences research. I feel actually it strikes at the heart of my own personality, my success in research and even conflicts.

As to the question, how can collaborative research help us transcend institutional boundaries, this conference is a perfect example of that.

So I just want to say thank you to both Julia Buckingham and Saneeya Qureshi for putting this together and their effort.

And collaborations like this help us to address cultural policies that work well, and things that don't, to be able to begin to change, to discuss these things. I would like to make sure we have enough time for all panellists to discuss things further, I just want to say a few brief things on lofty principles. I want to say that society is itself the result of collaboration.

We rise and fall together. We make this trade with each other, that when you do well, I do well. It doesn't always happen that way but you as an academic implicitly collaborate with each other. You do this through papers, conferences, and maybe even patents which may not be considered collaboration but it's putting your ideas out there for others to see.

These things, and others, like open access code and data force you to regularly share with other institutions and help mark your academic success.

And this is how your measurement of forward ability is measured, it helps influence the world and your research and further collaborations. So our goal as academics is actually to collaborate. We collaborate to move our understanding of the world forward more quickly and I would argue to improve the living conditions of ourselves, others, and future generations. We build on the work of those before us, and I hope future generations will build on our work in art, science, and all the aspects that we undergo as academics.

There are a number of challenges with collaboration. But I think the policies and the methods that have previously been discussed such as having appropriate purposes and clear leadership and funding can help resolve and drive collaboration. So with that, I will give it up for the questions.

>> PROFESSOR DAME JANET BEER: Josh, thank you very much indeed, that really added something significantly different to the contributions. Can I invite panellists to rejoin me on screen? And we can start the questions.

Just in terms of the areas that you all covered, there were some really interesting kind of repetitions in the sense of emphasis. So I think in one way or another, everybody talked about the importance of relationships. Everybody talked about inclusive leadership that was also respectful and generated a culture of generating trust. I think everyone in one way or another talked about playing so the strengths of a diverse team and the -- I think a word that -- a phrase that Karen put into the conference that you're working towards a collective knowledge economy, which is, you know, a really, really interesting way of looking at it.

But, of course, overarching, fundamental, and in the sense informative always, the shared sense of purpose and vision of success.

So, you know, I think we kind of began and ended there and that's obviously indispensable.

So having kind of revisited the dominant themes and language there, within that team, how is it possible? This is one of the questions -- for there to be freedom built in for postdocs to establish themselves as researchers no one else own right and, therefore, secure their own careers either inside or outside of the academy? Karen do you want to have a crack at that one first and other panellists, if you want to wave at me to come in on that one as well. So it's about how post-docs can establish themselves as researchers in their own right.

>> DR KAREN SALT: Thank you, Janet, and thank you for, I think, a really excellent overview of the discussion. It's been very rich and illuminating. It's a question interesting question.

There's some presuppositions in it that I think would be worth tackling a little bit in the first place. It's that freedom question. I can't quite get past the word "freedom" being used to describe the post-doc. It almost sounds as if the entire exercise is quite chained or constrained, and there needs to be an allowance to allow growth and possibility and --

>> Let's substitute space then.

>> DR KAREN SALT: One of the key things that needs to happen I think in projects is obviously whoever is the primary investigator or the lead that is on the project needs to hopefully bring people in in an effort to allow that growth and success to ultimately happen. Yes, that people contribute, but they are able to take something on to future projects and to future endeavours. So I would hope that what we are able to create from a system is create an environment where those principal investigators or leads are a inclusive leader and they lead their team with that growth and space about fundamental, and not just when you're a post-doc but all the time.

Even when you're the PI, you're also having those same sorts of freedoms and thinking about that growth and moving forward. One of the things that could be fundamental to starting to establish that, are for some post-docs and depending upon the project and what people are connected to, to be continuing to think about what are the things that motivate and interest them as research. What for some of the next things that they might go to or the next set of discoveries, they start to kind of assemble things that give them a bit of autonomy. It depends on what discipline, because in some disciplines, that's a given, that they would be working much more autonomously, and for others, that they would be contributing to a given space but really starting to find your niche will provide space for people to be able to grow a project off the back of that as opposed to always feeling like they are tethered to their senior leader or whomever they are working with.

>> PROFESSOR DAME JANET BEER: Thank you. Josh?

>> DR JOSHUA KAGGIE: There's a catch-22, which is very difficult to manage. Post-docs have to collaborate. There's no way about it. It offers new ways of research, new connections but, on the other hand, if you collaborate too much, you don't develop your own ideas thoroughly enough.

And so in order to progress with your career, you have to actually have first author papers. This is usually how many universities reward it.

And not necessarily award, say, middle author publications where you have been a collaborator. And so I think this is a challenging thing. Post-docs can sometimes feel a little lost in these collaborations. And it does differ by field. And you have -- there's this paradox. But the thing this keep in mind is post-docs are probably the best people to collaborate with in any lab mostly because they have the training and skills necessary to do hands on work, they don't have to worry about learning those things and maybe even new papers as much as say a Ph.D. student and they aren't as taken up with probably writing grants and the loftier goals that PIs have to focus on.

So they are early in their -- they are in early stages of their career where they only benefit from collaboration if they can manage to, as Karen says, find their niche.

>> PROFESSOR DAME JANET BEER: Julia, did you want to come in?

>> PROFESSOR JULIA BUCKINGHAM: Thank you, Janet. This is something we have talked about an enormous amount in the research concordat strategy group, and it's at the heart of some of the stuff in the new concordat. A few perspectives, I could talk for hours but I won't. Firstly it's incredibly important that the post-docs have a voice and that in the team meetings, however they are organised, post-docs are contributing ideas, they are helping to shape the project as it goes forward. We don't start with a blueprint of what we're going to be doing in three years time, we start with a concept, and projects evolve, and it's really important that post-docs are contributing to that evolution of the project, their voice is being heard and they are allowed to take things forward. So I think responsibility is key.

What responsibilities do we allow those post-docs to have in helping to shape the project and in helping to deliver the project? Because that's all part of developing as a person.

I also think there's a huge role for the project leader in this in having open conversations with the post-doc about their career development.

What is it the post-doc is trying to achieve, and they have many different ambitions. How is the PI supporting that post-doc in helping them develop their career? Those open conversations is critically important. I take Josh's point about papers, but it's not possible for everyone to be the first author, and we have got to create a culture where your position on the paper isn't the be-all and end-all, and we begin to respect everyone's very different contributions to a big interdisciplinary piece of work. And we have got to help people build their CVs.

It's critically important. Who would want to be a post-doc if you aren't being given the opportunity to develop your CV. I just think it's so important. It's all sorts of different opportunities you need to help them have as they go through that role.

>> PROFESSOR DAME JANET BEER: If I can put in a question that relates to that conversation, from Katy Roscoe, what would you recommend post-docs do as their first steps towards collaboration outside their immediate team supervisor relationship? That's about really finding other connections. Annette?

>> DR ANNETTE BRAMLEY: Yeah, one of the things that conferences like today's did a but the proliferation of online events is there's much more opportunity to attend things that aren't in your normal discipline, so you can get to understand some of the languages, some of the challenges that are existing in other fields and start to make relationships, make contact with people.

And I just wanted to also respond on the previous question but it also relates to this one, as you say, John. It's something for post-docs about how to make your ideas backable and whether you stay in academia or whether you go into industry, if you have got an idea and you want to make it, you know, taken up by your PI or by an investor or by your manager in business, you need to nurture and grow it, you know, with peers or with, you know, a safe sounding board, a critical friend before you pitch it in before it kind of is mature enough to stand on its own.

It's kind of like trying to pick a seedling before its really borne the fruit. So there's something about having that network of trusted friends or trusted people around you that you can bounce your ideas off and get second opinions. And they may have contacts that they can introduce you to as well.

>> PROFESSOR DAME JANET BEER: Yeah, I was going to say, you know, one of the things that I always wanted to do for my postgraduate students was make sure that they had access to my networks and that, you know, when they went off at a tangent, you know, off at a tangent but developed an area of work that, you know, I wouldn't necessarily be the natural partner for, that they had other people as a resource.

So that's really important but, you know, obviously depends on the nature of the supervisor relationship.

Josh, I'm going to move on to the next question because -- well go quickly and then we will go to the next question.

>> Just a brief remark. Talking it over with your PI so that you can use their network, because your PI probably has to know what you're going to be working on anyways. And they should be able to help you and want to help you.

>> PROFESSOR DAME JANET BEER: Yeah, that's right. Thank you very much, Josh. Edward, can I come to you on this question from Manish Sinh, how much do collaborations affect reproducibility in science?

>> Fabulous question. First of all, I'll give my congratulations to the question asker. Collaborations, first of all, and first and foremost and maybe the most obvious answer is you have a second pair of eyes. The amount of times that I have done something, late at night, working hard, you do something, slightly foggy, you think it's one thing but you send it to your colleague, your collaborator and they go, are you sure you mean this? And the next morning, you say, of course, I didn't. If you don't collaborate, you don't ever get these secondary sounding boards and get these other views or interpretations of what you've done. And essentially reproducibility is not about somebody with your exact knowledge and exact abilities being able to do exactly what you've done.

Reproducibility is about somebody else of reasonable competence being able to take what you have written or take what you have published or take what you have put out into the world and be able to say, yeah, I can also do that. I get the same result when I do these steps.

So, first of all -- first and foremost, I guess, having different views, different pairs of eyes looking at things, understanding or trying to understand what you have done just helps with that process.

And I think just in terms of transparency, I would just like to air one additional point which is often overlooked, I think, that availability and transparency and often both used interchangeably when we are talking about reproducibility of data, and certainly one of the things that you might be tempted to do, especially if you are not working as part of a team is throw something out into the world and say, it's out there now, therefore, it's reproducible. Actually the amount of times I have seen things that are essential irreproducible because they haven't that second look or that independent review to say, "Hey, can you clarify this a little bit more?" That comes naturally as part of a team.

That goes out into the open and you get confused between availability and transparency and transparency is really the key. It's clear what you've done, why you've done, and what you expect to see if someone else does it again.

>> PROFESSOR DAME JANET BEER: Julia, do you want to come in on that one and then Karen?

>> PROFESSOR JULIA BUCKINGHAM: Thank you very much. I would agree with what Josh has said, and I also think it's how you've done things as well. It's very easy to look at a data set and draw conclusions from it but if you don't really understand the fundamentals of the methodology and the design of what was done it's actually quite easy for things to get misconstrued and I think, again, in a team environment, you have got this sharing of everything. You are a team, you share your data and your experimental protocols, and as Edward was saying, you do something silly because you're tired, somebody else will pick it up and you will have those conversations.

So I think it really helps. You've just got a much bigger pool of people and I think this feeling of sort of openness in the team, you're absolutely open and honest with everybody, sharing is just so important but there will be occasions where things appear to be not reproducible because the design of the experiment was fundamentally very, very different and it's only when you get into the nitty-gritty of the design you realise, that's why you've got different data. And that's a simple example -- a simple example I can give you, if you work on animal physiology, for example, different strains of mice are different, so you could do the same experiment on different strains of mice and get different data, it's not that one is wrong offer reproducible, the fundamental day before or reproducible -- or reproduce image, the fundamental design is different. And if you miss out on that, it is not reproducible.

>> Thank you, even a nonscientist can understand that. Karen?

>> DR KAREN SALT: Often we were talking replicability, not reproduce I will not, and this is different as you cross the disciplinary garden in terms of the type of work but I do think two things that are crucial for collaborative practice, no matter if that takes the form of working with, you know, a symphony or all the way through to, you know, people who do practice type of work for that might be more arts oriented. This type of work is all about discussion, the more that you can discuss your work with the community, the better. It could be more formal like a methodological statement to giving statements, to unpack what you're doing and how you're doing it, having collaborations in that formal and informal way are just brilliant for that for really helping you get the tools of how to do that, but also just making it kind of normal for you to talk about your stuff.

And so it gets handy to be able to do that.

But I think one of the real big strengths of collaboration is the fact that you can bring more tools to the task.

There's, you know, I don't want another me to attack a problem that is complex! I've got me! I need more types of other brilliant people to come together, and it's not just necessarily interdisciplinary, people who have been trained in a different way or a different time period are seeing things slightly differently and that's exciting to bring all of that thinking together that can produce really novel, exciting, I think discoveries and ideas. So for me it's a tool kit kind of thing. The better -- the more I can bring folks together, the more tools I have and in a fairly selfish way, I don't have to have them all, I don't have to have all the tools and answers, my collaborators can contribute, and that's very powerful moving forward.

>> It's a symphony, isn't it, when it works. It's really a beautiful thing. Edward smart asks, what advice would you give to postdocs wanting to apply to funding, and do you think that research councils are doing enough to support post-docs in developing their independence? Who wants to have first go at that one?

>> DR ANNETTE BRAMLEY: Yeah, I mean, this is where I fall back on 20 years EPSRC.

So one of the great things that you can do as a post-doc on a UKRI research grant is to be a research coinvestigator which really enables you both to be paid but also to have your name attached to, you know, the grant which you can then use as collateral on your CV. I would definitely recommend that.

I think -- aside of UKRI there's plenty of opportunities within university to access pump priming funding which is really a good thing to do and a number of the learned societies operate fellowship schemes depending on what part of the research base you're in. So I'll put that there and hope that other members of the panel have had time to think.

>> PROFESSOR JULIA BUCKINGHAM: Yes, I agree with what Annette was saying. I think even before you get to the application side, and I think this is really important to do with Ph.D. students as well as post-docs and that's to engage them with the process of grant applications. There is a skill to writing one as we all know and the sooner you introduce developing researchers to the process, the skills needed, the rigour needed, I think that's really, really helpful because it's very daunting to write a grant application for the first time. So that support early is critically important. I would say, as well as the learned societies having fellowships quite a lot of them certainly in my area and I can't speak for other areas have quite a lot of small grants, 10-K, 15K, something like that which enables a post-doc to do something which is theirs and give them ownership of it. And if you have got a supportive PI, that is a really, really helpful avenue.

The other point I would make is to be honest about your career potential. And this is, again, where the right career advice is vital because there are people who are on fellowship track and they are going to do really well on the fellowship track but it's not right for everyone. And it's understanding what your chances are. If your CV isn't strong enough, you're not going to get a fellowship. So don't go for it. Wait a little while. Have those honest conversations but also understand what it is you need to do to get yourself to that level. It could be, write your papers up, because some of us when we were younger weren't so good at getting our papers written up on time. You do need the evidence of your research potential, that's really, really important. And I'll finish there.

>> PROFESSOR DAME JANET BEER: Josh?

>> DR JOSHUA KAGGIE: I find that it's less funder restricted.

It actually here is department dependent. That is, if you are in certain departments, then they encourage post-docs to be PIs for their own grants, to try to go for fellowships early. Whereas other departments restrict it to either senior research associates or even higher before you can really apply for your own grants.

In terms of fund he used to, UKRI has early research career fellowships, that I think they encourage everyone who is applicable and -- to apply for.

>> PROFESSOR DAME JANET BEER: Thank you very much. We're nearly out of time so I'm just going to ask Karen to give a response to one last question.

And that's from Alex James. How would you recommend people between different disciplines collaborate with one another, for example, we have seen how integral it is for scientists and policy makers to collaborate. But how can we make sure this collaboration is successful? Just a quick and easy one for you to answer, Karen!

>> DR KAREN SALT: Excellent! I like easy, Janet. Easy is really good.

>> PROFESSOR DAME JANET BEER: I'm sure you could talk on night on this one.

>> DR KAREN SALT: Exactly. My response is actually going to pick up on what I would have said in relationship to the last question. I think the first one is, really picking up I think Julia's point that funding type, you know, you need to match it to what you're trying to do.

Many start to imagine I'm going to go after something gigantic. And really you might need a feasibility study. You might need something that is actually quite small. You might need to go and create a network. You might want to create a conference or do something on smaller scale and create interdisciplinary collaborations, they work really well when you can bring together at that early stage to make sure, are we speaking the right language together? Before you actually start to sit down and write something in terms of a funding application. But I would also recommend that people go and find examples. The obvious one is to turn to a senior or project lead that you might interact with, a mentor but if you are connected to a facility, your research office is a gold mine.

Because they will have examples of types of funding that you can look for, and they will often give you anonymised information, and you can see a prototype, of how you work across that interdisciplinary divide and start to think about things, and you probably want to talk to people about where you submit. There will be some fund he used to of various flavours that, yeah, they are interdisciplinary but more interdisciplinary lite. And you need to really understand what that means in terms of how you pitch what your ideas are, and then there are other places that are all about the interdisciplinary. They don't want to see boxes of different people holding packages. They really do want to see diffusion, and looking at those different examples will really give you a wealth of a library which you can then start to draw from as you generate your own ideas.

>> PROFESSOR DAME JANET BEER: That's hugely helpful. Thank you very much. Before I hand over to my colleague Anthony Hollander, can I thank you, Annette, Karen, Ed, Joshua, and Julia for your time this afternoon, for contributing your wisdom. I know it will be hugely appreciated by the audience who have joined us this Friday afternoon and to wish you good luck and Godspeed with your next ventures, especially Julia, as she moves into, you know, a very exciting phase of chairing major research in the UK.

So, please, remain, you know, with us for the next closing part of the session but thank you all again. Anthony?

>> Thank you very much, Janet, and thank you to all panellists and good afternoon to everyone in this conference hall. As Janet said, I'm professor Anthony Hollander, pro Vice Chancellor for research and impact here at the University of Liverpool. And it's a really great privilege to be sharing this virtual stage today, and to be closing this really important event. I'm sure that you will all agree with me that today has provided a truly brilliant opportunity for post-docs and researchers from across the country to meet and network, and to hear more about key initiatives and the direction of travel across the national research agenda. Today has allowed you all to take advantage of activities, to foster conversations, and hopefully empower you to harness your career prospects.

The breadth and depths of the events provided today fully reflects, I think, the truly fascinating breadth depth flexibility of a career in research. The world is truly your oyster, and we have a wonderful keynote provided by Professor Dame Ottoline Leyser, a event on active well-being and just now an engaging panel discussion on collaborative research practices. I found that wonderful.

The day has also been greatly enriched by bite sized parallel session on a vast array of topics and I want to thank all speakers and participants for their invaluable and generous contributions today.

I want to give my sincere thanks on behalf of all of us to members of the University Liverpool Academy and in particular, if she won't mind my singling her out, the wonderful Saneeya Qureshi, who you may or may not have met but she has done so much work in support and, of course, the Liverpool Research Staff Association who I know well, the steering group for the RSA, who have been working tirelessly on your behalf over the past year together with a national group of post-docs, 24 colleagues in all representing 14 different institutions across the UK to organise and structure today's proceedings, they really have done a fantastic job. So a huge thank you to congratulations to all of you from everyone attending the conference today.

And now at this point, it is my really happy duty to announce the winners of the NPDC21 poster competition. I hope there's a drum roll going on somewhere in the background. We had a vast and varied rage of submissions on Twitter, a really interesting format, I thought for reviewing the posters forming a in the evening nation-wide showcase for some of our innovative, wide ranging and impactful postdoctoral research. All the poster submissions were judged by a panel of academics, research developers and leaders in industry from universities right across the UK, including, for example, Cardiff, Edinburgh, Liverpool, Newcastle, and queens Belfast. Now I'm delighted to present those winners and to -- to let you know that we have 22 submissions from across all four nations, apologies. I lost my point in the script there.

So I think we are going to have a slide coming up now with the details. You can see that the posters were shared online under the hashtag #NPDC21, and you can go back and see them there. The entries were highly impressive and diverse, and from increasing accessibility of research to patients from disadvantaged backgrounds to attracting eastern European workers to stay in the UK.

The panel of 12 judges were from health and life sciences, humanities and social sciences, science and engineering, and so on.

So a wide range of skills.

So now we come to the first prize.

The first prize will receive a £50 retail voucher and the prize goes to Dr Laura Gray from the University of Sheffield. And you can see the title of her fascinating poster on body mass index. Congratulations, and the second prize of £30 goes to Dr Shona Moore at the University of Liverpool for outbreak at blue dot festival. Congratulations, and fabulous for Liverpool too. And the third place goes to Dr Mapa Prabath, and you can see the title there. Congratulations, and I really enjoyed all of them as well as the other posters. There were a group of highly commented entries as well which will each win a £10 voucher and you will see those lusted here. Dr Francis Sherratt, Dr Debabrata and Dr Tracy. Thank you for your work. I hope everyone has had a chance to look to those.

Let me now, finally, close the meeting by saying that the NPDC strives constantly to research researchers from across the country to develop an ethos of working collaboratively, and to improve the working environment for researchers. I trust you will all stay in touch with the friends and contacts you have made today and that you will nurture and take forward the insights you have garnered across all the various sessions and activities that you have participated in.

As I bring the conference to an official close, just two reminders: All sessions have been recorded across NPDC and will be available as a permanent resource within the next two weeks on the respective session pages. So, please, go ahead and have a look, and those who weren't able to be here can do so well. Do remember to have a look through the NPDC21 virtual delegate pack which contains some excellent resources to spark your postconference reflections on your grand jury career and professional development.

These include the NPDC21 pocketbook of top tips and the self-reflection logs to aid in your commitment to action after today's sessions. On behalf of the University of Liverpool, I would like to express my that is just once again to all who have helped, and I will pass the metaphoric torch on to next year's hosts. We don't know who they are, but rest assured that all of us look forward to collaborating with the organisers wherever they may come from and attending the next conference in 2023. Thank you all very much and good night.