

Radio Adelaide interview with ANAT SAHMRI resident Dr Helen Pynor and Dr Jimmy Breen, leader of the SAHMRI Bioinformatics Platform and interviewer, Dr Naomi Hunter, Radio Adelaide, 7 Dec 2020.

DR HUNTER: Welcome back and you are listening to Festival City on 101.5. And today we have another amazing art/science collaboration. And in the studio today we have Dr Helen Pynor and Dr Jimmy Breen. And I said it right. Yes. You'll learn if you ever listen back to any of our interviews that I always say something completely wrong at some stage during the interview. So welcome to the show. What I would love to give our audience a little sense of is what you do as individuals and then how you've come together in this collaboration and I might actually start with Helen. Helen, tell us a little bit of a lightning exposé of your work.

DR PYNOR: So I'm a visual artist but I actually have a background in science. So I've had a longstanding deep fascination in science and my practice has focused on in recent years, philosophically ambiguous zones like the life/death boundary, organ transplantation, the relationship between prosthetics and living tissue, and things like what happens to tissue once it leaves the body. Like, is it still alive; what's its status? And I work across a whole range of mediums from installation to video, photography, sculpture, but also collaborating with scientists is a big part of my practice.

MS CHRISTOFI: So this is a pretty morbid topic in a way, in the areas that you've covered. Where did the interest stem from initially?

DR PYNOR: Yeah, good question. We could delve deep into my dark psychology for the answer to that. What I find, I mean, there is a morbid aspect to it definitely. But I think it's driven much more by a sense of curiosity and a life affirming sense of, I mean, the life/death boundary, when you start to look at that you realise that life just extends out everywhere into places that we don't normally think about. And, ultimately, I find these questions very life affirming, actually.

DR HUNTER: I was going to say, I actually am always fascinated by all things human body, biology. So I find it really interesting, but there is that idea of the abject when people see bodily like objects and they're not within the bounds of a body, then sometimes people can freak out a little bit.

DR PYNOR: Yeah, there's often a bit of an irk factor with my practice, but often, I don't really necessarily consciously calibrate it this way, but it's often I think calibrated at the

edge of something sort of irky and something fascinating or beautiful, that draws people in as well as potentially repulsing them.

MS CHRISTOFI: Yeah.

DR PYNOR: And if I get that edge right, then I feel like I've kind of succeeded.

DR HUNTER: That push/pull.

DR PYNOR: Absolutely.

DR HUNTER: I don't know about you, I love some repulsion. Thank you so much, Helen. Now, Jimmy. I said at the beginning of the interview when I read his bio that he was going to have to explain what the name of the unit at SAHMRI is that you are the leader of.

DR BREEN: Yeah. So the Bioinformatics Core Facility.

MS CHRISTOFI: Yeah, tell us, what is that?

DR BREEN: A bioinformatician is probably best described as someone who just analyses biological information. So it could be information about demography, like, sex, age, all that sort of stuff. Kind of what we describe as health analytics but my specialty specifically is genome sequencing. So I do the analysis of the raw - just putting the DNA into the sequencer and really the signal that comes out, and then really analysing that and putting it into a genome as such, or a profile of a person. It's probably, I guess, Helen was describing the birth/death scenario; we've kind of just got the death, in terms of that, right.

DR HUNTER: So quite an interesting collaboration that's happening here and you can correct me when I get it wrong, but my understanding is that you are looking at not only where that DNA or that material might go after it has been removed from the body - so thinking about the extended body or medical waste - but also around legislation in relation to it or looking at the ethics of it.

DR PYNOR: Yeah, we've got a few angles, really, on it. Where we started was thinking about the governance of DNA and there's an academic in Melbourne, Carolyn Johnston who we're also consulting who's a lawyer who looks at the whole question of how does ownership transfer when materials leave the body and things like that, and

who governs what you can do with it. So we started there but we've also been really interested in what DNA means once it leaves the body. So is it still life-ful? Like does it still have life in it? At what point does it lose that life? I know from previous work and projects that tissue - like, I did a project with chickens where we extracted cells from chicken meat in a supermarket and I was able to tissue culture them and essentially not just rejuvenate them but give them the conditions that made it clear that those cells were still alive. Like, there were still living chicken cells in chicken meat on a supermarket shelf. So I know that that life-fulness extends for a long way beyond what we would normally consider death, but I'd never considered how that applied to DNA, like, a more specific bit of tissue. And then I was intrigued by the whole idea of, well, what happens when it becomes part of datasets? So at first it's this wet tissue, then the DNA's extracted and then it's sequenced and it becomes code and then it becomes part of big datasets, so it becomes part of algorithms, and is it still alive at that point? When it's algorithm and part of a big dataset, does it still live? And that's a speculative question; it's one of the things that we're exploring, and there's no easy answer.

DR HUNTER: No.

DR PYNOR: But I love this idea that life can sort of extend in ways that we never thought about. So that's one angle.

DR HUNTER: So the actual material body itself, there was quite a big case, the HeLa, where Henrietta Lacks's cells were taken without her knowledge and this was something like in 1951. And today in the world exists more of her cells than ever would have existed in the world in her lifetime. And often those particular cells are used for making scientific knowledge, making new knowledge from those. So we're actually going a bit deeper than that again. It's not just the physical cell but we're talking about the DNA sequence and the information that goes further than that, would that be right?

DR PYNOR: Yeah. I mean, the HeLa case is such a famous sort of - - -

DR HUNTER: It really is.

DR PYNOR: - - - transgression of ethics, but they were figuring out, ethics didn't exist for that sort of material in that day, because it was the first time they'd actually successfully cultured human cells. But, yeah, it's such an incredible story.

MS CHRISTOFI: Because I guess, as well, in terms of what you were saying about the chicken DNA and being able to cultivate it, I guess, and bring it back into being, doing that with Henrietta Lacks's cells, it means sort of like producing it and making firm solid tissue for example, is that hers? Is she still living?

DR BREEN: Yeah, it's even somewhat more complicated because, I guess, with cell lines which, you know, you take cells from somewhere and you continually passage them, like, basically over generation, over generation, it's actually like she's been living thousands of lives and whereas I guess if you digitise and you sequence DNA, it's a snapshot. It never grows beyond that. It never mutates again, but these cell lines, they're essentially living for, you know, ever since she died.

DR PYNOR: And there's a whole mythology around her cells, too, that I used to hear about in labs that people would find that her cells had somehow floated across rooms and cross-infected other cultures and she's out there - - -

DR HUNTER: I read that, yes.

DR PYNOR: - - - in this really spooky way. Messing up people's experiments.

MS CHRISTOFI: And I guess, that's the thing that her consciousness would have died when her physical body did, but then conspiracy theorists could say - - -

DR HUNTER: I think it had more to do with the seals, et cetera, on the units that they were using. What do they call those?

DR PYNOR: Tissue culture flasks?

DR HUNTER: That's it. Yeah. I'm, like, I've seen then, they look like this in my head.

DR BREEN: They're not some sort of strange lab octopus or something like that that's crawling out in the middle of the night or something.

DR HUNTER: I'm sure that there's some horror movies that could be made of that, but we won't go there today. So, Helen, I know that you have had quite an extensive creative career and there's one particular project that I would love – because I feel like it relates to this project – where you actually had a piece of bone removed because it had to be, but then you went on to use that in your practice. So we often have unintentional extended body, I'll call it, where you've lost hair and saliva, skin cells

are floating away at all times, but this was intentionally removed and then you requested to actually have that given back to you.

DR PYNOR: Yes.

DR HUNTER: Do you want to tell us a little bit about that project that resulted from that?

DR PYNOR: That was a commission from Experimenter and, yes, I had surgery on my hip and I had the head of my femur removed and I was really keen to work with that bone material and to incorporate it into bone china work. So bone china, as you might know, is made up of about 50% animal bone. So it was like an early, well, not early compared to porcelain, but it was a method to try and create porcelain-like ceramics developed in England. And I found it really fascinating the idea that this porcelain or this bone china was full of animal material and that my bone could be part of that ceramic. And also that I could take it through all of those transformations that are involved in making bone china which are really alchemical and really beautiful but it wasn't straightforward to get a hold of the bone, which people are always surprised to learn that we don't get automatic access to tissue that's excised from our own body. It's, like, well, surely we own that. And what I found, there's a Melbourne-based artist, J.J. Hastings, who had researched all of the policies around keeping your own tissue. What she found was really surprising that actually the policies support you to keep your tissue if you want it, but the surgeons and medical practitioners are often not aware of that, so they often just reflexively say no. So I was able to pull out these policies when I made my request.

DR HUNTER: Obviously in advance, of the actual surgery.

DR PYNOR: Absolutely. Six months out.

MS CHRISTOFI: She said, I have receipts.

DR PYNOR: Yeah.

DR HUNTER: A question that I have is as human beings, we have a lot of our body that we can see and then a lot of our body that we can't see. What was it like to actually receive that piece of bone knowing that it had been inside you and now was this separate object? Did it have more sentimental value to you than say if you were using another person's bone or an animal bone?

DR PYNOR: Yeah. It did. It felt quite sacred and quite precious and it was also a hip that worked really hard to try and work all of my life, because I was born with this abnormality on one side. And that hip had worked so hard to make things work in really difficult conditions. So I felt this incredible gratitude for this bit of bone and that endeared it to me. And just knowing that it had come out of my own body, it's been there for all those years, and I think that tissue coming out of our body does have a sacred or spiritual quality to it, and it's something in our culture that we don't really credit or give credence to. Some cultures do, like Indigenous culture does.

DR HUNTER: And what about the objects that you made from it? What did you end up making?

DR PYNOR: Am making, in the process of making.

DR HUNTER: Still, right, okay.

DR PYNOR: I had CT scans done before the surgery and the biomed company gave me access to the 3D data of those scans. So I've had those scans printed, like, 3D printed and I've moulded them and the bone china is going to be cast into those moulds so it will be my pelvis and my right femur bone made in bone china made from my bone, supplemented by animal bone.

MS CHRISTOFI: Wow.

DR HUNTER: I'm loving it. I want to see this work.

MS CHRISTOFI: You know what's funny as well, is I had hip surgery myself when I was very, very small. Born with a dislocated hip that wasn't picked up for 18 months. Fantastic. Bit of a medical marvel. But I had to have surgery that removed a chunk of bone because it had started to grow a bit askew and everything was sorted and it's all fine now, but I feel kind of ripped off that I didn't get to keep it.

DR HUNTER: No-one thought of that.

MS CHRISTOFI: No.

DR PYNOR: You were already one and a half years old.

MS CHRISTOFI: How would I going to know that I would be - - -

DR PYNOR: That you'd want that later.

MS CHRISTOFI: --- creative. Exactly, exactly.

DR HUNTER : So Jimmy, how does it feel to have a creative practitioner embedded with you at SAHMRI or working in collaboration with you; and has it made you, like, push some of your boundaries to think about the way that you work in different ways?

DR BREEN: Yeah. We were literally just talking about this in terms of perhaps art and a lot of the things that Helen does is somewhat where scientists would want to be, you know, speculating to the point of becoming creative on top of it. Science is kind of bound by reality. It's an incredibly exciting project to be a part of because you can do the things that you have always wanted to do but obviously you can't. And, I guess a lot of people, for what I do specifically is probably classed by a lot of scientists as being fairly boring and very technical but I think a lot of scientists would love, you know, always want to interact with an artist because there are so many different areas that can be explored, but really when it comes down to it, we're really only addressing a really quite narrow fundamental question whereas with art, you're exploring way more larger themes that can, you know, there's so many more questions to out from that.

DR PYNOR: But they are so similar as well, because the foundation of science and the foundation of art both is curiosity and it's wanting to know more. Wanting to ask those questions. So I think it makes sense that as you said, being a scientist but working with an artist, there's probably hundreds of thousands out there that would want to collaborate.

DR BREEN: Yeah, absolutely. And a lot of the wanting to do this sort of residency with Helen was grasped by a question of my unease of being able to interact with patient data when I didn't actually know the patient. And a lot of scientists have that scale as well and so having to explore those particular themes as well, I think also will benefit my work later on. It just won't necessarily have a research journal article or something attached to it.

DR HUNTER: I think that's the thing about the ANAT residency is that often they don't have a set outcome because the idea is that you're not just going to do this one thing, you're actually going to research and explore and follow different lines of exploration. What is the name of the actual residency that you're doing?

DR PYNOR: Well, I don't know if it has a specific name but it's funded by ANAT and it's based at SAHMRI.

DR HUNTER: So Artist in Residence at SAHMRI.

DR PYNOR: Yep.

DR HUNTER: How long is the project aiming to be?

DR PYNOR: Well, ostensibly for seven months is the timeframe, and then there's funded two trips to Adelaide, this being the first one. So I can actually be in residence at SAHMRI. And then in between times, Jimmy and I speak quite regularly, yep, we have chats and so the thinking and the stimulating dialogue is going on over the whole time, even when I'm not here.

DR HUNTER: And do you find when you start a residency that there's a period of, let's call it assimilation and language learning?

DR PYNOR: You say potato, I say potato.

DR HUNTER: How has that been going in this particular project?

DR PYNOR: That is absolutely a process, yes. I mean, I have a science background so that helps me a lot. I've got the foundation for a lot of language.

DR HUNTER: What type of science did you study?

DR PYNOR: Cell and molecular biology.

DR HUNTER: That'd do it. Yep. There we go. That explains a lot.

DR PYNOR: So that really, really helps but there's always specific language that I'm not familiar with within it. You know, subspecialities of subspecialities that I have to learn, which I love that part as well.

DR HUNTER: Jimmy, what do you think could be the optimum outcome that could come from this particular project?

DR BREEN: I don't even know really now. When I first came into this, I was actually thinking of something very, very practical. For example, when we take some patient data and I do a lot of sequencing with young children who have acute lymphoblastic leukemia, we sequence them to find out what the problem that they have and then it goes to their clinicians who designs a treatment. I was thinking we sequence them and put it onto a hard drive or something like, and attach it to a necklace and say - or a thing to say, look, here's part of you, I don't want to take it all the time. You have it because it might be the only time that they ever get their genome sequenced. But in actual fact there's just so much larger things that happen, and I very much like the scenario where we're going to in terms of the living art and a visual display and things where I think it will probably engage a whole more people to the themes that we're trying to explore rather than a person just going, oh, well, I got it sequenced. Because if I give someone that hard drive, they need to really study 10 years and get a PhD to actually get something out of it rather than, I think, if we have some sort of art display, everybody can benefit.

DR HUNTER: So some science communication from it as well.

DR BREEN: Exactly. Yeah, exactly.

DR HUNTER: Absolutely. Because I was just thinking, what does that look like, when you have a genome sequenced? In my head I can't even imagine what that looks like so from a data point of view and a visual artist's point of view, if you were both describing what it was to look like, what would I be seeing?

DR BREEN: It's just a four-letter code to me. It's A, G, Cs and Ts, but just in - - -

DR HUNTER: But lines and lines of it.

DR BREEN: Yeah. A lot of the time when I'm interacting with it I'm just looking at billions and billions of lines of thing and then we piece it together in, like the world's most complex jigsaw puzzle. But you don't see the bits go together because we use algorithms to basically do that. So even the process is quite abstract. We just get results. But, really, the part in the middle is the most very, very interesting to me, but you kind of never see it and you need something to visualise that. And I guess a lot of people in my field struggle with the visualisation aspect of, okay, what does DNA actually look like? We never see it in its true form. How can we represent it to someone that just doesn't think, well, that's just - - -

DR HUNTER: Oh, look.

DR BREEN: - - - you know, nerdy.

DR HUNTER: I'm just imagining a ball pit of coloured balls.

DR BREEN: Yeah.

DR HUNTER: All different things stuck together.

DR BREEN: Yeah, well, one of the things that I wanted to impress on Helen in a lot of the work that we do is to say that DNA isn't just linear. So we think of it as a long stretch of DNA but really it's balls of string that have been mish-mashed together and it's stuck inside a sphere which is the nucleus of your cell. And, really, if we wanted to put it to its true representation, we'd do every visualisation like that, but obviously that's much, much even harder to visualise.

DR HUNTER: And the interesting thing is that when you're learning to see new data, new information, at first it's just so much stuff to look at, your eyes are looking all over it, but I'm sure after a time and after looking at a number of sequences, things would start to look different to you and you would be perceiving them in a different way and you could start seeing some information before it's even got to the final conclusion.

DR BREEN: Yeah, and that's why things like machine learning and artificial intelligence is so crucial to what we do now, is because the patterns that we see in the data, I'll be looking at it from 1 or 2 o'clock at night just looking at it and, oh, that's really interesting or whatever, but a machine learning algorithm could go, okay, that's associated to disease, that's associated to a particular treatment and that's where true, really insight comes in but we're getting to the stage in which the human eye can't do that any more. It's going beyond that.

MS CHRISTOFI: Yes, I had heard an interesting article or read an interesting article, I can't remember the exact details of it but it was a type of cancer analysis that they were absolutely getting done by machine because it was so much more accurate than it was by – maybe it was even skin cancer. But it was that they were having a computer looking at the images rather than the human eye because it was just so much more accurate.

DR BREEN: Yeah, I think radiography they do that now where they'll get a radiographer to look at it but then they'll also get the machine learning algorithm to look at it, because the pixels that it's going down to is out of the detection of the human eye now.

MS CHRISTOFI: Wow.

DR BREEN: So it'll be able to identify and a lot of the stuff that the DNA that we're identifying is now to the point in which microscopy can identify it, which is really exciting.

DR HUNTER: Awesome. And how long are you in Adelaide with us for, Helen?

DR PYNOR: Two and a half weeks this time and then another two and a half weeks in February.

DR HUNTER: Awesome. And do you have a blog that you were doing for this?

DR PYNOR: We will. We should tell you about one of the other things that we're doing, actually. In these chats with Jimmy, I was really interested in this idea that we're shedding skin cells and I was curious about whether we could sequence the dust in my bedroom and get the DNA out. And Jimmy - - -

DR HUNTER: And see how many people's DNA are in there. Sorry.

DR PYNOR: Yes, incriminate myself. And Jimmy was a bit sceptical about what the quality of the DNA would be, but he said that we're actually breathing out DNA, which I think was even more intriguing. This idea that - - -

DR HUNTER: So that means I'm breathing in DNA.

DR PYNOR: That means we're all - - -

DR BREEN: Yeah.

DR PYNOR: - - - breathing in DNA and breathing out DNA and there's this whole shared DNA cross-fertilisation going on. So the first experiment we're doing at a concrete level is actually, there's this device that's used to capture the breath from people's exhalations. And it condenses, the device condenses the breath into liquid and then you can take this liquid and extract whatever you want. So we've hacked this device so that the two of us can breath into it at the same time and we're going to collect - - -

MS CHRISTOFI: They're making a mutant. They're making a mutant.

DR HUNTER: I'm loving this idea.

MS CHRISTOFI: Yeah.

DR HUNTER: Sorry, go on.

DR PYNOR: We're going to collect our combined breath along with all the microorganisms that will be there too, and we're going to sequence the DNA that comes out of this combined breath which will be a combination of Jimmy DNA, Helen DNA, microorganism DNA. So it'll be this wonderfully contaminated sample and to work with this whole idea that we are constantly interdigitating with other life forms. We're not these bounded bodies that are in these neat vessels.

DR HUNTER: Correct.

DR PYNOR: We're just sharing ourselves all the time.

MS CHRISTOFI: But do you know what I picture though? I just picture the end product being Helen, Jimmy, Nespresso Columbian Roasted. Just this mix. I'm sorry. Your idea is much better.

DR HUNTER: That is amazing. I really love that idea and the breath is such an indicator of life, but also of death. That rhythm of breathing and then when that rhythm stops. As a glass artist, the breath is really, really vital to the work that we do because that's how we manipulate the glass most of the time. It's the internal and external pressure and so, often when you're making an object, if that object was to be broken, there's breath contained inside that. How it's been affected by the heat is another matter, but, yeah, that idea of the – so do you have to actually both blow into the machine at the same time or do you have the privacy of the room?

DR PYNOR: No. No privacy at all.

DR BREEN: Staring contest for 10 minutes.

DR PYNOR: We have to have our faces very close to each other and just literally breathe for 10 minutes into this device at the same time.

DR HUNTER: Okay, so were you breathing through your nose and out your mouth or in and out through the - - -

DR PYNOR: No, it's designed so you can breath through your mouth. It's a one-way valve, so that you can actually breath in through your nose or your mouth. And you breathe out and all your outbreaths are channelled into this shared little tube that condenses.

DR HUNTER: Okay, because I was imagining that this Jimmy and Helen soup is happening in the middle and you're breathing back in from that. I'm, like, oh, I'm not sure I'm down with that.

DR BREEN: Probably not COVID safe I'd say.

DR HUNTER: Yeah. What is your COVID management plan for this project?

DR PYNOR: No risk management has been done at all to this project.

DR BREEN: I think we hadn't even really discussed, like, COVID on that until a little bit after we'd come up with the idea and, you know, in terms of that, in terms of breathing in someone's breath, that is actually how COVID happens. So it's an interesting concept.

DR HUNTER: Absolutely, very pertinent at this particular point in time. And was it always intended that this would be the time that you came to South Australia or was the COVID border, did that affect the start date of your residency?

DR PYNOR: Not really. We got a little scare when that cluster happened. We thought we'd have to cancel or delay rather, but luckily it all came back into hand.

DR HUNTER: Blew over.

DR BREEN: Yeah.

DR HUNTER: Well, this has been wonderful. I have been totally fan-girling here. This is just my cup of tea. So if people want to find out more, I know that you're intending on having a blog occur, so that will be - - -

DR PYNOR: There'll be a blog on the ANAT website. So Australian Network for Art and Technology, ANAT.org.au, I think.

DR HUNTER: Pretty sure it's .org.au. That's right. Yep. So ANAT has been based in Adelaide for about 30 years now, and it has been supporting artists and scientists for that period of time and they've been really flexible in the last 12 months and swapping out a lot of their projects, putting off their conference and funding other art science collaborations throughout the year to make up for that. So if you're interested in finding out more and seeing some outcomes and the outcomes are always a surprise, then jump onto their website. And, Helen, do you have your own website that people can find out about your other works?

DR PYNOR: Yeah, which is www.helenpynor.com.

DR HUNTER: And, Jimmy, I'm sure that you'll have one being at SAHMRI.

DR BREEN: Yep.

DR HUNTER: Do you know what it is?

DR BREEN: Just SAHMRI.com and then you can just search for me and, I guess, my name comes up. I don't actually have one for my group but I need to actually do that.

DR HUNTER: No, you have a personal profile.

DR BREEN: Yeah.

DR HUNTER: And do you remember this photo?

DR BREEN: Oh, yes. All my photos look ridiculous because I'm generally smiling 99% of the time and then you have to not smile for the photo.

MS CHRISTOFI: I hate it when they say don't smile because they you're, like, well, that means I have to put my resting bitch face on, and I'm really bad. You don't want to see that.

DR PYNOR: That's my licence.

DR HUNTER: Well, it has been so wonderful talking to you today, and I'm really keen to watch the progress of this particular project, but also what outcomes might come out in the future from this wonderful collaboration. So thank you so much for coming in and having a chat with us today.

DR BREEN: Thank you for having us.

DR PYNOR: Thank you very much.

MS CHRISTOFI: That was visual artist Helen Pynor and scientist, Jimmy Breen chatting to us about their ANAT collaboration. You're listening to Festival City.

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