

## Oral History: Alan Robinson / 2019/3/29

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**MG:** = Interviewer, Mark Green

**AR:** = Participant, Alan Robinson

[??? at XX:XX] = inaudible word or section at this time

**MG:** This is Mark Green. It's the 29<sup>th</sup> of March 2019, and I'm at the Mitochondrial Biology Unit in Cambridge with Dr. Alan Robinson, and Alan joined the EBI on the Industry Programme and became team leader for the Industry Programme, and I just really want to ask Alan a little bit about his background and how he came to join the EBI. Alan?

**AR:** Hi. So this is Alan Robinson. So yes, so joining the EBI. Well that came about because I was doing a PhD, DPhil, as it's known in Oxford University, with Professor Graham Richards, and it was on molecular modelling and computer simulations of proteins. And I was busy trying to write up my thesis and Graham kept saying to me, 'What are you going to do next? You need to apply for jobs.' And one day he arrived at my desk and he had an advert, I think it was probably in *Nature*, and it was an advert for positions at the EBI and that they were starting this new Industry Programme. And I've gotta say, I pretty much just applied to it with my CV so that Graham would get off my back <laughs> and that I could get on with writing my thesis, 'cause I was blinkered in doing that, as you are at that time in your life.

So anyway, so I sent off my CV and I got on with writing my thesis, and I think it was probably within a month or two that I got the letter back inviting me to interview. Now what had happened since then was I was being funded by Glaxo, or Glaxo Wellcome as it had just become, and so I was there and I was working in their molecular modelling department when I got this message through and so I went along to interview, not really knowing too much about bioinformatics or EMBL to be honest. Although I applied, I did do some background research and I thought ooh, you know, this is an interesting organisation. Anyway, so I went along and I immediately thought this is somewhere that I want to work! The people that I met, so it was Tom Flores, a couple of others, Jeroen Coppieters as well. And I remember chatting with them and we went for lunch. And I think there might have been a couple of people being interviewed that day. But we got chatting and it went from being an interview to more kind of a discussion, and then I think it was, I would have thought, 'Ooh, it's time to finish the interview' and instead what happened was they said to me, 'Oh, we'd like you to meet the Director. We'd like you to meet Paolo Zanella.' I was like, 'Ooh, OK,' so I went into Paolo's office, and

I don't remember actually what we said, but what I remember is the two of us just chatting and interacting, and Paolo, Italian, and we were just both getting animated, and I went from having applied to this position to get my PhD supervisor off my back, to going, 'I really want to work here. I think they're doing some fantastic stuff.' So anyway, I'm then back at Glaxo, and I'm doing that and it's doing well, and my supervisor there, Mike Han, called me into the office and he says, 'We're really interested in you coming and working at GlaxoSmithKline.' Sorry, not GlaxoSmithKline, that was later. He said, 'With my Glaxo Wellcome hat on, I'd really like you to stay here at Glaxo. However, with my Mike Han hat on, I think you should go and work for the EBI, because it's just starting up, it looks like being really interesting.' Mike was also being involved in the Industry Programme as well. He'd already been approached by Paolo and Tom and the others about what was going to be done so he was basically on board with that project, so I basically, I think within a couple of days I'd actually said yes, I'm going to accept this position. Which was my first job. I was only at Glaxo for probably three months, part of my CASE award, and then I went off and I came to Cambridge <5:00> and started working at the EBI as a staff scientist.

And – shall I go on?

**MG:** And the CASE award is a UK Research Council –

**AR:** Yeah, it's a funding for a PhD that is part from the Research Council and part sponsored by a company, and in this case it was Glaxo.

**MG:** And when you were doing your DPhil, it seems to me that scientists tend, and this may be something you'll challenge me on, tend either to go into the commercial research sector or the academic research sector. There doesn't tend to be a great degree of crossover. Whereas of course you were at Glaxo and you moved into the EBI, and you moved with the Industry Programme, so you've got a more interesting past, more varied past than some on that. So what was it, was there something about industry that particularly appealed to you, or ... as well as the EBI?

**AR:** Did industry appeal? I did enjoy my time there, and certainly there's aspects of industry in terms of its very application focused, whereas academia can be rather ... I think rather than say me wanting to be in industry or academia, what I came to realise very quickly is that in some guise the EBI was sitting in the middle, and rather than falling between two stools it was actually taking the best of both. So you had both academic freedom but you were working on projects that were of relevance to industry, whether it be large or small, and that was something that was particularly interesting to me, rather than being in a particular research niche. And also it helped that you had a contract as well and you weren't surviving, necessarily, from one grant to another.

**MG:** And I'd like to know a little bit more about what the Industry Programme was and how it was set up, 'cause I know that, both you and I know that but ...

**AR:** Yeah. So I believe it was Paolo Zanella's personal project, personal interest, that he, as part of becoming director of the EBI and founding the EBI, is he was very keen that not only should it have both a service component, 'cause we have the EMBL nucleotide sequence database and at a later date other databases came in later. So it should have the service aspect but it should also have a thriving academic part to it as well, and that should help fertilise what was going on with the service part. But also there should be interactions with industry. And that, I think, was something that was of its time, novel. And so he was keen that we attract money from industry, initially from the large pharma, and that they would each pay into a pot and in return we would work on research and application projects that were of particular relevance to industry. And part of that would also be providing training as well, because at that time, as it is now, training in bioinformatics and computational biology was difficult. You were basically looking for people who were at this interface between biology and computer science. Those were particularly rare people. I actually came from a background of mainly chemistry but then I did computer programming, but always had an interest in biology, and that's actually how I ended up, I think, being recruited, because I was at one of those interfaces, and those people are rare.

So the idea of the Industry Programme was to provide a service to industry, but we also had academic freedom with it as well.

**MG:** OK. So how did the Industry Programme interact with the rest of the EBI? You're talking about research projects being done, so was that every team being involved or specific teams?

**AR:** It varied. I mean there was particular projects where individuals would be working closely with people in other groups, and also with academic research groups, so there was at least one person, <10:00> Matthew Eldridge, who was actually, although he was funded by the Industry Programme, he actually was embedded within one of the academic research groups there, Shoshana Wodak's group, because there was a particular interest from industry in having databases of metabolic information and chemical reactions, and they were like, 'We want that to happen.' Shoshana had a research interest in that, so it's like right, well then, we will embed a person within her group who will actually work on that, and see what they could develop. And the way it worked was rather than industry people being given a yearly report, was it was also to be almost a club of sorts, so we would have quarterly meetings where representatives from, I think it went from originally nine up to at least fifteen companies, came together and there would be a day of presentations and reports would be written, where industry would see what we'd been up to for the last three months and give some kind of guidance about what was of interest, was it not of interest, although they were generally quite hands off, because we were doing stuff that was interesting them. And what they also saw was although we were developing stuff for industry, they also saw it as being pre-competitive as well, so quite often although we might be thinking about how can we improve EBI services, rather than it being how can we improve them *now* or within the next year, it's like, what technologies are coming down the line that would improve services in the future?

And something I've not mentioned yet is the other important funding source and driver for this happening was also money from the EU as well. So originally we were given money and it was kinda, I'm not sure if actually it was a two or three-way split between money from EMBL, the EU and then contributions from each of the pharmaceutical companies. And the main focus in the beginning was on the development of standards, in actual fact the original name of the project was Bio Standards. So one of the things that industry was very much interested in was that they didn't wanna be locked into particular software solutions from companies. What they really wanted to have was open standards. So some of the work that was being done in the group, and I participated in that as well, was how could we develop software standards that would allow industry to basically use software from these different companies and it not actually be locked in? And also that this software would work together and it would work with services that were available from the EBI as well.

And that's probably ... of its time, was one of the real successes of the project. It actually ended up with various software companies being ... spun out as well, from the EBI as well as from other places that were using these particular standards. And in many regards it was the forerunner of what we now see with cloud-based and grid-based computing as well. So in terms of what Paulo did, it was very prescient of him.

**MG:** So you're making this point that this is a very novel departure, to have an Industry Programme of this sort. And it occurs to me if you've got nine to fifteen companies involved in this, all large pharma, all of whom would have been presumably competitors to each other in some degree or shape, and yet they're there coming together in a cooperative way?

**AR:** Yes. I mean certainly they are competitors in a pharmaceutical arena, although they work on different disease areas, so they're not necessarily direct competitors, but as I say, a lot of them realised or knew that some of the things that they needed to do they all needed to do and it was pre-competitive. They all wanted to know information about what was in the human genome, because at that point the human genome hadn't been published, it was still being worked on at the Sanger Institute and WashU and over in Japan as well. And also as time went on I think it became a little bit of a club as well <15:00> because as I say, we'd have these quarterly meetings and this was also an opportunity for them to get together on neutral ground and sometimes I would stay late. The meetings used to take place at the Duxford Lodge Hotel, and sometimes they would go on very late into the night, in the bar, so we'd have the day of meetings and talks, and then we'd go for dinner, and then we'd retire to the bar at the Duxford Lodge, and I think some unofficial and official business generally happened in the wee small hours <chuckles> after dinner. You know, I think information was shared about particular companies, biotech, I don't think it was anything clandestine going on, but certainly in terms of ... particular companies who might be selling services to the different pharmaceutical industries, then it was a chance for them to get together and just have a little bit of an informal chat about what was going on. I think a lot of them

saw actually a real value was being able to talk with colleagues in different companies and about shared issues that they actually had.

**MG:** And the Duxford Lodge was the hotel in the small village quite close to the EBI.

**AR:** That's right, yes.

**MG:** So presumably they were bussed onto campus for the actual meeting?

**AR:** Yes, absolutely. And something else occurred to me, some of the areas that Paolo was interested in us looking at, and the pharmaceutical industry were very interested, was obviously his background was in physics, and he'd been at CERN and he'd been, I think it was Head of IT at CERN, and he was interested in taking some of the technologies that the high energy physicists had been using and then seeing if they could be applied to biological data, which again nowadays seems absolutely obvious; why wouldn't you do it? But at the time it again was a novel thing to be doing. So there was doing that in terms of high-performance computing, the use of databases, and actually the one that I was recruited to do was visualisation, was actually given that we were having these, what we thought at the time were large datasets, but probably a thousand times smaller than we're used to dealing with now, how could we apply visualisation and knowledge discovery, now called machine learning or AI, to this biological data? So actually the initial role that I had at the EBI was in terms of looking at how visualisation was being used in lots of other fields and then applying that to biological data, so I had the freedom to go out and say, 'Well how are people looking at hierarchical data or large numerical data sets in physics or geography, and then applying that actually within biological data. And then I would get up at a quarterly meeting and talk about what we're actually doing, develop some software tools for that using a new programming language that had just been released called *Java*. Obviously now that's embedded everywhere. And then made those tools available actually within that language. And this was something that as I say, people were really interested in, and it was seen that an outcome of any of the research that was to be done in the group would then be to produce a workshop on it as well. So we would be having workshops, oh, I think we were up to maybe one a month at times, where basically people could come in from industry to this workshop, it would be run over one, two or three days, and basically we would do presentations and hands-on workshops, where we would be saying, 'These are the tools that we've developed. This is how they can be used.' And they would get to use them hands-on as well.

**MG:** So these would have been workshops for the people working in the big pharmas?

**AR:** Yes.

**MG:** And would they be the same people who were the representatives at the quarterly meeting or – would it vary?

**AR:** Sometimes, but it would vary. It would vary. And if there were open spaces left, then we would allow people who were within the unit, within the EBI, to actually come in and participate as well. And then we'd also have invited speakers as well. So one of the great aspects about the Industry Programme is we had money <20:00> from industry which we could use to ... with some freedom. It wasn't necessarily tied to a particular grant. So some of them, I mean you know, if you were putting in a grant proposal and certainly money from the EU was tied to particular projects, but the money from industry we were basically receiving, we could actually use to work on particular projects very quickly, or we could invite speakers, so in some regards the money from the industry partners allowed us to react very rapidly to changes that were going on. There's a couple of great examples come to mind. One was with microarrays, so microarrays suddenly burst on the scene and everybody was really interested in these, and thanks to money from the industry partners, what we could actually do is we actually paid to fly over one of the guys who'd been instrumental in actually doing the first microarrays printed on glass slides, and yeah, so we got him over, he gave a talk, so the way the Industry Programme quarterly meetings worked we would start off with a talk from a distinguished speaker. Normally that would take place in one of the meeting rooms in the EBI, but I remember when got Joe across, we actually ended up having to have it in the auditorium. The auditorium was full to capacity if I remember rightly, well over 300 people there, because this was such a hot topic.

**MG:** This was Joe ...

**AR:** <Pause> I will fill you in with the surname, but he was in Patrick Brown's group at Stanford. He was the first author. He basically did his PhD with Pat Brown. He printed the yeast genome on a chip and did the publication in *Science*. But it also meant that we could also react very rapidly with this microarray data that was coming in. So one of the things that came about was people like, all of these microarray experiments are being done, they're starting to be published; how are we going to capture this data? And so it was out of the Industry Programme and the money that we got from the Industry Programme, so it was originally Alvis Brazma who was doing a lot of the work, the idea of not only analysis tools, but also having a database where we could store this data. And people at first thought, 'You're crazy, you can't do this! These datasets are far too large.' But they were being published, the EBI had a role in capturing biological data information. And the other thing that came out of it was trying to define some standards for these as well, because compared to the DNA sequence data we'd been used to handling, which is kind of ... almost binary; you know, you've got four bases, A, T, G, C, and that's what it is. Obviously it'll be variation in there, but generally a sequence is a sequence. And you've sequenced it and you've got it. However, with the gene expression data, you've got all these genes, you're measuring their expression levels, it's all dependent upon context. So which tissue is it being expressed in, which organism you're using, what drugs might you be giving them at this time? What technology you're using as well. And so ... we ended up trying to define standards for this, and we actually worked with people over at Stamford, and this is what led to the development of the standard known as the Miami Standard, which is the minimum information about microarray experiments. And as this went on, and it was driven by Alvis, then the journals got on board as well and the journals

were starting to say, 'If you want to publish a microarray experiment, you need to conform to the Miami Standard.' And once the Miami Standard had come about then people in the proteomics world were also like, 'Yeah, we should have some standards too ...' Now if we had tried to do this through some kind of funding with a grant proposal, I don't think it would have ever would have happened, because the lag time, first of all you'd have to convince a funding agency that this is something that needs to be done, and generally the funding agencies, or at least their reviewers, are like no, we need to be seeing science and research. Whereas with the money from the Industry Programme, we could react very quickly to new needs, because industry was obviously very interested in how do we capture this information, how do we standardise this information as well? And we could say to them, 'We're interested in doing this.' And then they would say, 'Yes, go and do it.' And that would allow us to ... pretty much instantaneously put people on it. So I think the Industry Programme, when it allowed us to be really <25:00> quite mobile.

**MG:** And presumably that also brought in a lot of cooperation from the EBI because I know that scientists always want to be doing things, and to do things you need money, and to have a source of funding which is rapid and is quick and is as free of strings as possible is a very welcome thing, so presumably the Industry Programme was well set inside the EBI and got a lot of cooperation.

**AR:** Yeah, pretty much.

**MG:** How did you, as a big pharma, become a member of the club? Did you have to wait to be invited, could you go knocking on the door?

**AR:** Oh yeah, we contacted people and then sometimes we had companies contact us once they knew it existed, but I think we were up to either 12 or 15 pharma companies, and those were ones that either had sizeable presence in the UK or certainly within Europe, but it did get to the stage where I'm not sure if there's any other really major pharma companies who have presence in Europe who weren't part of it. We had all of the big ones, they were all there. But, one of the things that we knew we had to deal with, and certainly the EU was very keen that we deal with, was dealing with SMEs, the small to medium enterprises. We were dealing with the very large companies, very large pharmas, but there was an unmet need for small to medium enterprises. So one of the things that happened with the industry programme is within that we started to develop programmes that would also work for the SMEs, which maybe had less deep pockets, but also would benefit very much from the kind of, both the research we're doing, access to scientists and training workshops as well. So that was Dave Starks-Browning who ended up heading the SME project within the EBI, and again, I believe, as I remember, that was something that Paolo Zanella was very keen that we also move into, as was the EU as well.

- MG:** And did that have any kind of conflict with the big pharma, looking at the ... were the big pharma worried the SMEs would try and go and sell them things or look to be taken over or –
- AR:** As I remember, the SMEs weren't invited to Duxford Lodge <laughs>, you know, so I think there was a concern, but ... how I can say it, I think just everybody behaved themselves.
- MG:** So you started with the Industry Programme developing visualisation techniques and other software and so on, and you became the team leader for the Industry Programme, so how did your role change?
- AR:** Yeah, I mean it changed very much from being one of doing the science to realising that I had to much more spend my time both managing people and managing the relationship with all of these companies as well, as well as attracting new funding and dealing with grant proposals. I mean one of the things that went one whilst I was in charge of the industry programme is the EBI went through a very difficult period where we lost funding from Europe and so we had to try and make the transition there, and we went from a situation where the EU had been very keen to fund the EBI and the Industry Programme to one where it became a far more competitive process and there was this paradigm shift, it seemed, within the EU, that they would not fund infrastructure. I think that was the term that was used. We weren't the only ones that were affected. There were various other organisations that did find that they went through some very lean times. We were lucky, we had money from industry, but it was still a difficult time, that time. So yeah, I think it was that transition from being an active research scientist to realising that managing people takes a lot of time. Managing an organisation takes a lot of time, and there was a <30:00> fair amount of travel as well, because sometimes these companies wanted you to go out and visit them. And to give presentations about what we were doing, because there's only so many people could actually come to one of our quarterly meetings, but if one or two or three of us went over to one of the pharma industry's headquarters, we could talk to far more scientists there.
- MG:** You talk about managing the relationships with industry, that sounds as though that might have required a skill set that doesn't necessarily normally happen within the scientific community.
- AR:** Yes ... I mean although it was a good relationship, it was a friendly relationship, I'm still in touch with some of the people to this day who were part of that organisation, but at the same time they were providing money and they did expect something in return. It was perhaps interesting that the larger the company was, the longer distance view they kind of had. So the smaller companies wanted immediate or short-term returns but the other companies wanted a longer ... could understand there might be a longer-term benefit to this in terms of projects that were being worked on. Sorry, can you just repeat what it was you were asking me about?

- MG:** I was just saying the managing of the relationship with industry.
- AR:** Oh yeah. So it was a good relationship but a little story that I think ... I wasn't at this point the team leader of the Industry Programme, but I do remember there was a point where it really came home to me, where we were having a meeting and I believe Tom Flores was away, so he couldn't participate in this meeting, and so Tom asked me to take over this meeting, and to be honest I don't actually remember exactly what it was about, but I was standing up there at the front and I got asked a question about EBI services and what was the future. And I think I said something along the lines of 'Oh, I'm not quite sure about that' which was answering as a scientist. I'm sorry, I don't know ... at which point the representative of industry was like, 'You're a representative of the EBI, and so we expect an answer' and that was that kind of jolt of like oh, I'm making a transition here. I'm not just being a scientist, but also a representative of the EBI in terms of its vision and where it's going as well. So that was something that I was very mindful of from that point on. As I say, I then did later become the team leader of the Industry Programme.
- MG:** So presumably you're then having to anticipate the kind of questions that might come out and what the answer would be.
- AR:** Absolutely. And also rather than just being, 'I'm a scientist and this is my area of expertise,' was I needed to have a bigger vision of what's ... not only what's going on within the industry programme but also what's going on with the EBI in terms of both its services and its research and to a certain extent I suppose what's also going on with EMBL. But certainly with the EBI. But certainly once you become a team leader then you're interacting much more with the directors so you start to have that bigger vision. That's basically the transition that starts to happen, is you're transitioning out of my vision is my research to my vision is at an organisational level.
- MG:** And talking of the organisation, what was the EBI like when you joined?
- AR:** <Laughs> I remember this with fondness, because I'm not sure I've been in another organisation where it was like this, and I'll explain this. When I joined the EBI I think it had only just been going about a year, since it had basically moved into its buildings, and essentially everybody there was new, and you joined and it was a lot of young people as well, quite a lot coming from overseas, first jobs <35:00>, and so there was almost a collegiate atmosphere to it and so people have moved in so maybe they didn't know people, so there was a lot of social interaction going on, and I remember that we used to have a tea break in the afternoon and it would happen on the first floor above reception, EBI at quarter to four, four o'clock, and everybody would go. Basically it would be like oh, it's four o'clock, down tools, and you'd go round and there'd be flasks of tea out and there as biscuits as well, and people would chat. It was really very social. I think that is because it was a new organisation and it was new people, and when I say I'm not experienced it somewhere else, it's because I've gone into organisations that have

existed if not for decades ... I mean Cambridge University hundreds of years, eight hundred years odd, it's not the same kind of atmosphere. But those were exciting days. We were doing new stuff, we were dealing with new data, and so ... people were very much interacting with each other and you didn't need to put in necessarily mechanisms to get people to interact. We just did. And compared to how it was later, one of the other funny things I remember about it as well was there were empty offices. We were actually in a building that was too big for us at that time and there was empty offices. I always remember I'd just effectively moved from the university to there, I moved into a kind of bedsit place, I didn't have enough room in my bedsit so like other people ... we had stuff that we didn't really have room for, so we'd actually store it in the EBI. I remember at one time, 'cause I <laughs> decide whether you cut this or not! When I was at college, when I was at university, I used to run a DJ thing with a friend and I basically turned up in Cambridge with all the DJ kit and all the records. I couldn't store it in the bedsit so it was actually stored in one of the spare offices. I think there was a time when somebody opened the door to show people around and opened this door and there'd be like boxes of records and disco lights! <Laughs> Eventually we were told no, you can't – we actually need these offices now. So all of that had to go. But it was a great time to be at EBI. I'm sure it's still a great time now but there was something very special about that time, because we felt we were building something. So I look at those days very much as being ones where ... I suppose the same as people say with start-ups, as well.

**MG:** So what was the relationship with EMBL in Heidelberg like?

<Pause>

Ah, we're back on record. Do you want us to start that again?

**AR:** So, the relationship between EBI and EMBL, and I've got to say when I refer to EMBL I generally mean EMBL Heidelberg, now EBI was a new institute and there were a lot of us there, we're new, it's a new job, we didn't have a relationship with EMBL, we'd not worked there. There was people in the Nucleotide Sequence Archive who'd come over and obviously had very close ties to EMBL in Heidelberg, that's where they'd come from, but I think for a lot of us, we didn't really know about EMBL Heidelberg. They were ... yes, our parent organisation but we had not so much contact with them. Certainly I think the scientists possibly didn't have a lot of contact, and some of that came down to geographical distance, and I think the other thing that comes to mind is also we were doing different stuff. We were an informatics-based institute. And we did some <40:00> computational biology as well. There were groups doing computational biology at EMBL Heidelberg, but some of those had come over, but the ones that stayed, they were doing their own thing, they were very much academic research groups. So I wouldn't say there was any kind of ... we weren't purposely trying to distance ourselves, but I think being on that campus with the Sanger as well, usually you probably felt closer to the Sanger people than you did to the EMBL Heidelberg people, because you just weren't having an awful lot of contact with them, at least from a let's say scientist ...

**MG:** But there are people on your corridor, there are people who you see in the coffee shop, and you have that greater closeness and interaction than somebody who is a long way away, just geographically.

**AR:** Absolutely, and I think this is true of all organisations that have split sites. Now I know from when I was joined to Glaxo, actually just merged with Glaxo Wellcome and Glaxo Wellcome threw money at getting people together. So they were paying for social outings to try and get cohesiveness with people, and I do wonder if ... there weren't those kind of financial resources, so there just never seemed to be, as it were, a kind of routine opportunity for us to go, 'Let's go out to EMBL Heidelberg' or let's have some people come to us. And so I think there was a distance there. I think EMBL Heidelberg maybe felt it more acutely than vice versa. To us, we were just getting on with the job. We were just doing what needed to be done, without necessarily thinking, 'Oh, we're part of EMBL Heidelberg' or 'part of EMBL, and also there's the headquarters as well'.

There was one instance that really brought it home to me, and again I think it was also maybe part of that change from being a scientist to more managerial as a diplomat, once at EBI I organised three conferences and I remember I organised one of the first ones, I think it was the first conference actually on the site as well as for the EBI, which was on visualisation ... actually no, that was the second one. It was one on computer programming and using Java and I'd produced posters for this, and again this was early days, so we just basically did it ourselves; we put stuff together and we had them printed or whatever and they were sent out. And I remember Fotis Kafatos was paying us a visit and there was one of these posters up, and I was very proud that we were doing this poster.

**MG:** And he was the Director General of the EMBL.

**AR:** He was the Director General of the EBML and he'd come across, he came across occasionally, and he very pointedly pointed at the poster and said, 'Where's EMBL?' Because on the poster I'd put up the EBI logo and I'd put the EBI name, but in my naivety I'd forgotten to put on EMBL. And that was another kind of incident where transitioning from yes, I'm a scientist to actually no, I'm representing an organisation and the organisation I'm representing is EMBL, of which the EBI is one of the outstations. So I generally think that being in the industry programme, being its team leader, taught me a lot about ... recognising things at an organisational level and being diplomatic as well. Very much thinking about the consequences of what you're saying, not only as an individual but what it means for an organisation too.

**MG:** So you weren't by any means the first or the last person to have to relearn that lesson about EMBL and EBI!

**AR:** <Laughs> Yes.

**MG:** I've seen that happen many, many times. You mentioned the Sanger and you mentioned earlier that your involvement in the industry programme started before the human genome had been sequenced and so on, which was of course the first great achievement of the Sanger. What were **<45:00>** the working relationships like with the Sanger?

**AR:** I think ... generally very good, both working relationships and social relationships as well. The Sanger was pretty new as well and it was expanding rapidly. I mean we were a site that was expanding rapidly, a lot of new people coming in. And yeah, there were some very good relationships. My former partner worked at the Sanger and I met her at one of the social [??? at 45:34] that was going on. I mean we were young people on a new site. Yeah, I think it was a good working relationship because we were around each other. You had that proximity. There was lots of speakers coming in, so if the Sanger were putting on a talk or invited somebody in to speak, then you would be going along – and vice versa as well. And that was something that the Wellcome Trust I think was driving very well. We had the shared facilities. We had a restaurant that everybody went to. We had seminars that everybody went to. We had a social club that everybody went to. There as the diner café that everybody went to. There were sports teams. There was a football league, there was a rugby league. So there was all of these interactions going on and people knew, if somebody was giving an internal seminar then you got to know what other people were doing. So if you were interested in something then you could easily seek that person out, and it was also helped because there was a lot of recruitment going on and there was movement of people between the institutes as well, I think in both directions. Let's take you and Bernie as a case in point. I remember <laughs>, I remember when he was a PhD student, and going out, along with my former partner, to parties in his house, and now he's Director of the EBI. <Laughs> But I remember those early days!

So that kind of movement of people really helped. Let's say interestingly maybe a way that didn't happen with EMBL Heidelberg because of that.

**MG:** And of course the campus is about 12-13 miles outside of Cambridge, as we described as sitting on a field in the middle of nowhere. I'm not sure that's necessarily an accurate description. Was there much interaction with Cambridge University or was that ... again as a geographical distance, a bit more separated?

**AR:** I think it was a bit more challenging, yes. The campus ... it was. I actually used to live in Hinxton so I used to live in the middle of nowhere. The interaction with the university pretty much came about I would say through the PhD students. And we would invite people down from Cambridge University to give seminars as well. I think unfortunately, because of that distance, maybe us getting up to Cambridge or people down from Cambridge for our seminars was a rarer event. Basically if you went offsite you were probably offsite for the day. So the interactions with Cambridge University weren't anywhere as near as extensive as they could be with the Sanger. And also part of that is because, let's say particularly with EBI, it's true of Sanger as well, they were doing sequencing, and we were doing informatics. And there was less of that necessarily going on at the University of Cambridge.

**MG:** So you spent a number of years working on the industry programme, then I think you had a sabbatical and then when you came back you were working on the science?

**AR:** Yeah. So I'd been at the EBI I guess for about 7 years at that point. And I'd been working a lot on informatics-based projects including the derivation of standards, but we got involved with things like the microarrays and that just reignited my interest in actually doing stuff that was more <50:00> towards the biological end of bioinformatics. So at that point Mike Ashburner was co-director of the EBI along with Graham Cameron, and so I just went along to him and said, 'Is there a chance that I could basically have a bit of a sabbatical at the department of ...' No, I've got that wrong, Janet was the director at that point, I'm sorry. Janet was the director. But I obviously knew Mike from when he was director, he had his own research group, so anyway I was just like, 'I would really like to do this.' So I went along to Mike, he said, 'Yeah, can find you a little desk.' Really was a little desk, outside fly based in the Department of Genetics. It actually turned out, when I went along and said, 'I want to take this sabbatical', Janet said, 'Well, could you at least come in one day a week?' Which is actually what happened. I came in one day a week, to just keep things ticking over with the Industry Programme, and then I spent my time in Cambridge attending lectures and doing some analysis as well and basically getting back into the biological aspects of things, and then the sabbatical came to an end and I returned to the EBI, and Janet asked if I would basically head up what was going to be known as the eScience Programme, which in many regards is what the Industry Programme, with some of the work we were doing, was heading towards, in terms of thinking about future informatics technologies, and certainly the impact of eScience was gonna be huge, and we see that nowadays across many industries in terms of cloud computing and in terms of storage and what we called at the time grid computing, but that's basically what Amazon Web Services is nowadays, and again it came out of the high energy physics community. However ... I'd just spent a year interacting with biologists and I was like, no, my future actually lies with doing stuff that's way more biologically related. Now the EBI is basically a very ... you could say a dry place, it's full of people only doing informatics-based projects, working with biological data, and I was like I actually want to be working with the biologists. Rather than me being in a dry institute and maybe trying to interact with biologists, I actually want to become embedded in somewhere where biology is happening, and then use my skills there. And so I was offered this opportunity of doing the eScience thing but actually it's not where I see my future. So I basically then left EBI and this is how I ended up at the Mitochondrial Biology Unit, where I basically am an embedded bioinformatician here.

**MG:** So you're embedded. I was looking at the list of your research interests and so on, and one of them was MitoMiner and it draws, it's about localisation and mitochondrial aspects, and it draws on a number of different data sources, which includes some from the EBI.

**AR:** Yeah.

**MG:** Was your connection with the EBI, did that make it easier or harder to set up that –

**AR:** I think my experience of the EBI made it easier, or also seeing the importance of doing it. So the idea of MitoMiner, which I think now is the only ... I mean when we first started it, we'd have people producing databases in the loosest sense of the word, of information about what proteins are found in mitochondria, being able to catalogue those, all of the experimental data, because one of the aspects that we had is various people are doing experiments to say what proteins are in mitochondria? And we're interested in that, from an evolutionary point of view but also from understanding mitochondrial diseases, so if you've got a patient with a mitochondrial disease, if it's not due to a problem in their mitochondrial genome, then it's going to be a protein that's ... whose gene is in the nuclear genome but it's turned into a protein **<55:00>** then import. So if you've got a patient with a mitochondrial disease, most likely it's because of a protein within the mitochondria that is dysfunctional. So if you've got a list of which proteins are in the mitochondria, you've made your search for the disease genes so much easier. But the issue we had was that many people were producing these studies and they would just publish them and it would be in, if you were lucky, an Excel spreadsheet, but quite often just a PDF table and we looked at this like we need to collate the status together, so one, it was just like we need to get the status together, so that it's actually as a whole, which is exactly how things like the Nucleotide Sequence Archive was brought about as well, it's like we need this information together, it's greater as a sum, and we need to integrate it. I mean that was part of the issue with the Bio-standards Programme, what it wanted to do was it was about integration as well, it was about bringing things together so you could actually bring them together. So a second strand of MitoMiner and how my time at EBI has influenced that was we need to, we don't just want the information on the proteins but we want to integrate it with other things as well, with other types of information, because then you're just magnifying the value of that information. And then the third aspect that I learnt from the EBI that I brought to this was not creating a legacy for yourself. Or rather making it easy, so what am I interested in? I'm interested in what is the mitochondrial proteome and what other information can I bring? What I'm not interested in is developing a whole database system to do this. So I was just like we are not gonna write this. Who is producing something that actually we can use as a data warehouse? Because quite a lot of people, and this include the other mitochondrial proteome databases that we developed, and to be honest they've all fallen by the wayside, they all developed their own in-house bespoke systems, which meant not only were they having to maintain the data, but they were having to maintain the infrastructure. Now at EBI we didn't develop our own infrastructure, we used proper IT infrastructure to do the job, because then you basically didn't have to worry about it. And that's what we were interested in in the Industry Programme, how do we exploit IT infrastructure to do this, rather than some kind of home-brew solution. So I just basically looked around, here's a data warehouse ... the one that we use, again it's built on a relational database system, it's actually developed by the University of Cambridge, called InterMine. It's used by many projects around the world and it's head is Gos Micklem, who I met probably 20 years ago 'cause he was the representative for Glaxo on the Industry Programme <chuckles>. So I mean it even goes back to there, he basically left

Glaxo 'cause he wanted to be back in academia so a very good working relationship with him as well.

**MG:** And didn't he go to the Department of Genetics, which was Mike Ashburner's department?

**AR:** Yes. So Gos Micklem was there back then in the very early days of the industry programme, but he now is the Director of the Cambridge Computational Biology Institute, and I sit on his advisory board for that. So yeah, there are contacts that, relations that were established 20 years ago that are actually still working, socially a little bit, and also from a scientific and technological point of view. So yes, some of the influences that have been on my career in terms of the EBI has been thinking about developing, well actually trying not to develop IT. Somebody else has developed it, to use it. And then just focus on the application of that. so yeah. There is that. And also I think diplomacy skills. Rather than just being a scientist or scientific leader, I was interacting with an awful lot of people. So yes <laughs>, I developed a lot of social skills <laughs> and diplomacy as well.

**MG:** So one of the things that you mentioned was the excitement of being at the EBI and you said you were there for seven years. You came in when the Director was Paolo Zanella, and then that changed to being Mike Ashburner and Graham Cameron as the joint <60:00> heads of outstation and then it became Janet Thornton as Director. So in those seven years, you had seen a lot of change, a lot of things happening. Was the EBI a very different place at the end of your seven years to what it had been when you joined?

**AR:** Yes. Actually sitting here and going it was seven years, that's actually quite a short stretch of time it seems now, but at the time, yes some –

**MG:** But also about a quarter of the life of the EBI. So it's short in one way but actually it is quite significant in –

**AR:** It was incredible. I mean yes, we went through ... I think we experienced some changes there which each of the directorships had to deal with, and that will have had an influence on the unit. I mean basically when Paolo Zanella was director he was getting it established. We had money from the EU, we were new and there was an awful lot of excitement and resources were available and Paolo Zanella moved on and Graham and Mike came in, but the issue there is I think their directorships would have been affected by the fact that we suddenly lost that EU funding and we went through some lean years. I mean it affected everybody and everything. And Mike and Graham were trying to do everything but certainly I think that will be ... something about their directorships that is something that they would probably comment as well, because it was such a big issue for us. And then we transitioned to Janet, who I just overlapped with at the end by about a year, and I mean she came in very much with a research focus I would say as well, and she wanted to strengthen the research, because sadly one of the things that happened when we went through these lean years is things had to be lost because we didn't

have the money to run everything. And unfortunately one of the areas where the cutbacks were made was in research, because the EBI's mandate and focus was to provide services. That was the core. So what was cut away was unfortunately the research. And I think any institute knows, if you start cutting the research that's basically it, if you're not careful you're gonna stagnate. Research is very important. But we were in survival mode I would say actually at that point. How were we actually going to survive? But with Janet taking over, things got better. Actually it was after my time but things like the ELIXIR project, suddenly stuff started to come on, and so I think Graham and Mike got the EBI through a very difficult and challenging time, and did what needed to be done and did it very well. For then someone like Janet to take over and then carry it on. And we've seen the continued expansion of the EBI. I still keep tabs on what's going on in the EBI, and new services, more research focus, obviously bigger as well. So I think it was three very different periods but I think in some regards ... well obviously the director will shape it but it was also shaped by the politics of the time as well.

**MG:** I think we've probably come towards the end of the interview. I'd like to say thank you very much indeed. I think a lot of what you said has been really interesting about the feel of the place, and the feel of what was happening and the science that was happening and so on. Is there anything that you'd like to say that you feel we've missed or not covered?

**AR:** Actually there is one thing that pops into my ... it's getting back to the EBI as being a social place, an exciting place to be. Actually a couple of things. Two anecdotes, kind of related.

One is that when we would sometimes have these EBI social evenings, we'd have things like the international *cuisine* night, because we were an international organisation, and we'd have these maybe once or twice a year where everybody would bring a food in from their nation. I think one year I brought <65.00> spotted dick <laughs> which I had to explain! And another year I brought a cheeseboard, that might have been to annoy the French people ... obviously, with the vast selection of very good British cheeses that we have. But one of the things that would happen at these events as well is that there was also various people plaid musical instruments and quite often those people would turn up with their instruments and it would turn into a bit of a jam session as well, and people would be playing music from their particular country as well. And I think that's some of the fondest memories I have. I think the other one that I also really remember is when ... I hope it still goes on actually, is the Burns Night Supper which was instigated, or at least came about with Graham Cameron, and I just remember, although he was the Co-Director of the EBI, he spent quite a lot of time <laughs> organising that as well, very well. I mean the selection of whiskies we would have, and again there would be music, but that was for everybody on site, so everybody was coming together and there was ceilidh dancing, and again those are nights that I really remember and ... at the beginning of the night you'll be given three vouchers for your whisky and you'd go around and taste them. By the end of the night though, Graham was just there with a bottle, 'You need to try this, you need to try this, and this one needs a little bit of water ... try this.' So I have my fondest

memories, in many regards, of those kind of events that were going on at the EBI and on the campus at that time. Just some very good friendships that were going on.

**MG:** Good. Right, well thank you very much indeed. That's great. Thank you.

**<End of interview>**