HOUSE OF LORDS

Select Committee on Science and Technology

Corrected oral evidence: Contribution of innovation Catapults to delivering the R&D road map

Tuesday 15 December 2020

11.45 am

Watch the meeting

Members present: Lord Patel (The Chair); Lord Borwick; Lord Browne of Ladyton; Baroness Hilton of Eggardon; Lord Hollick; Lord Kakkar; Lord Mair; Viscount Ridley; Baroness Sheehan; Baroness Walmsley; Baroness Young of Old Scone.

Evidence Session No. 5 Virtual Proceeding Questions 38 - 43

Witnesses

Dr Jeremy Silver, CEO, Digital Catapult; Matthew Durdy, CEO, Cell and Gene Therapy Catapult; Professor Chris Molloy, CEO, Medicines Discovery Catapult.

USE OF THE TRANSCRIPT

This is a corrected transcript of evidence taken in public and webcast on www.parliamentlive.tv.

Examination of witnesses

Dr Jeremy Silver, Matthew Durdy and Professor Chris Molloy.

The Chair: Welcome to all of you. Please, when you speak for the first time, introduce yourselves so we get you on the record, because we are on broadcast.

Q38 **Lord Browne of Ladyton:** Good morning, gentlemen, and thank you for your patience. Your advantage is that you have heard the questions already, more or less. I will start with a familiar question to you. What new or emerging developments in science and technology do you think show most promise in their ability to be commercialised and deliver significant private sector investment?

Dr Jeremy Silver: Good morning. I am the CEO of the Digital Catapult. For us, there is not one technology alone. We look at a key group of significant advanced digital technologies. Through our research into the strength of the UK research base, the opportunities among the start-up community, the size of the global market and the UK need, we have identified a group of technologies that, when combined, represent an enormous opportunity for the UK. We do not really look at them individually, although we have depth of expertise in each of those areas.

There are technologies around digital infrastructure, so 5G in particular and the internet of things more broadly, immersive technologies such as augmented reality and virtual reality, and then of course machine learning and artificial intelligence.[1] Finally, there is distributed ledger technology, which some of you may be familiar with in relation to blockchain. An estimate of the value of these to the global economy is about £2.2 trillion by 2025. The real question for us, and I suppose this is where we put our focus as a Catapult, is how much of the ultimate market share of the potential in all these technologies we can win in the UK and how much UK companies can bring to bear.

We are looking at two different opportunities that we try to bring together. One is to bring a digital transformation to our domestic industrial base and to enable so many of the technologies we have heard about this morning to be powered. We have heard the word "digital" arising in other people's evidence this morning quite frequently. We are trying to galvanise our start-up community to engage them better in that endeavour as well.

Lord Browne of Ladyton: Mr Durdy, as well as new and emerging developments in your area, can you give us examples of advanced therapy medicinal products, ATMPs, you have helped successfully to commercialise in the UK? Can you explain how your Catapult has helped to overcome any barriers in the commercialisation of them?

Matthew Durdy: Good morning. I am CEO of the Cell and Gene Therapy Catapult. The question of the promising areas is one we ask ourselves

[1] Additional points added after the evidence session were: quantum computing algorithms and software.

almost every day. We believe that it is attracting and driving that private sector investment that leverages up the impact we are looking for. We apply three tests when we are looking at this. First, is there a significant market need? Secondly, are there significant barriers to addressing that need? Thirdly, are there the basic skills and capabilities within the UK that we can leverage to deliver some sort of advantage?

We think that the cell and gene therapy industry fits all those tests extremely well. There are significant healthcare needs. The industry is addressing major areas of healthcare need where the transformation is, in some cases, curative for the first time. The biotechnology and pharmaceutical industry is crying out for new product and new global advantage. We are able to serve that and therefore industry will invest in it. There is a fantastic legacy of 30 years' worth of investment through the universities into that area. That makes for the potential for an £18 billion industry within the UK in a few years' time.

To the question of how we have addressed these issues and moved the industry on, going back to 2012, when we first set up, there was not really an industry. We thought that one of the primary things we needed to do was to demonstrate to investors that there was the potential for these therapeutics to be purchased. We approached NICE and NHS England, and worked on a project with them to develop a report.

They came back, much to the surprise of the rest of the world, and said that a CAR-T therapy that was delivering curative change, where the alternative for the patient was death, could have a value of £500,000. There was much more detail in it than that. That put the UK and the industry on the map for investors. It has driven roughly $20 billion a year of investment over the last few years globally. That is an example of us shaping the environment and changing the game so that everybody benefits.

We have had an intensive relationship with a company called Autolus. It is a fantastic company in the same space, CAR-T. It has a new product that is more advantageous than the first generation of products that came in. We have been working with it since it spun out of UCL a few years ago. We have helped it develop its large-scale manufacturing, its supply chain processes and some of its technologies into manufacturing. We are now working with it on developing its manufacturing systems to supply from the UK into the US under a commercial licence. That could easily be £1 billion or £2 billion worth of products going out of its operation within our facility.

We recently had a light-intensity relationship with a company that spun out of Bristol University. It is a gene therapy company. We spent a smallish amount of time with it, talking about what the industry needs and what investors look for, looking at the breadth of its development and readiness for investment. It recently achieved a £45 million investment round from Syncona, a progressive UK investor. In my view, all that would count towards the 2.4% target.

Lord Browne of Ladyton: Professor Molloy, what are the new and emerging developments in your area? Maybe you can share some

successes with us.

Professor Chris Molloy: I am the chief exec of the Medicines Discovery Catapult. We are in year 3 of our first five-year grant funding agreement and have already worked with over 150 partnered projects across the UK in all the devolved regions. Our job sounds like a simple one, which is to industrialise and drive the adoption of new techniques and emerging technologies for our sector. Our sector is a combination of over 300 biotech companies, 60% of which have fewer than five people, and over 1,500 service and supply companies, so a diverse and SME-driven sector. Across that sector, we are working in technologies focused on imaging and in informatics. The technique, which I will come back to, is industrialised translation.

Imaging and the tools that enable us to see into a disease, the biology of which exists in cells, tissues, organs and humans, enables us to make smarter decisions based on a more complex understanding of what is going on. Those techniques and technologies are emerging from technology companies, academia and so on. They are a risk for the industry to engage and involve itself with and invest in. It is our role to test those techniques, to put those technologies to work in real-world cases and to prove their use. When that use is proven, the service sector can pick up those tools and drive their adoption. Where we are looking at complex mass spectrometry, PET imaging and other techniques which are driving better decisions because of more complex high-fidelity information. These imaging based approaches also lend themselves very well to techniques of AI and machine learning.

This bridges into another key technological area, that of informatics. Medicines discovery produces one product, which is data. Those data are used to make smart decisions about R&D and where to make the next investment. We need to get better at consuming that information and analysing those data, to enable that to happen. The amount of data available in the world is enormous and advancing exponentially all the time. Unless we harness it, capture it, distil it, curate it and then analyse it properly, we are squandering the investment in years gone by.

The final technique is that of industrial translation. Translation, in critical terms, from an academic asset to something that is industry-fundable or consumable is an industrial process. It takes learning and experience to do it. Our role in the UK is to make sure that industrial translation is disseminated as broadly as possible to those academic spin-outs and SMEs that need it and to engage the service sector in helping that community succeed.

Lord Browne of Ladyton: It would be unfair to Dr Silver if he did not get a minute to tell us about his successes too.

Dr Jeremy Silver: There are lots of them, but let me give you a couple of examples for a flavour of the way we work and why we do the things we do. One company to share with you is Flexciton. That is an AI company that we first engaged with in our Machine Intelligence Garage programme, which is an accelerator programme for early-stage, deep-tech AI companies around the UK. We partner with Google, Cray, Hartree

and a bunch of other partners to give those companies access to facilities, know-how and peer learning.

Flexciton came through that programme and, as a result, had engaged with us. During that time, we were also working with a company in Northern Ireland called Seagate, a worldwide manufacturer of disk drives and read/write heads for data drives. Seagate came to us and said, "We have a problem. We have an 1,800-step production process that is incredibly difficult to keep going and incredibly difficult to make more efficient. We have been working on this for three years, trying to solve it. Can you help?"

We introduced them to Flexciton, and worked with them and Flexciton through a very intensive three-week workshop session. At the end of it, they realised they had made more progress in those three weeks than they had in the previous three years. They then went on to contract with Flexciton to secure long-term engagement. Building the confidence of the traditional business to understand the opportunity an innovation company can bring, and the confidence of the innovation company to contract and overcome the difficulties of being a very small company trying to work with a very large company, is the kind of thing we do. We would like to do much more of it, frankly.

The Chair: I do not want to curtail you, but please keep the answers brief if you can.

Q39 **Lord Borwick:** I want to ask about collaboration and conflicts between the Catapults. Presumably, between the Cell and Gene Therapy Catapult and the Medicines Discovery Catapult, you have projects and ideas that arguably could fall into either category, and similarly between the digital and the satellites. Of course, there is Innovate UK over the top, doing its own things. How do you sort out in whose purview a particular idea falls?

Dr Jeremy Silver: As you can imagine, we work very closely with a number of the Catapults. A lot of the technologies we have deep technical expertise in are enabling technologies that allow other domains to transform. We work on a number of projects with the High Value Manufacturing Catapult. We are collaborating closely with the Satellite Applications Catapult and with the Connected Places Catapult. We do that project by project.

There are constraints. To some extent, the rules put us in competition with one another for the pot of money that is available. The level of opportunity to galvanise our own expertise and bring ecosystems together is the thing we are most excited by. That is what engages us. It could be made easier for us, because there are obstacles in the funding mechanisms, but we collaborate pretty effectively across the board at the moment.

Professor Chris Molloy: It is about having clear remits. The Cell and Gene Therapy Catapult, which preceded us by some years, set out a very clear stall as to where it saw its intervention. We were able to wrap ourselves around that and make sure that there was only positive overlap.

To give examples of that interaction, we are working with the Cell and Gene Therapy Catapult on one of our national R&D consortia in the area of hearing health, much of which has a regenerative medicine play. We have worked in the past with the Digital Catapult on workshops for AI and drug discovery. We are working with the High Value Manufacturing Catapult, and specifically the Centre for Process Innovation, on some of our strength in places applications for complex medicines, which are the nanoparticles and drug delivery systems. They are complementary to but not necessarily overlapping with those that the Cell and Gene Therapy Catapult is progressing. The key is setting clear remits and regular communication.

Matthew Durdy: I would echo Chris's thoughts. There are so few Catapults that there is not that much opportunity for conflict and overlap. If there were more, that would potentially be the case. Where it happens, and it has not happened between us and medicines discovery, we have old-fashioned dialogue and deal with it. I do not think conflict is a big issue.

The opportunity is the much more exciting thing. We are working together at the moment on a challenge. We are trying to orientate what we do to the challenges of government. One of the big challenges of government going forward, whichever Government it might be, is the rising cost of healthcare. We are working together to see whether we can make a plan, similar to the net zero challenge in carbon, for the Catapults to reduce the growth rate of healthcare costs. That works across all Catapults and not just between us and Chris.

Q40 **Baroness Young of Old Scone:** That leads on to the issue I wanted to pursue. Is the scale of public sector investment the issue in leveraging private sector investment? We have heard from other Catapults about the difficulties with the one-third, one-third, one-third funding model and the issue of accessing collaborative R&D funding. We also heard in our first session and from Dr Silver about being able to harness the industry to get system-disrupting or system-changing investments identified, and that then being funded outside the Catapult mechanism by government at a much greater scale than would be possible within the Catapult system.

Do we just need more money in the existing system, or do we need a different system for public funding leveraging private investment? Perhaps we could start with Dr Silver and draw on the point you made about system-changing investments.

Dr Jeremy Silver: Everything we are doing is about trying to drive investor confidence. We are doing that with a lot of early-stage businesses. When you look at scale and the challenge of trying to get to 2.4%, if we continue with the behaviours we currently have, with the familiar suspects of industries that currently invest in R&D, we may not get there. We have to be more creative and inventive. For example, we are working very closely in the creative industries that do not have a great tradition of investment in R&D, in the conventional sense in which we think about it; for example, the automotive industry. It is not to say

that they do not do R&D, but they do not work in conjunction with universities particularly closely. There is no legacy or tradition of leveraging public funding. Therefore, there is an opportunity, particularly because we have a great strength in the UK in our production technologies and production companies within the media sector, to grow them and make them more competitive globally by incentivising them to invest. For example, we are developing a programme in the Midlands on virtual production, which is a way of making films, TV shows and games more efficiently and flexibly than in the past, using games technology. This requires new investment, but, if it had that, we would get new investment coming from industry as well. The challenge is to find new areas that have not previously been touched. Stimulating those sectors may need different approaches.

Baroness Young of Old Scone: The Faraday battery model was to get a bow wave going, driven by the industry, which then assaulted government to a point where it had to shell out large sums of money, if I have read it correctly. Mr Durdy, do you see that as an alternative to the traditional one third, one third, one third?

Matthew Durdy: I will come back to the smartness of the use of money in a second. I will just make some observations about the level of funding, which you correctly hit on. When this Catapult started, back in 2012 or 2011, Innovate UK had about £450 million of discretionary funding it could use. We did a test to see whether it could follow through with its part of our need. Did it have enough money in the system to match our funding of £12.5 million a year? At that time, the answer was yes, because it had £450 million of discretionary funding. Play the clock forward to now and, in real terms, it has about a third of that in discretionary funding. The Catapult programme itself matches that. If it was just to provide the funding the Catapults needed to make the thirds model, there would be no money left for anybody else. There is a big issue of the quantum.

It is not just about quantum. It is also about how smartly you use that money. At the moment, there is a tendency to spread the money widely. As I said at the beginning, there are some sectors that benefit more fully from stimulation of investment. There are those where there are significant barriers to overcome, for instance. What is needed is more money, with well-thought-through, long-term, understandable, predictable industrial strategy alongside it, so the companies know what is coming and can plan their own development programmes alongside the availability of funding in the future.

Professor Chris Molloy: To support what my colleagues have said, we benefit from Innovate UK funding in order to take risk that industry finds hard to take or cannot take. As the Medicines Discovery Catapult, we are now at the limits of that. We have deliberately grown and scaled quickly to serve our sector, and we are now having to turn away risk because of resource constraint.

More importantly, we need to think about the opportunity to do things slightly differently. We have a great opportunity now in the area of

diagnostics in the UK. Government has been explicit that it wishes to stimulate that and produce an industry worthy of the name here in the UK. We should take an approach to that—which is a nationally strategic, important thing to do—where, rather than spread out investment over years and years, we look to impact investment. Through Covid, we have seen the impact of rapid investment delivering industry, academic and institutional collaboration.

We have an opportunity now to do that in the diagnostic sector. That could be through new forms like the 'Catapult Quarters' concept which the CBI is promoting alongside us, or something highly strategic with UKRI: matching the institutional academic assets with the translational capacity of the Catapults to show a difference in an industry the UK wishes to stimulate. Now is the time.

Baroness Young of Old Scone: Are you seeing signs that UKRI is firing up to that kind of approach?

Professor Chris Molloy: I look forward to that.

Baroness Young of Old Scone: I hear you say you look forward, but are you seeing any signs?

Professor Chris Molloy: I am seeing some very clear signs that the UK wishes to stimulate this industry in a sensible way, provide the opportunities, translate the money we have spent in academia into assets that industry can then pick up and stimulate those industrial partners to take them to market. We have yet to work out exactly what the framework for that looks like. We need to get on with it.

Baroness Young of Old Scone: Dr Silver is looking amused at that. Perhaps he would like to tell us why he is amused.

Dr Jeremy Silver: Chris is being very diplomatic, and I am sure I shall be very diplomatic as well. Given our economic circumstances and the impact of the pandemic, we need to place the emphasis more on the D side of R&D, the development element of the funding. We have to put more focus on industry engagement, helping take the incredible, valuable work that is going on within our university sector and putting more focus on getting it out and getting it to work in industry. That means more industry engagement and it needs a new kind of strategic alignment across the innovation landscape. I think you have heard that refrain from colleagues this morning. Implicit in that is a sense that perhaps it is slightly out of kilter at the moment.

Matthew Durdy: I will just emphasise the point: in the Catapults, we see ourselves as an amazing tool of industrial development. We have different ways of operating with different sectors. To be honest, we are on standby, saying, "We are ready. Show us your strategy. Tell us what you want us to do. We will come in and implement".

Q41 **Lord Mair:** We have heard quite a lot from the other Catapults about the barriers to the Catapults and industry collaborating with universities. I would like to ask each of the three of you for your views on that. Professor Molloy, in your evidence you talked about the need to

accelerate translation funding, which should be made available directly to academic Catapult collaborations. Could you say a bit more about that, please?

Professor Chris Molloy: The fuel for translation is a combination of available funds and industrial skills. We see the success of Biomedical Catalyst, which has been very useful at helping industry translate its assets. What was proposed and promoted in the life sciences industrial strategy was a translational fund that enabled investment to be made behind a range of assets coming from academia, much like venture capital would push an asset forward in a biotech. Funds would be available when an asset reached a certain milestone on a critical-path R&D translational plan, as opposed to an iterative set of "will they, won't they" grants that stagger translation across the academic milieu right now, where assets that get to a certain level may miss the next grant for whatever reason and then hang for some considerable while.

If we want to take a truly translational approach to this, the funding for translation must be available and delivered on an industrial scale with industrial-class decision-making. The combination of translational skills with academic endeavour, supported by effective funding that is hypothecated to that activity, is key to this. Right now, it does not exist.

Lord Mair: How would that differ from the third-third-third model? Would it be quite different?

Professor Chris Molloy: I do not think it needs to be. Our projects are already funded one third, one third, one third. You set aside a certain amount that would take the asset all the way to industry consumption or subsequent financing. You start that project running and, if it fails, you fail it fast, spare the money and recycle it for the next asset. You treat this as any industrial outfit would.

If you take a UK plc view, you have a certain amount of translational funding to take a certain amount of assets a certain distance. You put the right translational skills around it to manage that money and manage that programme through the critical path. The UK has plenty of assets, both service and infrastructure-wise, to do that. We just do not have the funding in one place. It is spread extremely diffusely and in a staggered way, over multiple three years cycles of having to go back to the well. That is not the way you do effective translation.

Lord Mair: Do you see the 30% cap as being a problem?

Professor Chris Molloy: Yes, because the translational element of this is treated as a service, which to an extent it is, but not as a true partner. Because the translators, the RTOs in this sector, have access to only a limited amount of the funding, it limits what we can do or means that we, as a Catapult, need to subsidise all the programmes we play in. That limits not only our ability but the output. We can take on only a certain number of CR&D tracks a year because we have to subsidise them out of other funds. That simply means that we are running in too low a gear, and I do not think that serves the nation particularly well.

Lord Mair: Mr Durdy, what do you think about it in the Cell and Gene

Therapy Catapult? What is your view?

Matthew Durdy: We work very closely with universities, as I have already outlined in one of the examples. We have a programme, deliberately going round. We have a narrow scope, so it is easy for us to work with that. Some of the problems we see are well documented, so I will not go into them. There is the lack of alignment that comes with the REF, and probably the KEF as well, and the lack of funding. If we had 30% to share in a much larger pool of funding, it would be less of an issue.

I will touch on a couple of others that probably have not come up. One is that the IP incentives the universities have are a problem. The IP is not released from the universities into the industrial sector, where it is properly exploited with proper funding, as quickly as it should be.

From our side, as Catapults, we are not well understood. We need to be better understood. We need the support of a programme that is well funded and helps the universities understand our role fully. This discussion will help in that. The universities need to understand that we play a different role from them. We have a lot to offer in leveraging up their investment and taking it through to great successes for the economy, which will be good for everybody. I would encourage looking at models such as MIT in the US, where intellectual property comes out quickly through a number of different hands.

Lord Mair: Dr Silver, in your written evidence you talked about there being rather a different approach, from the digital standpoint, in terms of universities and spin-out companies. You suggested that there are often more impactful and innovative products and services in the start-up world than university spin-outs. Would you like to enlarge on that?

Dr Jeremy Silver: The example of 5G is perhaps useful here. As you know, 5G is a new standard for mobile phones and has tremendous industrial application. The 5G Innovation Centre is based in Surrey University. Bristol University and King's College London have been UK leaders in this and continue to be. We work very closely with them. We have taken the open-source technology they have developed into a lab environment and created a facility that has been available for early-stage companies and start-ups to make use of and get their hands dirty with.

The funding for that facility did not come from the university. We won the funding for it with a local enterprise partnership, the Coast to Capital LEP in Brighton. We worked with it to build that. It funded it to the tune of £2 million and created a 5G testbed where we were able to bring cohorts of early-stage companies through to get their hands dirty, start to engage and understand how that technology could work for them. As a result, some of those companies pivoted their business models, developed their business case and received further investment from the private sector because they understood that technology.

If that facility had been available from the university, and if the whole process had been contracted and we were able to play a more active part together, it could have happened more quickly and at greater scale, I

believe. The challenge is how to create that level of engagement in a closer and more dynamic way. When that happens, and there are examples of it in certain sectors and particular cases, you can see that the opportunity grows really strongly.

Then there is the question of whether it is a university spin-out or a start-up that has come from graduate-skilled students. In a sense, I would make less of an issue around that. I am not sure that there is a huge challenge there. Universities would probably like to grow more spin-outs and we have enormous numbers of start-ups across the UK. I am not sure that in itself is a critical issue for the innovation landscape.

Q42 **The Chair:** How can the Catapults facilitate this Government's agenda of levelling up. What are the barriers to Catapults being able to help? I know, Professor Molloy, you are also involved in the strength in places strategy.

Professor Chris Molloy: We are a national centre, but we are of our place, here in the North-West, in Alderley Park in Cheshire, benefiting from an expert skills base, access to strong universities and manufacturing capability very close by, as well as a devolved healthcare system. It is a perfect place to put a national resource and enable it to feed the nation. As Dr Silver said earlier, having those local relationships with the LEP and others, and being tightly bound to our industry in this region, has enabled us to pick up the ball and drive on complex medicines.

It is an interesting approach to strength in places that has traditionally come from an academic base towards industry. We have taken the view that here is an industrial need that we will take towards academia. You end up in the same place, but you start in a different place. We hope that will feed the north-west and bring in other areas, not only of the Catapult community, for example CPI, but other specialists across the nation. While it feeds and nurtures a place, it does not have to be all from that place. Catapults, as national centres, have the opportunity to do that: to bring in skills they understand from around the nation, to plant and fertilise a particular place and to serve other regions. All the Catapults around the table today will have examples of where they have done that distantly from their headquarters location.

The Chair: Does that mean you think you are quite well placed to help the Government's levelling-up agenda?

Professor Chris Molloy: Yes, we believe we are, not just here in the North-West but to help other, relatively under-supported areas in the nation benefit from our translational skills at a distance from access to other parts of our infrastructure. That includes other areas of the country that are traditionally under-supported and have perhaps been sitting in the shadow of the so-called 'golden triangle' for many years.

The Chair: Dr Silver, you on the other hand are mostly based in the south-east. How are you placed to facilitate the Government's agenda?

Dr Jeremy Silver: We have worked very well to the Government's agenda for levelling up in two ways. Many of the commercial partnerships we have are with businesses that are placed all over the country. We have done projects with companies in Herefordshire, the north-east and the north-west. We also very early on developed a strategy, probably ahead of levelling up emerging as such an important policy of government, to have a regional presence.

From the beginnings of the Catapult, we have developed a presence in Sunderland in the north-east and in Belfast in Northern Ireland. We have pursued those and developed relationships with the local authorities, local councils, universities and LEPs in those areas. We have tried to see what the best way of working in those neighbourhoods and regions would be. We found that we need to work to the local specialisms. We need to respond to what local industrial need looks like. Because digital technologies are so diverse, it is possible for us to be quite adaptive and responsive in that way.

More recently, we have looked more closely at working with some individual universities in their regional locations. We are developing something particularly interesting in the south-west at the moment, with relationships across four universities in the Bristol and Bath area and the combined authority there.

At the same time, we are developing a testbed for 5G in Birmingham as part of the Government's testbeds and trials programme, the West Midlands 5G programme. There will also be testbeds in Coventry and Wolverhampton. We are now talking with the West Midlands Combined Authority about how we can build on that and add more to it.

In a similar way, we are working on a project in Nottingham with Nottingham Trent University to build a 5G and IoT testbed there. That is just the beginning. Very often, we build a facility, something that companies can come and get involved in, where they can learn about a technology. From there, programmes develop. We are able to build collaborations and bring people together who otherwise would not have a chance to work together. Although our headquarters are in London, we are very active across the country.

The Chair: From that summary, it sounds as if you can help facilitate the Government's agenda, but you are at a developing phase of doing that.

Matthew Durdy: The Cell and Gene Therapy Catapult manufacturing centre in Stevenage is almost a textbook case of development in action. Some years back, we identified that the industry as a whole, nationally and globally, needed a manufacturing development capability. We went to government. We were awarded £55 million. We built a manufacturing centre, but with the intention of creating a cluster of activity around it.

We chose the site carefully; we did a lot of work in selection. That led to the manufacturing centre, which now has seven companies manufacturing advanced therapeutics within the UK and will create long-term growth. It has already led to about 500 direct jobs and probably another 1,000 indirect jobs. It has attracted about £1.2 billion of

investment into the companies around the manufacturing centre. It is now the largest cell and gene therapy cluster outside of the United States and the third largest in the world.

That was done by design, with deliberate intent, and we could repeat that case working alongside government. We would not want to do it again in cell therapy, but there are other areas such as rare diseases and, potentially, targeted medicines. We can take that experience and use it again, working in conjunction with the levelling-up strategy. We are ready to engage.

Dr Jeremy Silver: To pick up on what Matthew just said, we are relatively constrained in the funding model. If there were more funding available, we would extend out into other sectors. In doing that, I think we would find other locations to be active in. The opportunities to create more impact and to address the levelling-up agenda go hand in hand.

Q43 **The Chair:** In one short sentence, what one recommendation do you think we should make about the Catapults?

Professor Chris Molloy: Have the Catapults as the explicit translational engines of UKRI.

Dr Jeremy Silver: I think exactly that. We need to be embedded in the process and recognised as the key network to facilitate translation into industrial commercialisation.

Matthew Durdy: My answer is very similar. We talk a lot. We share the frustration. We feel that we are an amazing asset that the Government have spent a lot of money building. It is now time to leverage that asset and use it for the development of the UK. There is an additional context of scale. We are talking about nine centres. It is probably less than a third of the scale of the Fraunhofers that we are often compared to. It is about using the existing centres well but also using the knowledge of the existing centres to leverage up and do more in other sectors as well.

The Chair: Thank you very much, gentlemen. It has been most helpful to us. Thank you for coming today to help us. Have a good holiday season. I hope it is all peaceful. Thank you very much.