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[00:00:00] **Emily Brennan:** Hello and welcome to the Workforce Foresighting Hub podcast. I'm Emily Brennan, communication manager and host. In this series, we explore the intersection of future skills and innovation, uncovering how emerging technology is shaping the workforce landscape. In today's episode, we're exploring the transformative role of RNA [00:00:30] therapeutics, which gained prominence during the COVID 19 pandemic, and are set to revolutionize the treatment of life threatening diseases.

[00:00:37] With rapid growth expected in RNA therapeutics manufacturing, the UK has a critical opportunity to lead the way, but only with a skilled workforce to support it. Join us as we dive into the CPI report, the key insights, the industry collaboration behind it, and the actions required to build a future ready workforce.

[00:00:57] So thank you for joining us today. Could we [00:01:00] start with some introductions? Karen.

[00:01:01] **Karen Burgess:** My name is Karen Burgess and I'm a learning development specialist with CPI.

[00:01:06] **Emily Brennan:** Thank you. And Simon.

[00:01:07] **Simon Hawdon:** Hello, I'm Simon Horden. I'm a chief technologist at CPI Biologics.

[00:01:12] **Emily Brennan:** Brilliant. And could you give us a bit of a, an overview of what CPI do, Simon?

[00:01:18] **Simon Hawdon:** CPI are a founding member of the UK government's high value manufacturing catapult, which helps to provide support to UK SMEs and [00:01:30] academics to commercialize their inventions and bring them to market.

[00:01:35] **Emily Brennan:** Okay, super. Thank you. And how have you been involved in this project, Karen, for the Workforce Foresighting Hub?

[00:01:43] **Karen Burgess:** I've acted as the foresight and champion and organizer. So convening all the stakeholders, coordinating it and helping the team facilitate the workshops, and then bringing together the recommendations

into the insights report at the end. And now I'm looking at how we translate those [00:02:00] recommendations and put them into action to have a positive impact.

[00:02:03] **Emily Brennan:** That's brilliant. And Simon, what was your role in the process?

[00:02:07] **Simon Hawdon:** I guess I'd like to think I brought more technical perspective and into the project. I've worked in intensification of of manufacturing processes for the last seven or so years. So I like to bring that sort of expertise and experience into this new Karen, how long have you been with CPI now?[00:02:30]

[00:02:30] **Karen Burgess:** I've been with CPI since January 2023. And actually I joined to get involved in the Workforce Foresighting Project.

[00:02:38] **Emily Brennan:** Okay excellent. And Simon, how long have you been with CPI?

[00:02:42] **Simon Hawdon:** Seven years now. I joined in 2017.

[00:02:46] **Emily Brennan:** Okay very good. And For people who aren't familiar you looked at the topic as part of your foresighting subject, you looked at the topic of RNA therapeutics and the manufacturing [00:03:00] processes around those.

[00:03:01] Could you tell us a little bit about the sector itself and what changes you've seen over the recent years? Maybe Simon, if we start with you.

[00:03:10] **Simon Hawdon:** Yeah, the RNA RNA as a product is a good example of that. It's so we saw through the technology itself being around for quite a long time now, but it didn't really come into its own until the COVID pandemic hit.

[00:03:27] During that, it [00:03:30] became apparent that The advantages of RNA were that in the rapidity of the process development and drug development. It was so quick to get from research and development into the clinics. And that's where it really came to a fore.

[00:03:49] **Emily Brennan:** Very good. And from your point of view, what changes have you seen in this area, in this sector?

[00:03:56] In terms of future economic

[00:03:58] **Karen Burgess:** growth of the UK [00:04:00] the UK's biopharmaceutical sector is incredibly important to that. It was a turnover over 40 billion pounds a year with employment around 66, 66, 000 people in the UK. And we've seen investment double over the past kind of 10 to 12 years in the sector, which has meant there's greater demand for, The skilled people and and constantly to evolve as the as new products and new processes come out through the sector.

[00:04:25] **Emily Brennan:** Yeah. So it's a really key industry for the UK. Yeah. Okay. [00:04:30] And so when we look at the skills challenge specifically, you alluded to it there slightly. Obviously the sector's grown, there's been big investment in it. There's new technology. There's been situations like COVID that have come along.

[00:04:44] What What's the situation with skills in the sector?

[00:04:48] **Karen Burgess:** As I said, we're seeing an increase in the workforce that's required within the sector and also with the new technologies coming down the line, that does [00:05:00] mean that we need different technical skills. There's various processes, which I'm sure Simon can talk about, that efficiencies within the manufacturing process.

[00:05:10] And so There's always a need to constantly upskill the workforce, but also look at continuing to attract fresh young talent to the sector.

[00:05:21] **Emily Brennan:** Yeah. Excellent. Okay. And so when you heard about the Workforce Foresighting Hub [00:05:30] project and the potential to be looking ahead for the skills for tomorrow, What was it that made you want to get involved with this project?

[00:05:41] With the context of what the growth of the biopharmaceutical sector?

[00:05:45] **Karen Burgess:** I've worked in the skills landscape for several years and one of the biggest challenges actually getting the level of detail in terms of the skills employers need at the level of detail that education trainer providers need to build a curriculum.

[00:05:59] Curriculum [00:06:00] developed takes a significant amount of time to get a curriculum written and to get it approved and out into delivery. So by

the time you've implemented curriculum for the skills that employers need, it's already out of date because industry's moved on. So for me, the real benefit of the workforce foresight and process is you're looking ahead using the technology that you've got.

[00:06:21] You're able to build the detail around the curriculum and so that you can actually deliver the curriculum and get the skills at the time the industry needs [00:06:30] it. So for me, that was a real benefit.

[00:06:31] **Emily Brennan:** Yeah. And Simon with the Foresighting Hub process we very much focus on technology first. What was your experiences with the process and going through it, looking at it from technology first?

[00:06:48] **Simon Hawdon:** Yeah, I think We picked RNA as an example because it's such a new technology and it's such almost a [00:07:00] disruptive technology in effect. A lot of the skills that are needed won't be available. You find that out as you're trying to do things and certain technology and equipment doesn't exist.

[00:07:10] So even that has to be developed. So the skills around, not just the R and D scientists in a lab, but also around the sort of, Development of the equipment required for the industry for industrial processing. All that needs to be developed as well. I think part of the way the workforce [00:07:30] foresighting process works, it allows you to tie that all in ties this the foresighting of skills in with sort of industrial strategy as well, which is a, which is an advantage.

[00:07:41] **Emily Brennan:** So we understand that the challenge in the sector we know that skills is going to be really important in terms of growing further and facilitating innovation in the sector. Can you tell me Simon a little bit more about the topic that was chosen, intensification what does that [00:08:00] mean?

[00:08:00] **Simon Hawdon:** Intensification is a broad sort of coverall term it encompasses all the different techniques that you might need to make an industrial process more efficient and more sustainable, yeah, so things like Turn the process from a a traditional batch manufacturing process into a more continuous process and shrink in the footprint and therefore reducing the amount of energy [00:08:30] that the process uses, amount of water that it uses things like that.

[00:08:34] So there's a lot of techniques involved and new technologies required as well, which is why it was a good example for this process. The since we

started the process of sustainabilities, people talked about intensification of process in terms of economic impact. But the same values it gives in terms of economics.

[00:08:57] It also gives in terms of sustainability [00:09:00] and sustainability has become much more important. The last sort of three, four, five years than it was before. So it's really a key way of making pharmaceuticals and biologic therapeutics much more sustainable and responsibly produced.

[00:09:20] **Emily Brennan:** So that concept of intensification applies across sectors as well pharmaceuticals or any manufacturing. [00:09:30]

[00:09:30] **Simon Hawdon:** It does there's certain techniques that you can adopt from different industries. In essence, a continuous production platform for biologics is not is new, but the concept of continuous production goes back to production lines and Henry Ford and things like that. So that concept is nothing new, but what is new is the way The technologies that are used to do it for biologics, for medicines and pharmaceuticals.

[00:09:54] That's a kind of different discipline in itself because of the challenges that [00:10:00] production of those medicines involve.

[00:10:02] **Emily Brennan:** Yeah. Okay. That's brilliant. That really paints that picture. So who did you involve in the study and the workshops and why were the different people brought in?

[00:10:13] **Karen Burgess:** Fujifilm Dyson biotechnologies.

[00:10:18] So they were our industry sponsor and we're also really lucky actually with all the stakeholders and all the people who get involved. And we had industry representation, membership organizations, which is a bio industry [00:10:30] association. And we had. Businesses from industry represent from business and industry.

[00:10:35] So large and small businesses we also had academia and and technologists from CPI and other research institutions to help. Provide the input that we needed to get the insights that would shape the future curriculum.

[00:10:50] **Emily Brennan:** Brilliant. So they really brought their insights, their subject matter expertise for the various stages of the process and for them, [00:11:00] what was in it for them?

[00:11:01] Why did they

[00:11:01] **Karen Burgess:** get involved? It is asked in terms of time, attending the workshops and Helping do the quality assurance around the insights that the data cube produces. So it's not a short process to be involved in, but actually in terms of the quality of the insights and the detail of the insights and actually.

[00:11:21] The ability to be able to take that data and readily turn it into action within quite a short amount of time. I think that's what makes it different to perhaps some of [00:11:30] the other skills activities these stakeholders might have been involved in the past.

[00:11:33] **Emily Brennan:** Yeah and my impression of sort of participants getting involved is there's a real passion for making a change, making a difference.

[00:11:43] It is a time commitment, but. They want to be part of that solution. Would you agree with that, Simon? Or what was your sort of impression?

[00:11:52] **Simon Hawdon:** Yeah, I think it's in, it's. At the end of the day, it's in everybody's interests to make a sustainable [00:12:00] business. You need the workforce to actually staff that business going forward.

[00:12:05] So it's in everybody's interest that that stuff that stuff exists. And it's it's great that we're able to do this based in the northeast of England. So it's decentralization.

[00:12:21] **Karen Burgess:** And I know from my previous experience, just how vital skills is to attract inward investment and make in the UK an attractive place to, to bring this [00:12:30] industry to, to continue the growth in the sector.

[00:12:32] From a business level or a broader national level it's vital.

[00:12:37] **Emily Brennan:** Yeah, which ties in with sort of the conversations that government are having at the moment with attracting investment. The workforce is really an asset for the UK, but we have to invest in it now and we have to look forward.

[00:12:51] And regionally, have you seen any sort of focus areas or incentives?

[00:12:56] **Karen Burgess:** I think in terms of actually the [00:13:00] progress around looking at making funding for skills and education, more flexible to meet the needs of employers and bringing together all of the different agencies that are involved in skills through, for example, Skills England, that I think that's a really positive step to avoid duplication and bring all those insights together to shape what's needed for the UK.

[00:13:22] **Emily Brennan:** Yeah. So operating on that sort of wider scale. So like you said, it's not that duplication of effort. [00:13:30] And people can collaborate and bring things from different areas. And the other thing I've noticed is this, there does seem to be cross sector Efficiencies to be made, so you can borrow 60 percent of a course here that might be in manufacturing, but it would be relevant to your sector as well.

[00:13:54] Or within some of the other standards that we've seen, there is there is a [00:14:00] commonality across

[00:14:00] **Karen Burgess:** sectors. Yeah, absolutely. And in terms of The intensification of manufacturing, digital solutions are an important part of that. And so there are certainly insights and skills that could be taken from other areas that are further on in this process and other industries that are further on in this process that can be used to shape the skills and curriculum for.

[00:14:22] The biopharmaceutical sector.

[00:14:24] **Emily Brennan:** Brilliant. That's great. You completed the workshops and the cycle and a report was prepared. [00:14:30] What was some of the key insights and takeaways from that report?

[00:14:34] **Karen Burgess:** What was really interesting was actually the cross section of skills and capabilities were required. Perhaps more general type of skills and capabilities needed in terms of data management, data analytics, software transfer protocols, alongside And increased capabilities within the quality function, HSE and the regulatory parts of the business, but then also a need to increase the [00:15:00] design capabilities around the design of new consumables and reagents to help increase efficiencies within the manufacturing process.

[00:15:07] **Emily Brennan:** Okay. Interesting. So you were maybe expecting more of the technical skills and capabilities to come out, but. There was a wider scope to what was coming out. Okay, brilliant. And for you, Simon, what was some of your kind of key observations? Yeah,

[00:15:23] **Simon Hawdon:** I think I'd back that up. I think it was interesting.

[00:15:26] To see that a lot of the technical capabilities we [00:15:30] already do, we already have we can, we're training people to do this kind of thing, but it's around the kind of development of the manufacturer and the actual production where this whole, we need to start training the in an effect that's what the HVMC was actually set up to do, it's so in a way it's backing up that theory from When the HVMC and CPI were settled it's to to commercialize to [00:16:00] to commercialize new technological findings and results.

[00:16:03] **Emily Brennan:** Yeah.

[00:16:04] **Simon Hawdon:** But also that the surprising amount of crossover as well. Okay. As Karen mentioned the digital and automation side of things cuts across all industries, but, and it's something that maybe biotech are being slower to pick up on. It's just highlighting the need for focus in those areas.

[00:16:27] **Karen Burgess:** Okay. And in addition to that, those [00:16:30] general manufacturing insights, there was also some particular characteristics of RNA that make it a little bit more tricky to handle than traditional products. Is that right? Yeah,

[00:16:39] **Simon Hawdon:** there are yeah, it has its own unique challenges being RNA. It's not, it doesn't behave like other sort of therapeutics.

[00:16:48] So the challenges around it are a bit more unique, but But that's not to say we haven't got the technical abilities to deal with it. And I think the studies showing that [00:17:00] the universities and trainers are Dealing with that, but we just need to train it out a bit more widely. For instance, working with RNA, it's something we do in the laboratory.

[00:17:11] When it gets into a manufacturing space, when it gets into a factory, or then it's a different, it's a different environment. And that's the kind of areas where it hasn't really been addressed before.

[00:17:20] **Karen Burgess:** Okay. And what was interesting from our cycle was actually reassuring as well that in terms of the current education and training provision there is a good foundation there.

[00:17:29] Okay. And [00:17:30] actually rather than a need for a whole new apprenticeship standard, for example, it's actually just layering on top of what's

already there in terms of modular curriculum and CPD courses to help shape the skills to deal with some of those challenges.

[00:17:44] **Emily Brennan:** Okay. Oh that's a really a good revelation there.

[00:17:48] One of the things I picked up there was, it's not just the the skills, the gaps and informing what curriculum needs to be [00:18:00] developed is really key, but it's also, from an organisation's point of view, defining what capabilities are needed so what those companies gonna be, need to be able to do, Which really is quite helpful for them in forming their strategy and focus

[00:18:15] **Karen Burgess:** for the future, isn't it?

[00:18:17] That's one of the things that I think is really special about the foresight and process. In that you start with the technologies and then you use that to find the capabilities that you need for the workforce. So from an employer perspective, you're building a workforce [00:18:30] development plan to adopt these technologies.

[00:18:31] And then from that, you then get the insights that the educators need to build the curriculum. So That's one of the real benefits of foresight and as a coach, I would say.

[00:18:41] **Emily Brennan:** Yeah. So that's a real kind of key for participants getting involved to know that, yes, we're asking for time and expertise, but really this could be a real game changer in terms of early insight into how those technologies are going to change your business and what you need to do.

[00:18:58] And for the [00:19:00] educators, of course, then developing the content and knowing. with some degree of certainty based on data that they're investing in the right place.

[00:19:09] **Karen Burgess:** Absolutely. And obviously you're making those connections and bringing all those stakeholders together as a group. So you've already got the connections and networks there to implement the findings without having to search and broaden the networks too much more.

[00:19:23] **Emily Brennan:** Brilliant. That's great. Thank you. I know that when your [00:19:30] report was completed, you launched your report at the buyer industry event. How was it received and what's been the reaction to the results?

[00:19:42] **Karen Burgess:** I think the employers that were involved were really interested in the insights that we could share and what actions they can take to, to put the recommendations in place.

[00:19:53] And there was a few priorities that came in terms of. all of the broader recommendations that [00:20:00] came from those conversations around looking particularly at prioritizing the regulatory skills and helping to build understand of RNA therapeutics, but also intensification within the regulatory teams, but then also looking at those Agile workforce skills around adopting new technologies that are going to be relating to digitalization and intensification.

[00:20:23] **Emily Brennan:** Yeah. Okay, great. And you talked about some of those [00:20:30] priorities, what sort of what sort of benefits have you received or what kind of actions have already happened as a result?

[00:20:38] **Karen Burgess:** We've started to look at how we can implement the recommendations into curriculum development, looking, for example, at the new resilience center of excellence for skills and opportunities that might be through connections and funding available there.

[00:20:57] We've also looked at how we can [00:21:00] map the clusters and look at where The need might be particular for particular skills within the UK and start to reach out to the institutes of technology in those areas, for example. Okay, brilliant. That's great.

[00:21:13] **Emily Brennan:** And what kind of support would you be looking for to continue this work to drive it

[00:21:17] **Karen Burgess:** forward?

[00:21:19] Obviously we're already working with the stakeholders involved in the cycle, but actually we would call out to other employers in the sector. If you're looking at adopting some of these technologies, invest in [00:21:30] RNA therapeutics. review the report, look at the recommendations and partner with us so that we can help develop the education training provision in the area that you need it.

[00:21:41] We'd also like to tap into any existing work streams around development of regulatory skills and see what insights we can share to shape that. And also more broadly, foresight in as a really helpful approach that can

address some of the skills that we experienced in terms of skills and mapping what skills industry needs for several [00:22:00] years.

[00:22:01] Let's use this and focus our energies on adopting this approach and implementing foresighting and avoid duplicating and going down other routes that might produce less impactful insights.

[00:22:14] **Emily Brennan:** The program's been running for nearly two years now. Why is a program like this, foresighting for the future, why is it relevant?

[00:22:25] Simon, can we come to you first?

[00:22:26] **Simon Hawdon:** Yeah, I think it's It's important to realize [00:22:30] that technology the world's changing place and the technology has to respond to those changes in terms of sort of things. Obviously things like pandemic response, but also the ways of making traditional medicines or changing and that in response to other challenges like net zero the goal to achieve net zero, climate change, things like that.

[00:22:55] So our ways of working have to change and to do that, we need to [00:23:00] use new technologies and develop new technologies. And. These new technologies have to be invented somewhere and that's what this is all this that's what this process is all about is developing new talent a new innovative sort of knowledge to, to go and actually work in the area and produce these new technologies.

[00:23:23] **Emily Brennan:** Yeah. Absolutely. And Karen, why would you say the program is relevant?

[00:23:28] **Karen Burgess:** As Simon [00:23:30] said, there's some great opportunities in terms of the innovations and technologies that are coming down the line to help the biopharmaceutical sector and others in the UK, but without the appropriately skilled workforce to adopt that, we're not going to see the UK maximizing that as an opportunity through the systematic approach that Foresight uses.

[00:23:48] I think we're able to really map out what's needed in terms of skills and put some really effective plans in place to prevent a skill shortage being a barrier to the adoption of these new technologies.

[00:23:58] **Emily Brennan:** Brilliant. [00:24:00] And obviously the government want the UK to be a competitive a competitor on a global scale and

an attractive investment and experience there are big policies around kickstarting economic growth and supporting businesses and being a technology leader.

[00:24:18] What does government need to do to support both sort of the conveners who are involved in this process and the program itself?

[00:24:26] **Karen Burgess:** I think one of the things that I've learned during my time working in the [00:24:30] skills landscape is that actually deep tech industries, the general approach to skills and education doesn't necessarily work.

[00:24:38] Work one size doesn't fit all and actually continue providing that flexibility and that investment to allow each sector to deliver the skills that it needs in a way that works for that industry.

[00:24:51] **Emily Brennan:** From your point of view, being the convener, there's a lot of time and effort to pull this together.

[00:24:57] And. create this [00:25:00] report at the end of the cycle. Has this been a good investment of your time and an investment for CPI as well?

[00:25:07] **Karen Burgess:** I think it has been beneficial in two ways. So first of all, learning about the foresight and process and as a methodology to support skills, that's been really interesting from my perspective, but then also CPI are acutely aware that the innovations for help to bring to market are disruptive in terms of skills landscape.

[00:25:26] So having The insights to back that [00:25:30] up and share recommendations to help shape future skills provision is something that's really worthwhile.

[00:25:36] **Emily Brennan:** And Simon, from your point of view, how has the program benefited you?

[00:25:40] **Simon Hawdon:** I think it's been interesting to Generally, I would be based in a really just in an R and D or tech techy sort of environment, but it's been interesting to actually see the wider implications of what we do and how that affects the industry as a [00:26:00] whole and what the industry are trying to achieve.

[00:26:05] Yeah, so and how we can find out how we can help them to grow their business, but also grow the UK biotech industry and the economy as a whole.

[00:26:17] **Emily Brennan:** We asked in a previous podcast about whose responsibility is this? And it really is, as Paul Shakespeare often talks about the three legged stool the sort of the workforce, the organizations [00:26:30] and the technologies, everything is married together.

[00:26:33] So it's, it really is everyone's responsibility to share, isn't it? It's not, it doesn't, for skills, it's not just the educators who are responsible for that. We have to share the responsibility as a

[00:26:46] **Karen Burgess:** As a whole. Absolutely. And it's great to see actually more and more people becoming aware of their responsibilities in terms of shaping skills and helping deliver the skills that the UK and industry needs.

[00:26:59] [00:27:00] So it's great to see that shift in terms of approach from that traditional view, where it is the educators. responsibility.

[00:27:07] **Emily Brennan:** Thank you very much both for joining us for this session. It's been really interesting. I think I would encourage people to read the report and dive into the detail of it and understand the sector a little bit more.

[00:27:24] And then if people have got questions, they can reach out directly or through the [00:27:30] workforce foresighting hub to get involved and find out maybe How they can support the next steps. Thank you for listening to the Workforce Foresighting Hub podcast. If you would like more information, please look at the podcast show notes or visit our website and follow us on LinkedIn.

[00:27:47] Thank you very much.