



World-Class
Belfast

Professor Helen McCarthy
Queen's University Belfast



Professor, entrepreneur and beacon

Helen McCarthy is a professor at Queen's who also heads a biotech business which is helping to combat Covid (among other things). She's a firm believer that entrepreneurs shouldn't veer away from delivering their passion. We were lucky enough to have some of her precious time recently.

Is there an infrastructure at Queen's to help translate your research?

"We have a Research & Enterprise Directorate at Queen's and a roadmap in place to support the commercialisation of research. For example, if you have an idea or make a discovery which you believe is worth patenting, an IP team comes in to move that process forward. There is also business-focused training available, which provides you with the tools to develop your idea, so the skill-sharing infrastructure is strong. I would also say, though, that academics here have generally become more entrepreneurial - they're increasingly driven by the commitment to ensuring that their research has an impact and a practical application, rather than simply generating knowledge for knowledge's sake.

"Much of the work to support the translation of research at Queen's is led by QUBIS which is the commercialisation arm of the university, and it's a great ecosystem for transforming world-class research into commercial innovation. When I started my spinout, for example, financial support from QUBIS really helped me focus on the business by allowing me to take a break from teaching and to have an additional researcher cover other work. That was fantastic."

Alongside that support infrastructure, I also think a bit of self-belief can really pay off. We're competing globally with academics from all of the top universities for pots of money, so we have to be entrepreneurial and innovative, but also fearless and confident, whatever our area of expertise. It's essential to have a different angle and to believe in it 100%.

"Innovate UK is the main 'pot of money' for start-up funding that we're competing for, and we do get a significant slice of that pie in Belfast. We also punch above our weight in terms of engagement with industry. From my perspective as an academic in the School of Pharmacy, I can certainly attest to the amount of industry funding we receive, and this also allows us to ensure we are constantly adapting and responding to industry needs. For example, Queen's recently developed an MSc in Industrial Pharmaceuticals, the aim of which is to produce graduates who are industry-ready, having received both world-class teaching and practical experience through placements in industry. Bridging the gap between the academic and industry mindsets is key to ensuring 'value added' for the economy here.

We recognise the importance of preparing our graduates to go out and contribute to society in whatever shape or fashion; so I think we already do exploit very well the entrepreneurial mindset we're known for in Northern Ireland, and that so many academics here have. There's no subject or area of activity where an entrepreneurial mindset won't help you, in my view, and many areas, it's absolutely essential - especially in the sciences. If you're not entrepreneurial, you'll probably struggle to grow a successful research group."

How were things when you first started out? How much time did you spend on academic duties compared to more business related matters?

“How much time was spent on the business? I would say, probably every minute outside of fulfilling my academic teaching and administrative roles, and managing my PhD students. When you build a business on a technology that you’ve invented, it becomes all-consuming, but in a good way. It’s not a chore. My attitude is that this is something that I absolutely have to do if I want to realise impact. There is probably no work/life balance, but then, in many ways, your work is your life. That’s certainly the case if you’ve invented.

“There’s a saying that mastery is all about not being able to tell if a master is at work or at play – in a nutshell, that’s how I view it. There’s no real ‘switching off’. I can remember sitting up all night to get the company’s website exactly the way we wanted it to be, because we didn’t want to go live until it was absolutely perfect. But that wasn’t a chore for me, because it was important to do it the right way. That right way might be different for every person, and there’s no single roadmap for the perfect business; a general set of guidelines, maybe, but when it comes to the individual technology or business, I believe that you do it your way, as it works best for you and in the time you have. It’s play, but it’s definitely hard play and the rewards are incredible. That’s what drives you forward, and I don’t mean the financial reward. I mean seeing your technology, which you’ve been instrumental in creating, going into a clinic with real patients.

“It’s incredibly nerve-racking at the same time, because you don’t know whether the technology is going to do everything in humans that has been so promising pre-clinically. That means it’s very scary, very risky, and very exciting.”

Do you think things have changed? Are they easier for entrepreneurs starting on their journey now?

“I think it is becoming easier, yes. I can remember when I started my research group in 2006, a senior academic said to me “gene therapy? Who’s working on gene therapy anymore? Is that even a subject?” They clearly believed that there was no point in doing this sort of research; but if you believe in something, and you see that it is going to be the future, then absolutely stick to your guns.

So while I do believe it will be easier for more researchers to spin out companies because of the innovation ecosystem that has been developed in universities like Queen’s, it’s also essential that people who are already doing it speak up about the gaps that we need to fill and where we can do things differently. The idea that we’re perfect, and that there’s no room for improvement is nonsense. There are things we do really well and others that we don’t do well. We have to be honest about that to make it easier for the next generation of entrepreneurs coming through.”

Tell us a bit about the gaps you think there are right now.

“Well, I think we have a real opportunity in Northern Ireland to realise the ambitions of the 10X Economy if we invest in biotech. There’s no doubt, as a result of the pandemic, that the biotech industry has come to the fore like never before, and there is great work going on in this field in our universities and beyond. In pHion, for example, we’ve been developing our vaccines using a fantastic NI-based Contract Research Organisation, Axis Bioservices. So the expertise and the opportunities are there, but we have gaps that we need to acknowledge. For example, a biotech start-up cannot currently rent out commercial wet lab space anywhere in Northern Ireland, and we don’t have the facilities to manufacture any of our biopharmaceuticals to GMP standards. So that’s a limiting factor, but it’s also a great opportunity. Belfast was well-known for its manufacturing capability in the first Industrial Revolution and beyond; now we’re in the fourth Industrial Revolution, and biopharmaceuticals are core to that. Yet, across the UK, there has been an acknowledgement during the Covid crisis that we do not have the necessary manufacturing capabilities for these advanced medicines. This is where Northern Ireland could lead the way if we harness our industrial heritage, our entrepreneurial mindset, and our biotech expertise.

Where would the funding come from for those wet labs?

“I think a cross-sectoral group of stakeholders from higher education, industry and government should get together and discuss how this could happen. We have fantastic wet lab science going on in the universities in Northern Ireland, and companies like mine want to grow the technology here and contribute to the NI economy, but it’s very challenging to translate that science when you’re starting out because you can’t afford to buy or even rent a space in a building and then pay for the necessary wet lab facilities and expensive equipment. So we need spinout incubators for biotech, and the potential return on that investment for Northern Ireland is huge.

We can learn from some of the big incubators associated with other UK universities where you can rent a wet lab and equipment. In pHion, we’ve become virtual members of Alderley Park in Manchester and are really benefiting from tapping into that experience and skill set in the commercialisation of life sciences research that they offer. So let’s bring the best of that back to Belfast, and enable young companies to rent out a wet lab space, to have access to equipment, and to be able to avail of advice and mentoring. Without it, a young company starting from scratch may never manage to progress despite having huge potential, because they simply can’t afford to. These are missed opportunities for our region to be global leaders in the biotech field.

Has anyone come to you about investing in their business and do you have any tips for them if they do come?

“I’ve had quite a few people come to me who have realised they’ve got some exciting technology that they want to spinout and have asked how they go about it. As a starter for ten, I’d advise someone looking for investment to be entirely honest that the technology isn’t going to solve everything. There’s a perception that, when you are in front of an investor, you should say that your technology is going to do X, Y, and Z when you know for a fact that it only does Y. You have to be honest about what it does.

“Beyond that, don’t give up if you have an investor that says “no, I don’t understand this”, because you need to have only one investor who understands what you’re doing. It took us in pHion a long time to find that one investor, and when we did find them, it was like buses – we had a few come along at once, and let’s just say that we were able to choose the biggest and best bus for us. We weren’t prepared to compromise along the way even when we had advisors suggest that we use our technology for other purposes. I can remember, before COVID broke out, how one particular investment company asked: “well, why are you working on messenger RNA vaccines?” At the time, we had already secured an Innovate Biomedical Catalyst Grant for this work which was to develop a therapeutic vaccine for HPV which would treat women that already have cervical cancer. I had confidence in what we were doing, so I replied: “because this technology works really well for messenger RNA vaccines. That’s why we’re using it”. My advice for a new start-up based on experiences such as those is that you’ve got to stay true to yourself.

“There is also an element of timing and luck. Nobody could have imagined that messenger RNA vaccines would come to the fore in the way they have in the last couple of years.. That said, my research on messenger RNA vaccines has been funded by Prostate Cancer UK since 2016, as we could see its potential with prostate cancer. I knew that this was an area where this technology would work, even before it was mainstream or popular, which brings me back full-circle to research-led education. Long before DNA vaccines, messenger RNA vaccines and recombinant viruses became everyday news, as they are today, I can remember teaching pharmacy students about gene therapies and how to make up medications that were going to be the kind of gene therapies that are becoming a reality today, and they were looking at me as though this was science fiction. There’s nothing that’s given me more satisfaction over the course of the last few years to say, it’s the pharmacists that are checking that this medication is okay, every time you’re getting a vaccine right now, and that medication is a messenger RNA vaccine or a recombinant virus vaccine. So, yes, it’s research-led education.”

Our time is up. It’s clear that Helen has many qualities that have brought her success over the years – and they would help any budding business owner. Erudite as a professor, driven as an entrepreneur, unswayable and enlightening like a beacon.



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