Global University Venturing

Magazine
April 2022

Bristol: a cluster on the rise

Science Creates and University of Bristol are turning the city into an innovation hotbed.

How Aspect advances SHAPE commercialisation

Q1 data analysis

Spinout profile: The Vaccine Group

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Global University Venturing

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There are enough slices of the cake

By Thierry Heles
Editor

In our January editorial, we celebrated how the focus on deeptech would bring a golden age for humanity. One of the reasons for our optimism was the huge series B round raised by Massachusetts Institute of Technology's fusion energy technology developer Commonwealth Fusion Systems (CFS). It is not the only spinout working on the technology, of course, and First Light Fusion – spun out of University of Oxford and backed by illustrious investors including Oxford Science Enterprises, IP Group and Tencent – did not let CFS keep the spotlight for too long.

First Light Fusion focuses on fuel elements that catalyse the fusion reaction and the spinout announced earlier this month that its so-called Big Friendly Gun had succeeded in firing a projectile at 4 miles per second (6.5 kilometres per second) into a fuel target to generate energy. What makes First Light Fusion's approach so promising is that its method relies on gas guns and the spinout has managed to swap out precious metals in the fuel – existing technologies have focused on shooting high-energy lasers at gold-encased exotic elements. The spinout claims its advances make its technology around 1,000 cheaper and it plans to produce its fuel targets for $10 to $20.

While Europe has historically been seen as playing catchup to the US in terms of innovation, capital and talent, the example of First Light Fusion illustrates that when it comes to deeptech, the old continent is no longer content playing second fiddle.

This is, thankfully, also true of investors. Imec.xpand, the venture capital firm aligned with research institute Imec, has now raised $166m towards a $277m target for its second fund and V-Bio Ventures, the venture capital firm supported by research institute VIB, closed its $120m second fund last month. Qbic, the multi-university venture fund aligned with UGent, VUB, UAntwerpen, UHasselt, ULiège, VITO and Imec, has raised $54m for its third fund.

Imec.xpand, V-Bio Ventures and Qbic are all Belgium-based vehicles. If you have not been paying attention, that may come as a surprise, but the small country has been punching above its weight for quite some time. Theodorus, the venture arm of Université libre de Bruxelles, even expanded into Canada two years ago, when local investors Caisse de dépôt et placement du Québec and Fonds de solidarité FTQ both threw their weight behind the fund.

Activity has been picking up throughout the continent, be that Technical University of Denmark-linked PreSeed Ventures' $62.3m fund closed towards the end of last year, quickly followed by a $137m fund close for Eir Ventures, whose limited partners include a group of Nordic universities including, through a sidecar vehicle dubbed UCPH Ventures, University of Copenhagen.

UVC Partners, the Germany-based venture capital affiliated with Technical University of Munich, has meanwhile raised $289m for its third fund. And France proved that a centralised model can work as its network of regional tech transfer offices, Réseau SATT, revealed it had launched a total of 672 spinouts by the end of 2021 – ten years after the network was created.

In Italy, where spinout-focused vehicles include the consumer goods group Nestlé-backed Eureka Fund, other, interesting changes are also afoot. The country introduced professor's privilege in 2001 but actors such as Italian Tech Alliance had been campaigning to undo this in a bid to bolster tech transfer activities in the country. And in early April, the government wrote a bill that would do just that, assigning ownership of faculty's inventions to the university.

The change would leave Sweden as the notable exception as a country that continues to exclusively rely on professor's privilege, illustrating perhaps that simply passing the rights to intellectual property from one to another does not necessarily equate more or fewer spinouts and investor interest.

None of this is to say that the US will stop being a leader anytime soon. In fact, the argument should surely be that the world really is big enough for a strong US ecosystem and an equally powerful European ecosystem. The challenges that lie ahead are certainly big enough to leave enough of the pie for everyone.

News roundup

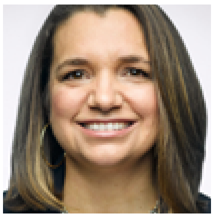
People

University of North Carolina at Chapel Hill (UNC) has hired Michelle Bolas as chief innovation officer and executive director of innovation hub Innovate Carolina. She had served as interim leader for innovation, entrepreneurship and economic development at the university since April 2021, having joined UNC ten years earlier.

Yale University has appointed Josh Geballe, chief operating officer for the US state of Connecticut, as its senior associate provost for entrepreneurship and innovation. Geballe takes over from Jon Soderstrom as head of the newly rebranded Yale Ventures, formerly known as the Office of Cooperative Research.

Doron Ben-Meir has joined Monash University as deputy vice-chancellor, enterprise and engagement, and senior vice-president. The appointment marks a return to a senior executive role within academia: Ben-Meir previously acted as vice-president, enterprise, at University of Melbourne from July 2016 to November 2019 after having run commercial services arm University of Melbourne Commercial from June 2015.

Western University welcomed David Muir as its first-ever associate vice-president for innovation and strategic partnerships. Muir's duties will include overseeing Worldiscoveries, the commercialisation arm of Western University also responsible for Robarts Research Institute and Lawson Health Research Institute, as well Western Research Parks.



The Engine, the US-based venture firm established by Massachusetts Institute of Technology and also backed by Harvard University, appointed Milo Werner as general partner. Werner will focus on the portfolio companies covering climate, human health, advanced systems and infrastructure.

Purdue Research Foundation (PRF), the non-profit foundation responsible for protecting Purdue University's intellectual property and promote entrepreneurial activities, appointed Brooke Beier as senior vice-president of commercialisation today. Beier has been serving as vice-president of the Office of Technology Commercialization since 2018, having first joined the tech transfer office in 2013. Her promotion expands her duties to also overseeing entrepreneurship and commercialisation hub Purdue Foundry.

University of Maryland (UMD) has appointed Dean Chang as interim chief innovation officer and associate vice-president for innovation and economic development in the Division of Research. Chang has been the founding associate vice-president for innovation and entrepreneurship for UMD's Academy for Innovation and Entrepreneurship for the past nine years.

Louisiana State University (LSU) announced the appointment of Alex Valiaev as the new director of its Office of Innovation and Technology Commercialization. Valiaev joins from Oklahoma State University, where he had been technology licensing manager since April 2017.

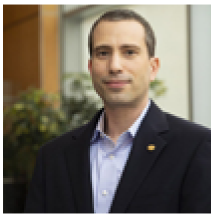
Trent University made its appointment of Prof Cathy Bruce as vice-president of research innovation permanent. Bruce has held the job in an interim capacity since September 2020, during which time she led the development of new policies, established the Early Career Researcher Awards and set up the Research Grant Incentive Fund.

Erienne Olesh has been appointed executive director of student and faculty innovation at West Virginia University, a position in which she will work alongside the Office of Technology Transfer. Olesh has been with the institution and its affiliates in various capacities since 2011.

University of Wyoming has named Parag Chitnis as its new vice-president for research and economic development and he will officially start on May 31. He will be responsible for overseeing research activities across UW's faculty, staff and students, directing technology transfer and commercialisation initiatives, facilitating industry-academia interactions and promoting the university's research mission.

MSU Technologies, the tech transfer office of Michigan State University, has found its new executive director in Anne Di Sante, who has been promoted from associate director. Di Sante takes over from Richard Chylla, who has joined University of Virginia.

Cambridge Enterprise Seed Funds, the investment arm of University of Cambridge's tech transfer office, has made the appointment of Christine Martin as its head permanent. The permanent appointment became effective on April 1 and follows Martin successfully raising an additional £30m ($40m) from the university.



Brian Coblitz has been appointed executive director of George Washington University's Technology Commercialization Office, putting him permanently in charge after a stint as interim managing director. Coblitz has been with the office since 2012, having originally joined as a licensing associate. He was promoted to senior licensing associate in 2015, before becoming senior licensing manager in June 2020. His promotion to interim managing director came in July 2021.

Ted Yamamoto, a former partner at University of Tokyo Edge Capital (UTEC), has joined the newly established Waseda University Ventures (WUV) as general partner. WUV is the venture capital arm of Waseda University, fulfilling a similar role to that of UTEC for University of Tokyo.

Allied Minds, the US-based commercialisation firm, is set to lose its chairman Harry Rein by the end of next month at the latest as he decides not to seek re-election. Rein said he would step down either at the annual shareholder meeting or May 31, whichever is sooner.

Paule De Blois, president and chief executive of Canada-based tech transfer organisation Axelys, has left after joining the Quebec government. De Blois will serve as deputy minister at the Ministère de l'Enseignement Supérieur, the ministry for higher education in the province. Axelys has begun the recruitment process for a permanent replacement and has named Nancy Rancourt, vice-president of customer experience and organisational performance, as interim president and chief executive.

Funds

Osage University Partners, the US-based spinout-focused venture capital firm, is hoping to raise $350m for its fourth fund, a regulatory filing submitted has revealed. The firm does not appear to have secured any investment yet.

University of Tokyo Innovation Platform (UTokyo IPC), the venture arm of University of Tokyo, announced the final close of its second fund with ¥25.6bn ($221m) in commitments from backers including the institution as anchor investor. LPs in the Accelerating Open Innovation Fund 1 (AOI Fund 1) also include air conditioning manufacturer Daikin Industries, public relations company Hakuhodo, synthetic rubber producer Zeon, leasing services provider Fuyo General Lease and real estate developer Mitsubishi Estate. They were joined by financial services providers MUFG Bank, Sumitomo Mitsui Banking Corporation, SBI Group, Norinchukin Bank and development bank DBJ Group, as well as one unnamed institutional investor.

Imec.xpand, the Belgium-based deep tech venture fund aligned with research institute Imec, achieved a first close of €150m ($166m) for its second fund thanks to a mix of new and returning limited partners. Fidimec, an investment fund of the Flemish government, supplied $36.7m in May 2021, while "most" limited partners from the first Imec.xpand fund returned, according to local newspaper De Tijd.

Big Idea Ventures, a US-based venture capital firm focused on food and agricultural technologies, has revealed an additional five universities that will support its Generation Food Rural Partners (GFPR) fund. Cornell University, Ohio State University, Rutgers University, University of Maryland and Washington State University have all bought into GFPR's proposition to establish food and agtech spinouts in rural communities near the collaborating universities. GFPR was launched in February 2021 with a $125m target and North Carolina State University as the initial partner.

V-Bio Ventures, the Belgium-based venture capital firm aligned with research institute VIB, closed its second fund at €110m ($120m), exceeding its €100m target. The firm did not identify any new limited partners. It had achieved a €96m second close by January this year, when limited partners included VIB, KU Leuven and Ghent University.

Main Sequence Ventures, the Australia-based deeptech venture capital firm established by Commonwealth Scientific and Industrial Research Organisation, secured an additional A$150m ($105m) for its second fund. The money came from the Australian government, which invested as part of its 10-year $1.6bn Research Commercialisation Action Plan.

AI and Robotics Technology Park (Artpark), an India-based non-profit foundation founded by Indian Institute of Science Bengaluru, has unveiled plans to launch a $100m venture fund, according to the Economic Times. It hopes to begin investing by May or June.

NGT HealthCare II Impact Fund, an Israel-based venture capital firm focused on healthtech developers, has raised a $92m vehicle to invest in university spinouts and corporate spinoffs, with the tech transfer offices of Technion and Hadassah Medical Center both joining as strategic partners, according to Calcalist.

The government of Québec committed C$100m ($78m) to a new fund that will look to support the commercialisation of and provide pre-seed financing to innovations based on public research in the Canadian province. The money is being supplied through its investment company, Investissement Québec, which will manage the fund called Eurêka. The vehicle will have a 20-year horizon and primarily operate as a fund-of-funds, but will also seek out co-investment agreements in the form of management mandates with select partners. Investissement Québec will collaborate with regional tech transfer organisation Axelys.

UC Berkeley SkyDeck, the accelerator of University of California, Berkeley, closed its second fund at $60m thanks to a mix of new and returning limited partners from the first vehicle.

Newton Biocapital, a Belgium-based life sciences venture capital firm, secured €50m ($57m) in capital for its second fund from limited partners including Belgian sovereign wealth fund SPFI/FPIM as a cornerstone investor. Several limited partners from the first vehicle have returned for the second fund, though none were identified.

Uniseed, the Australia-based multi-university venture fund, secured a A$75m ($56.2m) commitment from superannuation fund UniSuper. The investment marks UniSuper's first major foray into venture capital, chief investment officer John Pearce told the Australian Financial Review. UniSuper hoped that it would turn "into a much more significant investment over time", he added.

Superannuation fund Hostplus has added A$75m ($56m) to the IP Group Hostplus Innovation Fund, a vehicle it launched together with commercialisation firm IP Group, the Financial Standard has reported. Hostplus previously committed $99m to the fund, which was launched in 2018.

Qbic, the Belgium-based multi-university venture capital firm, announced a first close of its third fund at €49m ($54m) thanks to investors including Noshaq, an investment company that also operates its own spinout-focused vehicle, Noshaq Spin-Offs, in partnership with University of Liège. LPs also include insurance and financial services provider KBC, banking group BNP Paribas Fortis, as well as state-backed investment companies SFPI-FPIM, PMV, LRM and Finance&Invest.Brussels, and unnamed family offices and private investors.

Texas Medical Center, the US-based medical complex involving multiple universities, will provide an additional $50m to its TMC Venture Fund, the Houston Business Journal reported. The centre's board of directors has approved the full sum, which will be released over the next decade.

Fiducia, a Japan-based investment firm, has achieved a first close of ¥3.26bn ($28.3m) for its inaugural fund thanks to limited partners including Tokyo University of Science's subsidiary Tokyo University of Science Investment Management, according to DealStreetAsia. Fiducia Growth Tech Fund has also attracted AI Capital, Nanto Bank and Pavilion Capital.

Pack Ventures, a US-based pre-seed and seed venture fund, has launched to invest in spinouts and startups from University of Washington (UW). The fund looks to back any entrepreneur linked to UW's ecosystem, be that faculty, students or alumni. It is led by partner Ken Horenstein, who is joined by venture partner Beth Kolko, a professor at the university.

Q1 2022: a slowdown, but no reason to panic

> After a record-breaking 2021, the new year has started slowly but there is an upwards trend.

By Thierry Heles
Editor

The world we find ourselves in a few months into 2022 is significantly different from that at the end of 2021. Russia has invaded and is seemingly committing war crimes in the European democracy of Ukraine, sending shockwaves through the western world and prompting Germany to change its foreign policy with a single speech by chancellor Scholz that will inevitably be studied by historians for many years to come. One of the reasons for Putin's unprovoked war is his paranoia of an ever-expanding Nato, so it is ironic that the autocrat's actions have led both Sweden and Finland to be openly considering membership of the military alliance – putting the organisation much closer to Russia's territory.

Financial markets have struggled in this reality. Much of Europe – chief among them Germany – relies on Russia's gas reserves to keep homes heated and industries manufacturing, and the invasion has pushed up prices. It adds to challenges already created by a reawakening economy after the pandemic slowdown – problems that have caused a cost of living crisis even in countries that barely consume any Russian gas at all, like the United Kingdom.

Tony DeSpirito, chief investment officer at BlackRock's US Fundamental Active Equity, predicted that the market would transition to one that warrants "greater selectivity and a rebalance toward value".

This greater selectivity is something that will likely also impact spinouts. Although investor interest is still high – see the editorial in this issue for a selection of new funds launched, particularly in Europe – much of that interest is in helping solve huge challenges. That trend, of course, is not new and spinouts have long been exceptionally good at tackling big challenges. But the focus is becoming sharper and the actors more mature – be that through Bristol building quantum technologies and biotech clusters essentially from scratch (see our feature article in this magazine) or through funds focused on deeptech that are likely to take a long time before a return can be generated becoming more popular.

The 274 deals closed in the first quarter of 2022 appear to prove this point. The deal count is a notable drop from the 320 in the opening three months of 2021, although it is an upwards trend month on month since the December 2021 slowdown. Interestingly however, the money invested through those 274 deals only totalled $6.4bn – a staggering drop from the almost $9.9bn in the first quarter of last year. February 2022, in particular, saw the least investment in terms of capital in the 15-month period.

Numbers are never the whole story, of course, and noteworthy news emerged in February. Apollo Therapeutics, the biopharmaceutical company co-founded by Imperial College London, University of Cambridge and University College London, welcomed King's College London as its newest partner, strengthening a business that was already offering a unique proposition.

And nine-figure deals still happened in the shortest month of the year, too. Although not the biggest, Seismic Therapeutic, a US-based immunotherapy discovery technology developer, is significant because of its co-founder Timothy Springer. Springer, a faculty member at Harvard Medical School, is arguably best known for his involvement in mRNA vaccine developer Moderna, but his portfolio also includes gene-editing company Editas, biotech developer Tectonic Therapeutic and integrin drug developer Morphic Holding.

The biggest deal of the first quarter belonged to Eikon Therapeutics, a US-based drug discovery and development company co-founded by University of California (UC), Berkeley researchers, which completed a $517.8m series B round from investors including UC Investments in early January.

Insurance provider Harel Insurance took part in the round, as did T Rowe Price Associates, Canada Pension Plan Investment Board, EcoR1 Capital, StepStone Group, Soros Capital, Schroders Capital, General Catalyst, E15 VC, Hartford HealthCare Endowment, Abu Dhabi Investment Authority's ADIA subsidiary, AME Cloud Ventures, Column Group, Foresite Capital, Innovation Endeavors, Lux Capital and Horizons Ventures.

Founded in 2019, Eikon Therapeutics is building on super-resolution microscopy that enables the precise characterisation of protein interactions in living cells – offering a much more comprehensive insight than the static snapshots of frozen materials that are currently used. Eikon plans to focus on previously undruggable targets, though it has not revealed details yet.

Its underlying technology was created by co-founder Eric Betzig, whose appointments at UC Berkeley include professor of molecular and cell biology. He received the 2014 Nobel Prize in Chemistry for the development of the technology.

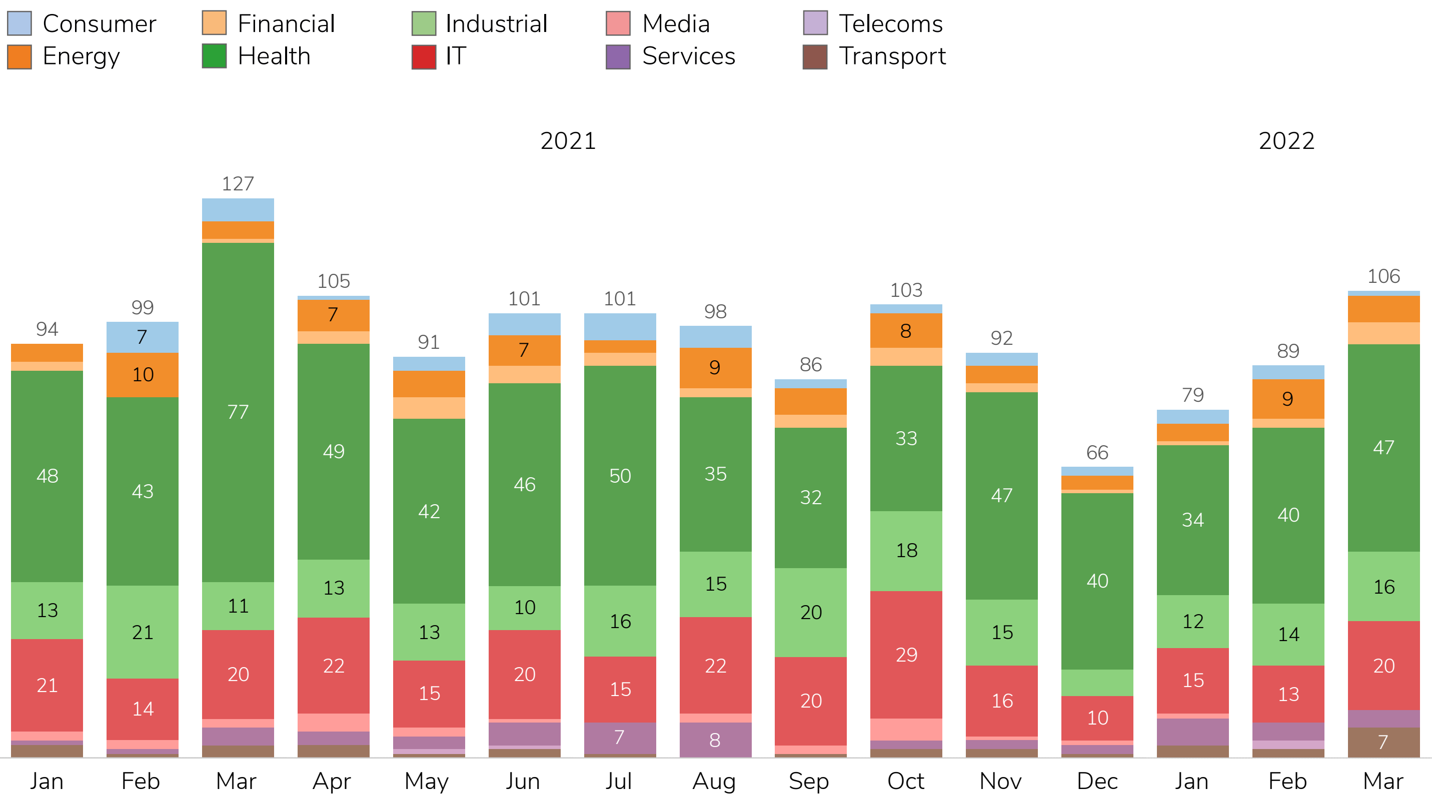
The second and third largest deals went to medical device developer Enable Injections and employer-focused personalised healthcare platform Transcarent, which raised a respective $215m and $200m in series C funding.

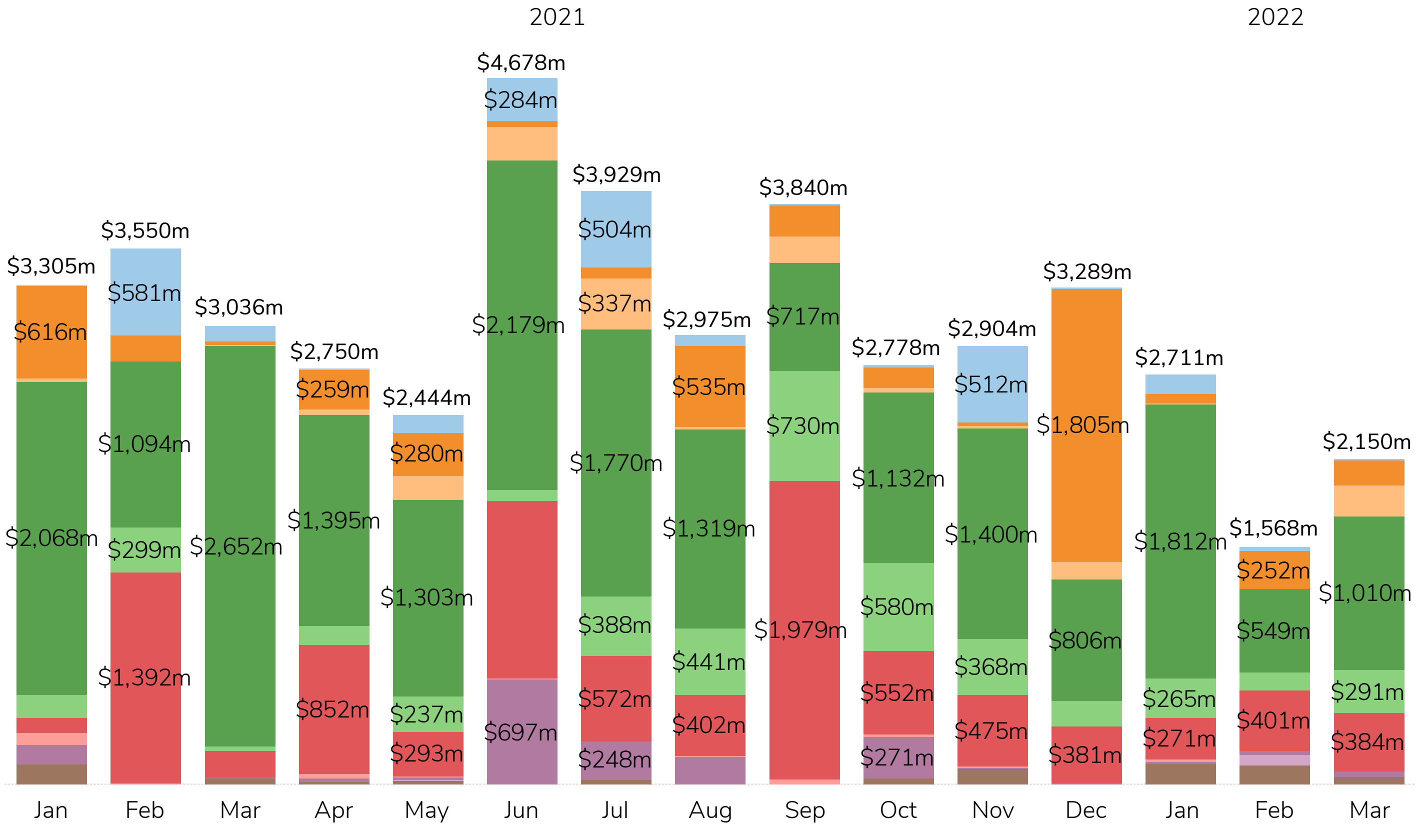
Enable Injections's backers included Ohio Innovation Fund, the venture capital vehicle co-founded by Ohio State University, Ohio University and Kent State University, as well as Cincinnati Children's Hospital Medical Center. Transcarent's backers featured Rush University Medical Center, the teaching hospital of Rush University.

Top 10 deals by size in Q1 2022

Company	Institution	Sector	Round	Size
Eikon Therapeutics	UC Berkeley	Health	B	$517.8m
Enable Injections	Cincinnati Children's Hospital	Health	C	$215m
Transcarent	Rush University Medical Center for Health	Health	C	$200m
Jeeves	Stanford University	Financial	C	$180m
Affini-T Therapeutics	Fred Hutchinson Cancer Research Center	Health	Undisclosed	$175m
SiFive	UC Berkeley	IT	F	$175m
Scandit	ETH Zurich	IT	D	$150m
Source Global	Arizona State University	Energy	Undisclosed	$150m
Superpedestrian	MIT	Transport	C	$125m
Korro Bio	University of Chicago	Health	B	$116m

Deals from January 2021 to March 2022





The number of exits meanwhile increased year-on-year to 27 in the first three months of 2022. With public markets having cooled down, however, many of these exits were in the form of mergers and acquisitions, where the price paid for spinouts often remained undisclosed. The relatively modest $794m in proceeds should therefore be read with some caution – the actual figure is likely higher.

The largest three exits were indeed all acquisitions, with Trifacta, a US-based data management software producer based on research at Stanford University and University of California, Berkeley, coming out on top. The company agreed to a $400m all-cash acquisition by analytics automation technology provider Alteryx. The acquisition also allowed corporates Telstra, NTT Docomo, BMW, Google, Infosys, ABN Amro, Deutsche Börse, Ericsson and New York Life to exit. Trifacta had raised a total of $224m as of a $100m funding round in 2019 valuing it below $1bn.

C-Lecta, a Germany-based enzyme engineering and bioprocess developer spun out of University of Leipzig, meanwhile agreed to an acquisition by food group Kerry for €137m ($155m). Kerry bought a 92% stake, with the remainder held by C-Lecta's management. C-Lecta specialises in precision fermentation, optimised bioprocessing and biotransformation to create high-value, targeted enzymes and ingredients for consumer segments including food and beverage. High-Tech Gründerfonds had joined an unnamed angel investor for a €600,000 ($733,600) investment in January 2006, after which C-Lecta raised undisclosed sums in August 2006, in 2008 and in 2018.

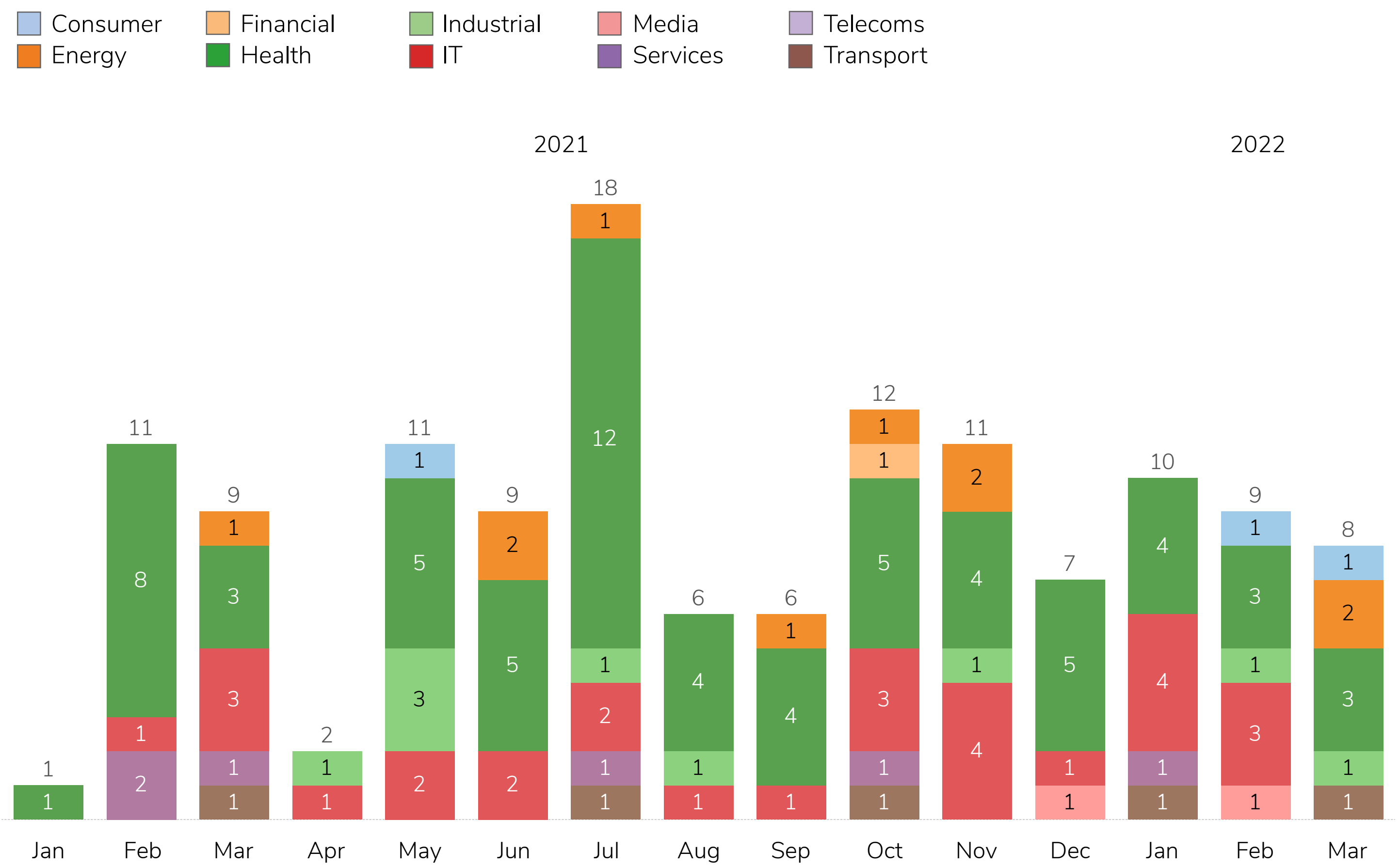
And Syndesi Therapeutics, a Belgium-based developer of therapies to treat cognitive impairment, was acquired by pharmaceutical firm AbbVie for $130m upfront, with the potential for up to $870m in milestones. The agreement provided an exit to Vives Louvain Technology Fund, the university venture fund of Université catholique de Louvain, and V-Bio Ventures, the venture capital firm linked to research institute VIB. Syndesi last raised $21m in a series A round backed by the two aforementioned investors in February 2018, a month after it was spun out of biopharmaceutical firm UCB.

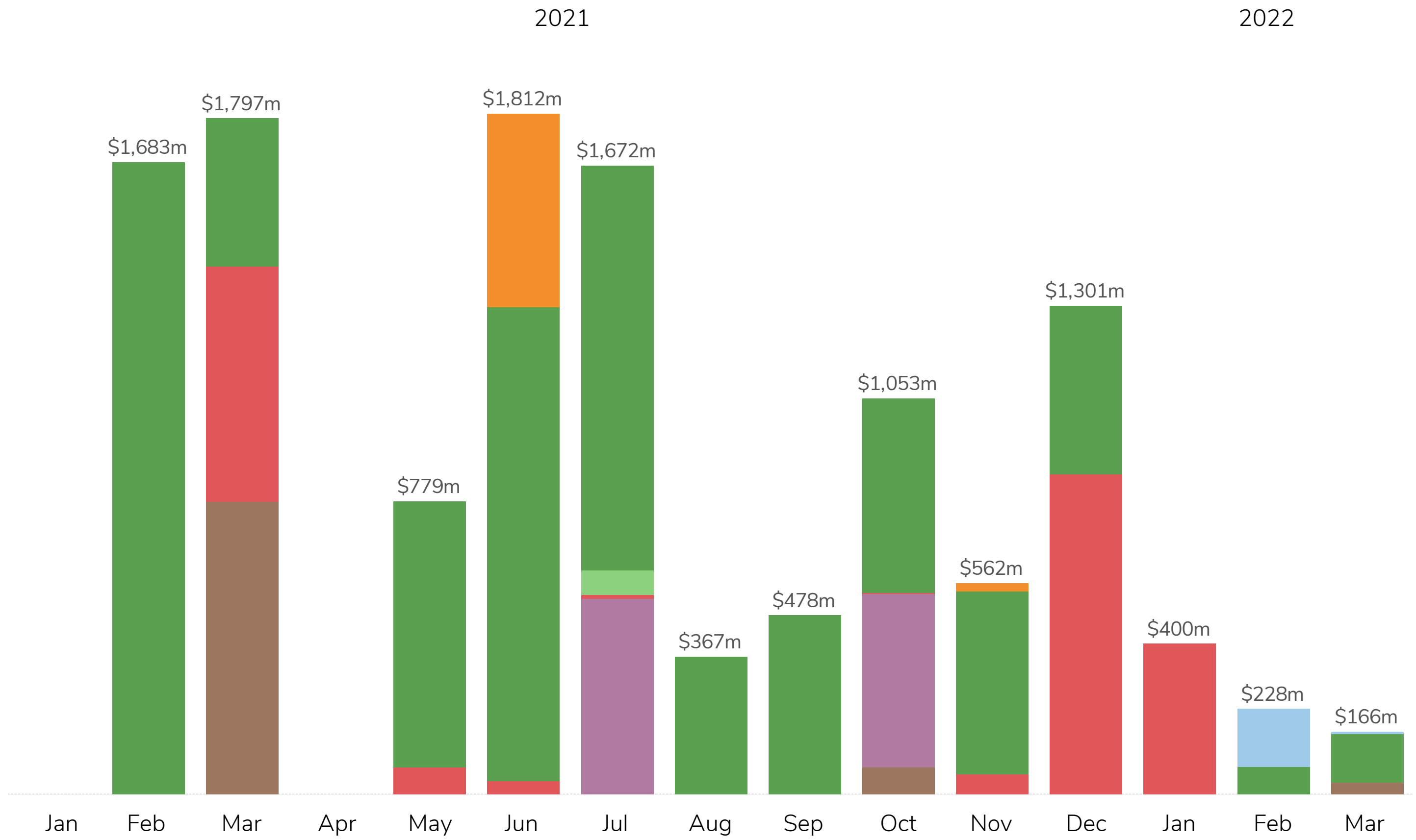
One other interesting exit in the table was the merger of Alpine Intuition and Cohesive Computing, two Switzerland-based artificial intelligence technology spinouts of EPFL. The combined company will operate as SquareFactory and will aim to offer an end-to-end machine learning operations platform to train, deploy and host AI applications, while also offering consultancy and development services. Sergio Giacoletto, board member of Cohesive Computing as well as adviser to Alpine Intuition and one of its investors, has been appointed president and interim chief executive of SquareFactory. Details about either company's historical funding could not be ascertained beyond a low six-figure sum secured by Alpine Intuition from members of Business Angels Switzerland in January 2021.

Top 10 exits by size in Q1 2022

Company	Institution	Sector	Type	Size
Trifacta	Stanford University, UC Berkeley	IT	Acquisition	$400m
C-Lecta	University of Leipzig	Consumer	Acquisition	$155m
Syndesi Therapeutics	Université catholique de Louvain	Health	Acquisition	$130m
Rewrite Therapeutics	UC Berkeley	Health	Acquisition	$45m
The Floow	University of Sheffield	Transport	Acquisition	$31.5m
Aelis Farma	Inserm	Health	IPO	$28.1m
TouchBistro	Allied Minds	Consumer	Stake sale	$4.4m
Adaptate Biotherapeutics	King's College London	Health	Acquisition	
Alpine Intuition, Cohesive Computing	EPFL	IT	Merger	
Aurtra	University of Queensland	Energy	Acquisition	

Exits from January 2021 to March 2022





Bristol: a cluster on the rise

> Science Creates and University of Bristol are turning the city into an innovation hotbed.

By Thierry Heles
Editor

Years before Harry Destecroix would sell his University of Bristol spinout Ziylo to pharmaceutical firm Novo in a deal worth up to £623m ($820m), the entrepreneur was facing down a screaming landlord and several police vans trying to kick the company out of its offices on a Friday night. It was not the first time Ziylo was losing its headquarters.

"It felt like nobody wanted us to exist," Destecroix told Global University Venturing.

Having initially worked out of the basement flat he shared with co-founder Tom Smart, the pair moved Ziylo into a building occupied by a design agency that had no use for one of the floors. Destecroix put in a computer network, the team laid new floors and had desks made by the same designer who would later create the furniture for Science Creates, the incubator launched by Destecroix.

Six months in, the design agency's managing director informed Destecroix that they had sold the lease to a developer and Ziylo had to move out. And so, the team moved across the street into a former BBC building.

"It was about 1,000 square feet but it looked like someone had just ripped everything out," Destecroix remembered. They rebuilt the space, partitioned it off into one part for Ziylo and one for the incubator's development team. They put in a board room. Then one day, they received an email asking "a lot of odd questions" that made it clear the landlord wanted them out.

"About a week later I received a phone call saying the bailiffs are in and had locked us out. They told us we were being evicted for breach of tenancy. But luckily, we had an experienced chairman, Keith MacDonald, and I do not think they realised that these kids with skateboards would have a whole team of lawyers emailing them," Destecroix said.

"This guy was furious. He had bought this building and he wanted to do whatever he wanted with it," he continued. Ultimately, Destecroix's lawyers warned, the new landlord would serve the correct notice and force them out, so the law firm produced paperwork to get Ziylo's team into the building and, using two hired vans, the team emptied the office.

"At 6pm, the landlord shows up and he starts screaming and shouting, and then calls the police. Suddenly five police vans show up at the office on a Friday night in Bristol. It was hilarious," Destecroix recalled. The police inspected Destecroix's paperwork and, content everything was in order, went away.

After they had cleared the building, Destecroix offered a cup of tea to the landlord. Having calmed down, the landlord acknowledged that "what you are doing is really interesting", Destecroix remembered.

The entire ordeal could have been prevented with a civilised conversation, Destecroix said. "Out of all the things that try to kill you as a startup, there were so many unnecessary things," he explained. Although the idea of opening an incubator already existed by Ziylo's second eviction, the incident reinforced the realisation that such a space was desperately needed.

"That is what these buildings can protect from. People can focus on the science and development, not getting evicted. The big wide world is just not meant for a non-revenue generating innovative startup. A lot of people in the normal commercial world do not understand it," Destecroix reflected.

Destecroix – quick to point out everything was a team effort – had nevertheless embraced being the face of it all. "As with all stories it is good to have a central character to carry the message. It is humanising," he pondered.

Harry Destecroix

Science Creates' journey began in earnest in 2017, when a first incubator, dubbed Unit DX, opened in Bristol's St Philips neighbourhood. A second location in Old Market followed in November 2021 and, in early April 2022, Destecroix handed over the leadership of the incubators to Ashley Brewer. Destecroix moved his focus onto Science Creates Ventures, the venture capital arm of the Science Creates brand.

"We cater for that fast-growing deep tech company that needs access to high-quality research facilities," Destecroix described the incubators' mission. "They want to be in one of the greatest cities in the UK to live in, Bristol, and that has benefits of attracting talent, which is in high demand at the moment, of course."

Science Creates charged rent at a rate that was "reasonable for pre-revenue startups" but it took no equity. The incubators gave outsiders, be that government or investors, a focal point within the city, Destecroix argued.

Visitors to the Old Market location are greeted by an atrium-like, sunlight-flooded space complete with comfortable seating options, a kitchen area and meeting rooms that embrace geekiness in their names. Destecroix chose one called Magnesium for the interview with Global University Venturing.

"We raised a lot of debt to build the facility, so much of the rent we charge pays off that. It is a very narrow margin business, but we do it because of the wider economic benefit, which is centred around this realisation that depending on where research is done has a huge bearing on whether it is commercialised," he explained. "The world needs a lot of ideas – the pandemic highlighted we were not ready for it. It is going to be a huge challenge to meet net zero and 75% of diseases have no cure."

These huge differences were one thing that a lot of people within business support did not appreciate, he added.

This need to innovate had always been Destecroix's view of the world. Growing up in a family of medical professionals, he was "always fascinated by doctors and surgeons who are able to save people's lives", he noted.

"I was very much a problem child in the sense that I took things apart, diffused the house, reset the breakers... I could not be left alone because there would probably be a risk of fire," he quipped. This drive to understand how the world around him worked led him into a career in biotech where he stepped into a "very fortunate chain of events" that meant he was doing his PhD at the pinnacle of 20 years of research from Prof Anthony Davis into making artificial glucose binders – the technology later licensed to Ziylo.

"I have had this real privileged journey where I spun out into an ecosystem that was very early and underdeveloped for its external support. I had the unique opportunity to run experiments, to try and improve things for others who followed," he said.

"To have our own safe spaces is really important," he stressed. "That led to the first incubator, which was about trying to square that circle. I needed space for my own company and I had met all these other academics with ideas and wanted to spin out companies – people like Adam Perriman and CytoSeek."

Ziylo had a "great chairman" who let Destecroix pursue the incubator while remaining chief executive. "I saw these things as a vehicle to do Ziylo because we were solving a big problem for us."

Science Creates had no interest in catering for the type of entrepreneur that came out of a business school and wanted to copy an existing idea into Bristol, he stressed. "There are very few people who innovate, not many companies that move the needle. We are looking at: how do we take a fundamental breakthrough and use it to create a new product or service that was not possible before? How does that affect the world?"

> *It is a very narrow margin business, but we do it because of the wider economic benefit, which is centred around this realisation that depending on where research is done has a huge bearing on whether it is commercialised.*
>
> Harry Destecroix

Unit DX filled up within two years and “it was clear that that was the problem,” Destecroix said. “It was a classic chicken and egg problem, because local government had for years debated on whether to build labs on the science park. It is obviously very hard to see a demand when companies have nowhere to go. Fundamentally, there is a lack of understanding of the business models that spinouts use, which means that they do not have the revenues to secure commercial properties. They are there to try and get to that first spark; there is no revenue.

“A lot of government is focused on revenue-generating businesses. Then it is about everybody fighting over who mows of the grass, whereas we are focused on planting the seeds or enabling people to plant the seeds themselves. But you need to make sure that there is a field and you have seeds.

“Now that everybody can see that there is an ecosystem and spinouts are raising money, it is all obvious, which is great and ultimately what we wanted to do. We wanted enough critical mass that the market takes over, which is how it works – market failure, government or someone else steps in and takes a risk, establishes a market, everyone starts copy-and-pasting.”

University of Bristol and local government have certainly stepped up their game.

Bristol mayor Marvin Rees, who came into power in 2016, is understandably a major proponent. He said: “Bristol is one of the top technology hubs in the UK, recognised in 2017 as the UK’s top smart city and currently third in the world for tech unicorns behind the US and China. Digital technology and the startup culture is an important foundation for innovation in such a range of sectors across the city, from life science and manufacturing to covid-19 recovery, and we are committed to providing spaces and opportunities for its continued development. We want to continue to improve access to this sector, so that startups and major employers benefit from the diverse talent pool here in Bristol.

“We are working with partners to develop the area around Temple Meads as an enterprise zone, implementing planning policies to improve opportunities and spaces for organisations such as deep tech ecosystem Science Creates. We are also proud to support aspiring entrepreneurs through the Business & Intellectual Property Centre in the Central Library, which is an invaluable resource for startups and small enterprises looking for support securing intellectual property, business intelligence or expert guidance.”


Mustafa Rampuri

Mustafa Rampuri, director of enterprise services at University of Bristol and director of the Quantum Technologies Innovation Centre (QTIC), explained the university’s plans for Temple Meads: “It covers our technology-based activities, but there will also be the Bristol Dental School. We are constructing a new building that will house QTIC, students from the School of Management and from engineering and sciences as well.

“The opportunity for creative collision is high. We are gearing up for the emergence of student-based and researcher-based ventures. By putting students in close proximity with engineers we are removing the blockers in our current organisational structure for collaboration.”

There would also be “two cool facilities”, Rampuri said. “The Design Factory is a large-scale hackspace that does design thinking all the way through to 3D printers and CNC cutters. That will help on that hardware journey.

“Then we have the QTIC Centre and that should allow in the region of 200 people to be co-located in there.”

Construction is due to complete in 2026, having suffered an 18-month delay due to the pandemic.

Dick Penny

Dick Penny meanwhile knows a thing or two about the city's evolution to the unique place it is today. Now semi-retired – he offers consultancy services on a select basis – he led creative hub Watershed from 1998 to 2018 when his parting words were: "Do not just do brilliant stuff, but help someone else do brilliant stuff."

The Bristol of yesteryear had been "very comfortable" and although it was interesting, it was "a bit too pleased with itself", he remembered. The place was bleeding talent, because early-career people could not see a future. But over the past 30 years, Bristol "has developed a bit more of an edge and, critically, more confidence and visibility. That has meant that people who come to study or have grown up here do not feel like they have to go somewhere else.

"There are opportunities on people's doorstep. It is interesting how you need to create a sense of scale – larger scale, because Bristol is small compared with international centres – but also a sense of openness and visibility."

He added: "It is becoming a place where there is so much going on – that is on the cultural front, on the social activism front, on the environmental front and, critically, on the tech front."

Whereas Bristol's proximity to London used to be a problem, it had gradually turned into an advantage as the city gained its own identity. It was true of other cities like Cardiff or Manchester, too, but "Bristol is slightly ahead of the curve," Penny argued.

Penny met Destecroix while he was still running Watershed, where his job was to connect the city more. Although Destecroix was now a well-known person in Bristol, he had been making plenty of noise even before Ziylo's acquisition, Penny recalled.

"It was obvious that Bristol had a very strong, high-value manufacturing centre, primarily aerospace, that had been embedded for a long time. We had a strong, growing chip design infrastructure. But both aerospace and chips were design, and the creative industries were design – and nearly all of those were white label.

"I had been trying to join up these pieces. Robotics is a key area where things have joined up, for example with Open Bionics. They make 3D-printed prosthetic limbs, and they also have deals with Disney and James Cameron. Are they a creative industries company? Are they a medtech company? Are they a robotics company?

"What we did not have in that mix was any serious biomedical companies, and obviously that is where the big money is. Then suddenly, there is Destecroix."

Everyone was telling Destecroix to just go to the golden triangle, Penny remembered, but he wanted to do it in Bristol. Penny recognised Destecroix was doing for biosciences what the media had gone through over the past three decades, turning from an industry that felt like it needed a London base to one that was confident to have its headquarters in Bristol.

"What I like about Destecroix is his determination to do it here, to use his success, to help other people. Where else does that happen? The west coast of America. It is that sense that it is not just about my own discipline, we need people who understand big data, design, communication. Destecroix is bringing a massive new chunk to this ecosystem, which bit by bit is growing and gaining confidence. He is absolutely driven, I take my hat off to him."

Prof Michele Barbour, associate pro vice-chancellor for enterprise and innovation at University of Bristol shared the enthusiasm for the city. "The Bristol innovation ecosystem is really exciting, fast-moving, fast-developing. There is still scope to develop further, but it is a key aspect of how we as a university interact with the city and the world more widely.

"From the university's perspective, we have a lot of world-leading research and it is very much at the forefront of our interests to get that research out there into the wider world. What that means depends on what research it is. But the innovation ecosystem that surrounds us in the city and in the region is key to us realising both the impact of our research and our civic mission."

She added: "Science Creates is a fantastic place. What they offer and how they deliver it is important for entrepreneurs and early-stage companies in the local area."

That Science Creates had two distinct locations was "an illustration that there is no one-size-fits-all when it comes to a company that either is spinning out of a university or starting up," Barbour noted. "There is a diversity of needs, both in terms of the space and facilities, but also where they need expertise, guidance, consultants or mentorship."

She continued: "The formal events and training that they run are great, but it is also just bringing people together over a coffee or a sandwich and letting them speak about what excites them and what frustrates them about their early-stage companies and let that cross-pollination happen naturally. That is why incubator spaces like that are important."

Although still new in her current job – she was promoted in February 2022 – Barbour is well-placed to understand the intricacies of the ecosystem, having launched her own spinout, Pertinax Pharma, in 2015. That experience had been "really exciting", she celebrated.

"It was not in my game plan," she admitted. "It was a chance research finding that led to a discovery of a technology which we felt could have applications in the wider world." Eventually that research reached a stage where it was beyond the remits of a university and rather than take a backseat or license it to an existing company, Barbour was "too excited and too enthused about the technology and how we could move it forward to be willing to step away".

She added: "I learnt an awful lot about how innovation is adopted and taken forward in a more commercial environment. I made a network of contacts that have


Michele Barbour

become fantastic long-term contacts and, in many cases, friends. It really broadened my view as an academic and in my new role, what I would like to do is encourage other academics to take that path, but with insight and a realistic view of what is ahead."

One of the key support systems that was still lacking in 2015 was space. "At that time, there was very little in the way of lab space for rent available. We were one of the first tenants of Future Space, an incubator based at University of the West of England. It was fantastic for us and it was really good timing, but they were the first to operate and they filled up rapidly."

Nowadays, there were also more training programmes available, she added, and more of a recognition of the benefits of this type of company. "The culture in higher education is adapting to see that these activities are absolutely the right things for academics to be engaging with," she reflected.

Destecroix noted that his passion for Bristol was because it was uniquely placed to pull it all off: "There are not many cities in UK where you can do this well, because you need to have enough of a research base, a big enough city and good connectivity to other cities. It has to be an attractive place for young people to want to live. Bristol has a lot of these things going for it."

> *Bristol is renowned for caring about everything. It is a great independent, free-thinking city that does a lot to promote issues. We are here to try and develop solutions from Bristol. We have had a fantastic reception from local government and from community.*
>
> Harry Destecroix

That the Temple Meads quarter was a 200 acre-site in the city centre was an important factor too, he argued, because it allowed scientists to work in Bristol – not in a research park so far out that it might as well be in a different city.

"These jobs should help invoke cultural change around how not only the researchers view translational research and entrepreneurship, but also how society views this type of business and and how differentiated it should be.

"Why should scientists not be rock stars? TechCrunch did that for IT – they were ridiculed, but they were transformative to how people view technology," he said.

Those tech startups created a lot of angel investors, who were looking to support the next generation – a lot of whom were trying to solve deep technology problems. The pandemic helped shift the public perception of the importance of science.

There was already a perceptible impact, he declared. "I was speaking to the dean of life sciences at University of Bristol and they are seeing huge waves of people coming into biosciences as a result of the pandemic. People want to add to this effort of improving human health and fighting pandemics."

Nowadays, you could easily imagine people saying, "you can code, that is so cool", Destecroix pondered, "whereas 20 years ago nobody would have cared". It was the same concept with deep tech, he argued. "We should celebrate these people and not hide our geekiness."

He added: "Bristol is renowned for caring about everything. It is a great independent, free-thinking city that does a lot to promote issues. We are here to try and develop solutions from Bristol. We have had a fantastic reception from local government and from community. We had hugely supportive planning applications from the Old Market community, largely because of the outreach programmes that we have been renowned for as well – their school children have come through here.

"I have been in Bristol for 12 years and a lot of people here are Bristol through and through, so we want to give back to the city as well as, importantly, look out on a global scale from what we can solve."

That global scale would also come from Science Creates Ventures, Destecroix noted. The two were separate, he stressed, with their own plans and teams.

Ventures was set up when Destecroix became an angel investor after selling Ziylo and noticed that the deep tech companies he was interested in had almost logarithmic capital requirements. These startups "very soon outgrow" their initial investors.

"The problem in Bristol was that too many cornerstone investments were by angels and that is dangerous because for these companies to ever be successful they need VC money."

The difference between securing an angel investment and VC funding was stark, Destecroix observed. An angel investor only had to like the entrepreneur and their idea to take a punt, because all the decision-making, risk and responsibility fell on the investor themselves.

As an institutional investor, Science Creates Ventures needed to follow regulations set by the UK regulator, Financial Conduct Authority. There was a fund manager, Kin Capital Partners, an entire investment team, a due diligence process and investors that Ventures had to report to, he explained.

"The amount of people and complexity involved in making sure that I am not just giving you money because I like you is so much more stressful for you

as the founder. But the benefits are that instead of convincing 20 people like me, you convince two or three of us and the money is there. Often what happens is those funds understand this sector and technology, and they have reserve capital to lead the next rounds."

A previous lack of enough institutional money meant that companies never raised enough capital to scale properly or it took them several more years to achieve it. That, in turn, created the additional problem of "expertise suffocation" – experienced senior management was not interested in joining these companies, because they would rather work for a venture-backed company.

The aim for Science Creates Ventures was to "build a renowned venture capital firm on a national and international scale over the next decade". The firm, while rooted in Bristol and expecting to make half of its investments in the city, had already been investing throughout the UK. "I think what Bristol has suffered from is it is too internal," Destecroix remarked.

To date, Science Creates Ventures had invested in rounds together with long-established peers such as Parkwalk Advisors, Octopus Ventures and the British Growth Fund. Mercia, too, recently opened offices down the street from Science Creates, Destecroix noted.

"They took us for lunch, it was great," he enthused, because it meant Science Creates was becoming an important part of the venture capital landscape not just in Bristol but in the UK. "Trust starts to build," he added. "You get to know each other's processes and respect the other partners."

These were firms that received hundreds and hundreds of pitches but made only a few investments. "If they are putting their name to something, then there is usually something there," he declared. "If you can bring on these investors early on and build that relationship with them, trust builds in the management team. It is one thing to have the technology, but will the team fall apart?"

It was not a nice experience as a founder to go through the pains of institutional investment, Destecroix acknowledged, but "it teaches you a lot and readies you to take on that larger investment because it only gets worse".

Science Creates Ventures was hoping to get involved in those larger rounds in future, Destecroix revealed. Currently a seed investor, that would invest in pre-seed rounds on occasion, the idea for Fund 2 was to expand into series A rounds.

Destecroix had given up on angel investments and instead put money into Science Creates Ventures "under the same terms as the other investors", he stressed. "Venture capital is where I want to spend a lot of my time now."

He was fascinated with insights gained into how companies operated and watching young chief executives taking their businesses to new heights, he revealed. It was a privilege to be a part of that and then being able to use the knowledge to find more opportunities to improve people's quality of life.

Destecroix also remains a director on Carbometrics, the business spun out from Ziylo following its acquisition that is working on glucose sensor chemistry to develop continuous glucose monitors. The company is led by chief executive Andy Chapman, who previously served as chief scientific officer at Ziylo. Notably, Chapman was not the only person who made that move: "the whole team was transferred to Carbometrics", Destecroix remembered. "It was almost like everyone went to work the next day and we just changed our name."

Barbour noted, too, that the venture capital scene in Bristol had exploded in recent years. "To quote some numbers, in 2020, we were looking at about £330m in the region, whereas it was £1.1bn last year. Investors cannot help but notice that trend and cannot help but want to lift the lid and see if there is something exciting there that they might like to get involved in."

External reports corroborated these numbers, Barbour added. "We were ranked as the number seven city for spending last year by Beauhurst and the best for return on investment in a recent report by GovGrant.

"That does help to consolidate that profile and publicise to the world what we already feel, which is we are a great place to come to if you are interested in investing in spinouts and startups."

The university had benefitted from its membership in SETsquared and personally, she had also had support, training and mentoring through their programmes, she added. SETsquared's work included specific programmes aimed at increasing diversity and making sure people from diverse backgrounds were able to launch startups, she stressed. Here, too, the numbers were increasing – before SETsquared focused on this area, "the proportion of founders and C-suite members of the spinouts was about 4% or 5% women, about 4% or 5% black, Asian and minority ethnicity. Last year, it was 45% women, 24% black, Asian and minority ethnicity."

Barbour cautioned: "That is not to say the job is done. There is more progress to be made in these areas, and SETsquared also have aims to look at the LGBTQ+ representation and try and make sure that they are doing everything they can, but those numbers are impressive. I hope that other groups trying to achieve those ends might learn from some of the work that SETsquared have done to actively grapple with those challenges."

Barbour herself was involved with an Oxford Brookes University-initiated programme looking into the reasons why so few women researchers were

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Michele Barbour

creating spinouts – a project spearheaded by principal investigator Prof Simonetta Manfredi – and the Women on Boards initiative that aimed to bolster the number of female directors.

Science Creates' backers also included Research England and Barbour welcomed the fact that the government was putting its money where its mouth was. "If the government means what it says about the science superpower, then that is going to require investment. That is what we are seeing and that direction of travel is really pleasing," she noted.

"What we need to see is the initiatives that I genuinely think are coming, which is to bridge that gap between traditional academic research and industry. There is the startup economy and the spinout economy, which is an important part of that, but also things like the Catapults and allowing large companies to access the expertise within universities and incentivising academics to want to do that."

It was important to note that the range of innovation coming out of University of Bristol, Barbour underlined, and to recognise that it was not all spinouts founded by people working at the university. Student enterprise also played a crucial role. Examples of the latter included haptic interface technology developer Ultraleap, originally founded by a PhD student which raised £60m in a series D round in November 2021, Barbour said, while female urinal developer Peequal was an example not only of a startup that had recently raised £250,000 but also of a company co-founded by two women, Amber Probyn and Hazel McShane, when they were still undergraduate students.

"We have put a lot of work into supporting student enterprise with a few different initiatives, some of which have been running for a number of years and have a really great track record, some of which are new," she stressed. "We really do consider that student and graduate enterprise is a key part of this economy, they raised £7.5m last year."

Rampuri contributed: "Our special sauce is our ability to convene and connect at the intersections of innovations. We innovate in where cyber meets creative or where biosciences meets fintech. There are some interesting intersections that can happen because of our small but beautiful scale. We get a lot of people from different sectors coming to the same events and so get a lot of crosstalk between them in a really positive sense."

Rampuri's experiences with government support had been mixed, he admitted. He managed to secure £35m for QTIC after weighing up conflicting recommendations from colleagues who told him either version of "do not ever ask the minister for money because they get really annoyed" and "make sure you have an ask ready and make sure it is really big".

Our job is to reach into the lab and help researchers become entrepreneurs. Most of the knowledge of these deep technologies sits in people's heads.
You have to support that journey of people – call it training or a fellowship, call it what you like, but it is about moving people from being in a lab to being in the market.

Mustafa Rampuri

He recalled: "There was a ministerial roundtable held at Bristol and we presented to David Willetts, then the minister of state for universities and science, what we thought the potential for the UK was."

The focus on quantum technologies was not happenstance. Rampuri, who started off in industry initially working on rocket motors at BAE Systems, noted that there had been seminal work done at the university whereby the first-ever demonstration of on-chip quantum CNOT gate was developed – "it is like the transistor for a quantum computer," he explained.

To date, QTIC had supported around 35 quantum technology businesses, he noted. "They employ more than 220 staff, raised £60m to £70m and generated a huge amount of economic value."

Bristol now did end-to-end quantum, from foundational mathematics through to startups developing products and services, he celebrated. Importantly, "all of that is within a square mile of the university."

But a major hurdle Rampuri identified was the lack of a programme that would help get research out of labs into deep tech spinouts. That £35m for QTIC had come from the government's Quantum Technologies Enterprise Centre, which was not refunded.

"Perhaps the misunderstanding in government is that there are one or two programmes that look very similar, but they are actually very different," he pondered. "ICURe, for example, is good at helping people understand whether there is a market or not. What it does not help them do is construct a business around it, develop a product or a service, understand how they are going to get that funded, what their team is going to be, or what their governance and board structures are.

"You might say, there are a lot of accelerators that do that, for example the Seraphim Space Accelerator, which is a good programme. But they take incorporated businesses who largely have already received seed funding and are a couple of years out of the lab.

"Our job is to reach into the lab and help researchers become entrepreneurs. Most of the knowledge of these deep technologies sits in people's heads. You have to support that journey of people – call it training or a fellowship, call it what you like, but it is about moving people from being in a lab to being in the market."

At the moment, he argued, that journey was allowed to be passive. The UK, he declared, "cannot compete with the US in sheer money terms, but we can compete with them in other ways. The thing that Europeans are good at is what I call Alpine-style innovation, whereas Americans are good at motorway-style innovation."

He elaborated: "Americans will build the motorway up the side of the mountain, but it needs a huge amount of resource. Brits and Europeans are a two-man team with a piece of rope and they get up there fast and they make it to the top first. The big problem with that is the result of 'invented here, exploited elsewhere'.

"What you can do with these modest interventions is that you put in the fixed ropes – think of it as the equivalent of the Italian climbing technique called via ferrata, which consists of fixed metal ropes. Anybody can do the climb; you just clip onto a metal rope and it is there permanently. That is the opportunity."

But those interventions just did not exist currently and it was a frustratingly hard thing to articulate, he lamented. "I have spoken to numerous people, including at UKRI and to science minister George Freeman, and they keep coming back to 'has that market failure not been dealt with?'

"Actually, no, there is a whole market, which includes things like Seraphim and ICURe, but there is a specific failure right at the coalface that really needs to be addressed because that is where the bottleneck is."

Universities were not equipped to deal with this on their own and, importantly, also typically did not think that way in the first place, he claimed. "Patent budgets and tech transfer teams are ludicrously small. We do not do tech scouting. We do not do entrepreneurs-in-residence unless they are part of some other programme. It is not in our DNA and that is fundamentally something that needs to change within the commercialisation landscape."

It was not all doom and gloom, of course. Rampuri celebrated the existence of SETsquared and its approach of training founders the basics of running businesses to de-risk them for investors.

Ziylo went through the SETsquared programme, as did Ultraleap and hundreds of others, Rampuri noted. They were not necessarily tech startups either, he stressed, giving the example of Gapsquare, co-founded by Zara Nanu, which was working to close the gender pay gap.

"They spent quite a bit of time in SETsquared and quickly sold for about £8m, which is impressive given that it is almost a social enterprise."

Such exits created people who could then give back to the ecosystem and that was key to Bristol's future. "When I look at things like the Cambridge phenomenon, the takeaway is not that they have massive amounts of money but the general commitment to the phenomenon – David Cleevely, Hermann Hauser and the many others who have come after who are totally committed to supporting the next generation as they come through.

"It is that level of commitment that we want to build as part of our ecosystem."

Engine Shed, which also fell within Rampuri's remit, was "a great place to convene people and get them excited and sign up to becoming mentors, coaches and trainers", he said.

"Destecroix is that next generation and he is totally bitten by the bug," Rampuri added. "I am a director on his board as well, because the university is a co-investor in Unit DX, so I am obviously a fan and I think he does an amazing job. I am very supportive of the work that he is doing and I am always encouraging people to work with him and to do more with Science Creates, because it is fabulous for the region."

The university had thrown its weight behind Science Creates because, much like there was a lack for the support of quantum technology startups, there was nothing to capture biosciences either.

"Innovators need somewhere to go. It was a collision of coincidences in a way that Ziylo was needing space outside of the university to scale up – there were many other companies that were getting toward that point in time – and it was a great shout for Destecroix to say, 'we need to build an innovation centre'."

Asked what his hope for Science Creates' future was, Rampuri responded that he trusted Destecroix to spot an opportunity and make the most of it. "The best that we can do is get behind it and not get in the way," he maintained.

Both Rampuri and Barbour predicted that more science-based incubators would emerge in the city, with Rampuri revealing the university had held discussions with interested parties particularly around the Temple Meads zone.

"Science Creates will probably have a relationship with those so that they can bed into the ecosystem quickly," Rampuri predicted. Part of the trick was also continuing to make sure startups emerging out of SETsquared kept being de-risked enough to be a good bet for Science Creates Ventures and other firms.

The pandemic had helped create a favourable environment for venture funding, he observed, as investors were now much more comfortable hearing pitches over Zoom.

Looking to the future himself, Destecroix meanwhile highlighted the importance of the team around him – many of whom he now had been surrounded by for some eight years. Jokingly calling it his learning support team, he pointed to the need to balance getting a lot of work done without risking burnout.

"If I spend an hour with my team, they have two days' worth of work. The only way that I can do well and we can achieve things is with this amazing team that does all of the work and helps buffer and deliver."

"It is like organised chaos," he concluded. "On the outside it might seem that I am here, there and everywhere, but actually it is all part of the plan. It has definitely not been plain sailing to get here, but as long as you are prepared that it is going to be difficult or require much of your attention then that is okay."

Some might argue that something like Science Creates would have eventually been built in Bristol even without Destecroix and that the city was always travelling in this direction. There are certainly many people working towards this goal, but Destecroix's contribution was undoubtedly crucial.

He might be filling incubators instead of stadiums but spend any time with Harry Destecroix and you will walk away thinking of him as the kind of rock star he wants all scientists to be.

How Aspect advances SHAPE commercialisation

> **Universities in the UK and globally are turning to Aspect to help commercialise SHAPE research.**

By Thierry Heles
Editor

Arts, humanities and social sciences (SHAPE) have historically not been at the forefront of technology transfer, dominated as it is by the science, technology, engineering and mathematics (STEM) disciplines. A key reason for that reality is the patentability of inventions out of those departments, making a commercially successful route arguably more obvious.

But with SHAPE subjects making up a significant part of most universities' schools, the approach is changing. One project looking to elevate the status of these fields of study is Aspect – an acronym for "A SHAPE Platform for Entrepreneurship, Commercialisation and Transformation" (the "s" in Aspect initially stood for social sciences but Aspect's remit quickly expanded).

Prof Julia Black, strategic director of innovation and professor of law at London School of Economics and Political Science (LSE), chairs the Aspect consortium having helped originate the "rather mad idea", she quipped, after a trip to Massachusetts Institute of Technology (MIT) and Stanford University that disproved her hypothesis that LSE was the only institution that had left SHAPE behind when it came to commercialisation. In fact, Black remembered, MIT and Stanford "were doing a lot but essentially nothing in social sciences".

LSE joined forces with the universities of Cardiff, Glasgow, Manchester, Oxford, Sheffield and Sussex, as well as venture studio Zinc – founded by a visiting professor at LSE – and won a £5m ($6.5m) award from public body UK Research and Innovation (UKRI)'s Connecting Capability Fund.

Today, Aspect operates on a two-tier structure – the core group accountable for the public funding and an increasingly long list of associate members.

"We have different communities of practice to support those working on research commercialisation, on business engagements, on communications and on entrepreneurship. That functions from the bottom up, so members bid to run projects and programmes," Black explained.

Aspect faced "a vast lacuna", Black lamented. "There is not a wonderful, established landscape with a few holes here or there, which is what I thought it might be when I started. There are a few islands of activity with vast lakes in between and no connections between them."

But, she insisted, "one of the exciting things about Aspect is the network and how to develop that. That is the connectivity between institutions and the individuals – the connectivity between those who are supporting researchers but also between researchers themselves."

Sean Farran, head of marketing and communications at Aspect and global innovation lead at LSE, remarked: "The community element is a key one. We ran an online festival last year and one of the observations from an attendee that stood out to me was, 'I have finally found my tribe'. They were coming from Australia, and what we are seeing more and more of now is talking to people across the world about Aspect that it aligns in some way with what it is they are working on.

"The other element is the opportunities that present themselves, both for the individuals and institutions, in having more visibility and mapping out the entrepreneurship ecosystem – seeing where the gaps are and how to fill them.

"Moving forward it is not only about what a

Julia Black

increase it, teach it to others and collaborate, how public and policy can come together and how different areas of innovation can collaborate."

Black added: "The question is to what end are we doing this, because the connectivity cannot be an end. To me, the end lies in the 't' in Aspect – transformation. There are a lot of academics who want to do good with their research and what is important is how they can go out and make an impact. A lot of that effort has been oriented towards policymakers, non-governmental organisations or other people, with academics doing it by adding in their ideas and insights. But there is only so much that policymakers can do. What we wanted to experiment with Aspect was: is there another way that you can mobilise your knowledge for public good and make it scalable, while developing it in such a way that the research becomes sustainable with an income or data stream? That requires using mechanisms of the private sector."

And the private sector was undergoing a changing zeitgeist, Black pondered, citing the increasing importance of social enterprises, models such as B Corp and a drive towards environmental, social and governance principles. "We are doing this in a very changed environment than it would have been even five years ago. You can start conversations with academics, saying 'it is not all evil'," Black declared.

"For the SHAPE disciplines it is a messier route partly because of intellectual property that you cannot protect in the same way. You have to find different ways to mobilise and scale, which means academics have to start thinking about the business plan much earlier and the TTO manager needs to move much earlier," she added.

Morven Fraser-Walther

Morven Fraser-Walther is the IP and innovation manager, and enterprise lead at University of Glasgow, as well as chair of the Research Commercialisation Community of Practice for Aspect. She said: "Social enterprise particularly in the university context can offer additional benefits that are interesting and different to researchers when we think about commercialisation of university-led research.

"Our ecosystem in Scotland is well-placed. We work very closely with Community Enterprise and other partners to integrate into the wider ecosystem that exists in Scotland around social enterprise.

"We have, importantly, funding opportunities in Scotland to be able to do this, and ways to internationalise through groups like The Challenges Group, for instance."

She added: "This is not an unknown quantity, there is a greater push towards social enterprise as it offers an exciting route for universities to think about in terms of fulfilling some of our values, aims and objectives that are rooted in the place in which we live."

One of the consortium's projects to commercialise research is the Aspect Research Commercialisation (ARC) Accelerator, a first-of-its-kind initiative globally to provide entrepreneurial training, ideation, mentoring and practical support to help SHAPE researchers build ventures from their research.

"ARC is funded by the original Aspect bid, a follow-on bid through Research England and the Economic and Social Research Council," explained Chris Fellingham, director of the accelerator and the social sciences and humanities lead at tech transfer office Oxford University Innovation.

The six-month programme was specifically aimed at research commercialisation, Fellingham stressed, with each researcher team following their own institutions IP and equity policy.

"We do not just want anyone's plucky startup – there are other places for that," Fellingham argued. As Aspect was free to join, universities could in theory become a member only to gain access to ARC, but the future model for Aspect and ARC was still a matter of discussion, he clarified. "Longer term, we are looking at financial sustainability for Aspect and there is a question mark as whether to it is a membership-funded organisation, which would cover the cost of ARC, or whether ARC seeks Research Council funding.

"My personal preference is the latter because ICURe is funded to the tune of £4m per year and ARC would be a fraction of that – it would also mean the Research Councils are covered for social sciences and humanities commercialisation. It seems like the logical thing to do, certainly to me, to get more value out of the research they are already funding."

ARC did not take stakes in companies because that would not make sense, Fellingham argued. "One, every university has their own IP policy and that would be a mess. Two, there is no legal entity for Aspect to hold the equity. Three, if we held equity, someone would need to manage that equity and that would add to the cost. And four, it would make it harder for researchers and universities to engage with ARC."

He added: "I do not think it would even work particularly well as a model because of the type of companies we work with – there are going to be fewer unicorns then you get in STEM, so an equity realisation model is less likely."

The programme offered was evolving quickly, Fellingham said. "Initially, we divided it into three parts. The first part was one-on-one entrepreneurial training, not wildly different from that which you would get on most accelerators. Market validation is the centrepiece, similar to ICURe. Then there is a pitch at the end with pre-seed funding that we included as part of our grant because it is a little harder for some of these projects to source funding.

"We pivoted in two key ways. One, we now link them with mentors very early on, and the mentors are responsible for dealing with the market validation and value proposition. In the first iteration, we were almost pretending that these were tech startups that are going to get investment and build digital products. When you pull accelerator training off the shelf, that is what you get. But they are not tech startups."

Mentors were a key part in trying to make the experience more bespoke, Fellingham added, and "giving SHAPE researchers one-to-one support as well as helping them on the entrepreneurial journey, which is harder for them because they are not as socialised to the idea that they could be entrepreneurs".

He continued: "I appreciate a lot of scientists are not either, but if you go to some very active parts, like medical science at Oxford, even if they do not want to be an entrepreneur, they know colleagues who are intent on doing it. It is not a crazy concept."

The other part that was changed, Fellingham elaborated, was the move to a multimodal model where "maybe a third will be a startup with a digital product".

"One third will be a service provider, like a consultancy," he said. "For example, Prof Roberta Guerrina at University of Bristol helps large companies with equality and diversity initiatives. How do you do it as a large company? How do you embed it? How do the stakeholders work? Which policies work? There is no product she can use, it is her going in, working with them and helping them implement it. Over time, she will build that as a consultancy. That is not a tech company, she cannot go to a VC.

"We needed people who knew how to build a consultancy, and instead of building a product where you try to find the market fit and scale it, it is more like a sniper bullet where you tailor your offering to exactly what the client needs. Slowly, you can standardise it and scale it, but it is a different pathway."


Chris Fellingham

The third change was slightly different, he said. "About half of them are social ventures, so we wanted to provide more support around that. What kind of financing might you access? It is obviously going to be more impact investment or debt financing, so again, different from the VC model that most accelerators guide you towards."

Fellingham, who described his personal philosophy as trying to "do public policy outside of government", added that a distinct advantage of commercialising SHAPE research was that, generally, capital requirements were much lower.

"A consultancy really does not need much to start," he deliberated. "In theory, you can incorporate and go off to your first client. That is a big advantage. If you are a life sciences business, there is no way to start without capital."

Beyond the low capital requirements, there were also significantly fewer to no regulatory hurdles, he added.

"In terms of them as entrepreneurs, there are pros and cons," he considered. "Some of them are stronger, socially, at communicating their work probably because a lot of the work that comes to us has already had an external partner and that is where they got the idea. That may be easier compared to a scientist who creates something in a lab and then that transitions harder.

"But there is more resistance to commercialisation in the SHAPE subjects. There is a sense among some that it is selling out or that it is inappropriate for publicly funded research to have any kind of commercial value. That can make it harder."

Black mused that people would often ask her why SHAPE research was not being commercialised. "It is, but it is done by Bain, McKinsey, KPMG, Deloitte, law firms and so on," she argued. "You need to find ways to figure out what is scalable – such as measurement, data-driven methodology, tool kits – and the academic can then get income from someone using their tool but also access the data to understand how it is used, which means it feeds back into the research.

"It is a different business model, much more bespoke. In STEM, the tech transfer office has a patent and then they have two choices – it is a spinout or a licence, and both are well-trodden paths.

"Success also looks different and that is the next nut we have to crack. It might not be return-on-investment and it will not be 20 years of work paying off with a blockbuster deal. Even income or investment metrics will probably not be the same. It will be impact on society, but we need to devise acceptable metrics for this.

"We are working in the right space now though because the rest of the private sector is trying to capture social impact metrics. There are more than 600 standards for ESG investing, so we are not short. It is shifting the understanding of the nature of capitalism."

Fraser-Walther agreed that there was often not the same socialisation of commercialisation but noted that Aspect and ARC had improved matters. She recalled: "When we first went out and asked our academic community if they wanted to talk to us, I was new in post and did not know what would happen. They could have all said no. We did not think that was going to happen, but it was a risk.

"Now that we are a couple of years in and we are looking for opportunities, they are more mature. There is a greater socialisation of that word 'commercialisation' – it is not a useful word, but it has some currency – and there is a greater understanding of what that could look like."

She noted that she did not like setting up SHAPE and STEM in opposition as many of the challenges remained the same for both areas, she argued.

"At Glasgow, I focus on the SHAPE disciplines but I have projects in the STEM disciplines. The challenges around innovation are around finding time for academics. They are around doing something that nobody's done before – putting that out into the world is and will remain challenging. We should not see this as being able to get over that barrier because I do not really see that as a barrier. It is a feature not a bug."

She continued: "If I look at the ARC accelerator cohorts and their destinations, many of them are social enterprises or potentially consultancies. Often, they have links with local authorities or national government. All of this is more atypical of a way that you might have previously carried out commercialisation within a university context, but that does not mean that STEM could not or do not do those things. It is just that we may not have done them before.

"There is a lot to learn from both sets of disciplines in terms of where both can go and where both could go together. Interdisciplinarity is something that is an essential rather than an extra."

She would be delighted if more Scottish universities would join Aspect, she added. Asked how she would try and convince her peers, she summarised: "Aspect to me is the opportunity to pilot things, to try things, to experiment, to iterate. It is a grand experiment made up of smaller experiments where we can see and test in real time how we develop business engagement, student enterprise, commercialisation for arts, humanities and social sciences. We can see all the different facets of that ecosystem and how we might interact.

"Secondly, Aspect is a way for us to have a collective voice for the SHAPE disciplines in terms of commercialisation. Personally, I have learned a huge amount from speaking to colleagues in other institutions, from being able to call on other institutions and ask about things I do not understand. It is a way for us to be able to interact, to try things, to collaborate in that very social science way of co-creation and advance the field."

Queensland University of Technology was the first to show interest in Aspect's work, and Fellingham noted that through talks he had given in continental Europe, he had identified a keen interest in SHAPE commercialisation there too.

"It could easily expand significantly," he speculated.

"There is a lot of interest in the Benelux countries. It occurs to me that in those countries, and to a lesser extent in Germany and the Czech Republic, there is a different understanding of the role of the university and this idea that they should be more engaged with the economy and society. My sense is there is not the same tension if researchers want to do something commercial.

"I will add, too, that Canada, Australia and New Zealand are hotspot areas. University culture is different there. I used to work at FutureLearn and those universities do not have the same highly traditional view that some countries do of the role of the university in society and they are more entrepreneurial as university entities."

Meanwhile, Black and Farran had been in touch with peers in Norway who were interested in joining. Black said: "Working between STEM and SHAPE comes more naturally to them because their research funding and structures are much more interdisciplinary than ours."

Interest had been growing in the US, too, Black added. After a presentation at AUTM's conference, there was now a special interest group focused on social sciences commercialisation.

"I am really encouraged by going international. We know the UK context and there is so much more that we can learn," Black said. "No one university has a whole host of academics who are doing this and they are not necessarily going to find their tribe within their home institution. By providing a network you have many more opportunities to meet like-minded people from whom you can spark new ideas."

Farran added: "It is also interesting to consider how this will shape identity. Talking to international parties, it is about people becoming aware that this is what they are doing. The UK is helping to forge that identity on a global scale."

Looking ahead, Fraser-Walther pondered: "I hope Aspect continues to experiment. I hope that it continues to pilot things that we do not know if they are going to work. I find that exciting. You often have a feeling or data that suggests something might work, but that is different to whether it does or not.

"I hope it retains that experimental, innovative core. I hope that what we will have done is to demonstrate internally at our own institutions and externally the power and contribution that the SHAPE disciplines bring through economy, through people, through society.

"And I hope that we can show that impact in a much more targeted way around what it is that we bring to the table."

Fellingham hoped in a five or 10 years' time, Aspect would have a few "big hits". "There are really obvious areas where SHAPE commercialisation has already had a big impact," he argued. "For example, climate change, education, finance and health and social care are some of the big things, as well as potentially analytics services for businesses."

Edtech, he said, already had delivered good examples, such as OxEd – which did not go through ARC as it was spun out earlier. The company assessed the language ability of children aged five to eight, and it secured funding during the pandemic to help identify pupils who were at danger of falling behind and helping them catch up.

"For me, that was a really fantastic story of a social science startup actively contributing to the pandemic response," Fellingham noted. "Obviously, Oxford's big stories were around the vaccine and the recovery trial – perfectly correct – but the fact that other systems like education were at risk and we had a startup that was helping correct that is an enormous story."

He cautioned: "What I do not want are these patronising responses that you sometimes get along the lines of 'oh yeah, social science is important, it helps you think differently'. These are organisations which can have a large impact and sometimes deliver big profits. The sector will be more varied, but we need a few big hitters to change the perception and realise the value."

There is one major institution in England still missing from Aspect's membership list: University of Cambridge. Emma Salgard Cunha, commercialisation manager for arts, humanities and social sciences at tech transfer office Cambridge Enterprise, said: "We are watching Aspect with interest. I really admire Aspect. It has been, amongst the Connecting Capability Fund projects, an example of genuinely innovative collaboration with a lot of different facets and great people involved."

Cunha ascribed Cambridge's decision to remain outside of Aspect for now to the fact that when the

Emma Salgard Cunha

collaboration launched, Cambridge was already active in the area and so, "especially the business development work that Aspect did in the first year and the concentration around thinking about interactions between researchers and existing entrepreneurs or spinouts or startups, we had already done".

Indeed, Cambridge Enterprise had been looking at SHAPE since 2018, she explained. "Our greatest area of engagement has historically been in academic consultancy services. When we initiated our project to explore arts, humanities and social science commercialisation more widely, we had great traction with academics in the schools of humanities and social sciences and we were hoping to build on that to bring engagement into other areas of commercialisation support.

Cambridge Enterprise aimed to engage with researchers and expose them to "the whole breadth of what commercialisation looks like", Cunha continued. "That approach has borne good fruit and we now have plenty of active commercialisation projects representing disciplines across the whole of the organisation."

Cambridge Enterprise had, under Cunha's leadership, relied on a matrix team for its SHAPE project, pulling in expertise from across its technology transfer, consultancy and research tools units, but was now recruiting two dedicated staff.

Cunha, like Fraser-Walther, cautioned against seeing STEM and SHAPE disciplines in opposition. She explained: "We should not think of software as being technical and the arts and social sciences as happening separately. Software and data are core to social science research and for its dissemination.

STEM crossovers were not only found in software. “We have researchers working on new materials and designs based on new materials. There are overlaps between engineering, civil engineering, systems thinking, design and the social sciences and the arts.”

There was a danger social scientists involved in collaborations could be sidelined, Cunha observed. “It is almost like their expertise is not fully recognised and they are considered as the brand or communications person who is bringing a shiny wrapper for the technology. That is not what is happening. The insight that the social scientist or the arts and humanities researcher brings is often the crucial enabler and the technology is then built to their specification. We cannot remove the social scientist just because the technology exists.”

She stressed that tech transfer practitioners needed to recognise this danger and work proactively.

Externally, a lot of building blocks for progress were in place, Cunha said. “The engagement from the Economic and Social Research Council has been exemplary. We need a sustained push from research and innovation funders to recognise the value of commercialisation beyond the pound signs and to equip universities to be able to work with SHAPE researchers.

“It is often through a translational research project or an innovation-focussed call from the Research Councils that our researchers are realising the possibility of finding real-world beneficiaries for their work and trying to push research outside of the university for public good.”

Despite these building blocks and support internally at Cambridge, she said, “in the wider technology transfer community there probably is still a mindset around protectable, registrable IP first, and application and impact later.”

She continued: “We have to learn to recognise the value that comes not in the form of patents and support our researchers to recognise the value of their work too. Nor do those of us working with arts, humanities and social science have to feel like we have to replicate STEM commercialisation. We can be flexible, we can think with the researchers, we can help them to find new mechanisms for impact.”

STEM commercialisation practitioners offered a wealth of expertise to their peers focused on SHAPE, but it was a two-way street, Cunha noted.

"Certainly, we will develop best practices in the arts, humanities and social sciences, which will change STEM commercialisation. That is inevitable and a good thing."

Cambridge, too, had delivered interesting examples of spinouts, Cunha said. One was Versed AI, a spinout out of the Faculty of Modern and Medieval Languages and Linguistics and the Institute for Manufacturing in the Department of Engineering. The company maps supply chains in real time to identify risks – be that understanding second-tier suppliers and the interdependence of nodes within a manufacturing supply network, geopolitical risks, or risks of modern slavery.

Another, "completely different", example was Shaping Horizons, Cunha noted. The spinout emerged out of the Centre for Latin America Studies, having initially been funded as a research project by the UKRI's Global Challenges Fund. "The research project set up incubation programmes and developed training and resources for hundreds of young people between Latin America and the UK, so that they could engage in creating new projects which addressed sustainability issues in their environments. The spinout is a social enterprise," Cunha said. "What is cool about Shaping Horizons is that it provides training and mentoring for young people, and it also provides training for the mentors. Indeed, it is now starting to spin out its own social enterprises, because what happens when you get engaged innovative young people together to deal with sustainability problems, they come up with great ideas. They have not yet needed investment from us, but we hope that time comes soon. They incorporated in August 2021."

Cunha concluded: "Social science companies have a good understanding of the problem that they are trying to solve. They are not in the position of having invented something and now trying to find the application. Their specialism is absolutely in understanding where the problem sits; they understand the system very well.

"For us, commercialisation does not necessarily mean that it needs to make huge amounts of money. Of course, sometimes making money is a good proxy for the level of impact that something is making, but it is not always the case."

Respect process by challenging it

> **Mark Mann on why processes exist and why they must continually evolve.**

By Mark Mann
Founder, Mark Mann OÜ

There is no doubt in the knowledge exchange business that there is a hell of a lot of process. Whilst undertaking it I made no secret of my loathing for it; being imprisoned by paperwork of any form is just not me. However, my loathing for paperwork should not be confused with disdain. There are very, very good reasons why processes are there. Here is a non-exhaustive list of the usual biggies:

• Organisations that fund research often have some rights to the results. The agreements can be quite vague, and sometimes your innovation comes from a combination of sources. This needs sorting out before you can start selling stuff.

• If you file a patent, when it grows you have multiple territories with various deadlines, bills, office actions, challenges, paperwork and so on. You can easily lose track of what needs doing when. If you do, you could invalidate your patent. You need process to keep on top of things.

• Researchers and academics have day jobs and responsibilities. If they were working in any other business, you would need to get the permission of your boss to even consider doing something other than your day job.

Universities, though with more freedom, still want to make sure that their lectures are going to get delivered on time and to the same quality before anyone starts thinking about this knowledge exchange nonsense.

I have a big “however” here though. Processes are instigated in the present, usually to stop some disaster happening again. I am not going to highlight any occasional PR disasters universities have had when someone on the innovation side of the university has gone rogue – no need to drag that shit up again. The processes instigated as a consequence are usually very blunt instruments; they do not suit all projects in all situations. They are done for very good reasons, but deal with situations in the present and do not usually envisage what might happen in the future.

Processes should and indeed must continually evolve. Take, for instance, the relatively new area of commercialisation in the arts, humanities and social sciences. There are usually no patents at all, yet all the processes around commercialisation are designed with patents in mind. Furthermore, the intellectual property generated is often weak (though certainly not always) copyright. Does it therefore matter as much whether funders have rights to the IP generated? Your legal advisor will tell you “yes, there is a risk” and there is a small one, but the risk for your institution in the real world is much, much smaller than it would be if your IP were patentable. At the other end of the scale, how many universities have an ethics panel for commercialisation in the arts, humanities and social sciences? Sure, they all (should) have one to gain permission to do the research in the first place, but is there anyone responsible in a technology transfer office to check on the ethics of how you should sell a social science-derived intervention and do they have the necessary expertise to do so? You could really mess people’s lives up if you get this wrong.

I confess that a big part of my strategy of getting things out whilst at Oxford was to hack away at process. I would do so by going back through the institutional memory to ask why a process was put there in the first place. At the heart of all decisions were two fundamental principles:

1. That the reputation of the university needed to be protected above everything else.

2. That if any money were to be made from an innovation supported by the university, the university should get a fair share.

The first principle I had the deepest respect for, the latter, not quite as much. Let us face it, one of the primary aims of universities in the 21st century is to diversify its income, and commercialisation is seen as a promising route. Very, very occasionally, a university gets lucky and makes a packet from a particular patent or spinout. Usually, commercialisation earns the equivalent of pocket money. It is great as it is unencumbered income (that is, you can spend it how you like), but compared to the research budget it comes from, it is puny. At Oxford, for instance, the income it gets from the Research Excellence Framework assessment of its impact alone dwarfs the total income from Oxford University Innovation, which for most universities would be a hefty amount (about £20m per year).

Where am I going with all this? There are three points:

• Processes should be relevant to the situation – do not put everything in the same bucket. It might seem fair, but it is not. Understand what risk you are managing. Sign off low-risk decisions quickly.

• Do not design process on false assumptions. Universities largely do nt make huge amounts of money out of commercialisation. Impact assessment is worth far more money. Therefore, in most cases universities should pile it high and sell it cheap.

• Do not forget to look to the future. By all means strip redundant processes away, but do not forget that you will probably need new ones too, but do try and make them efficient.

This comment first appeared on LinkedIn.

How The Vaccine Group protects humanity through animal health

> **CEO Jeremy Salt talks about how the University of Plymouth spinout is working to prevent zoonotic diseases such as Ebola and covid.**

By Thierry Heles
Editor

There are, in the UK alone, more than 30 indigenous zoonoses – diseases transmissible from vertebrate animals to humans – ranging from anthrax to Lyme disease. Worldwide, there are more than 200 types, according to the World Health Organization, and they make up a significant percentage of all newly identified infectious diseases as well as several existing ones.

Some zoonoses have a large direct economic impact beyond the human health implications. In the UK, more than 27,000 cows were slaughtered in 2020 due to bovine tuberculosis and the costs for controlling the disease run at around £100m ($130m).

Others have caused epidemics in the past, such as Ebola, which was responsible for more than 11,300 deaths over the course of 2014 to 2016 – a large proportion of the suspected and confirmed more than 28,600 cases.

Of course, the most severe zoonosis in living memory has been the covid-19 pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (Sars-CoV-2). As of mid-March 2022, there have been more than 464 million cases worldwide and more than 6 million deaths. The need for a vaccine was acute, and thankfully spinouts Moderna, BioNTech (through its partnership with Pfizer) and Vaccitech (through University of Oxford's deal with AstraZeneca) all had technologies that were able to target the spike protein.

While quick to develop and deploy, the approaches had a significant drawback: as the virus mutated, the creation of booster shots became necessary and all three vaccines now require three shots to remain as effective as possible.

The Vaccine Group (TVG), a spinout of University of Plymouth, is working on a best-in-class vaccine. TVG's technology revolves around a herpes virus-based animal vaccine platform that it primarily uses to protect animals against infectious diseases rather than wait until they have arrived in humans.

Jeremy Salt, chief executive of TVG, told Global University Venturing that the major difference between its vaccine and commercially available ones was that it particularly targeted the T cell response. "Because of the way that the herpes virus replicates normally, and the vector that we have, we can generate very strong T cell responses," Salt noted. "We have seen a lot of variation in the spike protein over the time that all of the epidemiological sequencing has been done. It is inherent in T cells epitopes that they do not tend to vary as much as the B cell targets on the surface of the virus."

He elaborated: "From the outset, our approach was to make use of that particular attribute of the vaccine – targeting less variable T cell epitopes – and we then incorporated other proteins, which were not constrained by being the target of the anti-spike antibody. We were able to include two other proteins from the virus. We hope that this would then be a useful vaccine against a wider range of variants."

This plan of attack has been off to a promising start. TVG approached Pirbright Institute, focused on infectious diseases in animal farms, to look at T cell responses in a pig model. It "might sound odd", Salt acknowledged, but pigs "are a nice correlative in terms of their immune response".

The model showed that TVG's vaccine not only induced very strong responses against the novel coronavirus but also against the original strain that had been responsible for the Sars outbreak in 2002.

Jeremy Salt

"Obviously, we do not need a vaccine for Sars-CoV-1," Salt acknowledged, "but the extrapolation is if we can protect against Sars-CoV-2 and as distant a relation as Sars-CoV-1, it is not unreasonable to expect that anything in between those two, and on the other side, is going to be covered."

TVG has discussed the data with the UK Medicines and Healthcare Products Regulatory Agency, who were "extremely helpful" and is now using internal funding to generate the additional data needed to be able to move into phase 1 trials.

Once TVG reaches that point, it will need a strategic partner as it does not have the resources in-house. But rather than this being an issue, it is one of TVG's strengths. The spinout is a relatively small business, yet it has a huge network through the two-decades-long work of its scientific founder and chief scientific officer Michael Jarvis.

Jarvis, with the support of University of Plymouth's tech transfer office and commercialisation firm Frontier IP, incorporated TVG in 2017 and the spinout continues to collaborate with the university as Jarvis maintains a joint appointment – he is an associate professor in virology and immunology.

The spinout's initial work was built around a collaborative grant involving partners from Europe

> *The advantage for us in these partnerships is that animal health companies have huge capability to determine where potential markets are. Whereas when we are tied into grant funding, the targets are within the scope and control of the grant-awarding body, not necessarily the commercial market.*
>
> Jeremy Salt

and the US, such as the Defense Advanced Research Projects Agency (commonly known as Darpa) to look at the possibility of intervening in the reservoir host of a zoonotic infection and trying to reduce the risk of spillover into human populations. A big part of that project involved the development of software to be able to model the potential impact of such spillovers.

Since then, TVG has undertaken research into vaccines for Lassa fever, Ebola, bovine tuberculosis, E. coli mastitis, African swine fever and streptococcus suis. The development of a vaccine for the latter is jointly funded by the British and Chinese governments. Streptococcus suis occurs in pig livestock and a vaccine would additionally enable a reduced antibiotic use to combat antimicrobial resistance.

Some projects were supported through BactiVac, a Research Council-funded organisation that awards small amounts of pump priming in the context of bacterial vaccines. It was a "slight diversion" from zoonotic diseases but "the common element was the issue of antimicrobial use", Salt explained.

Moving forward, TVG expected to increase its focus on high-impact animal diseases but would continue to pursue vaccines for zoonotic diseases, Salt revealed. "The actual amount of work on zoonotic diseases may remain the same, but the overall size of the company will increase. We are looking now at diseases such as porcine reproductive and respiratory syndrome and developing a vaccine with protection against a broader range of strains. This high-impact swine disease is one of the key global issues in terms of loss of productivity in the pig industry, and that project is being done with commercial partners; we are lining up a route to market straight away."

Strategic partnerships were a key component of TVG's business model, Salt stressed. The spinout developed vaccines to either proof of principle or proof of concept stage and then licensed them out, he elaborated. "With grants, we have not necessarily started with a commercial partner every time, so there has not always been a defined route to market.

"The flexibility that it gives us is that it is a relatively limited capital investment to be able to demonstrate proof of principle. The other advantage is it creates a better opportunity for us to find a range of partners later on, rather than tying ourselves to a single partner who may decide ultimately for their own reasons that they do not want to continue with a product. It also gives us a chance to work on a range of diseases."

There were disadvantages to this model, Salt admitted. "We are tied into a royalty model. There may be ways of generating more income if we owned and developed the products, but that would be a huge step for a startup like us. The model we have is appropriate for where we are.

"We will slowly evolve to get to a slightly later point in development, but what we are very keen to do with the diseases which we see as key for animal health, rather than in zoonotic diseases, is to find a partner early on who will commit."

He added: "The advantage for us in these partnerships is that animal health companies have huge capability to determine where potential markets are. Whereas when we are tied into grant funding, the targets are within the scope and control of the grant-awarding body, not necessarily the commercial market."

The plan to go slightly further down the development track stemmed from Salt's prior expertise gained in business development. He explained: "I have a very clear view of what companies see as the components of a proof of concept. Often scientists believe they have a product earlier than the company might. Where I would like to take us is to potentially immediately transfer the technology into a facility that could, in theory, go into regulatory-type pivotal studies. In other words, if we can get a little bit further, we would have more knowledge of how our constructs perform at something useful to manufacturers."

It was a goal that TVG was looking to finance through its next investment round, Salt said, but even in the medium term, he did not see the company going beyond that stage. Speaking of money, Salt added that he had been positively impressed with innovation agency Innovate UK: "They seem very well organised, motivated and have been extremely helpful in trying to find other sources of money for us."

The government support had generally been favourable to grow a company like TVG, he continued. The country was "well organised on the various vaccine networks, both on the animal health and human health sides".

Notably, vaccinology was a relatively recent area that only emerged over the past 10 to 15 years, he noted. "Previously there was microbiology, immunology, virology, molecular biology… Gradually people have come to accept that vaccinology per se might sound very applied – therefore, why would any basic researchers want to get involved – but the British government has done a good job at backing this concept that vaccinology needs its own investment. To encourage people to work on vaccines and look at the specifics of translational research has been really useful.

"How do we do that translation? It comes in multiple ways. It can be encouraging SMEs to get involved in early-stage projects. It can be allowing companies to be part of these collaborations and giving them money. That funding is now available to companies like TVG helps to put some flesh on the bones of that idea that was built up through the vaccine networks. People are also prepared to put money into the applied sciences, on top of merely the basic research. Then, there are the Vaccine Manufacturing and Innovation Centre at Oxford and the Future Vaccine Manufacturing Research Hub at Imperial College London."

Such a well-rounded ecosystem was a crucial aspect of emergency responsiveness, Salt argued. "Unless there is a commercial partner, it is very difficult to make the transition from bench scale to manufacturing – it is not usually done in one jump. Even groups like TVG, which are slightly more informed about commercialisation processes than the average university, cannot take technology and put it straight into high-volume manufacturing."

This was where actors such as the aforementioned Pirbright Institute came in, Salt explained. It announced last year plans to establish an animal


Michael Jarvis

vaccine facility partly funded by the UK Foreign, Commonwealth and Development Office and the Bill & Melinda Gates Foundation.

"This is physical infrastructure that allows the flow through from the research base into the scale that you need to be able to transfer into manufacturing," Salt stressed. "It is tangible and that takes time."

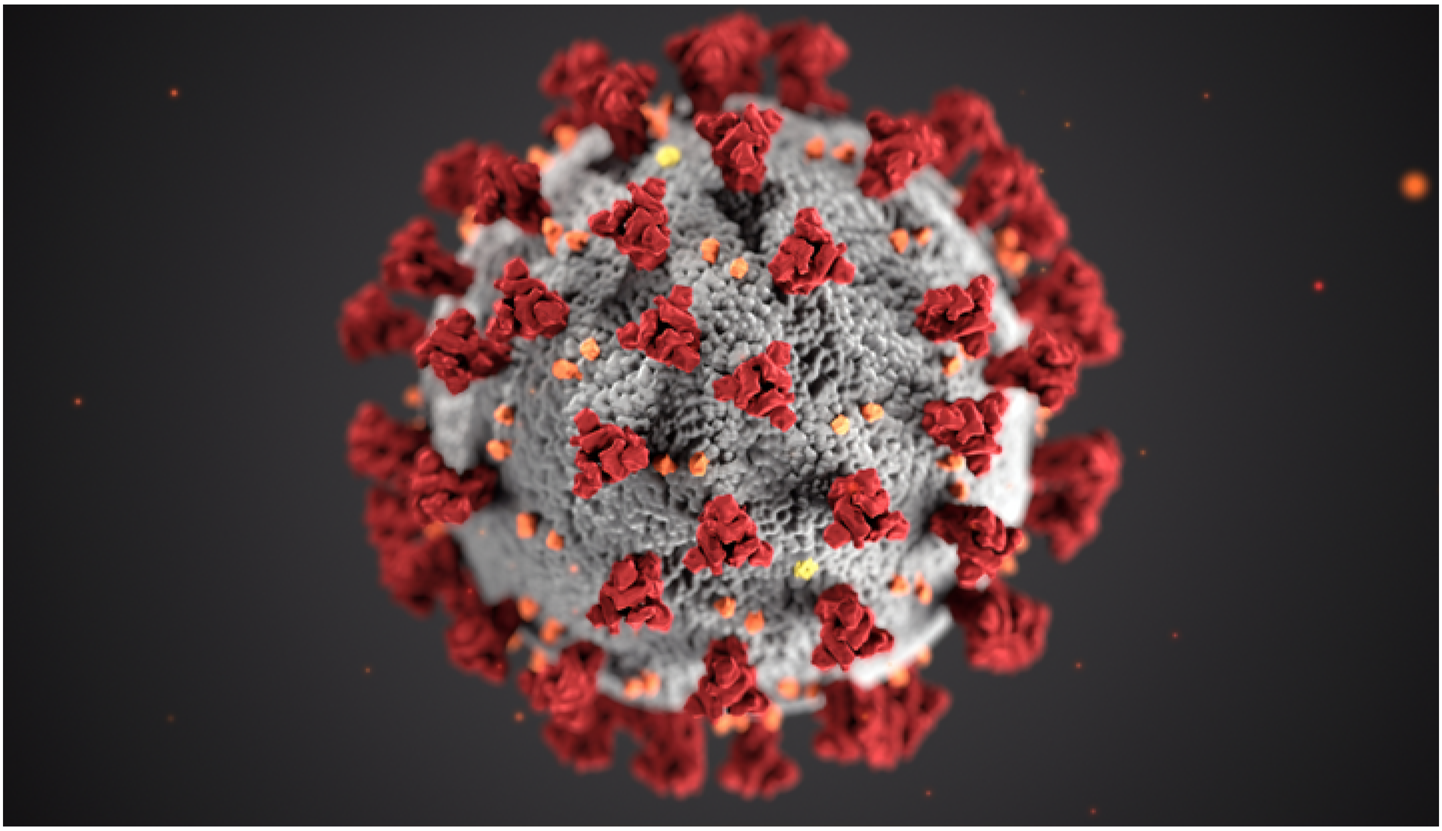
None of this was a response to the covid pandemic, Salt said pointing to the Jenner Institute at University of Oxford which was established in 2005 and produced the foundational research enabling the AstraZeneca vaccine. "The ability of the scientists to create that construct so quickly and the competency and confidence that the regulators had to be able to dramatically change their processes is not instantaneous. It has been built up over years and a lot of it on government grant money."

Existing facilities were motivated by a desire to be prepared for disease X – a term officially adopted by the WHO in 2018 as a placeholder for a hypothetical, unknown pathogen that could cause an epidemic – but they "are not overnight successes", Salt said. Having such facilities available in quiet times for companies like TVG was very helpful, he maintained.

Challenges remained, he lamented. As TVG moved closer to a phase 1 trial for its covid vaccine, the amount of available public funding had been reduced because the acute need was gone. Notwithstanding this, he added, "what we are left with is a huge amount of interest in vaccinology and the infrastructure. We feel it is relatively urgent that we are continuing this three-pronged approach effectively – pursuing government outside any grant cycle, making applications where there is a reasonably short turnaround and talking to our own investors about the possibility of funding this next step."

There was not, however, any "large missing chunk" left in the UK's public ecosystem after decades of strategic investments and an evolution of university thinking on research commercialisation, Salt celebrated. "The disappointing bit for me is not a government issue," he said. "It is the limitation on the number of private companies who ultimately have the capacity to go ahead and develop products and market them on a global scale. As somebody who has been involved in this industry for most of my career, it seems that companies have moved away from the UK. We have AstraZeneca and GlaxoSmithKline, but there is a feeling that there used to be a wider range of choices and it is a little bit narrow today."

Salt was unable to offer insights into why big corporations had chosen to leave or foregone a UK base. For TVG, the tax environment was favourable to collect investment, he declared, but he was not clear whether it was a lack of support or a disincentive that



caused companies like Zoetis, his former employer, to leave.

Ultimately, it did not matter to TVG, he claimed. “Europe and the world are accessible to us. But from the UK economy point of view, it is slightly disappointing that we do not have any of that.”

Perhaps the most crucial part of the UK ecosystem for TVG was Frontier IP, without which “we would not be sitting here,” Salt underlined. While the university did a good job supporting Jarvis with the technology development, protecting the initial IP and encouraging him, their expertise ultimately did not lie in running a business. “On a day-to-day basis, Frontier IP give us operational support and that knowhow makes it far easier for a spinout like this to be set up.”

He continued: “The key thing in addition to operational support is strategy. Where we are going as an organisation, being able to build up the business plan with the financial modelling that is available within Frontier IP, and the networking with potential investors is crucial.”

The importance of private funding was not just about money, he said. “It is the breadth of what we can work on. If we were continually applying for grants, our direction would be dictated by what the grant funders are prepared to consider. With our shareholders, we have a chance to persuade them our vision is going to give them a good return on their investment. It is ultimately for them. It has freed us up by having these contacts and Frontier IP giving us access to these investors.”

That vision for TVG’s future would involve it exploring the utility of its technology in other areas, Salt revealed. Specifically, the spinout planned to look into companion animals and using its platform as a gene delivery for functional proteins.

Salt had joined TVG because he was attracted to this stage of company development and size, and because it gave him the opportunity to apply the knowledge accumulated sitting on the other side of the table. “It seemed to be a good time to build on the data and trying to add to it, maximise its potential uses and expand the business,” Salt reminisced. “It was attractive to look at a technology, have a chance to influence where it might go and ultimately build the company into a money-making venture.”

He concluded: “It was nice to think something may come of all of this.”

It may be early days still for TVG, but with the leadership of Salt and the expertise of Frontier IP behind the spinout, there can hardly be any doubt that something will, indeed, come of this.

Venture enters its age of ashes

> **Public market challenges are leading corporates to reconsider their strategies, with some spinning off their venturing divisions.**

By James Mawson
Editor-in-chief

Larry Fink, head of the world's largest asset manager, BlackRock, told investors in his annual letter that globalisation was over. Business and capital have retreated from Russia in the face of its invasion of Ukraine. This could be bad news for inflation, the economy and by association the stock market.

The initial public offering (IPO) and mergers and acquisitions (M&A) markets have already slowed dramatically in the first quarter and looks set to remain subdued in the second. According to a report from Renaissance Capital: "Plummeting returns at the end of 2021 effectively put an end to the past year's IPO boom, and coupled with the escalating war in Europe, issuance ground to a halt in late February."

The plummeting IPO volumes are mainly due to the 90% fall in the number of special purpose acquisition companies able to list in the US in the first quarter. Given Spacs' target acquisitions were often loss-making, venture-backed startups this drying up of liquidity will knock M&A as an exit route and put more pressure on them to raise further rounds even if at lower valuations.

The fall in public market valuations

has knocked on to the fair valuations of venture capital investments. Tiger Global Management's flagship hedge fund fell nearly 34% in the first quarter, due to poor-performing stocks and markdowns of private holdings, according to an investor letter seen by reporters at Bloomberg. "In hindsight, we should have sold more shares across our portfolio in 2021 than we did", the firm wrote in the letter. "We are reassessing and refining our models using all the inputs available to us."

Lennar, a US-listed house builder, last month said it would spin off its corporate venturing unit after losses from its investments.

As reported by Global Corporate Venturing, Lennar said it would spin off its LenX investment division later this year to become a "pure-play homebuilding company," citing volatility in the valuations of the publicly-traded companies it holds a stake.

In its latest quarterly earnings report, Lennar recognised $395m in paper losses during the quarter to the end of February from its investments in six publicly traded tech companies: real estate tech startups Opendoor, banking software provider Blend Labs, rental manager Sonder, home insurance startup Hippo, solar and energy service provider Sunnova, and self-guided tour provider SmartRent.

Lennar had backed Sonder's $170m series E round and Opendoor's $135m round before their flotations. LenX is also a major stakeholder in Doma, a publicly traded digital title, escrow and closing provider, but uses a different accounting method to estimate its value, according to news provider Inman.

The group has been an active investor as LenX. Its deals this year include Veev, the US-based operator of a vertically-integrated homebuilding service, which secured $400m in a series D round, joining the $185m second tranche of US-based advanced materials-focused homebuilder Icon's series B round, investing $30m in Withco, the US-based creator of a software platform designed to help small businesses manage commercial property, and walkable neighbourhood developer Culdesac's equity financing as it prepares to open its first housing units.

The challenge for even the recent deals is their valuations could seem overpriced. One expert advisory firm that lawyers use to provide independent valuations said even under the least conservative metrics many rounds priced by VCs even in the past

month were overvalued by 50% or more. Of course, VCs are sitting on record amounts of dry powder – money raised from their limited partners on which they will earn management fees once put to work – and so most tend to be pro-cyclical investors, that is they do more deals at the end of the economic cycles than at the start.

Corporate venturers are often caught up in VCs' hype but face more danger given chief financial officers and executive change can pull the plug on even successful groups unless strategic impact and experience can pull them through. Education is vital to prevent the more than 1,000 corporations that have started venture investing since the pandemic first hit from folding causing reputational damage to the industry and affecting a generation of entrepreneurs as well as preventing corporate executives screwing up even established teams.

More than 60% of the senior executives at Fortune 500 companies Stanford academics Ilya Strebulaev and Amanda Wang spoke with confided that their parent companies do not understand the norms of venture capital.

This is leading more of them to the GCV Institute where about half the 200-plus corporate attendees to courses last year came from those learning how to "land the value of CVC" inside the organisation (the other half came from the CVCs learning the latest insights of organisation and professional development).

The totemic investor for this generation is of course SoftBank, which has invested about $100bn in the past five years to buy stakes in private companies.

SoftBank founder Masayoshi Son has told his top executives to slow down investments, as the world's largest tech investor seeks to raise cash amid falling tech stocks and a regulatory crackdown in China, according to the Financial Times.

The estimated writedown at the Japanese group for this quarter stood at $30bn, although a recent uptick in some shares meant it was now closer to around $20bn, the people told the FT. "Valuations for Chinese companies listed overseas have collapsed," said one person close to SoftBank's China team to the newspaper. "We do not expect a turnround anytime soon."

The value of SoftBank's Alibaba stake plummeted from about $208bn in November 2020 to $69bn in March, while its stake in ride-hailing giant Didi was about $9bn underwater, the FT said.

One person familiar with the company's plans added to the FT that SoftBank was pushing to raise cash and was evaluating assets that could be liquidated. Early

in March, SoftBank sold a $1bn block of shares in the South Korean ecommerce company Coupang, at under $21 per share, a 40% reduction from its IPO last year.

The Japanese tech group is also finalising loans worth as much as $10bn tied to the IPO of chip designer Arm, following the collapse of its $66bn sale to US peer Nvidia this year.

Arm's IPO is expected to be on US markets as its main executives and customers in Apple and Qualcomm are there. However, Arm faces the open source threat of Risc-V so whether its valuation can reach its reported heights of $60bn seems a stretch to some who know the company well talking on background.

SoftBank has an estimated $23bn of cash and was confident of continuing investing, albeit at a slower pace than the about 200 deals it struck last year. Speaking at a Los Angeles venture capital conference in March, Nagraj Kashyap, a managing partner at SoftBank's Vision Funds after joining from peer Microsoft's M12 CVC unit last year, said the fund aimed to make fewer investments, but with higher amounts of conviction. "There is a slow reset of expectations that is trickling through the private markets," Kashyap said as reported by the FT. "They have not caught up to the public markets, clearly."

Logan Bartlett, partner at VC firm Redpoint, agreed in its state of current market report last month that "private markets have not yet meaningfully corrected. [There is] anecdotal information about retrades and lower prices but not yet widespread."

He pointed to deals at 100 to 200-times annual recurring revenue (ARR) were still happening regularly.

And Bartlett added in summary: "[We] can try to draw insight from internet bubble and housing crisis for how it might impact private markets. Each took about 10 quarters to go from peak to trough. [This] would mean we are still 2.5 years from bottom."

However, the private capital markets are now much bigger than they were back in 2000 or 2008 and a roiling market will have more impact than the limited effects the dot com bubble imploding had 20 years ago.

Unregistered investment companies – comprising venture capital, hedge, and private equity funds – hold more than $14trn in net assets, according to the US regulator. By comparison, the entire US banking sector holds only a little more than $20trn of assets.

The nature of funds should mean there is little systemic risk compared to toxic derivatives at banks but wiping out a lot of money will still hurt and cause scars.

Funds offer better returns through diversification, committed capital and more powerful governance than episodic investments by business units or corporate development teams more rewarded for M&A.

As William Birdthistle, director for the division of investment management at the Securities and Exchange Commission, told the ICI Investment Management Conference at the end of March: "To paraphrase the historian Francis Fukuyama, the investment company – or at least the collective investment vehicle – might represent the end of finance. The fund as a financial concept appears to have won, for now."

And out of the ashes of the impending devaluation crisis, post-globalisation could come the seeds of better decision-making about which companies to back to build the portfolios in these collective investment vehicles.

The blockchain or Web3 could offer better decision-making using the wisdom of crowds through voting technology and algorithms than available historically. In which case, and along with the sums seeding innovation across the spectrum from healthcare to climate change, finance and communications, the massive sums invested in startups and new ideas since the golden age of corporate venturing ended about five years ago will not have been wasted. Like a phoenix emerging from the ashes, it will bring forth the opportunities to make the world a better place.