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An industry of major growth

While many sectors were dealt a severe blow by the COVID-19 pandemic, biotech and medtech saw continued growth and are thus attracting top candidates even for non-scientific roles. According to [McKinsey](#), between January 2020 and January 2021, “the average share price for European and US biotechs increased at more than twice the rate of the S&P 500, and Chinese biotechs performed more than six times better, with their average share price more than doubling in a year.”

With this growth comes a major need for the best personnel. As Michele Porreca, Chief People Officer at US-based company Prelude Therapeutics says, “Science is leading candidate attraction.” Jörg Trinkwalter, CEO of Medical Valley EMN e.V in Germany, concurs, saying that due to the pandemic, “healthcare is probably one of the most stable growth areas worldwide.”

Trinkwalter predicts that healthcare will remain a “market of the future” because of demographic changes and global population growth. With greater strain on health systems, technology and talent will increasingly be sought to help the sector. In this white paper, we explore some of the current trends, challenges, hubs, and recruitment dynamics in one of the world’s most exciting and fast-growing sectors.



TRENDS

Areas of Innovation

Within life sciences and health, there are disciplines that stand out above others when it comes to biotech. According to Porreca, oncology is a “hot market.” She says competition is strong with a “small pool of experienced leaders” who are drawn to newer technology platforms such as CAR T-cell therapies (a treatment in which a patient’s immune cells are changed in the laboratory to attack cancer cells) and stem cell therapy (the transplantation of blood stem cells to treat diseases and conditions of the blood and immune system).¹ Oncology is also earmarked by Oliver Kühn, a managing partner at Swiss company AUDAX & Socius Pharma Consulting, as a major field of innovation.

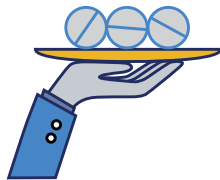
When asked what the major drivers for growth are for the medium term, Kühn said, “The big driver is certainly oncology, because prices will not rise immeasurably. From oncology you can quickly get to personalized medicine.”

1. Bristol Myers Squibb is building a new CAR-T plant at the Leiden Bio Science Park dealing with stem cell and gene therapy. They will need 500-700 new employees. <https://www.bms.com/nl/about-us/onze-productiefaciliteit-in-leiden1.html>

Like other experts, he also highlights the ways in which the COVID-19 pandemic has galvanized innovation in the health sciences. He says that because of the pandemic, mRNA vaccination “has gotten a big boost.”

Sylvie Ponchaut, Managing Director of BioWin, the Health Cluster of Wallonia, Belgium, also references the pandemic, saying it “has created fantastic new opportunities, in particular in cell and gene therapy.” Research in these fields has grown and, in turn, therapeutic approaches that are “highly personalized.” This, according to Trinkwalter, is one of the four Ps that defines the vision of technology in medicine: it is “personalized, participatory, preventative, and predictive.”

FOUR P’S THAT DEFINE THE VISION OF TECHNOLOGY IN MEDICINE



PERSONALIZED



PARTICIPATORY



PREVENTATIVE



PREDICTIVE

For Antti Vuolanto, COO at Herantis Pharma in Finland, the focus on prevention is a major trend. Speaking about diseases that affect the central nervous system, such as Parkinson’s Disease, he says the current drive is a move away from symptomatic treatment to ones that could cause diseases from progressing. Despite major financial investments and efforts, the pharmaceutical industry has not been able to develop disease-modifying drugs that can achieve this. Vuolanto blames this on a lack of a thorough understanding of the disease pathology, and that is where biotech comes in. Many big pharma companies and small biotechs have “invested a lot in understanding the underlying biology” and this work is starting to generate “meaningful outputs.”

He cites as an example a new Alzheimer’s drug, aducanumab, from Biogen that was recently approved by the FDA and which is designed to clear away clumps of the protein that causes the disease. “I would expect that during the next 10 years, there will be several major breakthroughs in the business, meaning multiple

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—Antti Vuolanto, COO, Herantis Pharma



blockbuster drugs on the market—in a similar manner as immune-oncology drugs have penetrated the cancer treatment markets during the last 10 years,” he says.

Ida Haisma, Managing Director at the Dutch-based foundation Leiden Bio Science Park, mentions that the industry mainly tries to develop early diagnostics, but there are also a few early start-ups in Leiden that try to use the “(model) disease” to find a drug that does indeed alter the progression of the disease. In addition, neuropsychology will also be indispensable in the investigation of the biological mechanisms behind neurological disorders and the effects on the cognitive function of the brain.

Another key area is medical technology that is used directly on the human body in a multifunctional way. This is according to Patrick Guidato, the manager of the German-based Cluster Medizin.NRW (North Rhine Westphalia). By way of an example, he says, “One would no longer have a normal stent that keeps the blood vessel open, but one that also measures blood pressure and is biohybrid-processed so that it is more compatible with the immune system and may transform into tissue over time.” More generally, he adds, the best innovation results when we think in the correct order. A common problem in basic research is that “people sometimes develop according to the principle of ‘technology seeks application’.”

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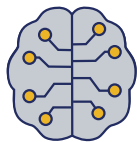
In this business, I can bring well-being to patients with unmet clinical needs, and bring hope to those who have lost it.”

—Antti Vuolanto, COO, Herantis Pharma

AREAS OF INNOVATION

According to research by StartUs Insights, the top ten biotech trends and innovations are in:

ARTIFICIAL INTELLIGENCE



GENE EDITING



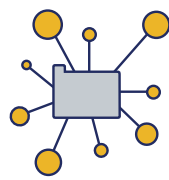
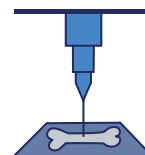
GENE SEQUENCING



BIOMANUFACTURING



BIOPRINTING



BIG DATA



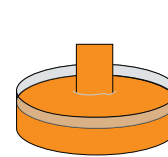
PRECISION MEDICINE



MICROFLUIDICS



SYNTHETIC BIOLOGY



TISSUE ENGINEERING

Instead, one needs to think in advance and ask, “Is there an application for what I am developing or what problem would I like to solve with this? If the answer is ‘none,’ then the development at that point doesn’t make any sense.” Vuolanto makes the same point about what should drive growth beyond the profit margin. “In this business, I can bring well-being to patients with unmet clinical needs, and bring hope to those who have lost it.”

Digitization, Big Data, and Robotics

The experts all agree that digitization is a key factor in biotech and medtech. It cannot, however, be seen as a silo, as it is part of every aspect of a biotech—or medtech venture. Guidato describes it as an interdisciplinary field and says that any

biotech or medtech company should think outside the box if it wants to survive. “You make contacts with people you don’t know very well and who may not have much to do with medtech either. It is about establishing networks with interdisciplinary partners.”

Ida Haisma, points out that digitization also has implications for an older workforce. “There is a large workforce of those over 55 with great knowledge of how to develop drugs but they often don’t have the necessary digital skills for the future,” she says. To this end, there is a need for heavy investment in digital (re)training.²



According to Jörg Traub, Managing Director at Forum MedTech Pharma e.V, digitization has meant speedy distribution of work, but like Haisma, he worries about the skills pool. There is a “major shortage of skilled workers in medical technology and this will likely become even more drastic,” he says. He also sees robotics and AI as being an integral part of development. “Digitization goes hand in hand with robotic automation, both of which have become a trend but are still in their infancy,” he says. He adds, however, that the human factor remains crucial and gives the example of surgery. “I do not think an AI will replace a medic but instead will be an aid to a medic. There will always be a medical professional who controls it, but the robot is a form of quality assurance.”

Another key component is the relationship between digitization and the collection of Big Data. On the user-end, Guidato says digitalization has created a world in which “everything that comes our way (such as advertising and our devices) is tailored to us.” Everything is becoming more personalized, and society is increasingly expecting this of medtech too. But the flipside is that all our activities and health or disease indicators feed into Big Data and this can pose ethical problems. Guidato says that an example of the collection of data is in the field of widespread diseases that are difficult to map in a clinical environment.

2. For the Leiden Bio Science Park, four themes define its profile: Early diagnostics and technology (personalized medicines), Regenerative Medicine: stem cell and gene therapy, Prevention and Lifestyle and Vaccines and infectious diseases. Furthermore, there is a cross cutting theme: AI and data science which applies to all the four above mentioned themes.

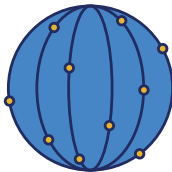
CHALLENGES



Regulatory Frameworks: Although regulation is necessary, it can pose a risk to biotech and medtech by acting as a barrier to innovation.



Investments Funds: While the current purse for innovation in the life sciences might seem healthy, global competition has meant that it is not in fact easy to secure investment. Early-stage biotech companies especially, may struggle to prove the relevancy of their venture in such a competitive environment, while existing ventures are seen as less risky to investors.



The Treatment of Real-world Data: Technology has created an environment in which Big Data can be gathered from and by individuals in their daily lives, but while mining it forms a useful basis for innovation, it also poses questions about the ethics of sharing private information.



Talent: Because biotech and medtech are relatively new industries, growth of the industry is outpacing skills development, and as a result, recruiters are competing with one another to find the best talent both locally and abroad.

He gives the example of a heart attack: clinicians may encounter the patient for the first time at the moment of diagnosis, but “if you have a heart attack in ten years, you can use your smartwatch to evaluate your lifestyle in those ten years leading up to it.” With so much data generated, scientists can use it for research purposes. However, says Guidato, “People have reservations as they don’t know what will happen to the data, so great care is required in the disciplines to be successful.”

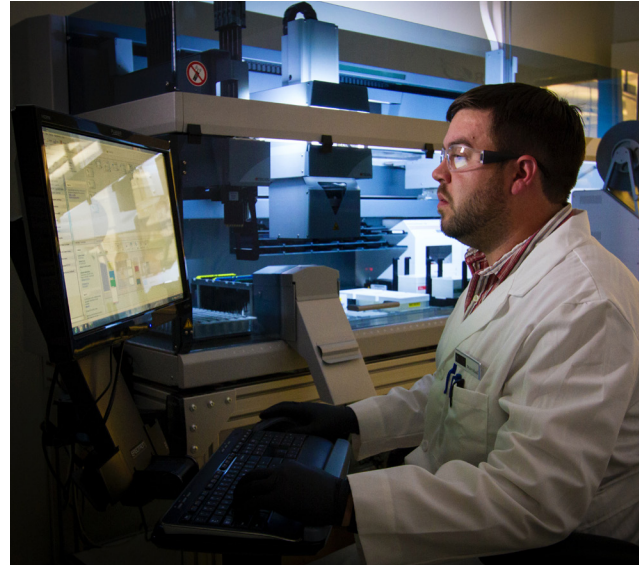
As Kühn says, “There is an increased awareness of our own bodies,” and this represents opportunities for businesses. He said it is not yet strictly regulated, and he can “imagine that health data will be collected and evaluated” resulting in, for example, “a personal vitamin mix for the lifestyle and needs of the body created with the data.” He points out that you can already collect lifestyle data from a smart watch. “With this big data, I see many opportunities, but also dangers in terms of data protection,” he says.

Some regions have implemented mechanisms to safeguard ethics in this regard. As Trinkwalter points out, “In Europe we have created an opportunity based on the General Data Protection Regulation. ”This is designed to safeguard the “ethical handling of data,” which is very important since “data is the key driver of the next leap in the innovation of health.”

RECRUITMENT

Looking Abroad

That national boundaries have been eroded to a large degree is a point all the experts make. Trinkwalter sums it up when he said, “The entire industry is becoming very internationalized, and in some areas, it actually will not work without international specialists.” An example is Big Data, and who should be implementing it. Specialists such as data scientists or medical IT specialists are “not on the market today,” according to Trinkwalter, adding that in his native Germany, “many clinics have a hard time finding such staff.”



“Because biotech is mushrooming,” says Paul Bilars, CEO of NecstGen and Starfish based in the Netherlands, “new ventures and old ventures are all competing for the same talent.” Marie-Louise Bots, SVP Corporate Development, Turn Biotechnology concurs, “The pool of genuine expertise in biotech is small,” she says. This has resulted in what Haisma describes as “an intensive battle for international talent.” She says that the pandemic has drawn attention to the potential of working virtually, and that this has created “an entirely new dimension in the war for talent. That is also why we, at Leiden are developing our Human Capital Agenda for future Demand for Talent.” This has resulted in

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—Jörg Trinkwalter, CEO,
Medical Valley EMN e.V

diverse international teams, which Bots sees as a very positive development. She says leaders who can “nurture the diversity of a group” are an asset.

The other side of that coin is that if you have “too homogeneous a group, there is a great risk in biotech that the venture won’t thrive from startup to scaleup.” As Bilars points out, though, for all the strengths of

having an international team, cultural challenges can arise. He says “diversity can bring extra difficulty” and that it can “take time to understand one another and make sure nothing is lost in translation.” He gives the example that Dutch people are very direct in how they communicate, and this stands in sharp contrast to other countries, where communication is couched in more polite phrases. As a result, Dutch people may seem “blunt” to others who then become “hesitant to speak out about what’s on their minds.” He adds, “This is not an asset for a startup, where many things are not yet captured in processes and protocols and where transparency is key.”

Bilars says that with a clear line between the private sector and the more “publicly-orientated” sector, some potential recruits are motivated by money while others by the “intrinsic motivation and drive” of what the sector can achieve for patients’ lives. With a small pool to choose from, companies search abroad, and with current technology, an international team can work together from different destinations. Vuolanto says, “the primary focus is to find the right person and it is not important where he or she comes from. Remote or partly remote work is okay so there is no need to relocate.”

He adds, however, that travel is sometimes necessary because “personal interaction is irreplaceable.” Porreca also highlights the importance of co-workers at least sometimes being in a physical space together. “If candidates can drive to the office, even periodically, it’s better for team building and developing the culture of the organization,” she says, adding that her company is focused on recruiting in the surrounding region rather than internationally. Traub predicts that the deficit in the skills pool is only going to get bigger. “The major shortage of skilled workers in medical technology will continue to exist and will likely become even more drastic, especially in the IT sector,” he says.

“

What you read in the media is mostly the success stories. . . while in fact, a lot of entrepreneurship in biotech is hard work and perseverance.”

—Marie-Louise Bots, SVP Corporate Development, Turn Biotechnology

Choosing the Right People

Bilars advises finding someone who is “fit for the job” and can work in a team. “Talent can grow,” he says, “so don’t be too strict about publications, track record, and years of experience.” In a relatively new industry, even five years counts as solid experience, and according to Porreca, the pandemic “has emboldened people to make career changes,” resulting in “significant movement in the biotech industry.” She says candidates are receiving multiple offers, and “money seems plentiful.”



For Bots, it is also about having the right mix in the team, because it’s not just biotech experts you need to build the company. You also need opinion leaders, “great financial talent,” and those who are excellent with regulatory issues and quality and assurance. Overall, you need someone with stamina, says Bots. “What you read in the media is mostly the success stories,” she says, “while in fact, a lot of entrepreneurship in biotech is hard work and perseverance.”



According to Vuolanto, it's also about a balance between "experience" and the ability to be "hands-on." Experience in big pharmaceutical companies can mean a recruit is used to working with healthy budgets, personal assistants, and a large team, whereas "daily life in a small company requires the ability to be hands-on, make decisions with limited knowledge, and tolerate some degree of uncertainty." Ponchaut also draws this distinction between large companies and smaller ventures. She said those who join the latter need to

be very flexible, but that this may prove difficult for those who have spent their careers in the former. She says, "People working in large companies may dream that innovation and changes are much faster and easier in small structures, and in some ways they are, but there is also the reality of limited resources." Not all experts with experience in big pharma can transpose their skills to a smaller venture, but "personality will make the difference."

Porreca believes that recruiting the best talent is about planning ahead. She says "you can't do everything at once" when it comes to personnel, which is why her organization, Prelude Therapeutics, created a "roadmap to get the company where it wants to be." Part of this is moving the recruitment agenda from "a discussion primarily about budget to discussion about organizational development" instead. She said talent acquisition is "top of mind with the need to balance speed with getting the right people in the door." This is against a backdrop of companies needing to "move quickly to land talent and have a good strategy to retrain them once onboard." According to Ponchaut, there is a need for more production-related profiles in the manufacturing of biologics. This includes operators, technicians, quality controllers, and infrastructure managers. She adds, "Other sought-after profiles are all data-related profiles," and she emphasizes mixed profiles—someone who has expertise in both biotech and finance or digital marketing, for example.

“
[talent acquisition is] “top of mind with the need to balance speed with getting the right people in the door.””

— Michele Porreca, Chief People Officer,
Prelude Therapeutics

INTERNATIONAL HUBS

Some locations are establishing themselves as biotech and medtech hubs. As Ponchaut so aptly says, "Although these benchmarks can make you dream, they can't just be copied and pasted as you have to take into account the important cultural and contextual differences of each place."

Hubs Mentioned by the Experts

Flanders (Belgium): The number of large companies has grown from five to 11 in 15 years

Switzerland: Described as having an exceptionally dense ecosystem and attractive tax system

Boston (USA): MIT ecosystem seen as being exceptionally strong

Israel: Very innovative and proven to be capable of supporting growth

Minnesota (USA): Home to Medical Alley

North Rhine-Westphalia (Germany): Has around 500 companies in the life sciences, including 109 core biotechnology firms

Leiden, The Netherlands: Ranks second in the world for numbers of patent applications in biotechnology

North Carolina (USA): Home to The Research Triangle

Also in the USA: San Francisco, San Diego, and Indianapolis

Other Hubs as Identified by Research

In 2020, StartUs Insights conducted what it called “an exhaustive [analysis](#) of the global distribution of 1219 startups.” From their research, they too named Boston, San Diego, and San Francisco among the top five hotspots, and they also named New York City and London.

CONCLUSION

As this white paper shows, biotech, medtech, and other tech innovations in the life sciences are among the most exciting sectors currently taking the world by storm. As with any relatively young industry, the learning curve is steep and there are challenges ahead, but on the upside, it is an exciting world of innovation, attracts the highest caliber of personnel, and is, in every sense, the next frontier of the global economy.

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