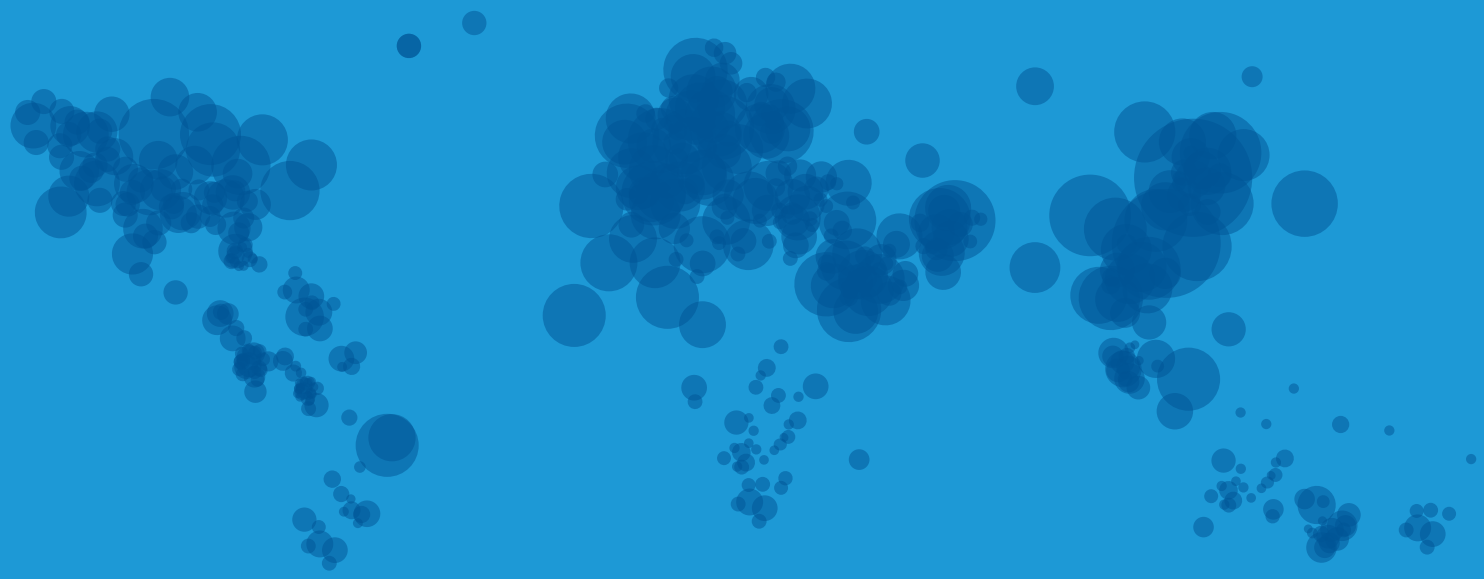
THE CHANGING LIFE SCIENCE WORKPLACE

Designing to accelerate science

A Report by Genentech in partnership with WORKTECH Academy

WORKTECH™ ACADEMY

Genentech
A Member of the Roche Group



DISCLAIMER:
POST-COVID EXECUTIVE SUMMARY

This report was written and researched before the coronavirus pandemic. It explores the key drivers of change in the life science industry from shifts in workplace expectations to the increasing sophistication of technology. These trends are still relevant, and in many ways amplified, in the wake of the COVID-19 pandemic.

This report highlights how the life science workplace can be adaptable and resilient to disruption by proposing three models for the future: blended, partnered and automated. As companies prepare to return to lab and office space it is undeniable that COVID-19 marks a pivotal turning point in how and where people will work. While the move towards remote working will significantly affect the landscape of office workspace, there is still a great need for physical presence in the lab environment.

The absence from the work environment has given workers and organizations the chance to re-evaluate how they work. This new model of working has placed emphasis on the crucial role technology plays in communication and collaboration. This transition will continue when the workforce returns to their work environments. In this respect, the automated model whereby real-time virtual collaboration exists within lab spaces is more relevant than ever.

The blended model, where office work environments and lab space share amenities and work areas, will be looked upon favorably by many real estate teams who are reducing their property portfolio as more employees work on flexible and remote schedules.

Finally, the partnered approach looks at developing strategic partnerships between large corporate enterprises and smaller start-up companies to foster an ecosystem of collaborative innovation. Where the world is looking to science for an answer to the virus, innovation is vital to finding a solution.

Although the literature and expert interviews in this report were conducted pre-COVID, the conclusion of the report highlights how the life science industry can be more resilient in the face of disruption. The themes and conclusions drawn in this report are perhaps even more relevant in the face of the pandemic.

This report intends to surface the bigger conversations around the future of the life science workplace. It draws upon key shifts that are occurring in the industry and places them in a broad framework which can be used by industry leaders to inform the next steps for a corporate life science organization.

CONTENTS

EXECUTIVE SUMMARY

This report from Genentech in partnership with WORKTECH Academy examines the changing parameters of design for the corporate life science workplace and how workers in the industry can be better supported in the future.

It looks at the competitive pressures in the industry and at how new technologies, regulations, governance structures and research processes are fast reshaping the traditional commercial landscape of office space, labs and manufacturing.

We draw on a mix of academic literature, practice reports and interviews with workplace experts from North America, Singapore, China, UK and Europe to ask how large bioscience and pharmaceutical companies can become more flexible, agile and dynamic places for their research teams to address new challenges.

The first section of the report explores the contextual factors that are impacting the life science workplace, and opening the door to new design initiatives, under three main headings: people, place and technology. Behavioral aspects include changes in how scientists work, the race for talent and the demands of newer entrants to the workforce amid a paradigm shift in employee demographics, and the relationship between office and lab culture.

Place-based factors range from the rise of individualization in life science research to the impact of such concepts as activity-based working and other external factors such as the community-building ethos of coworking spaces. Technology factors include the effects of AI, automation, and machine learning on laboratory organization, as well as digital transformation and connectivity.

The second section of the report presents current practice, pilots, and projects in the field. These emerging developments suggest new directions for the life science workplace in terms of spatial typologies, neighborhood working, user engagement, smart spaces and change management to support the adoption of new behaviours. Genentech has made significant changes in office space through its Neighborhood Work Environments (NWE) program and many aspects of this transformation can be applied to lab space. There are also international case studies from Genentech's parent company, Roche; AstraZeneca, Bayer, GSK and Merck.

The final section of the report presents three scenarios for the future of the life science workplace. 'Blended' describes a scenario in which general workspace, manufacturing space, lab space and virtual space in life science companies become part of one seamless experience. 'Partnered' describes a scenario in which life science companies become integrators, sitting in a wider ecosystem of collaborative innovation with many front-end and back-end innovation activities conducted alongside external vendors and collaborators. 'Automated' describes a scenario whereby AI, robots and people must work alongside each other in new-style labs that are part of digital real estate.

All three scenarios for the future share common traits and are becoming visible in emerging global practice. The report concludes with a belief that the building blocks are being put in place to create a more dynamic, permeable, integrated, and flexible future for scientists and researchers in the life science workplace.

The report responds to the rapid changes occurring in the life science industry and how they are impacting the nature of work and spatial design in lab space. The key messages are that there needs to be a closer alignment of office space and lab space to ensure greater intra-company collaboration, there needs to be an integrated approach to technology and space, and large corporate life science companies should make strategic partnerships in order to foster more innovation.

INTRODUCTION

The life science workplace today finds itself at the epicenter of an increasingly competitive global landscape in which companies and the research scientists they employ are under unprecedented pressure to produce ground-breaking research and innovative solutions for the market.

In the race for growth and novelty, the work environment is now required to adjust to changes in business models, employee expectations, real estate costs and much else besides. But how well adapted is the life science workplace itself to the demands of dynamism, agility, and flexibility?

Many large biotech and pharmaceutical companies are located in traditional office buildings spread over millions of square feet, with fixed lab infrastructures, legacy IT systems, and legacy work practices that are difficult to reshape and sit behind the curve of workplace change evident in other industries. Yet, to fulfil its mission as an accelerator of science, the life science workplace must adapt speedily and efficiently to future challenges without any loss of rigor and integrity in established models of scientific discovery and development. This is not an easy balance to achieve.

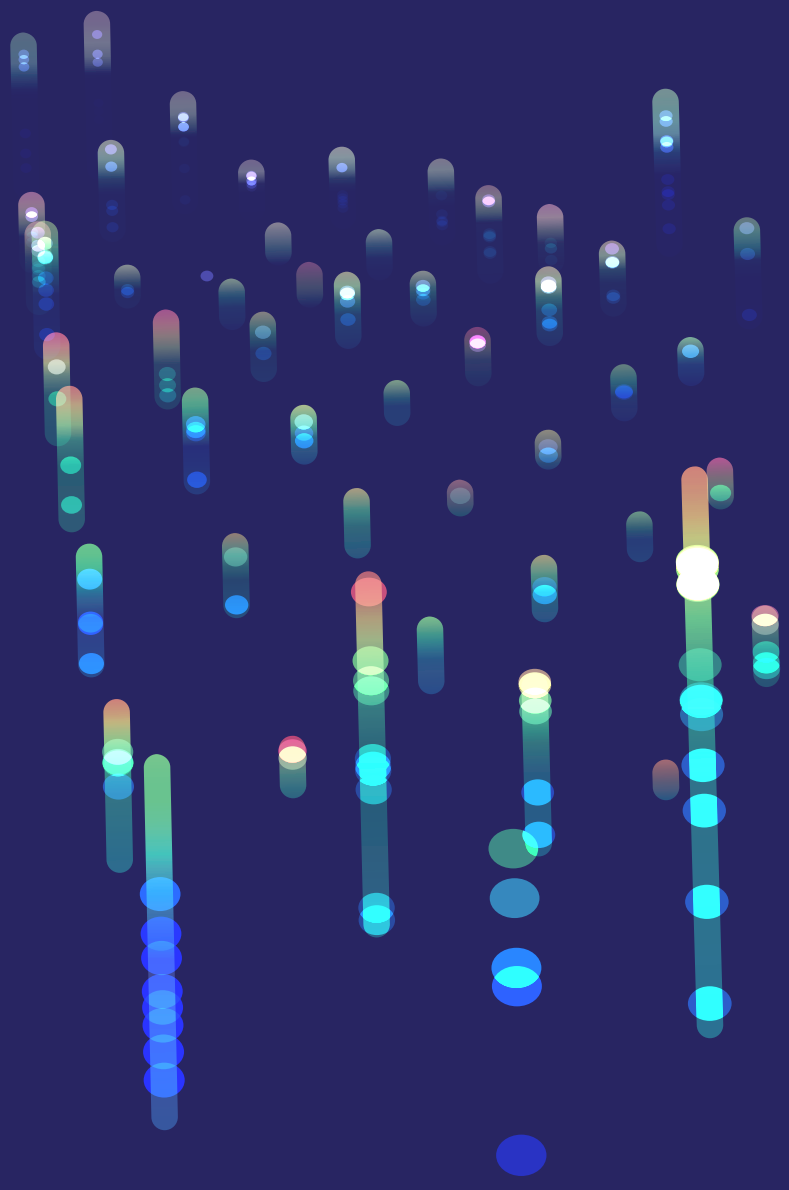
This report sets out to examine the parameters of new work environments within the context of the life science industry, in particular charting a path of innovation from general office space to future lab space where researchers can flourish.

Genentech has partnered with WORKTECH Academy to describe a series of scenarios for how the life science industry may design their work environments based on current trends and translating ideas from other innovative business sectors.

The overall intention is to inform a new and different perspective on the future of the life science workplace as an entire ecosystem in which traditional models, roles, functions, and demarcations between different spaces are fundamentally challenged.

The report gathers data from interviews with industry experts, academic evidence; and research by leading practitioners in the field. Interviews were conducted with experts from North America, Singapore, China, UK, and Europe offering an international perspective on the life science workplace.

Genentech and WORKTECH Academy would like to thank everyone who has participated in the interview process. As the life science sector becomes more dynamic, the potential for workplace innovation is greater. This report into contextual trends, current practice and future potential, marks a contribution to the debate about the changes ahead in the sector and at how science can be accelerated through better workplace design for researchers.



1 CONTEXT AND BACKGROUND

In this opening section, we look at the contextual factors that are affecting the life science workplace and opening the door to new design initiatives, under the broad headings of people, place, and technology.

The size and significance of the life science industry, and its influence on the global economy, does not insulate it from the pressures and disruptions that many other major industries face. How the life science workplace responds to these shifts will help to define its future growth prospects. As expectations of work and workplace rise, and technology grows in sophistication, organizations in the field need to consider space and technology together to successfully future proof their business. Understanding the context and drivers of change will equip them to strategically plan for a future workplace that works for scientists and researchers.

1:1 People

The workforce is not simply the biggest asset for any organization – it is also its key enabler of change. The verbal feedback and numerical data employees provide gives an insight into how well a work environment is performing and provides a design platform to make improvements. However, the people who work in the life sciences can be a driver of change and a barrier to it. Social expectations around creating a more dynamic, collaborative, and team-based environment are increasing.

What is clear from our research is that the type of work being conducted within the life science industry is undergoing a paradigm shift.

New ways of working

Traditionally, scientists who worked within research and development carried out and recorded experiments in fixed lab spaces. However, as technology has become more sophisticated, data recording is more automated and the role of the scientist has shifted to be more analytical. A report by Deloitte (2018) found that 35 percent of repetitive, standardized tasks not requiring judgements such as quality or edit checks can be automated.

As the focus of much scientific work moves from recording data to analyzing data, a consequence is that more data scientists and data analysts will be required in the life science workplace. However, these roles are not reserved for life science companies who will increasingly find themselves competing with large tech and banking firms for the same talent. This puts the onus on life science companies to offer best-practice workplace experiences and amenities that are globally competitive in comparison with other sectors. The search for new hybrid talent, for example people who combine biology with computer science, makes this trend more acute.

While research and development functions are undergoing significant changes to ways of working, general office space in the life science industry is faced with shifts which mirror some of the wider changes occurring in more generic workplaces around the world. There is a requirement for HR, IT and real estate departments to move out of their silos and jointly manage the workplace experience more effectively for incoming millennial and Generation Z workers. These are cohorts who expect much more flexibility and choice in their work settings.

There is also a movement for life science leaders to introduce less hierarchical and more fluid and enabling models of leadership, to speed up decision-making and trial more theories and experiments instead of extensively focusing on one. This leadership model empowers researchers to take risks to be proactive in their research and not reactive.

> ‘Being bold and pushing boundaries moves the entire company forward and allows for smarter risk-taking’
>
> – Jeff Davis, Genentech

These changes are not unique to life science; they are impacting all industries in many geographies, but compared to some industries, life sciences simply has more ground to make up – a situation not helped by a current mind-set among its senior leaders more focused with R&D investment in drug discovery than R&D investment in the workplace itself.

> ‘Traditionally workplace is seen as a cost, not an investment’
>
> – Sofonias Demsas, Bayer

Culture and trust

According to the interviews conducted, there was consensus that there has been considerable resistance to change in the life science industry, for example in relation to the introduction of Activity-Based Working (ABW). This was not seen inside some companies as a way of improving the work environment, but as another cost-cutting scheme produced by the real estate team. There was a lack of trust by scientists, who are highly focused on meeting precise objectives, that they would receive the right spaces and tools from the real estate team to conduct their work effectively; surrendering space in which they’d been accustomed to working was difficult.

This tension was crystallised around the specialized needs, processes and work styles of R&D teams: how could the real estate team possibly know how to design the right space? People expect logic and rational thinking to predominate in scientific organisations but many of the workplace change agents we spoke to were surprised at just how much space is an emotive issue in the life science industry.

> ‘Changing lab space provokes a more emotional reaction as scientists are attached to their space, and their equipment needs to be consistent for research’
>
> – Martin Bruebach, Roche

Over time, some of this tension has dissipated as new cohorts of talent have joined the sector and company leaders have accepted the business case to design work environments that are more flexible and collaborative. There are signs of a growing maturity in the life science workplace, yet culture change still needs to be managed very carefully and adopted from the very beginning of any redesign process in order to be successful.

To manage the transition to new ways of working, new social contracts are being drawn to establish shared expectations around team and individual behaviours. These agreements make the implicit, explicit by forging common expectations of work norms and developing a set of guidelines to ease employees into change.

Demographic change

A key factor across all industries has been changing demographics in the workforce which now means at least four generations of workers can occupy the same space in a single company. This dynamic represents both an opportunity and a challenge. A common generalization is that older workers provide a wealth of steady-state knowledge and experience requiring an unchanging workspace, while younger entrants to the workplace offer fresh perspectives and an openness to change requiring a radical new workstyle.

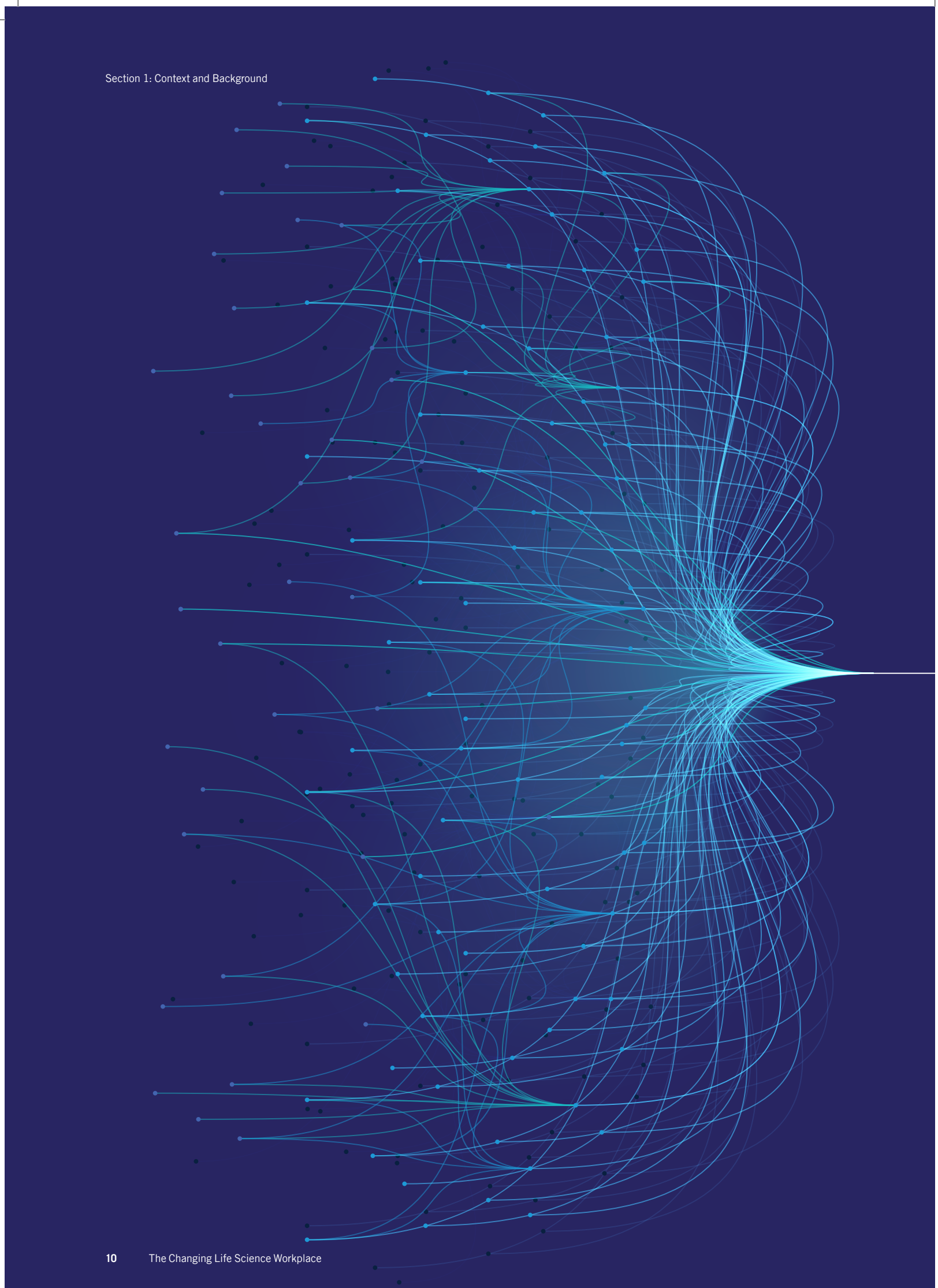
However, the picture is much more complex than that. Different generational cohorts tend to have more things in common than those that mark them apart, according to design research, including the need to focus, collaborate effectively with colleagues, and recover from cognitive fatigue and overload. The need for workplace wellbeing applies to all age groups equally. According to BioSpace’s 2017 report, over 90 percent across all generations in the life science profession rate interesting, life-changing work as an important aspect of their work.

Nevertheless, it cannot be ignored that there is a generational pendulum swing underway. Each generation differs in its priorities. According to the BioSpace 2017 report: 84 percent of millennials in the life science profession rank opportunities for growth and promotion as most important, while Generation X prioritise manageable working hours and Baby Boomers want a workplace culture that matches personal preferences.

Understanding the different demographic demands of the workforce can provide an opportunity for the life science industry to shape new ways of working tailored to their workforce.

1:2 Place

A shift in work style, culture and workforce attitudes has brought with it a new list of demands in the place-based workplace. Traditional life science workplaces have changed significantly in the past decade as organizations strive for more collaborative, knowledge-sharing environments. While much of this change has been driven by people’s expectations, other factors such as the development of technology, resources, and external influences have also driven change in place.



Individualization v shared space

Before the boom of the life science industry and before technology was accessible for everyone, there was an emphasis on shared resources in the workplace. Instead of using individual laptops to conduct research, scientists would use a resource library. This shared place would prompt serendipitous interactions and conversations with peers which could often lead to spreading knowledge and solutions throughout the company. This type of unplanned collaboration is exactly what many organizations around the world are trying to achieve now, but the accessibility of technology means that people will often resort to the internet before they speak to a colleague or communicate with colleagues through their device instead of face-to-face. This shift has seen employers create new opportunities for interaction and tools to spark more unplanned encounters in the office.

'I witnessed a shift from spontaneous and unplanned interaction to more individualized research'

– Geo Adams, Roche

In general office space, the introduction of mobile technology has acted as an enabler of mobility so that employees are untethered from their desks and can move freely between different work settings. They have choice and flexibility in where and how they work, and they are more likely to bump into colleagues who work in different departments. This fosters interdepartmental collaboration despite owning personal mobile devices.

However, the picture of individualization at work looks different in lab design. As employees have access to their own set of tools and equipment to carry out their work, they do not share tools or make trips to the library to find information; they discuss their work with colleagues less and knowledge-sharing is reduced. This shift has seen physical changes to infrastructure such as less shared spaces and shared tools and the introduction of personal devices such as tablets, laptops and mobile phones.

More digital equipment also means the growth of individual workspace per scientist in lab spaces, with significant cost implications.

Traditionally, shared lab space describes an area along the lines of reagent, media, or buffer prep. Sharing equipment is generally limited to large and, generally, expensive pieces of equipment (ie: mass spec, liquid handler) or lab support (fume hoods, biosafety cabinets for tissue culture).

With the shift towards more flexibility and versatility to support change in project assignments, the idea of shared lab space needs to expand to the entire lab. This can potentially pose challenges in terms of validation/ calibration of instruments.

Despite the individualization of work reducing chance encounters and unplanned collaboration, it also means that information flow can be faster and more efficient as people can find answers instantly on the internet. Another benefit of individual space is that people feel like they have control over where and how they work; less shared resources also mean less compromising with colleagues around space. However, there is both a need and an opportunity to design collaboration and break out spaces to enable spontaneous interactions to still occur naturally.

Flexible Workspace

Buildings in the life science industry were traditionally built for business-led functionality, but more recently there has been the added layer of user consideration in terms of location, experience, and wellbeing. While many design concepts can be borrowed from other industries which have successfully redeveloped general office space, lab space requires highly specialized design. These specialist areas are increasingly being surrounded by a diverse mix of more generic research spaces, leading to some blurring of the boundaries between lab and general office space and an inter-mingling of people working in specialized areas with those who work more broadly in research.

A key focus is to create flexible work environments which are modular and more easily changeable, allowing lab and office space to adapt according to work demands. While flexible spaces are a more expensive investment, the return is greater in the mid to long-term, according to a Gensler report on Adaptability in Life Science Design (2018), because there will be less disruption to the workforce when space uses inevitably evolve in the future.

While the need for flexible space is well recognized in general office space, the concept looks a little different in lab spaces. The work process in lab space is linear and clear-cut and requires specific collaborative teams. This differs from the general office space where workflow can be less pre-defined. The design of the space, therefore, needs to reflect the type of work being conducted. The introduction of new concepts, for example Activity-based Working and adjacent influencers, need to be investigated carefully for the benefits they can bring to the life science workplace prior to implementation.

'Scientists are experts in labs and they know what tools they need, but it's important to combine with designers to develop spatial strategies together and find solutions to improve processes and collaboration'

– Martin Bruebach, Roche

There is no doubt, however, that external placed-based influences are having an impact on life science. The rise of the coworking movement, for example, has created a template for more buzzy work communities with a higher level of service, comfort, social interaction and design style. Coworking spaces have helped to reorient employee expectations in the corporate sector. How life science companies respond to these changing expectations is part of the bigger picture of workplace innovation.

1:3 Technology

Technology has a large role to play in changing the way work is conducted in the life science industry. The automation of processes, particularly in lab space, has shifted roles; researchers and scientists are now required to amalgamate new combinations of skills to conduct their jobs.

Scientific methods and processes are sufficiently clear-cut that there is huge potential for artificial intelligence to reshape the process. Discoveries that were previously made over the course of several years are now being made within a matter of months with the assistance of AI, resulting in dramatic cost and time savings. This has led to a fundamental shift of how the life science industry will manage R&D activities in the future.

The digital shift in life science has placed an even greater emphasis on data collection and analysis. A report by Arup, The Future of Labs (2018), found that technology such as AI, robotics and automation, cloud computing, and web-based platforms enable novel forms of research. This not only impacts how science is conducted, but the settings in which research take place, both in lab and office space.

AI impact on business process
Artificial Intelligence is encouraging the transformation of many business processes within an organization. As humans and smart machines collaborate more closely, work processes become more fluid and adaptive.

AI is changing the way that R&D teams think about how they conduct experiments. The reduction in time spent doing linear, processing tasks allows scientists to spend more time to explore avenues that might have previously been off limits due to time and cost constraints. According to H. James R. Wilson, author of Human+Machine (2018), AI is causing a fundamental change in mindset to how scientists pursue new, riskier ideas that could lead to unlikely scientific breakthroughs.

Digital demand of space
Digital transformation in general office space may mean a reduction of space and better desk sharing ratios, but the reality is different in lab spaces. The demand for more sophisticated technology is physically growing the amount of space needed in labs because the amount of hardware is increasing. While the old infrastructure needs to remain, new technologies simply add to the space; and when combined with a tougher regulatory environment around safety regulations, this growth in scientific machinery puts significant new demand on real estate.

On the other hand, the digitalization of science means that researchers are spending less time in labs and more time outside of the lab performing computational tasks to analyse and share their data. This trend is seeing the emergence of research facilities in coworking spaces, incubator hubs, and maker-space labs, which suggests institutional labs are no longer the only spaces where the acceleration of science can take place. Technology is creating different typologies of lab space and forming new scientific communities in the life science industry. It is also contributing to a convergence of different types of lab (wet, dry and so on) into a single, all-purpose lab environment.

Digital Connectivity
Institutional labs and physical research space have in the past been the main anchor to build a scientific community. Today, collaborative technologies are enabling new digital communities to emerge. Researchers can collaborate remotely in real time with their colleagues, while technology allows remote monitoring of equipment. This level of flexible working is particularly valuable for companies whose extensive global footprint requires extensive international collaboration.

There is also an opportunity to improve internal collaboration through the use of shared digital platforms. Emerging collaboration software allows employees to effectively share knowledge and files on one digital platform which is accessible to an entire team. As the use of iPads and digital notebooks are introduced into lab workflow, digital collaboration can easily occur across lab and office environments.

‘Biometrics could be better utilized to streamline workflow. As an example, rather than entering a password dozens of times per day every time we access a new application, we could use a fingerprint scanner in lieu of the password. Additionally, we could pair this capability with portable computing sessions to seamlessly access a single computing session while the employee moves from the office to labs and back’

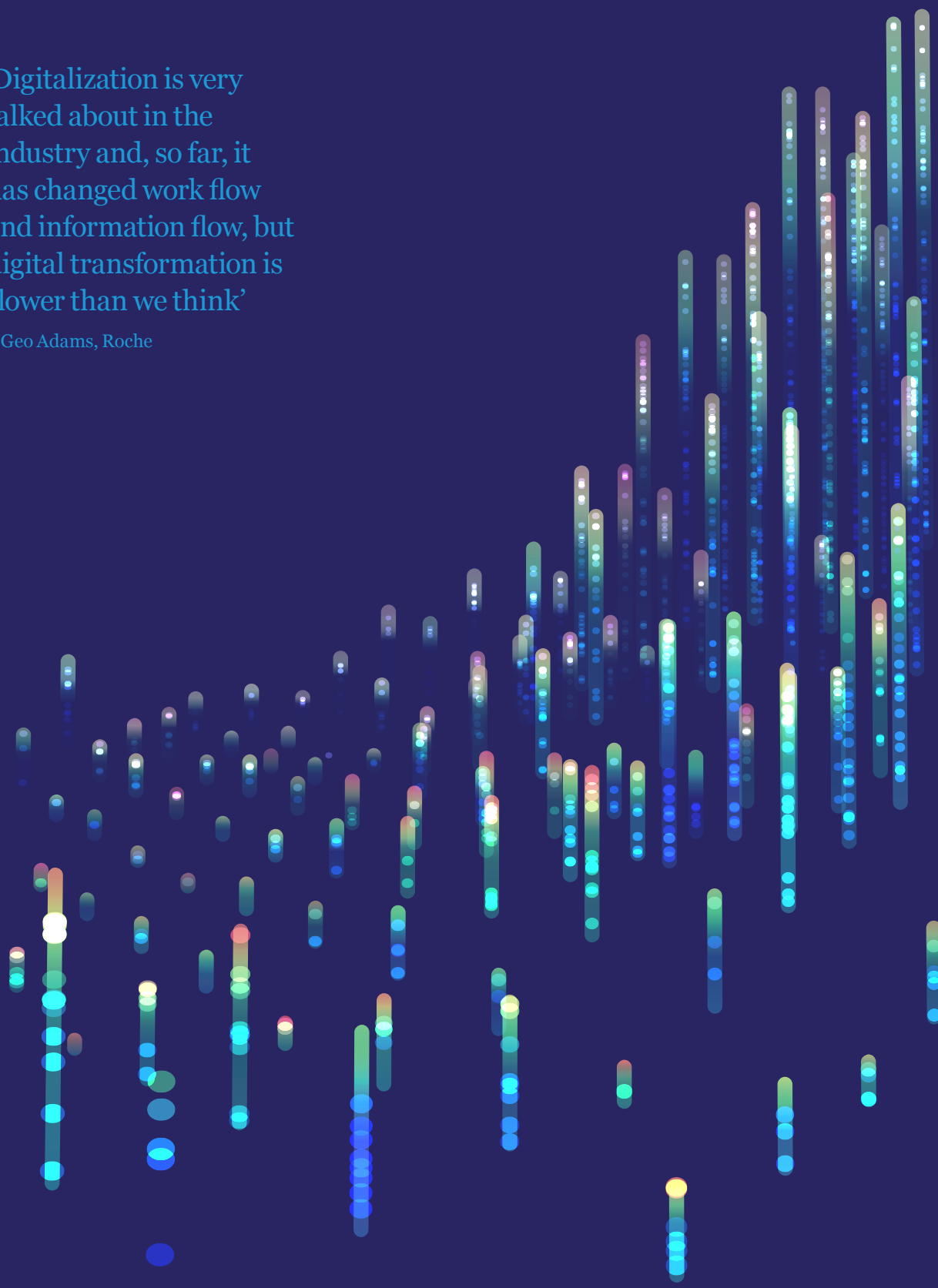
– Chris Morrow, Genentech

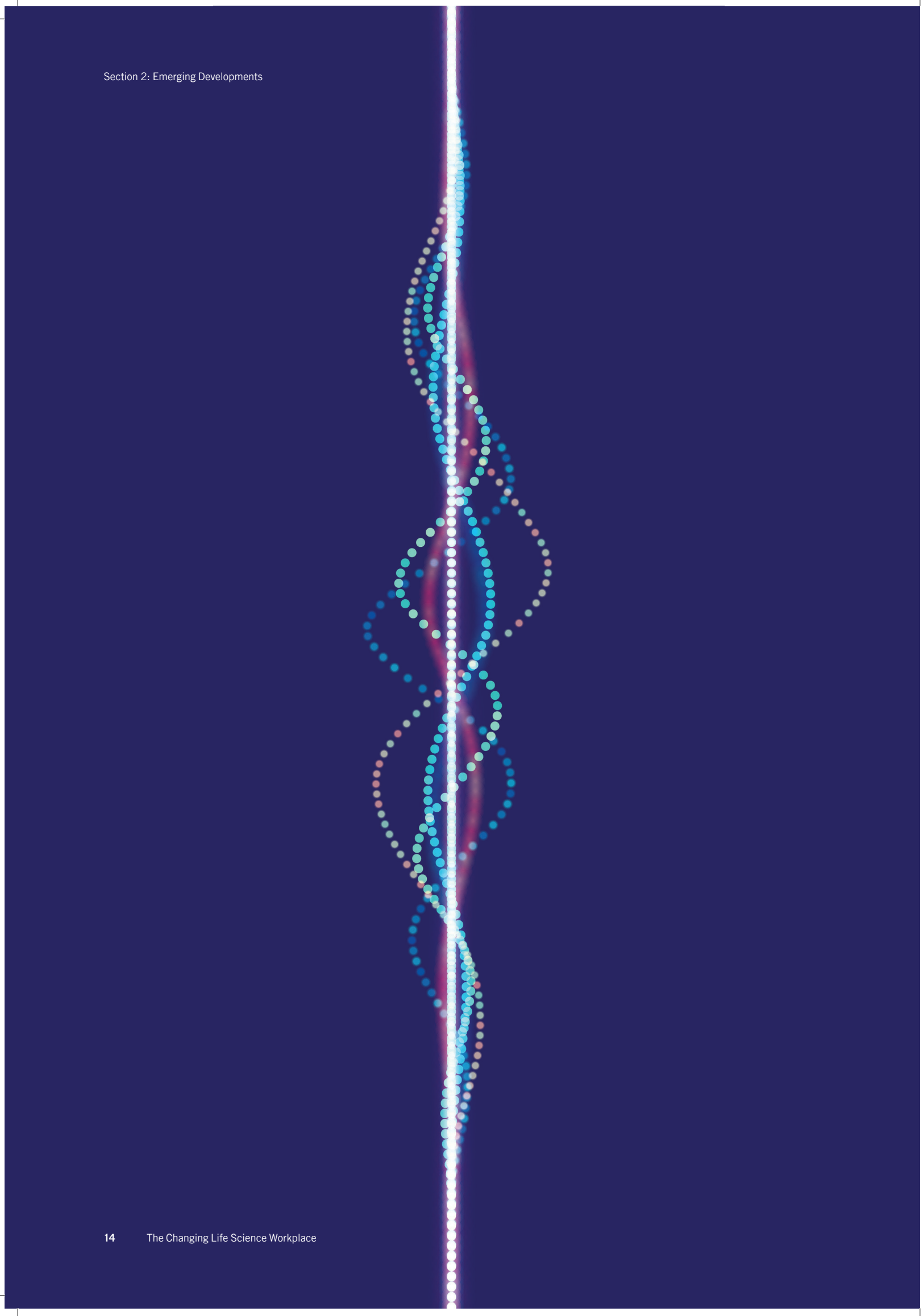
A downside of digital connectivity in the workplace means that employees can hide behind technology to collaborate with colleagues instead of having face-to-face discussions, even when they are in the same building. Poor open plan office design can exacerbate this trend whereby employees feel intimidated to have discussions in front of the rest of the office. According to one academic paper (Bernstein and Turban, 2018), open plan environments can prevent face-to-face collaboration from occurring as employees do not want to disturb colleagues or be overheard. This has seen the rise of team and neighborhood designs to combat the negative effects of open plan.

Many life science companies are in various stages of digital transformation, but according to the Deloitte Centre for Health Solutions report (2018), only one in five of biopharma companies are digitally maturing and only 20 percent of respondents to its survey said their organisations were developing leaders with the necessary capabilities to lead in the digital environment.

‘Digitalization is very talked about in the industry and, so far, it has changed work flow and information flow, but digital transformation is slower than we think’

– Geo Adams, Roche





2 EMERGING DEVELOPMENTS

In this section, we review examples of current practice and projects in the life science workplace to capture a fast-moving picture of innovation and experiment in the sector

2:1 Flexible workplace design

Standard open plan space can have adverse effects on levels of collaboration, as we have described in the previous section, but a strategic and integrated design approach can play a big part in making shared environments successful. Careful planning and analysis of behaviour in work environments has led to the emerging trend of neighborhood environments. This trend has been adopted by progressive life science organizations which have recognized the benefits of interdisciplinary collaboration and individual focused work.

Companies such as Genentech have tackled the stigma of shared seating in general office space by developing neighbourhood guidelines. Zones of collaboration have been created specifically for people to meet, collaborate, and socialize. While these spaces may not appear on every floor, employees know that there are dedicated spaces where they can talk freely without disturbing other colleagues. These different space typologies aim to support and mirror the different types of work styles and interactions that already take place in the office.

In recognizing that workflow in labs is also dynamic and evolving, there is an opportunity to evaluate different formal and informal interactions that take place in labs and understand spaces that are most appropriate for collaboration and individual focused work. While this may look different to general office space, there is an opportunity to create diverse spaces for different types of work activity in labs.

Traditionally in lab space, multiple noisy instruments were placed in the same lab. However, this does not build a comfortable environment because of the volume of noise. Spatial design in labs is now becoming more strategic as 'split labs' are introduced whereby a door separates a loud instrument from work benches. Machines only need to be manipulated for a short duration and can then be left. Transparent walls and doors can still give the impression of openness while mitigating the impact of auditory distractions.

Spatial Typologies in general office space

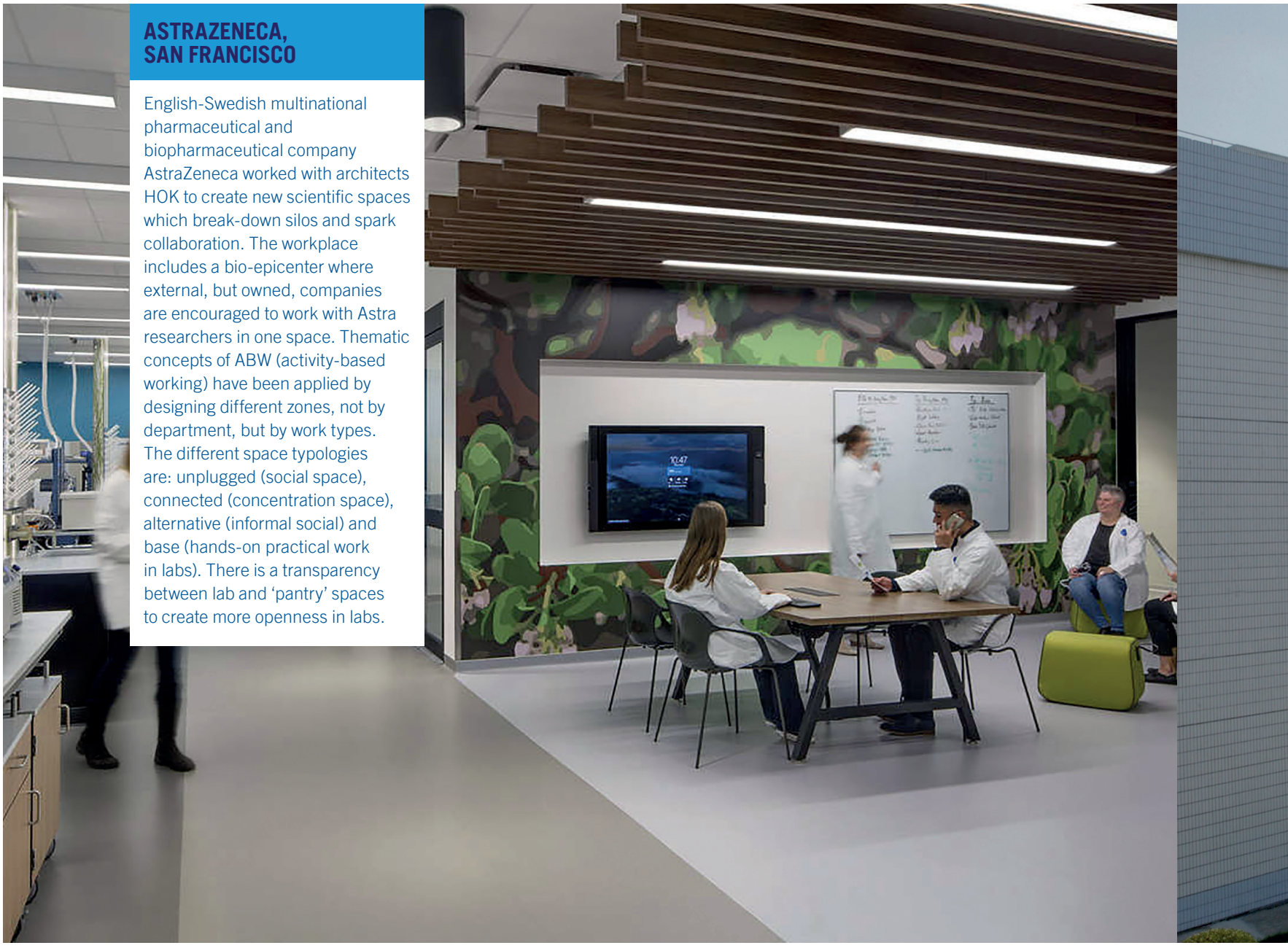
Global pharmaceutical company Bayer has tried to apply a balance between an open environment and enclosed spaces to understand the spatial models that work across the company. To achieve this, Bayer adopted a neighborhood strategy in general office space.

Employees were placed in neighbourhoods of 12 to 16 desks. These neighbourhoods are further disrupted by different types of space such as concentration rooms, break-out spaces, and meeting spaces. There was a set process in place which every project followed, helping to integrate change into new workspaces. Given Bayer's global scale, new workspace is approached on an individual basis to ensure that the culture and needs of specific teams and geographies are met.

This spatial strategy is still a work in progress. In the future, the company plans to collect data from each project to help understand trends in behaviour and how space is being used. Based on this data a more accurate representation of space can

ASTRAZENECA, SAN FRANCISCO

English-Swedish multinational pharmaceutical and biopharmaceutical company AstraZeneca worked with architects HOK to create new scientific spaces which break-down silos and spark collaboration. The workplace includes a bio-epicenter where external, but owned, companies are encouraged to work with Astra researchers in one space. Thematic concepts of ABW (activity-based working) have been applied by designing different zones, not by department, but by work types. The different space typologies are: unplugged (social space), connected (concentration space), alternative (informal social) and base (hands-on practical work in labs). There is a transparency between lab and 'pantry' spaces to create more openness in labs.



be understood and the space can be adapted to reflect different trends.

Spatial Typologies in labs
Research by Roche Group is currently trying to benchmark different spatial layout in labs. The emergence of smart machines in labs means that the nature of research is changing as more scientists will need assigned enclosed office space to analyse and discuss their research. However, growth of office space does not necessarily mean shrinking lab space as smart equipment still requires the same amount of physical space although the utilization by people in that lab space will be lower.

This approach calls for companies to identify the types of labs required to carry out the necessary research. These spaces then need to be optimized by design through analysis of what processes happen in each space and what spatial layouts they require. From this analysis, the degree of flexibility can be calculated and certain typical lab layouts can be created.

Getting the acoustics right
As spatial typologies evolve in life science companies, there is a need for closer scrutiny of the issue of acoustic privacy, which can be adversely affected by more open environments. Scientists need spaces for intense concentration – and noise pollution provides an unacceptable barrier in the scientific workplace. A cautionary tale can be found in The Francis Crick Institute in London, which opened a cutting-edge biomedical research center funded by several partners in 2016. Its cavernous open plan environment was carefully designed to optimize the opportunity for interdisciplinary collaboration between 1,500 scientists working on different areas of research to meet and share ideas. However, occupants complained about noise pollution, with up to a quarter of scientists in the building affected. Tests were carried out and improvements were made. Today the organization is constantly improving its sound quality through survey feedback to ensure the right acoustic balance between collaborative and focused work.

ROCHE, SHANGHAI

Roche Group has overcome cultural boundaries in its Roche Diagnostics Shanghai office's adaption of neighbourhood working. In China, employees are strongly discouraged from using lab space for meetings and collaboration, as they do not want researchers to spend too much time in industrial space. This means lab space is segregated from general workspace. The focus for collaboration is placed instead on the 'in-between' spaces between floors and adjacent spaces to the labs. This prompted Roche to install a central neighbourhood on the third floor and a secondary neighbourhood space on the first floor, connected by a large staircase, as part of a strategic approach to making neighbourhood working successful in a new cultural context.

GENENTECH – NEIGHBOURHOOD WORK ENVIRONMENTS PROGRAM

While dynamic start-ups and cash-rich tech disruptors have the luxury of being agile in the face of rapid change, large pharmaceutical companies face more restrictions in terms of regulation, legacy systems and set cultural attitudes among staff. When Genentech, which own 5.5 million square ft of office, lab and manufacturing space and has more than 13,000 employees, embarked on a journey to address new ways of working in 2014, it was initially met with resistance. Since then, Genentech has developed a Neighborhood Work Environments Program complete with the adoption of new behaviours, technology and spaces to better understand how its employees want to work.

Genentech recognized the need to create more balanced environments which support a spectrum of work from collaborative environments which aid knowledge sharing and a more cohesive workforce to individual spaces for tasks which require deep concentration. Its office was traditional, decked with cubicles and wired technology which was not optimal for collaboration and supporting different work styles. In contrast, the Neighborhood Work Environments Program aimed to create shared environments where people could work more collaboratively and spark more innovation.

Genentech started its journey of workplace transformation by first engaging with its leaders who were interested in prototyping something new, and they started to develop a framework for the new working model. The real estate team encouraged leaders to engage with their teams to understand how they needed to work in the future to support their desired business outcomes or goals. This feedback would help shape the design of the new environment. This qualitative data was coupled with evaluation studies. Data from utilization studies was used to understand how space was being used; at peak times, utilization only reached 68 percent. These results revealed an appetite for change. From this, Genentech identified three key ingredients critical to adopting new

ways of working: engaging leaders, appointing change agents and activating a network of places through the use of collaborative technologies and team agreements.

These results led to Genentech's Neighborhood Work Environments (NWE) initiative – a mix of shared spaces, technology, and agreements to support the new ways in which people work. Each neighborhood has a mix of spaces, from enclosed spaces and team rooms to open studio areas and casual drop-in areas. To create each neighborhood, workplace research activities are conducted during a 'pre-initiation' phase. This research helps to understand the desired outcomes, organizational readiness, and leadership's willingness to change.

The NWE initiative and prototypes led to a new building on the South San Francisco campus, Building 35. The success of the space is measured through surveys and utilization. There is a pre- and post-assessment framing new projects and yearly updates from then on. The post-assessment survey is deployed after six months, which allows employees to adapt to the work environment; thereafter a quarterly survey is deployed.

Five years on from the initial launch of NWE, a more flexible work approach has now been adopted by the entire company and around half the office population are in shared environments. The program is endorsed by senior executives, and employees feel comfortable working flexibly within their neighbourhoods and outside them. Constant monitoring of space utilization and satisfaction means that the work environment is always evolving and adapting to the needs of its occupants. Getting the balance right between collaboration and concentration spaces is an objective that the company is tirelessly trying to achieve. With the success of implementing NWE into the general office space, there is opportunity to extend this concept into lab and manufacturing spaces where applicable.

2:2 Culture and Change Management

Change management is usually a key element in implementing new ways of working in any organization. This rings particularly true in the life science industry because of its diverse spectrum of employees that carry out very different job roles. More recently, employees in the industry are multi-disciplinary and cross-functional and this calls for more integration in the workplace.

Often people are resistant to change, therefore it is crucial that communication ensures they understand the rationale for change. This has been one of the biggest learning curves for real estate in global life science companies in recent years.

As the need for collaborative innovation drives the physical redesign of the work environment, this has led to many life science companies experimenting with different techniques to encourage employees to get on board with new ways of working. Roche Group in Switzerland implemented a 'Work 4.0' initiative to establish the right culture and leadership within the organization. This program has now developed to help identify future skills that will be needed in the industry and the tools that are needed for a more remote and mobile workforce. The program unifies HR and real estate departments to develop a new working culture which champions leaders to be catalysts for change in their businesses.

Bayer has also promoted a culture of engaging its workforce. Bayer believes that maintaining the right culture of trust is a tool for attracting and retaining talent, and consequently driving business success. This culture is evident in its new headquarter development in Reading, UK, where the work environment supports diversity, trust and autonomy – qualities which are measured in an annual employee survey. To help get employees onside with its location move, the company developed easy-to-use technology and diverse work spaces. These tools encourage employees to be more autonomous in making choices about how they want to work. Often resistance to change is because people feel like change is being forced upon them by the real estate or HR team – Bayer built employee choice into its approach from the beginning.

ROCHE GROUP, PENZBERG

Roche Group in Penzberg, Germany used an inclusive method to integrate a smooth change into its workplace. The real estate team conducted a change management workshop with the leadership team, of around 30 people, in a particular business unit in lab space. This business unit hosts 800-900 scientists and the range of skills and backgrounds is diverse. From this workshop, the business is putting together a team of 10 -15 people which will collectively work on optimizing concepts and finding synergies within the business to expand on collaboration concepts and create open environments for everyone in the unit.

2:3 Innovation & Smart Spaces

The introduction of smart technologies has ushered in a new era of flexible smart workspaces and lab spaces. The term 'smart' can be interpreted differently across industries, so in the context of this report, smart space is the provision of tools to cater for better ways of working in flexible, technologically-enabled spaces.

Smart tools

According to a report by Arup, the emergence of smart labs contains connected machines, equipment, sensors and devices which allow researchers to monitor, adjust and analyse experiments remotely. This approach heavily relies on the automation of previously human job roles – these roles tend to involve highly repetitive steps. Smart machines can learn from previous actions and adapt or prepare experiments accordingly. This process allows researchers to produce conclusions from real-time feedback and analyze results of the experiment.

Genentech has introduced an innovation arm within its Pharma Technical Operations (PT) department called iLabs which works to modernize technical operations, and shape and accelerate technology innovation. The purpose of iLabs is to provide a testbed to pilot new concepts and rethink the nexus of innovation across Genentech and Roche by collaborating with partners and connecting them with the knowledge, tools and space to explore ideas.

iLabs offers different types of lab set-ups across the Genentech campus which allows people to connect across different functions and areas of the campus. These labs provide a safe space to pilot riskier concepts and learn quickly from them.

Flexible space

The trend in laboratory design in the past decade has been to build with flexibility in mind. Technology is maturing at a rate which is rapid and unpredictable, making it impossible to anticipate what new technologies and forms of research will exist in the future.

This means that office space and labs need to be built with flexibility – with smart technology embedded from the beginning – so that space can be repurposed over a single weekend. In general office space, flexibility can be interpreted through modular, reconfigurable furniture and exceptional connectivity around the office. In lab environments, flexibility refers to the provision of the right equipment to conduct different types of research in the same space. According to Gensler's report, Adaptability in Life Science Design, a well-designed lab can reduce the need to invest in costly adaptations of lab space elements.

Shift in workflow

The introduction of automation into lab space means scientists have more downtime as they do not need to be at their benches at all times to monitor the machinery. Instead of spending time doing routine checks, scientists are spending more time researching new areas and innovating. As a result, user workflow has shifted so there are more frequent trips between lab and office areas. Traditional building layouts do not accommodate this new workflow and a significant amount of time is wasted during travel. This workflow shift has created an opportunity for life science companies to rethink the connectivity between lab and office space.

As the industry continues to gain a better medical understanding of how to treat diseases through personalized therapies, the development of drugs is more tailored to individuals. This is reducing the amount of 'blockbuster' drugs in the market and companies can work on treatments for a more narrow and specialized segment of the patient population. This shift in how researchers develop drugs will impact how teams collaborate and work together and ultimately, how the drugs are manufactured.

SMARTLAB

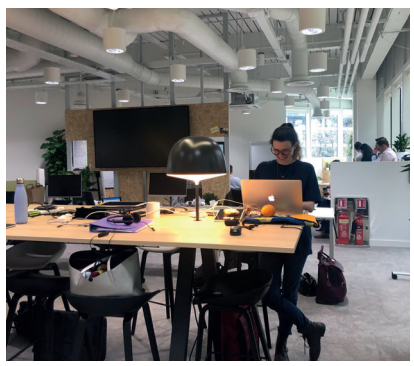
The SmartLab concept is the brainchild of Arup and Gensler and is intended to be a space where scientists can flourish. It provides a sustainable model for spatial design in lab space. It is a multi-functional space which enhances communication and collaboration between scientists. It is characterized by a modular design which can be rapidly and easily reconfigured to accommodate new layouts with minimal disruption. Ventilation systems are configured to accommodate both biomedical and chemistry research. Specialist labs have been designed to stringent regulations, both maximising the potential of space whilst providing a carefully controlled environment. Scientists have complete control over the location of equipment to allow flexibility and autonomy to choose different work layouts.

'With increased automation of basic laboratory procedures freeing up time, users don't need to be at the bench all of the time, so user workflow has frequent trips between lab and office areas'

– Rod Mathews, Genentech

GSK WORKPLACE PERFORMANCE HUB

In 2018, GlaxoSmithkline converted a former skincare laboratory in its west London HQ building into a Workplace Performance Hub with the aim of measuring the behavioral responses of different teams in a flexible working environment in order to calculate potential productivity gains. People working in the Hub were asked to wear heart-rate monitors and a number of variables such as changes in lighting, aroma, visual imagery and soundscaping were tested. Memory, distraction and decision-making tasks were used to evaluate behaviour. GSK's real estate team started this progressive workplace experiment with the company's digital data analytics team, considered the most open to new ways of working, before moving on to introducing more traditionally based teams to the flexible and airy space. The Workplace Performance Hub was designed by Modus with an eye to understanding how different environmental elements support wellbeing and productivity, and supporting GSK's developing position in the global race for talent.



2:4 Academic-corporate collaboration

As the nature of the knowledge and skills required by scientists evolve, the link between academic research and corporate research in the life science industry becomes more important. Most talent entering large corporate life science enterprises come straight from university campuses where shared resources and inter-disciplinary collaboration is the norm.

Roche Group conducted research within its Swiss workplaces to understand what makes people happy at work. One of the results was having a mixture of disciplines under one roof because it created spaces for unplanned meetings. This finding has driven an initiative for future workplaces to bring different people together and use shared resources as a tool to unite the workforce. Shared resources can help the on-boarding and orientation processes for new graduates to develop more organically.

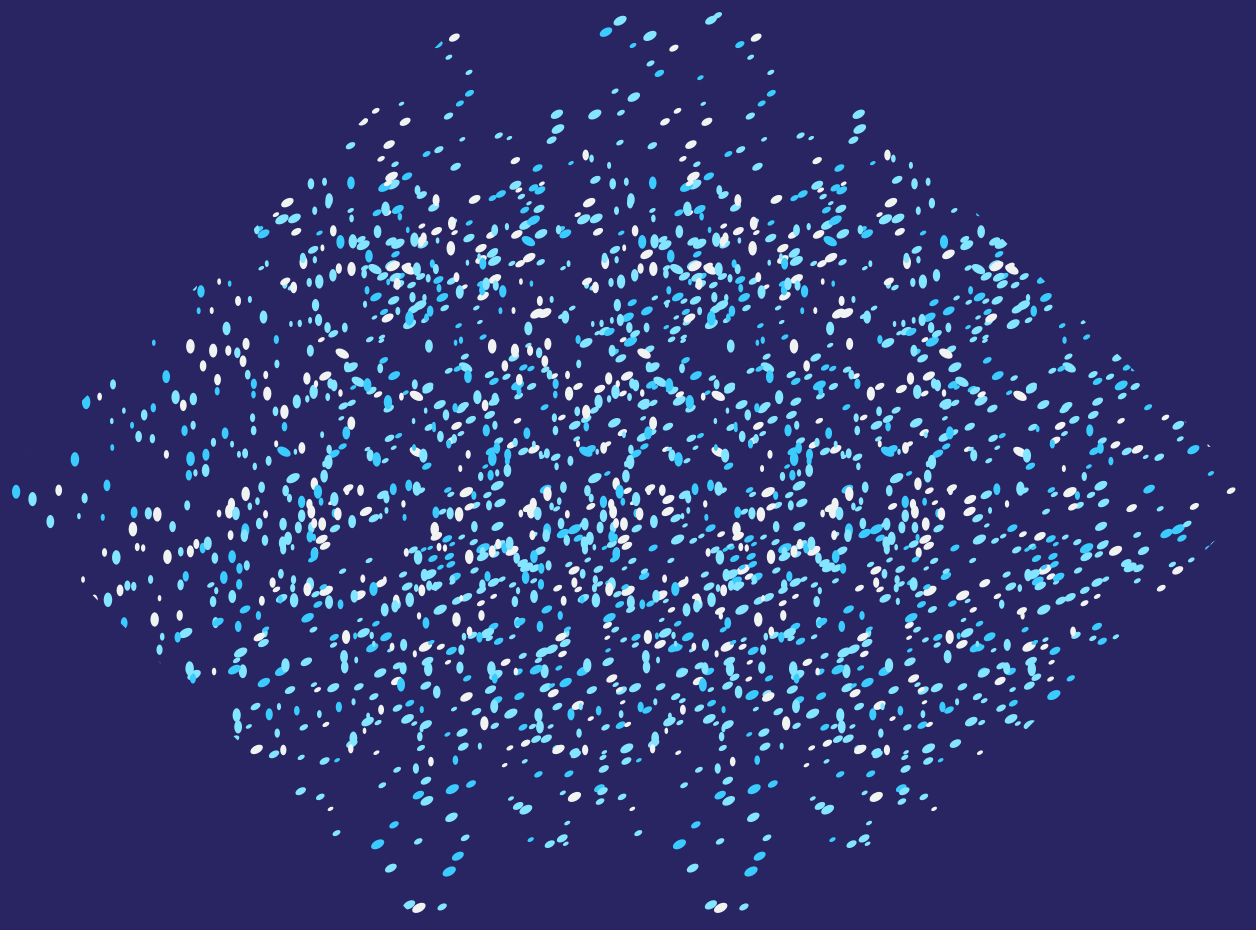
The intersection of innovation
University life science research often benefits from targeted governmental funding. An example of this is in the UK where substantial investment in early-stage research in universities is part of a strategy by the British government to keep jobs in big pharmaceutical companies from relocating elsewhere. The result is that university research teams, start-ups and corporates are now increasingly collaborating within an emerging knowledge ecosystem to develop innovative new solutions. This has implications for where and how life science companies locate and organize their office and lab facilities.

MERCK LAB, GERMANY

Merck Biopharma has used the close interaction of academic and corporate researchers to foster collaboration and cutting-edge science through its Open Lab. The Open Lab invites guest researchers to conduct their own research projects alongside Merck teams at its laboratories in Darmstadt, Germany. This allows academics and students to have access to cutting-edge lab facilities and gain industry experience whilst expanding networks and accelerating their own research.

PARC PARIS

The Université Pierre et Marie Curie in Paris has opened a new building which is intended to bring together researchers from different disciplines, start-ups and other companies under one roof. The building will be open to the public and encourage interaction between researchers and other industries. Lab spaces are visually permeable: people can witness everyday activities in labs and there is less of a physical barrier between different workplaces.

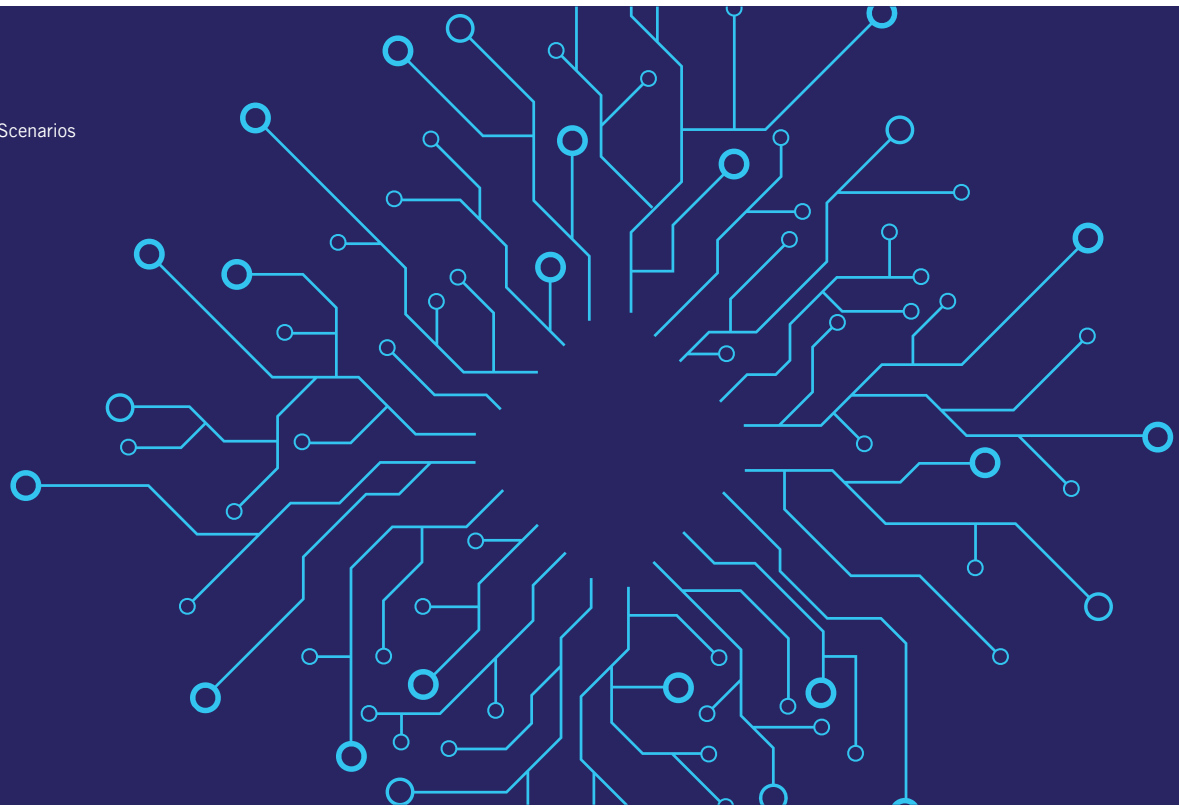


3 FUTURE SCENARIOS

At a time of dynamic change for the life science industry, the intersection of space, technology and behaviour is opening up new vistas for the way office and lab space is designed.

Where large pharmaceutical companies once relied on an established reputation to attract talent, they are now forced to re-evaluate their workplace offering – in competition with tech companies and prominent players in other industries. As the pace of the sector accelerates, research and development needs to create more efficient methods and faster results – this will depend on the quality of the environment researchers are working in and the equipment available to them. And amidst this turbulence, it is clear that the impact of new technologies such as AI and machine learning is already reverberating through the industry.

The question for those tasked with future-proofing the pharmaceutical corporations through workplace investment is how all the various emerging factors described in this paper come together. As a perfect storm, or in configurations that can be strategically managed? To help guide us through the maze, this report sets out three future scenarios based on current research and trends. These approaches are not intended to be mutually exclusive and can be integrated. To some extent they are also interdependent and are likely to co-exist as different companies with different cultures chart their own path through uncertainty.



BLENDED

3:1 Blended

A scenario in which general office, lab space, and virtual space in life science companies become blended

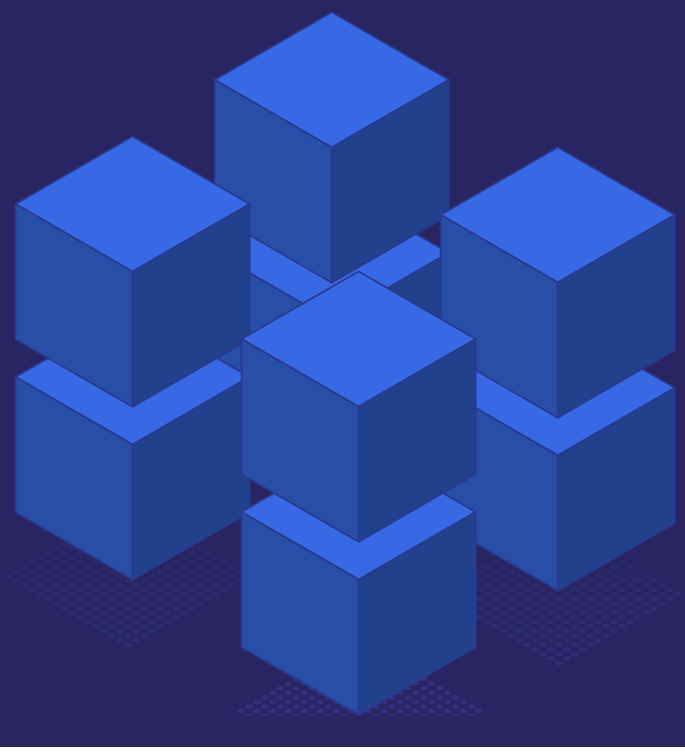
A lack of permeability between lab, office and virtual space in workplaces will no longer continue to work as the industry develops. Future growth will depend on more seamless collaboration between different teams, businesses and geographies within an organization. This means that workplaces will need to be designed with both physical and virtual connectivity in mind.

In this scenario, the future life science workplace blends lab space with office space by integrating different business lines in one building. This shifts the real estate footprint whilst also encouraging inter-disciplinary cohesion. Once different departments are under one roof, spatial design and more transparent and permeable materials are optimized to create better sightlines and physical connections between research and administrative departments.

The blend of space extends into the virtual world. Developments in technology enable employees to work across different geographies in real-time. Data is being shared across the organizational network in real-time, with collaborative technologies infiltrating lab space, meeting space and break out areas.

> ‘Unstructured process is where real innovation happens. There will be a real focus on collaboration between teams in the company and spaces will need to become more open and accessible, not only in a direct and physical way but also to collaborate with teams in different geographical locations’
>
> – Martin Bruebach, Roche

The blended approach sees a more cohesive and unified organization which not only places innovation and knowledge-sharing at the heart of its mission but also addresses the demands of millennial and Generation Z workforce entrants for a more seamless experience across a continuum of workspaces and tech platforms. In the war for talent, the blended scenario has the all-round appeal to attract and retain premium people.



PARTNERED

3:2 Partnered

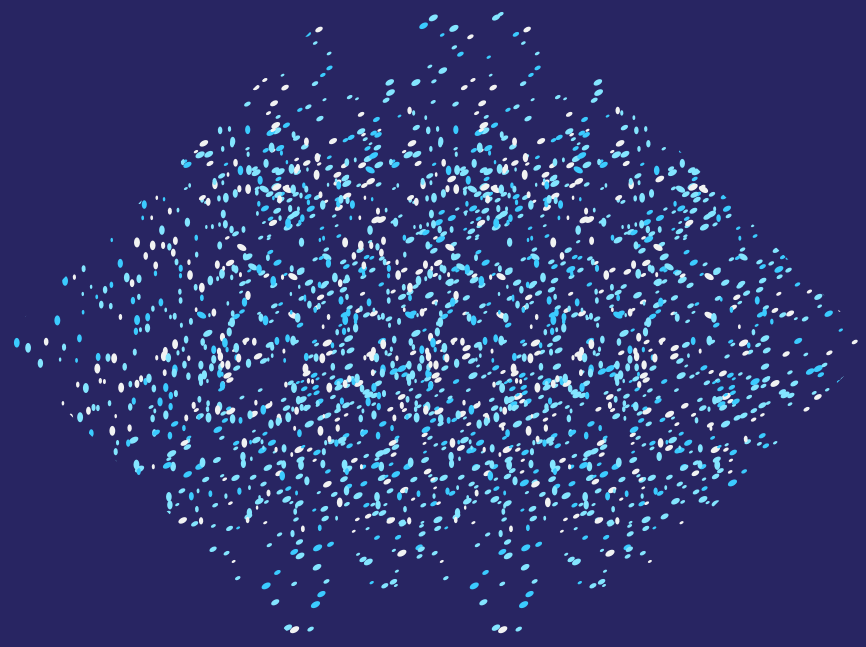
A scenario in which life science companies are integrators, with many front-end and back-end innovation activities outsourced

This scenario repositions large pharmaceutical corporations with a partnered model in which the fixed 'big science' campus is refreshed, realigned or abandoned. Early-stage discovery research is outsourced to universities and start-ups; back-end manufacturing and packaging processes are outsourced to suppliers; the trend to outsourcing clinical trials is accelerated. Office workspace itself is outsourced to contemporary coworking providers and lab space similarly shifts to more attractive city locations in pop-up or other flexible formats.

Life science firms more closely emulate the 'buy-in and bolt together' approach of the car industry, as integrators focus on acquiring IP from elsewhere and taking it to market, buying in whatever services are required en route. Research and development in this scenario becomes highly specific and business-led. Certain market-oriented functions are prioritized and the rest outsourced. Labs become less utilized and data analytics are outsourced to external companies.

In this scenario, the life science campus is broken down into smaller units to become more diverse, activated and dynamic. Some sites are sold off. General workplaces are filled with marketing and commissioning teams; the offer to new talent is unambiguous and attractive, recognizing that many graduates will seek to start their careers in smart start-ups or in-vogue tech firms before looking at big pharma.

This model will situate the large life science company at the hub of a wider ecosystem of collaborative innovation. It must coordinate the inputs of a range of different players in the network – start-ups, specialists, suppliers and other partners – and it must recognize and respond to the series of interdependencies and new relationships that the partnered model brings. In this scenario workplace design generally becomes more permeable to outside influences with more satellite spaces in cities and close to universities. The outside is brought in and the workplace looks outwards.



AUTOMATED

3:3 Automated

A scenario in which AI and machine learning occupy lab space and ask new questions about the co-existence of robots and people

As automation, AI, and machine learning increasingly impact the future life science workplace, more heavy machinery will occupy lab space and more routine jobs will be automated. In this scenario, lab spaces will be significantly less utilized by humans. Instead, researchers will have more time to focus on more complex and innovative experiments which require human ingenuity. Automation simply allows researchers to focus on new developments instead of supervising existing equipment and experiments. Machines and scientists will share space and bring a new level of efficiency and creativity to labs.

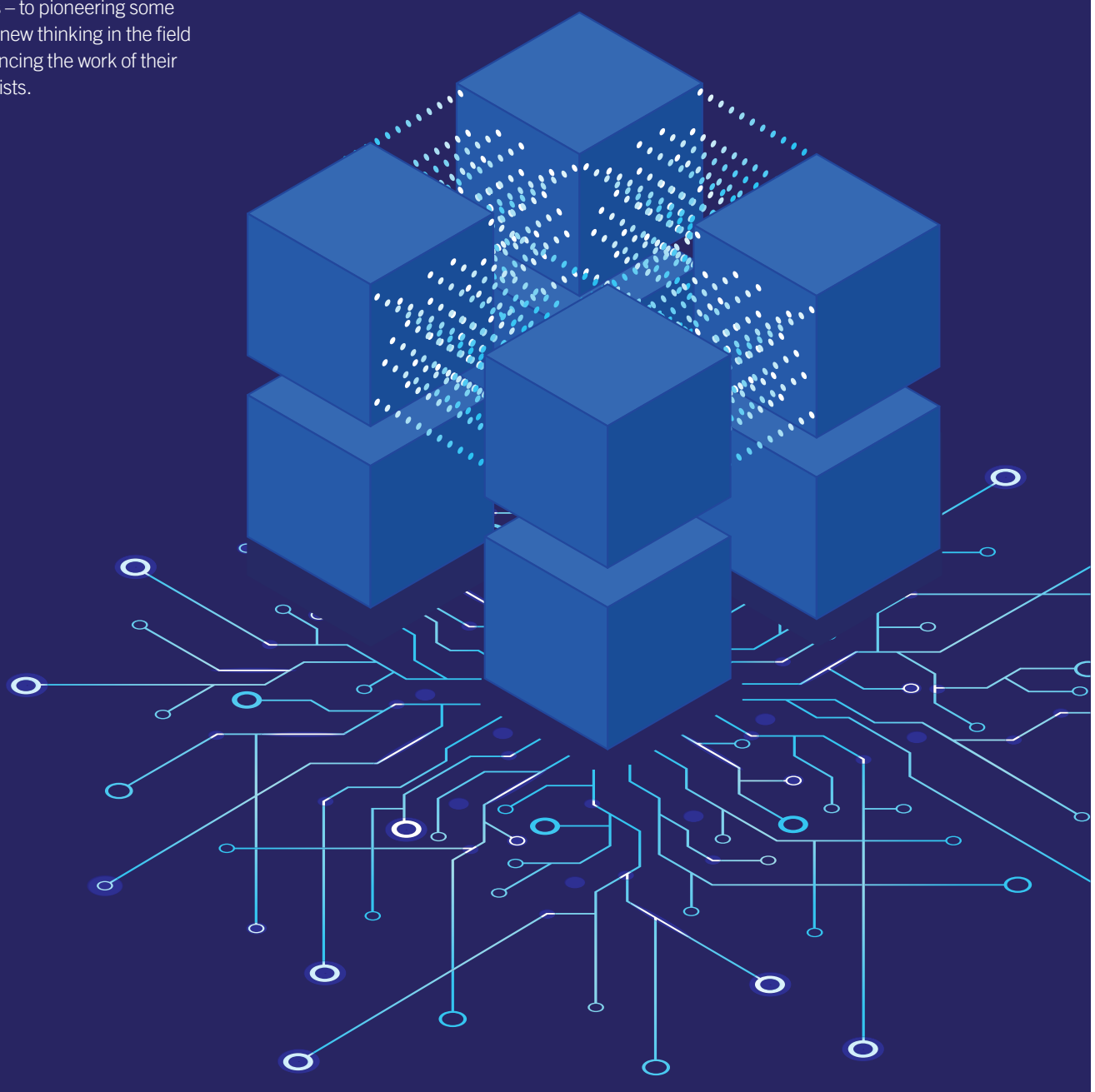
The automated approach reimagines how such lab space might be redesigned in the future, with humans more exposed to natural daylight and given better vistas on the perimeter of lab facilities while the machines hum away in the middle of deep floor plates and in basements. Such clear demarcations will create attractive spaces for people to work and support talent attraction, but new research and behavioral protocols will need to take root for the transition to be successful.

Architects Scott Brownrigg have described this emerging phenomenon as 'Digital Real Estate' – this is a condition which features 'sustainable environments populated by humans and machines symbiotically co-existing, and using big data and emerging techniques to promote technology-led development'. Iain Macdonald, director of Scott Brownrigg's Advanced Technologies unit, suggests that such facilities will not just be located on the periphery of the city but also downtown. He argues that, as younger citizens migrate back to live in the city center, they will increasingly find themselves co-existing with machines: '

In life science companies, new workplace design strategies will reflect this coexistence - with super-visible digital dashboards exchanging real-time data between machines and humans.

Shared traits

It is likely that aspects of all the three scenarios described here – blended, partnered and automated – will be present in the future life science workplace. Although they articulate and exaggerate distinct trends in the sector, they also share common traits. Traditional lab spaces in particular face transformation of various types. Experts predict that the life science workplace will develop defined shifts – from fixed to flexible, from opaque to permeable and open, and from silos to shared facilities and knowledge. In making these shifts, life science companies have the opportunity to spring from behind the curve of workplace change – visible in other industries – to pioneering some of the smartest new thinking in the field and really enhancing the work of their research scientists.



CONCLUSION

As the three scenarios described in the preceding section of this report suggest, the emerging life science workplace of the near future is set to turn existing models on their head.

General office space and lab space facilities will not be so clearly demarcated as independent entities from each other as today. New hybrid approaches to space and facilities will reflect new ways of working and new business processes.

Drivers of change are likely to remain constant across different types of space – such as the development of new technologies, the adoption of new ways for working, the race for talent, the demands of generational shifts and the requirement to manage cultural change across the entire workforce. What will be new is how these spaces are blended, adapted and reconfigured.

Across the life science workplace generally, there is widespread recognition that much has already been done to introduce new trends in general office space, aligning the sector more closely with other fast-moving industries and using new technology to do so. The response has been slower in lab space due to the nature of work traditionally conducted in these facilities. That, however, is set to change – and when it does, there will be real momentum in the field.

How general office design concepts translate into labs is the subject of debate, both within Genentech and in other companies. Clearly the more flexible workstyle afforded by technology will play a part – but the tech dimension goes further. Automation has already been accepted into manufacturing spaces, and in lab space AI is enabling researchers to mine historic data sets to uncover new insights and to conduct virtual experiments to test hypotheses more quickly.

This skill shift will be most prominent in R&D as scientists move into more analytical roles. The focus will no longer be on who knows how to monitor the equipment best, but who can derive meaning from data. This shift will push the life science industry further into the increasingly competitive global landscape of talent attraction and retention.

The life science workplace is now up against tech giants, legal firms, financial titans and many other industries to compete for the world's premium analytical talent. As this report highlights, life science can no longer rely on legacy reputations to bring in the top talent.

The future is therefore all about designing for people, place and technology in the round, in order to achieve sustainable and successful organizations where scientists and researchers can feel supported as their work changes.

User workflow has already shifted and scientists are spending less time in labs and more time travelling between lab and office space. This report outlines an opportunity for workplace design to re-evaluate the workflow of all employees to create environments which are optimal for increased collaboration and productivity, while also balancing the need for focused individual work.

It is possible to see the life science workplace of the future as a series of inter-dependent strands within an innovation ecosystem spanning across geographical and virtual networks. Such a reimagining requires a commitment to the bold new ideas that will transform the sector. On the evidence of this report, some of the key building blocks are in place to make that happen.

SOURCES

Accenture (2018) Reworking the Revolution report

Arup (2018) Future of Labs report

Bernstein Ethan S. and Turban Stephen (2018) The impact of the 'open' workspace on human collaboration 373 *Phil. Trans. R. Soc. B* http://doi.org/10.1098/rstb.2017.0239

BioSpace (2017) Ideal Employer report

Deloitte (2018), Deloitte Centre for Health Solutions Report

Gensler (2018) Adaptability in Life Science Design report

Wilson, J & Daugherty, P (2018) Human + Machine. Reimagining work in the age of AI. *Harvard Business Review Press*

Myerson, J., Bichard, J. & Erlich, A. (2010) 'New Demographics, New Workspace: Office Design for the Changing Workforce', Gower, UK

Scott Brownrigg (2019) Digital downtown: will home and digital workers coexist? *WORKTECH Academy.* https://www.worktechacademy.com/human-robot-workers-coexist-city/

Suyeon Bae, Abimbola Asojo, and Caren Martin. 'Impact of Occupants' Demographics on Indoor Environmental Quality Satisfaction in the Workplace.' Building Research and Information, in press.

Wohlers, C and Hertel, G (2017) Choosing Where to Work at Work – Towards a Theoretical Model of Benefits and Risks of Activity-Based Flexible Offices. Ergonomics, 60(4) p. 467-486

INTERVIEWS

Geo Adams, Head of pRED Facilities and Infrastructure, Roche, Switzerland

Toby Benzacry, Director, Modus, UK

Matthew Bigam, Real Estate Director for EMEA, GSK, UK

Martin Bruebach, Head of Site Asset Strategy, Roche, Germany

Sofonias Demsas, Manager of Real Estate for EMEA, Bayer

Simon French, Workplace Design Director, GSK, UK

Rachel Kessler Park, Strategic Facilities Planner, New York

Sandra Klapper, Real Estate Manager, Roche, Switzerland

Tim O'Connell, Director of Global Science and Technology Practice, HOK, San Francisco

Christoph Rogge, Global Expert Workplace Strategy, Roche, Basel

Matthew Short, Director, Modus, UK

Tom Stuart, Project Manager pRED new lab building (RICS), Roche, Shanghai

Jeff Davis, Head of Clinical Supply Center, Genentech, San Francisco

Kara Calhoun, Head of PTIS Strategy & iLabs, Genentech, San Francisco

Steven Day, Informatics Analyst, DevSci Informatics, Development Sciences, Genentech, South San Francisco

Chris Morrow, Director, DevSci Informatics, Development Sciences, Genentech, South San Francisco

Rod Matthews, Associate Director, OMNI Biomarker Development, Development Sciences, Genentech, South San Francisco

*Interviews were conducted between July and August 2019

ABOUT GENENTECH

Genentech, a member of the Roche Group since 2009, has been delivering on the promise of biotechnology for more than 40 years.

Considered the founder of the industry, Genentech is a biotechnology company dedicated to pursuing ground-breaking science to discover and develop medicines for people with serious and life-threatening diseases. Our transformational discoveries include the first targeted antibody for cancer and the first medicine for primary progressive multiple sclerosis.

www.gene.com

ABOUT WORKTECH ACADEMY

WORKTECH Academy is the world's fastest growing knowledge platform and membership club exploring how we'll work tomorrow.

It brings the best insights, ideas and evidence from the WORKTECH conference series, now in more than 25 cities around the world, to a community of workplace professionals all over the world. The Academy's content is curated in six streams: people, place, technology, culture, design and innovation. Genentech is a Corporate Member of WORKTECH Academy.

www.worktechacademy.com

Genentech

A Member of the Roche Group

www.gene.com