

looking back on what we learnt at Lab of the Future 2019

We caught up with six key speakers from the Lab of the Future Congress on the issues most important to them. Here we present their insights and other highlights from the conference.

From buildings and technology, to people and processes—what is the lab of the future?

Bryn Roberts is the SVP and Global Head of Operations & Early Development at Roche. He started his career in pharmacology, later specialising in high-throughput screening, data science and informatics. He has been at Roche for 13 years, with senior roles in informatics and operations, including lab automation and building R&D centres.

“The concept of the lab of the future has influenced our work in two main ways:

Firstly, we need to innovate the physical space we often think of as the lab, keeping it up to date and agile regarding technology, science and new ways of working. At Roche, we are building a number of new centres around the world to reflect this. These are designed with collaboration and sharing as primary drivers, and in a modular fashion to support agility. Scientists work together in neighbourhoods based on shared activities and projects, rather than traditional disciplinary silos. We’re digitalising these new centres to take advantage of automation, internet of things (IoT), building management systems, etc. to optimize workflows and drive productivity, for example, reagent and consumable supply chain, equipment sharing, electronic notebooks.

However, the concept of the lab goes further than that. To get meaningful data, we can’t just stay confined to buildings, we need to bring experiments out into the real world. In the context of disease, we are exploring a number of ways to do this. People talk about their symptoms in a totally different way online than they do to their doctor. Using social media as a tool to understand how disease affects people, we uncovered impactful symptoms of Parkinson’s Disease that weren’t in our focus previously. Innovative digital biomarkers, based on mobile and wearable sensor technology is another example. These are being used to monitor subjects with various neurological and neurodevelopmental conditions, such as movement disorders in Huntington’s Disease and social interactions in people with autism. Using approaches like these, we are able to gather far richer and more representative information than could be obtained from clinic-based assessments



Bryn Roberts, SVP and Global Head of Operations & Early Development at Roche

two or three times per year, and can do so in a manner that is more real-world relevant and reduces the assessment burden for patients.”

“One challenge with this approach is that people are rightly concerned about their privacy. It is crucial that we ensure that we have not only peoples’ consent, but their fully informed consent, for their participation in these studies. We are also building the monitoring tools using the principle of privacy by design, meaning that the data collected are appropriately anonymised and encrypted, and that privacy is protected for individuals all the way from their smartphone through the entire data storage and analysis processes.”

Regarding the Congress, Bryn says, “There’s been a real effort made to do things differently to traditional conferences, and the Live Lab was a prime example of this. It’s great to have so many smart people all under one roof.”

Monika Lessl, VP Head of Corporate Innovation, R&D and Societal Engagement at Bayer took part in the opening panel alongside Bryn and Steve Martin from GSK. Her contribution focussed on breaking down barriers, an issue she says is particularly important as we remember the 30th anniversary of the fall of the Berlin wall.

“My background is in science, and I’m especially interested in its impact on society. I’m attending the conference because the themes of connectivity and collaboration are crucial for me to find innovative and sustainable solutions addressing the needs of a growing and ageing population.”

“To prevent and treat disease for example, we need to understand factors ranging from the socio-economic and lifestyle influences on health, to the deeper molecular mechanisms of illness. To achieve this rounded understanding, we have to break down barriers between geographies, cultures, and disciplines that have not historically worked together. More generally, it’s important for us scientists to break down barriers in our minds, and be open to new ways of thinking.”

“I think this event is great, because it raises broader questions about what a lab is: we can no longer consider a lab as just a building with four walls, but as a space where we experiment and explore novel ideas.”



Left: Monika Lessl, VP Head of Corporate Innovation, R&D and Societal Engagement at Bayer

Right: Steve Martin, Head of BioPharm Discovery at GSK

People and productivity

The R&D model is changing rapidly, and this will affect the way scientists work together in the future. To find out more, we caught up with two major service providers: Avantor and Thermo Fisher Scientific.



Bruce Dembofsky, Director of Scientific Services at Avantor

Bruce Dembofsky, Director of Scientific Services at Avantor chaired the 'innovation track', and he presented a talk on the 'human factor enabling the lab of the future'. The importance of people, not just technology, was emphasised throughout this conference, and Bruce was exemplary of this.

Bruce says, "In the life sciences, and particularly in the pharmaceutical industry, there is pressure to be as productive and high-throughput as possible. But the nature of this work can be a drain on scientists'

creativity. Scientists in drug discovery spend 45% of their time doing protocol-driven lab work, but only around 10% on the higher-level creative tasks needed to innovate."

"We are seeing more and more of our customers wanting to be 'innovative', but what does this actually mean? To innovate, you need both creativity and productivity, and the creative—or human side—is something scientists want more of. To free up more time to be creative, we are offering Lab of the Future services, which allow scientists to hand over some of the routine tasks that take up their time. People can't work in silos anymore—science should be a team sport!"

Richard Milne, VP & GM, Digital Science, Thermo Fisher Scientific shares a similar view on the importance of people in the lab, particularly as scientists adapt to an increasingly digital environment. Richard has been involved in the digitization of the scientific process for nearly 20 years, originally helping with the transformation of the procurement process. More recently, he's been working with customers to understand how digital technologies can be used, not only to support ancillary work processes but to transform the lab environment itself.

He says, "People are under pressure to be doing more with less, expectations in terms of output and speed of delivery are rising. As an industry we need to support and rise to that challenge. A key element in that is collectively establishing a new normal which takes

advantage of digital technologies in a scaled and operational way. This will require standards and



Left: Ralph Haefeli, Senior IT Manager, Novartis
Centre: Richard Milne, VP & GM, Digital Science, Thermo Fisher Scientific

Right: Mike Stapleton, Managing Director, Accenture

collaboration, creating that environment to deliver those gains is not a muscle that the industry has developed well."

"The lab of the future impacts my work tremendously. It is changing the conversation both within and outside our company - we are having to drive greater integration and cross-business collaboration within Thermo Fisher, whilst building ecosystem partners from outside the company."

Commenting on the event, Bruce says, "It was a good mixture of organisations, and we're pleased to see it's not just about technology, but also considers the human side of the lab. The Congress has been a good opportunity for us to get a better understanding of how the R&D model is changing."

While Richard adds, "The Congress was very useful: the lab of the future impacts my work every day, so it is great to have an event devoted to it."

The importance of data

The importance of data, from capture to analysis and interpretation, was highlighted by many.



Rob Brown, VP Product Marketing at Dotmatics

This was reflected eloquently by **Rob Brown, VP Product Marketing at Dotmatics**, who told us: "The value of data has been compared to that of oil, but neither produce value until they have been discovered, extracted, refined and productized in the most efficient way."

Rob adds, "From our perspective, automating data capture and interpretation is one way of handling the challenge. Most of our customers wish to ensure they have the flexibility to integrate new applications within their workflows. This, along with discussions

held at the conference, demonstrate that implementing the lab of the future will be an ongoing process."

"The speakers, from a variety of organizations, were compelling, and eager to share their experiences. Lab of the Future initiatives like this conference will be one key to transforming productivity in scientific research organizations, where handling the ever-increasing volume of data is a critical bottleneck."

Mark Buswell is VP of Research Solutions at GSK. He took part in the keynote panel on Technology and its impact on the Lab of the Future.

Mark introduces himself: "I trained as a chemical engineer at Cambridge University, and I joined GSK in 2002, where I now have accountability for



Left: Paul Donohoe, CTO of Somark

Centre: Mark Buswell, VP of Research Solutions at GSK

Right: Chris Waller, VP and Chief Scientist at EPAM

all pre-clinical IT solutions supporting R&D from target sciences through discovery and development, and finally to clinical trial supply.”

“A key challenge in the pharma industry is tackling declining productivity; many promising drug molecules fail in the later stages of development. To address this, we can’t just make incremental improvements, but we need to have a more fundamental re-think of how we do work in a lab and how we collect data.”

“The primary output of the lab is data collected from experiments, but data isn’t always accurate, and doesn’t always tell us the right things. To make R&D sustainable, we have to think carefully about the questions we are asking when we do experiments. This becomes increasingly important as we use data to train models to help us make decisions. For those decisions to make sense, the data have to make sense too.”

“It is essential these data are published in an open and flexible format that will remain easily accessible in the future, both to ourselves and potential collaborators. At GSK for example, we are using ‘cognitive services’ from Microsoft to extract historic data (e.g. from failed compounds) that have long been forgotten, and put it all into the same format so that new insights may be drawn.”

“I’ve really enjoyed discussing these ideas at the conference. The panel format works well—in contrast to everyone just listening to a presentation, it’s more informal and promotes discussion.”



Wolfgang Colsman, CEO of ZONTAL

Data standardisation is a matter that **ZONTAL’s CEO, Wolfgang Colsman**, cares about more than most. He is the inventor and architect of the Allotrope Framework. This is a set of data standards initially agreed to by 13 of the 20 major pharmaceutical companies which now gets adopted more widely across the industry.

He says, “As businesses are implementing their digital strategy, we need new technologies that enable the digital integration by providing high quality data sets, ready for consumption by data scientists and data citizens. New standards are

needed to support this harmonisation so information becomes available and interoperable across a variety of data sources.”

“The Lab of the Future concept is helping work to become data-centric and to lower the cost of compliance and integration. Processes can be automated, allowing a multitude of scientific applications to use and seamlessly share their data sets.”

On the conference, Wolfgang says, “There has been a good audience and lots of people to speak to.”

Starting conversations:

The 300+ delegates from across the life sciences industry were invited to contribute to open discussions in the exhibition space. During the Live Lab, the ‘catch box’ microphone was passed around from person to person, inviting everyone to offer their perspectives on a range of issues affecting life science R&D.

Many collaborative networks and industry groups have formed off the back of events like this. For example, the Pistoia Alliance, working to encourage pre-competitive collaboration in pharma, formed from a shared vision held by representatives of AstraZeneca, GSK and Pfizer who met at an Italian conference in 2007. By actively encouraging open, informal conversations between some of the industry's best minds, who knows where the conversations held at the inaugural Lab of the Future Congress may one day lead.

The story doesn't stop here either. In May 2020, the Lab of the Future Congress USA will be held in Boston, Massachusetts—the World's largest life science cluster and the Lab of the Future Europe is moving to the centre of Amsterdam on 13th & 14th October.

Be part of the next conversation



Lab OF THE **Future**

19-20 May 2020
Hilton Back Bay Boston USA

Lab OF THE **Future**

13-14 October 2020
Beurs van Berlage, Amsterdam

Website

Website