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Success Will Depend on the Ability to Operationalise AI, Not Just Adopt It

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Dr. Oliver Hampton explains how artificial intelligence, integrated data ecosystems, and continuous learning platforms are reshaping biotechnologyâ??from target discovery and clinical trials to precision medicine and healthcare delivery.

As biotechnology enters an increasingly data-driven era, organisations are rethinking how discovery, clinical development, and healthcare delivery intersect. Artificial intelligence, multi-omics, real-world evidence, and advanced analytics are transforming not only how therapies are developed but also how patients are identified, treated, and monitored over time. **During BIO International Convention 2026 in San Diego, BioSpectrum Asia spoke with Dr. Oliver Hampton, Chief Data Officer at Southern Research,** about the organisation's new $98 million biotechnology centre, the growing role of AI in drug development, and how integrated data ecosystems are accelerating precision medicine. He also shares insights on supporting biotech entrepreneurship, overcoming data fragmentation, and preparing for the next decade of innovation.

Southern Research recently expanded its biotechnology capabilities through a new $98 million biotechnology centre. How do you see this investment changing the organisation's role within the global drug discovery and development ecosystem, particularly as biotech companies seek more integrated research and development partners?

At a basic level, the expansion significantly increases capacity and capability. This investment has doubled our laboratory space and adds advanced, modernized infrastructure that supports everything from early discovery through preclinical and translational research.

Equally important, the investment creates room to grow the broader innovation ecosystem around us. By moving core operations into the new facility, we can retrofit legacy lab space to expand our Station 41 incubator, allowing us to support more early-stage companies and create a more seamless path from startup incubation to advanced development within a single, integrated environment.

As Chief Data Officer, you sit at the intersection of biology, data science, and clinical innovation. How is artificial intelligence and advanced analytics reshaping the way organisations approach target discovery, translational research, clinical trial design, and real-world evidence generation today?

Artificial intelligence and advanced analytics are fundamentally shifting biopharma from hypothesis-driven science to data-driven discovery across the entire R&D continuum. In target discovery, AI is enabling the integration of multi-omics and biological networks at scale, identifying novel targets, biomarkers, and disease mechanisms that would be difficult to detect using traditional approaches.

In translational research, AI is closing the gap between discovery and clinical application by linking molecular data with real-world patient outcomes, enabling more precise patient stratification and better-informed decisions on which assets to advance.

Clinical trial design is being reshaped into a more adaptive, data-driven process. AI is optimizing protocol design, identifying eligible patients from real-world datasets such as Catalyst by Southern Research that accelerate recruitment thereby reducing timelines and improving trial success rates.

Precision medicine continues to evolve rapidly, driven by advances in genomics, multiomics, and computational biology. What developments do you believe will have the greatest impact on patient outcomes over the next five years, and what barriers still need to be overcome to fully realise their potential?

Over the next five years, the most impactful developments will come from the convergence of multi-omics data, real-world clinical data, and scalable AI platforms that can model disease more holistically. These technologies are enabling a shift from population-level medicine to precise patient stratification, identifying which patients are at risk, and which patients are most likely to respond to specific therapies or interventions. AI-driven integration of genomic, phenotypic, and longitudinal clinical data is especially powerful in linking discovery to real-world outcomes and accelerating translation into clinical practice.

Equally important is the emergence of continuous learning systems, where real-world evidence is generated in parallel with clinical development. This enables more adaptive trial designs, earlier signal detection, and a tighter feedback loop between research and care, ultimately improving treatment effectiveness and speed to impact.

However, several barriers remain. Data fragmentation and poor interoperability continue to limit the ability to integrate genomic and clinical datasets at scale, and data quality and bias remain ongoing challenges, particularly in underrepresented populations. Programs like Catalyst by Southern Research are designed to address these gaps by building consented, longitudinal clinicogenomic cohorts that integrate diverse data sources and enable continuous reanalysis, creating a scalable foundation for more representative evidence generation and precision medicine at scale.

Through Station 41, Southern Research is helping early stage biotechnology companies access infrastructure, expertise, and commercialisation pathways. What are the most common challenges faced by emerging biotech innovators today, and what distinguishes the companies that successfully transition from promising science to sustainable businesses?

Emerging biotech innovators face several persistent challenges. One of the most fundamental is access to specialized infrastructure, particularly wet lab and office space, that allows young companies to advance their research without shouldering the cost and complexity of building out their own facilities. They must also navigate regulatory and commercialization pathways alongside their scientific development. In our region, two additional gaps stand out as especially critical.

The first is assembling a competitive and operational team from the talent in and around Birmingham and across Alabama. Beyond strong science, early-stage companies need leaders with expertise in finance, business development, and regulatory strategy, along with experienced CSOs, CTOs, and CEOs who can guide a company from the bench to the market.

The second is access to Series A capital. Meaningful pre-seed, seed, and supplemental funding is available locally, from private investors and State of Alabama economic development groups, to help launch a startup, but the "next step" Series A funding needed to reach the next critical inflection point is more limited. On the coasts and in established life science hubs, a Series A round is typically $25 million or more; in the Deep South, even a $5 to $10 million round would be transformative for a startup's success or eventual exit.

What distinguishes the companies that succeed is their ability to pair strong science with a clear translational and commercial strategy, leveraging platforms, partnerships, and high-quality data to move efficiently from discovery to validation and into the clinic.

Programs like Station 41 are designed to address these gaps. We are expanding our footprint and adding wet lab and office space to support additional companies, while providing the expertise and commercialization pathways early-stage innovators need. We are also building the regional talent base on multiple fronts: convening experienced leaders through dedicated

working groups such as our C-Suite Principals, Rare Diseases, and Immunology & Inflammation groups, attracting additional expertise from beyond our region, and cultivating homegrown talent through partnerships such as the UAB Master of Science and PhD in Biotechnology programs, which were designed to prepare the next generation of biotech founders and operators. Together, these efforts help innovators scale more rapidly and translate promising science into sustainable businesses.

We are seeing increasing convergence between biotechnology, artificial intelligence, advanced diagnostics, and digital health. How do you expect these disciplines to interact in the future, and what opportunities does this create for accelerating therapeutic innovation and improving healthcare delivery?

From a Catalyst lens, these disciplines are converging into a unified, integrated ecosystem rather than operating as parallel domains. AI and advanced analytics are converting multi-omic and clinical data into actionable insights, while advances in diagnostics and digital health enable earlier detection and continuous patient engagement. Together, these forces are shifting care from episodic, reactive models to a continuous learning system in which data is generated, analyzed, and applied in near real time.

In practice, this creates a significant opportunity to accelerate therapeutic innovation by closing the gap between discovery and clinical application. Integrating genomic, clinical, and real-world data enables earlier identification of disease drivers, more precise patient stratification, and the design of faster, more representative clinical trials.

From a healthcare delivery perspective, this convergence enables a more longitudinal and proactive model of care. Patients move beyond one-time diagnosis into a continuous cycle of data capture, reinterpretation, and insight generation, where new genomic findings, evolving clinical data, and emerging therapies are dynamically aligned. Programs like Catalyst are critical in enabling this model by building consented, recontactable clinicogenomic cohorts that connect patients, data, and research to support both ongoing care and continuous innovation.

Looking ahead to the next decade, what are the most significant scientific, technological, and operational trends that biotechnology leaders should be preparing for today? Additionally, what message would you share with biotech entrepreneurs, researchers, and investors navigating an increasingly competitive innovation landscape?

Over the next decade, the most significant trends will come from the maturation of AI as a foundational layer across the drug development and healthcare delivery ecosystem. We are moving toward AI-native platforms that integrate multi-omics, clinical, and real-world data at scale, enabling more predictive models of disease, faster target identification, and increasingly automated design–test–learn cycles. In parallel, continuously learning systems—where data from discovery through real-world use feeds back into development—will compress timelines and improve decision-making.

Catalyst by Southern Research is a tangible example of this future. By building a consented, recontactable clinicogenomic cohort and applying AI to integrate genomic, clinical, and longitudinal data, Catalyst demonstrates how patient identification, trial matching, and real-world evidence generation can function as a single, connected system. This shifts from episodic studies to an always-on infrastructure linking discovery directly to patients and real-world outcomes.

For biotech leaders, the message is clear: success will depend on the ability to operationalize AI—not just adopt it—through high-quality, integrated data platforms and by embedding AI into core decision-making processes.