ZETA SYMPOSIUM

# _26

## minds and machines in synergy

review

# minds and machines in synergy

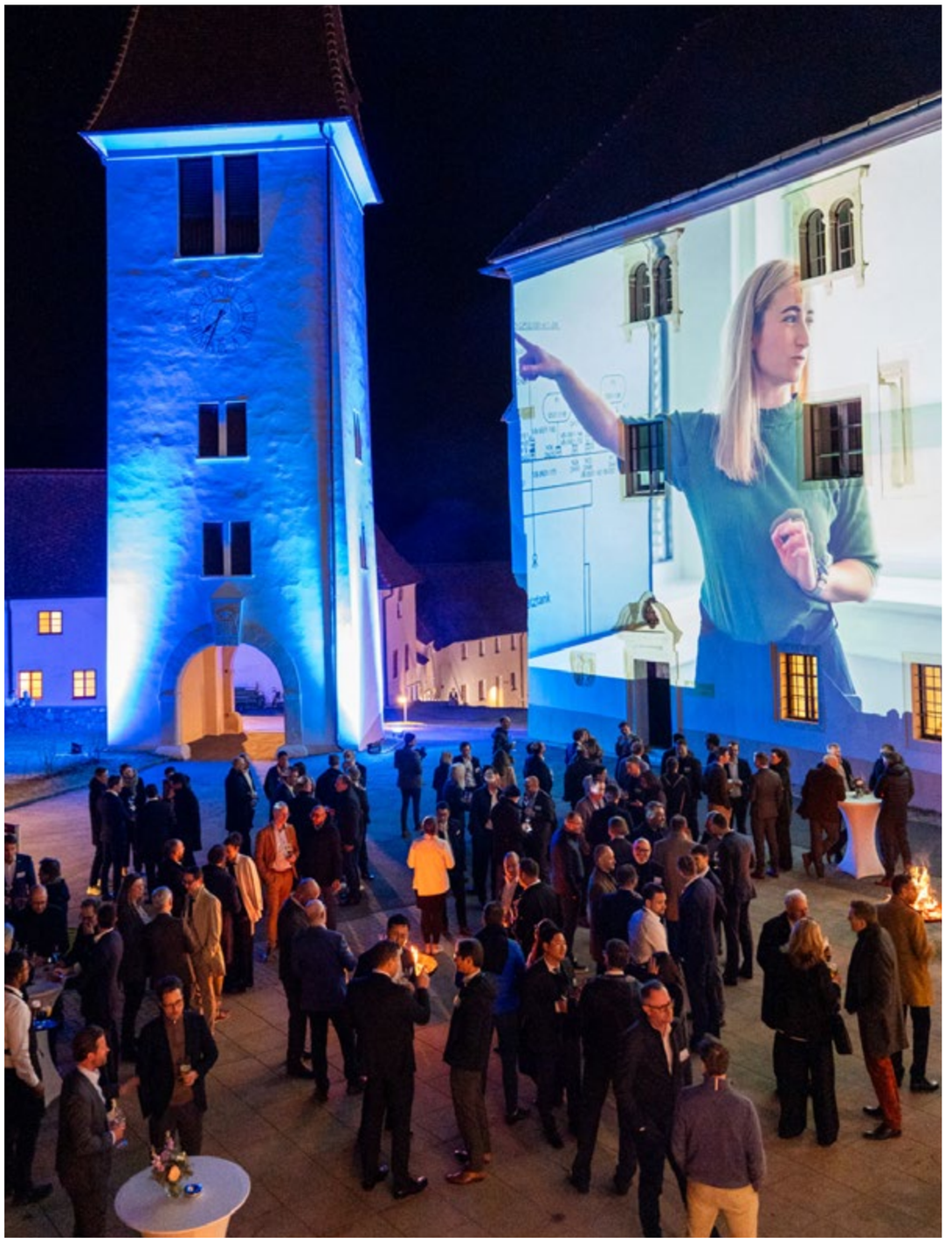
## Transforming pharma together

The 7th ZETA Symposium, held from March 9–11, 2026 at Schloss Seggau, once again brought together industry leaders, researchers, and technology innovators from around the world.

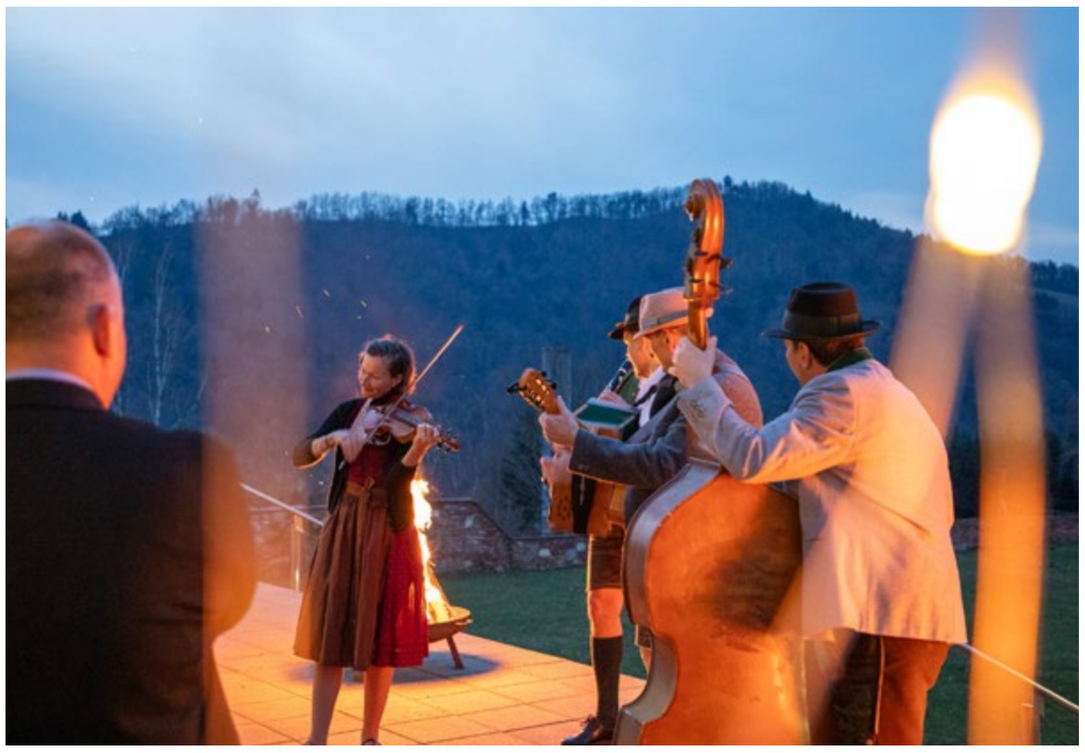
Under the guiding theme “Minds and Machines in Synergy”, the event explored how human expertise and intelligent technologies can jointly shape the future of pharmaceutical manufacturing.

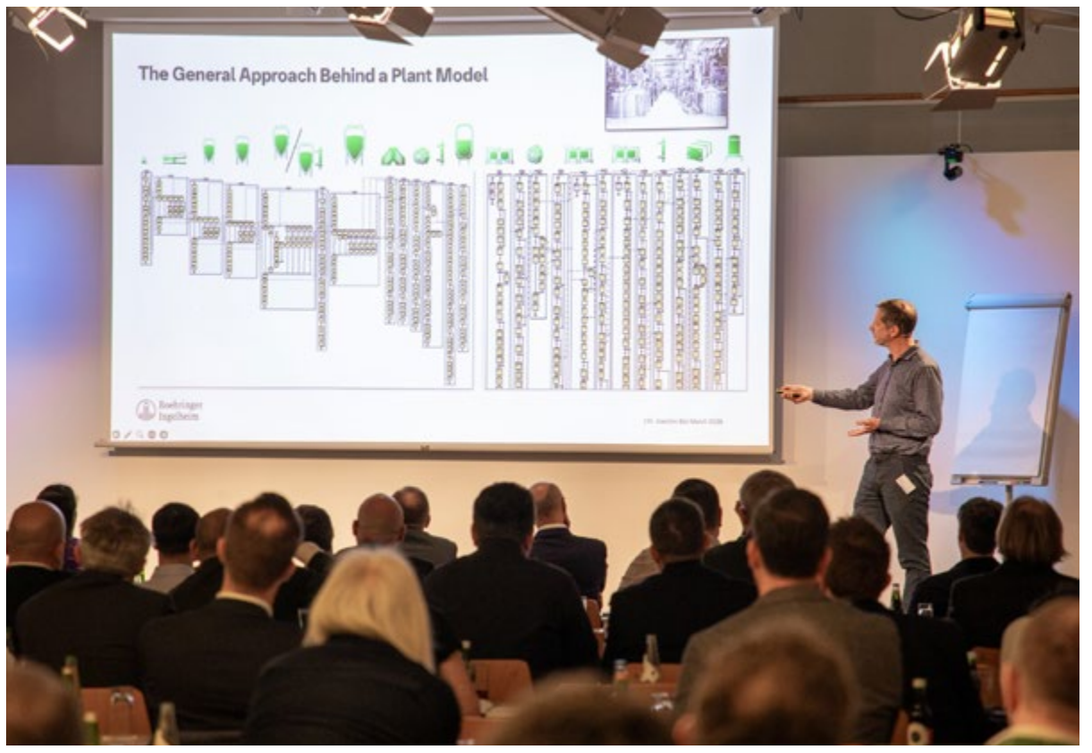
180 guests from 18 countries, spanning regions such as the US, the Middle East, Egypt, and India, contributed to a truly global dialogue.


PANEL DISCUSSION
04.10 - 04.55 PM
Supply Chain Resilience in the Changing Geopolitical Environment
SIEMENS




ZETA
SYMPOSIUM
E+H
Endress+Hauser

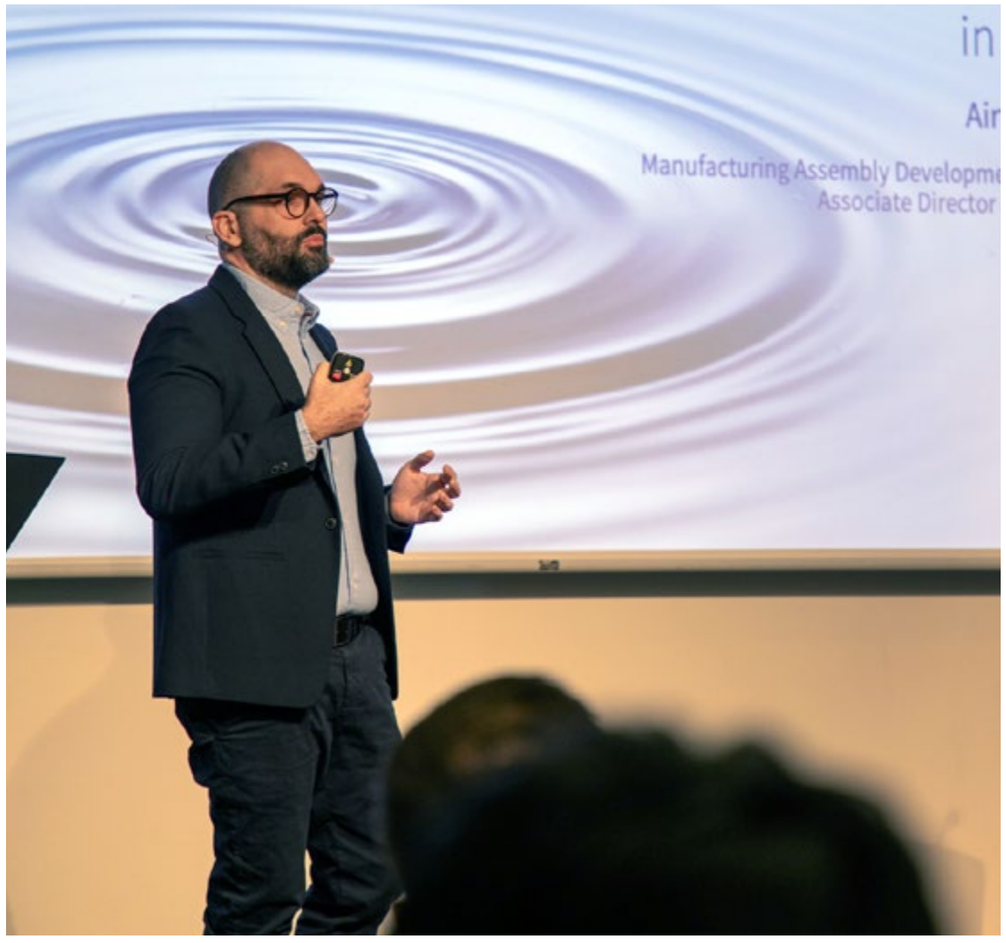



The General Approach Behind a Plant Model

# conference sessions

In his opening address, **Andreas Marchler** highlighted the rapidly shifting geopolitical, economic, and technological environment. He reflected on challenges ranging from the pandemic and global supply chain instability to shifting production capacities and the emergence of new crises. Against this backdrop, he emphasized that planning security has become nearly impossible, making collaboration and innovation more essential than ever.

The ZETA Managing Director pointed to the accelerated adoption of AI over the last two years, describing it as a turning point not only for the economy but also for pharmaceutical production. He encouraged participants to think holistically - from molecules to patient - and called for breaking silos to turn information into actionable innovation.




**Darren Dasburg**, CEO of Clarus Biologics, provided an in-depth look at the rapidly evolving cell and gene therapy ecosystem, shaped by thousands of emerging companies and expanding therapeutic targets. He illustrated how consolidation, new business models, and capital-market shifts influence the pace of innovation, and highlighted the soaring complexity of genetic therapies, comparing their molecular scale to constructing the International Space Station.

Dasburg also showed how development cycles, investment dynamics, and regulatory pressures are reshaping product pipelines, emphasizing that manufacturing scalability and cost efficiency have become decisive strategic factors.

Furthermore, he explored upcoming modalities, such as xenotransplantation and genetic correction technologies, offering an outlook on how engineering and biology increasingly merge to create next-generation therapies.

Following the keynote, **Airton Miranda** (Novo Nordisk) demonstrated how digital continuity creates an end-to-end data backbone connecting design, process development, manufacturing, vendor management, and operations.

He explained how digital threads shorten delivery timelines, reduce revision cycles, and enable “right-first-time” engineering. Miranda also emphasized the value of model-based approaches and digital twins, which allow testing and optimizing production lines long before physical equipment is built.

**Günter Waxenecker** presented significant milestones in 20 years of AGES, the Austrian Agency for Health and Food Safety, and its interactions with the European Medicines Agency (EMA).

He explained how strategic initiatives launched by EMA establish innovative frameworks to support the industry and ensure regulators are equipped to assess novel applications, like AI-enabled production, digital twins, continuous manufacturing, and lifecycle-oriented regulatory models.

Waxenecker emphasized the rising importance of real-world evidence, platform approaches, and scientific advice frameworks that reduce uncertainty for innovative developers.




**Christian Ramsauer** (TU Graz) explored how robotics is transitioning from rigid, fixed machines to agile, autonomous agents that act as a “mobile nervous system” of a factory.

He highlighted labor shortages, rising costs, and global competition as major drivers accelerating robotics adoption. Ramsauer also introduced emerging technologies such as humanoid robots, quadrupeds, and advanced automated guided vehicles (AGVs) that will increasingly take over hazardous or repetitive tasks in production environments and visual and acoustic system inspections.

Ramsauer is convinced that the gap between lab research and factory reality is closing and humanoid workers are on their way to being a standard commercial reality.

## a mobile nervous system ...

SESSION III – Personalized Care and Human-Centered Innovation

Representing communications and engineering perspectives, **Duccio Manetti and Maria Concetta Santangelo** (Kedrion Biopharma) discussed the unique nature of plasma-derived medicines - a value chain rooted in human donation.

They emphasized that true innovation in this field is less about modifying products and more about strengthening supply chain resilience, GMP-driven facility design, built-in redundancy, and digitalization to secure reliable access for patients with rare and chronic diseases.

Highlighting the importance of manufacturing excellence, they noted that engineering plays a strategically critical role in ensuring reliability and global availability of life-saving medicines.


**Thomas Wieland** (Foundation Medicine) provided an in-depth look at the diagnostics landscape, demonstrating how computational biology, multimodal data, and machine-learning–based signatures deliver deeper tumor insights that go far beyond classical genomics.

## … go far beyond classical genomics

He highlighted Foundation Medicine's vast datasets – spanning DNA, RNA, real-world evidence, and imaging – which power improved therapy selection, biomarker discovery, and regulatory-grade reporting.

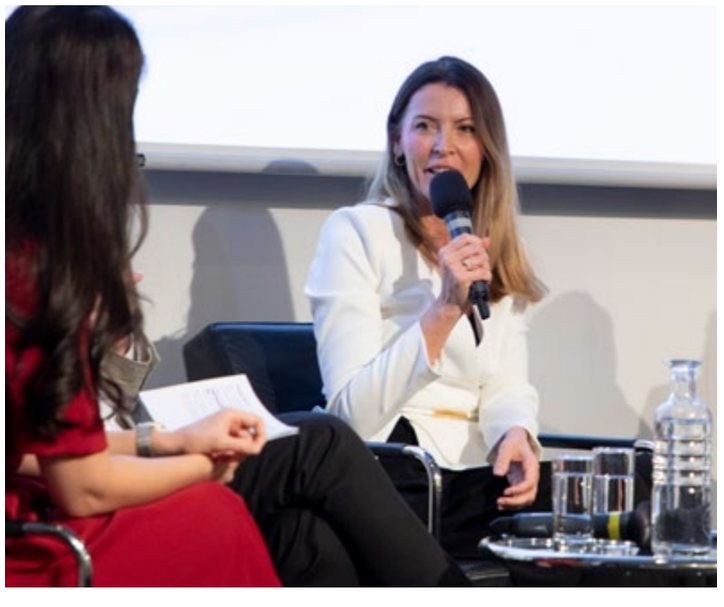


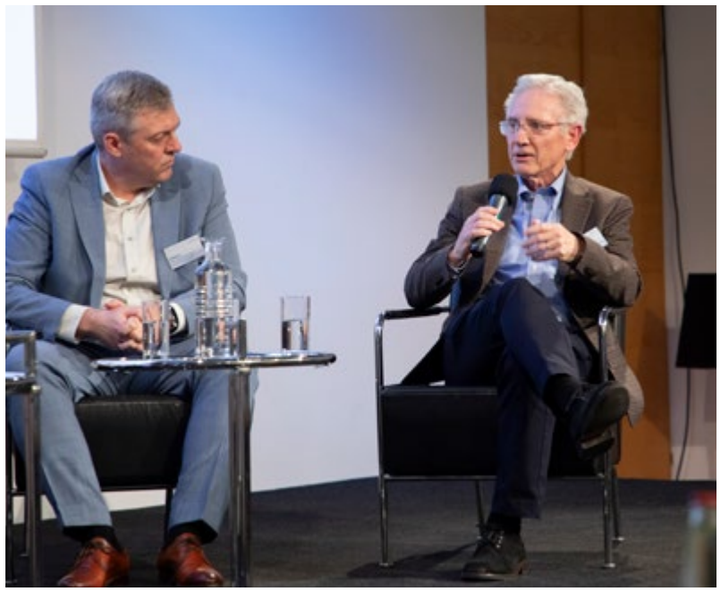
# sponsor forum & panel discussion

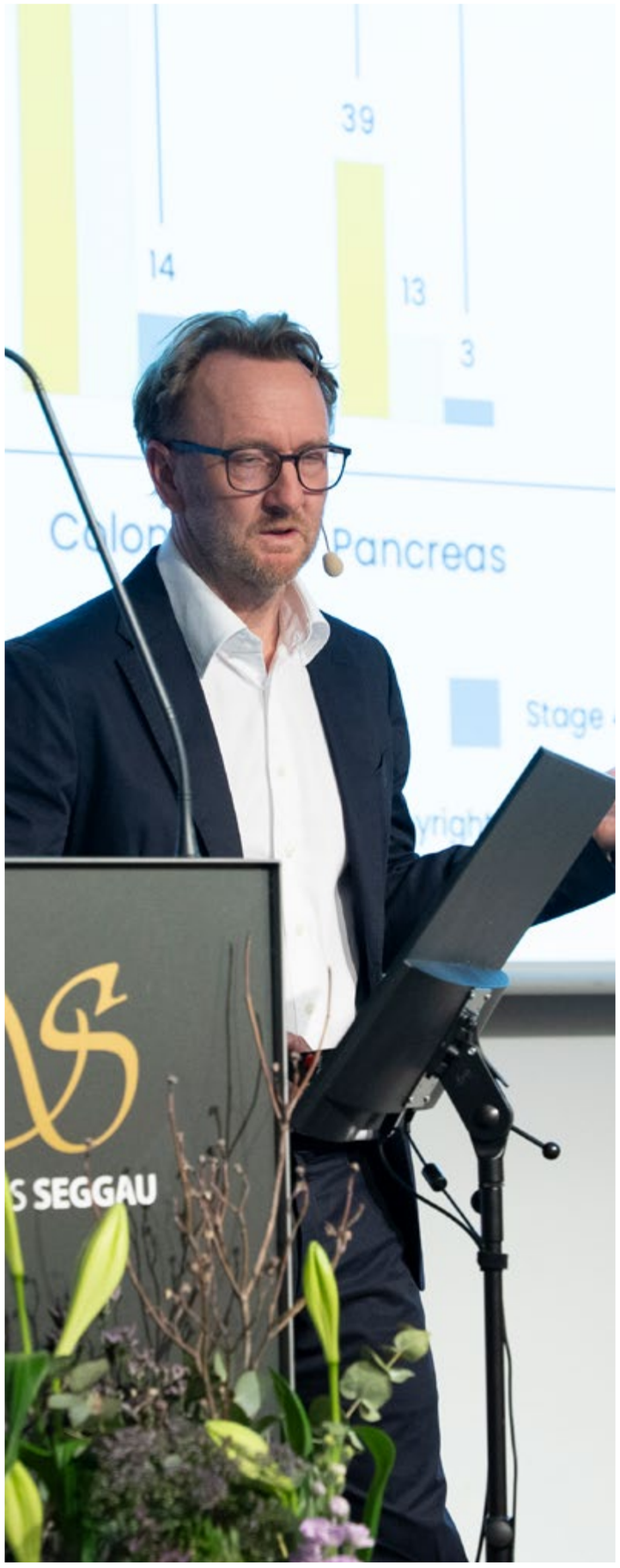
The Tuesday morning Sponsor Forum featured lively discussions with enthusiastic participation from attendees.
Each selected business partner – Siemens, AVEVA, GEMÜ, Endress+Hauser, Mettler Toledo, Dockweiler, and Turck – invited the audience to their tables to engage in conversations on carefully chosen and highly relevant topics.

**A heartfelt thank you to our amazing sponsors for making the event such a success!**

A high-level panel featuring experts **Lejla Pock (Human Technology Styria)**, **Harald Freudenthaler (Boehringer Ingelheim)**, **Darren Dasburg (Clarus Biologics)**, and **Günter Waxenecker (AGES)** explored how geopolitics, regional shifts, and evolving regulatory frameworks are reshaping global supply chains.
A theme that strongly resonates with the industry's current climate of uncertainty.






# think summit - a glimpse into the future

Journalist and author **Thomas Schulz** (DER SPIEGEL) offered a captivating tour through Silicon Valley's breakthroughs in AI-driven medicine, longevity research, quantum-enabled drug discovery, and engineering-based biology.

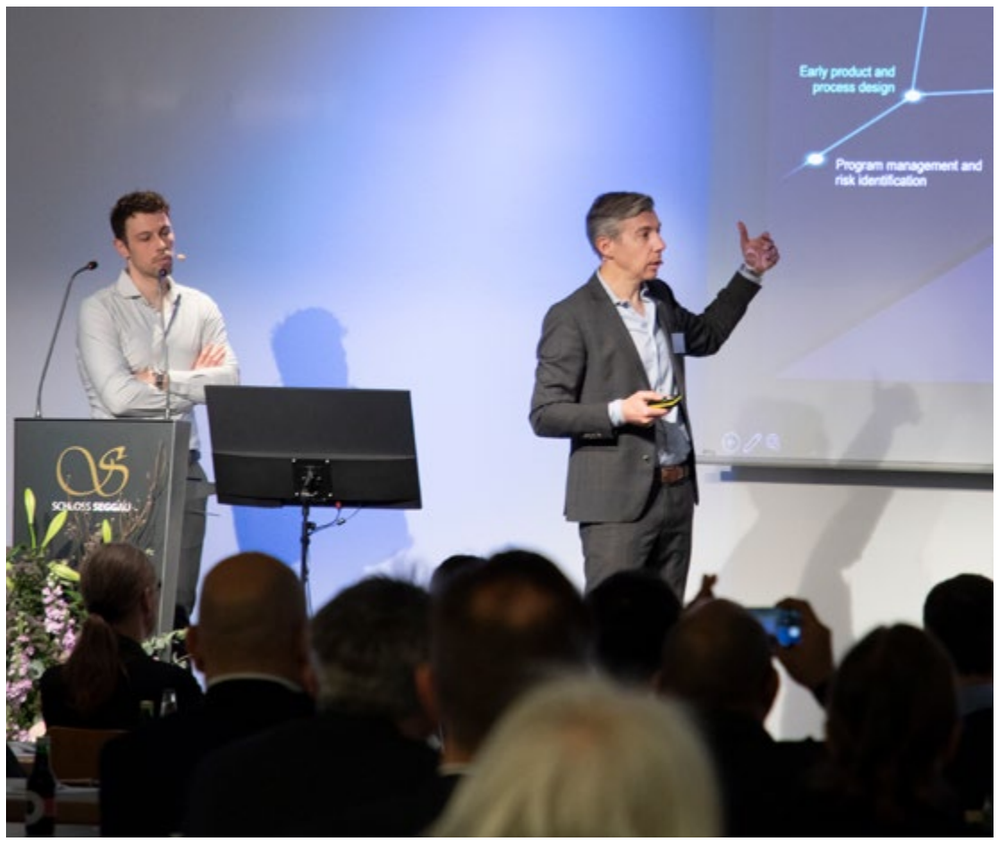
He demonstrated how diagnostics, screening, and therapeutic design are experiencing exponential acceleration, marking a fundamental shift from empirical science to an engineering discipline.

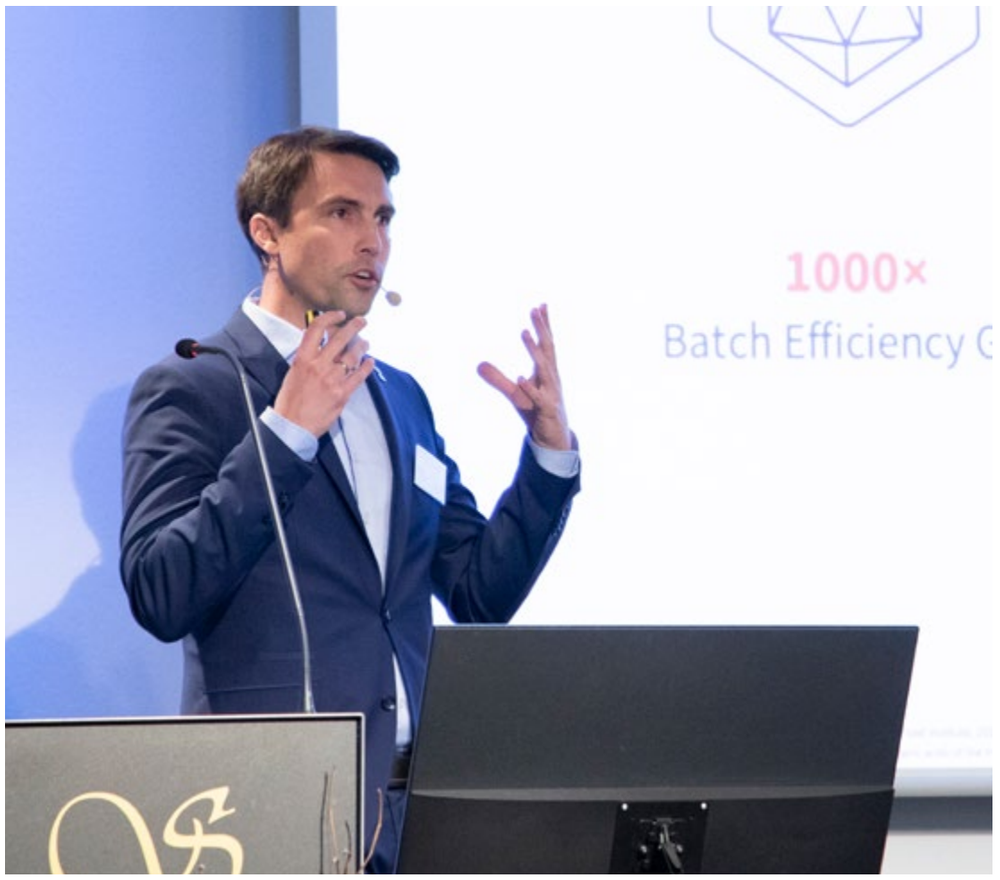
In their joint session, **Dirk Wollaert** (Siemens) and **Niels Vandervoort** (J&J) illustrated the practical impact of digital threads, autonomous process twins, and integrated product-process design.

Wollaert introduced a proven methodology that simplifies the complexity of a digital transformation and Vandervoort demonstrated a successful solvent swap process as a real-world example.

# … autonomous digital twin

He showed how J&J's self-optimizing, autonomous digital twin was developed to predict the scale-up of the chemical process step, optimize it, and run in the optimal way.




**Mark Duerkop** presented how Novasign leverages AI-driven digital twins, automated data processing, and intelligent experimental planning to reduce risk and accelerate bioprocess development, scale-up, and manufacturing.

He highlighted major industry bottlenecks and showed how Novasign's integrated platform can cut experimental load by up to 70%, shorten development timelines by 12 weeks, and significantly improve predictability from small-scale to production scale.

Through case studies spanning viral vectors, biosimilars, media optimization, and continuous bioprocessing, he demonstrated how combining mechanistic and data-driven models enables smarter workflows, better quality control, de-risked scale-up, and fully automated end-to-end process control.

**Joachim Bär** presented how Boehringer Ingelheim uses digital plant modeling to optimize its global biopharmaceutical production network.

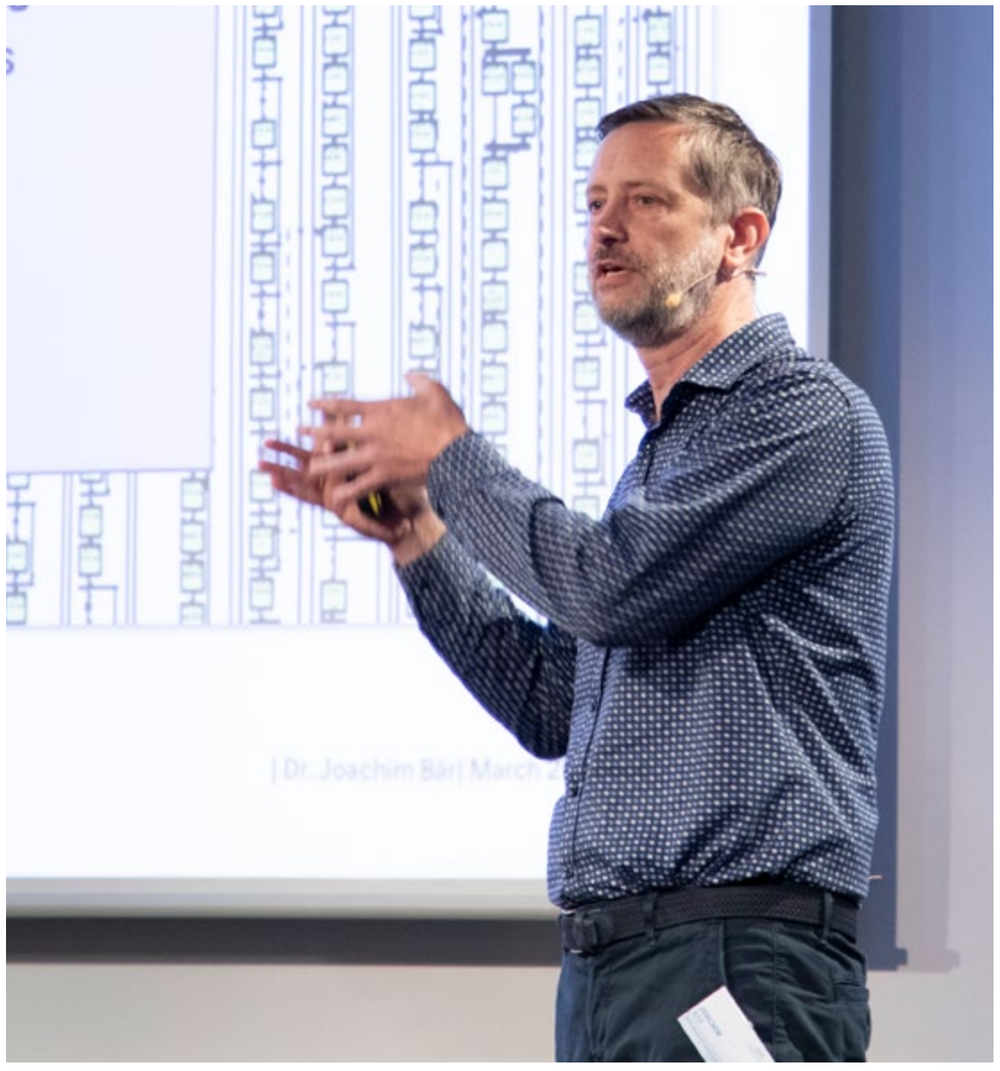
The approach integrates detailed process attributes - such as volumes, costs, mass balances, and sustainability metrics — into dynamic simulations that support decisions on capacity utilization, cost of goods, debottlenecking, technology transfers, and sustainability performance.

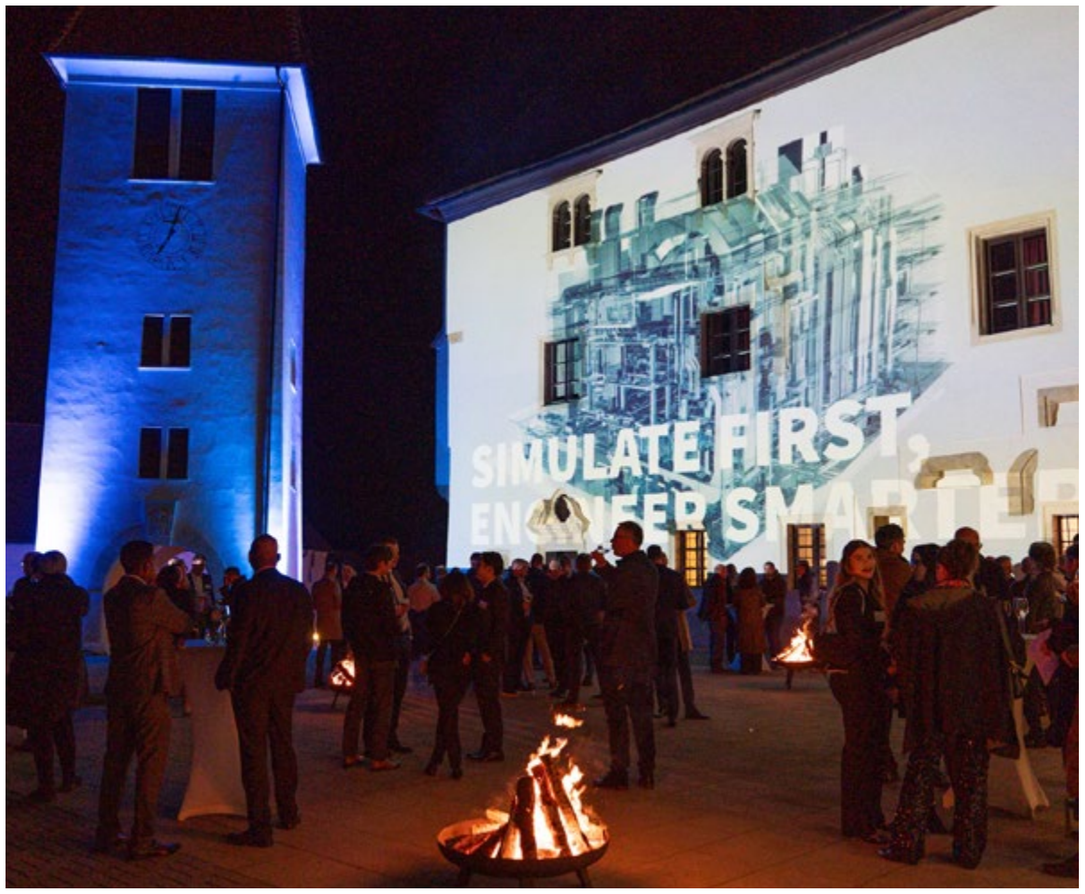
Case studies showed that combining process modeling with plant, cost, and sustainability modeling can significantly boost productivity, reduce material costs, and improve environmental impact.

Deloitte expert **Kendra Bussey** explored how supply chain digitalization and AI are reshaping pharmaceutical manufacturing in response to rising complexity, new therapeutic modalities, and global uncertainty.

A central theme was that breakthrough science is advancing faster than today's supply chains and manufacturing systems can support. To close this gap, companies are increasingly adopting AI, digital twins, agentic systems, and spatial computing.

She also presented a joint ZETA-Deloitte initiative on the in-silico value chain, mapping how AI and digital twins could revolutionize drug development end-to-end.

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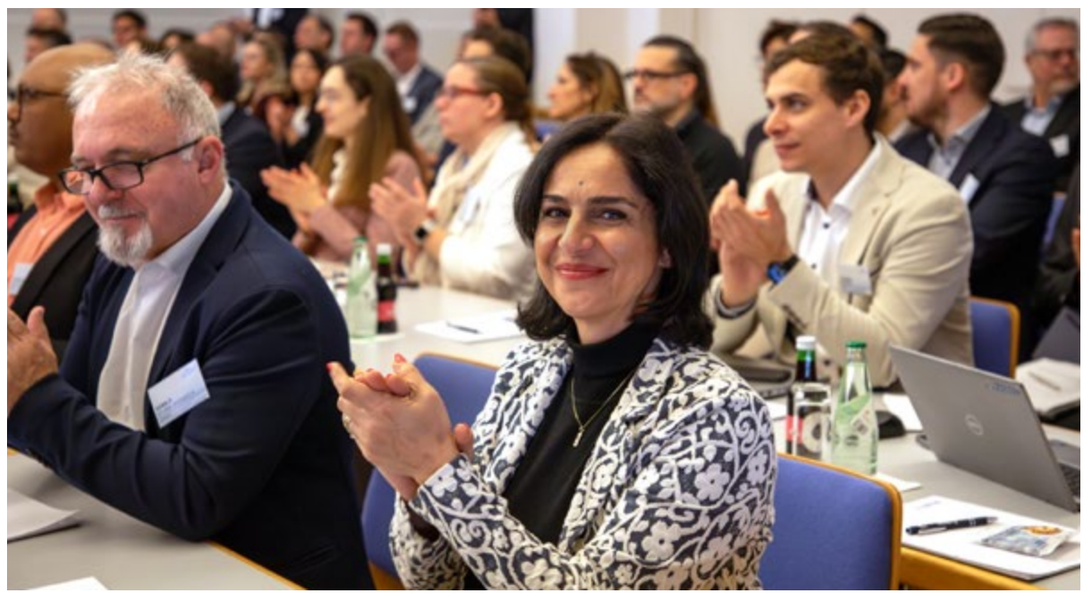



Why we are here
ZETA Symposium brings together the people who
innovation.
reflects our belief that
an execution function,
biopharma impact.
novation

**Christian Gruber** explored how advances in AI and high-performance computing are transforming structural biology, protein science, and drug discovery. He traced the evolution of the field - from early structural biology relying on massive synchrotron facilities to today's AI-driven approaches capable of analyzing millions of protein structures and binding sites.

His company, Innophore, uses machine-readable 3D point-cloud descriptors ("catalophores") to predict protein function, discover new enzymes, and identify drug targets across sectors such as enzymology, virology, and pharmaceuticals.

## ... minds and machines work synergistically

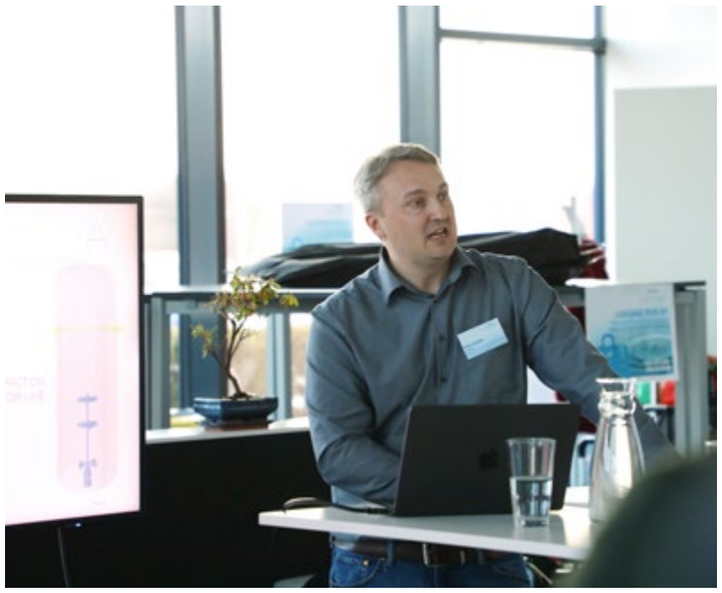
He emphasized that AI is rapidly advancing - supported by milestones such as the Nobel Prize for AlphaFold - and that computing power from tech companies is now essential for scientific progress. He closed by highlighting frontier developments like models that can read and now write DNA, pointing toward a future where minds and machines work synergistically to accelerate biological innovation.


**Thomas McCarthy** (AVEVA) outlined how life sciences companies can navigate today's surge in capital investment by moving beyond traditional project delivery toward an integrated digital strategy.

## beyond traditional project delivery ...

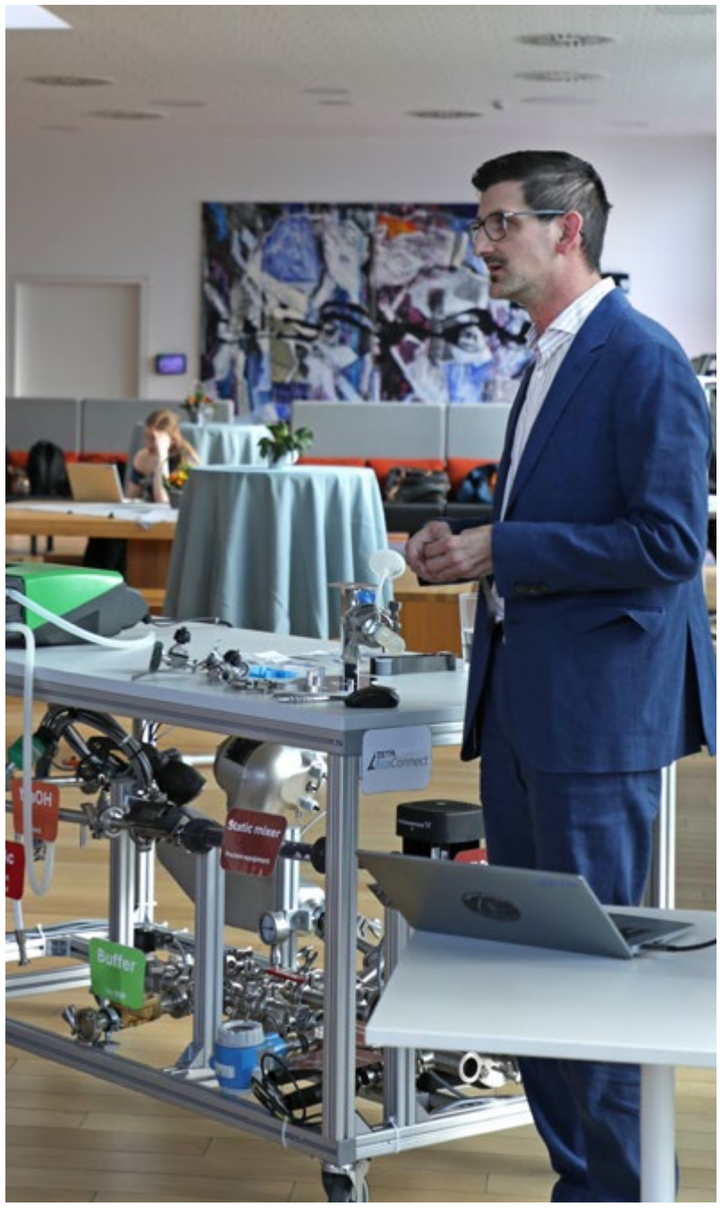
By linking EPC 4.0 (advanced engineering and project execution) with Pharma 4.0 (digital maturity in operations), organizations can design, build, and operate facilities more efficiently.

Central to this transformation are Operational Digital Twins, which provide real-time insights, predictive capabilities, and end-to-end lifecycle optimization.

# workshops at the ZETA headquarters

On the final afternoon, participants visited ZETA HQ in Lieboch for hands-on workshops. Exploring topics such as connected lifecycle engineering, simulation to operations workflows, CFD meets realization, and practical demonstrations of InFlow (buffer inline conditioning), EcoConnect (aseptic connector), and PUPSIT (pre-use post-sterilization integrity testing) solutions.



# summary & outlook

The **ZETA Symposium 2026** successfully demonstrated how the synergy between human expertise and intelligent systems is reshaping modern pharma.

Across all sessions, a clear message emerged:
**The industry is entering a new era where data, digital models, and AI become essential pillars of innovation, resilience, and patient-centric progress.**

As in previous years, participants valued the open exchange, collaborative spirit, and opportunities to shape ideas that will define the next generation of pharmaceutical manufacturing.

Looking ahead, the **ZETA Symposium 2027**, taking place from **March 8 to 10, 2027**, will continue this momentum, offering fresh insights and new opportunities to co-create the future of pharma.

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