

Proving AI's Value in Life Sciences

R&D productivity in the life sciences sector is under increasing pressure. Biopharma companies face the challenge of bringing drugs to market faster, more cost-effectively and with higher success rates, all while managing rising costs and adapting to evolving standards of care. AI is emerging as a vital enabler, helping the industry rethink traditional R&D approaches and unlock new levels of efficiency, speed and precision.

AI's impact spans the entire R&D value chain, with maturity varying across stages. It is most advanced in drug discovery and early research, where it accelerates target identification, optimises chemical structures and reduces unnecessary iterations. AI is also evolving in clinical development, with applications such as patient selection, adaptive trial design, and digital twins enabling smarter trials and faster results.

The true potential of AI lies in its ability to connect patient data – biomarkers, genetic profiles and other characteristics – to drug response, driving the development of precision therapies in oncology and increasingly in areas such as immunology, cardiometabolic disease and neurology. A foundational step in this journey is consolidating and cleaning data, ensuring AI systems can deliver actionable insights and maximise their impact.

Realising AI's promise demands a strategic approach. Biopharma companies must embrace a dual-track strategy: partnering with AI innovators that offer differentiating approaches while simultaneously building robust in-house capabilities to establish long-term competitive advantage.

Successful integration of AI also requires more than just technological investment – it calls for organisational evolution. Actively driving change management across teams and processes will be essential to embedding AI as a core enabler of business transformation.

In focus: AI's role in R&D productivity

- 1 Speeding up discovery:** AI reduces drug discovery timelines from 3-4 years to as little as 1-2 years, with technologies like Atomwise's AtomNet cutting early screening by 50%.
- 2 Increasing success rates:** AI tools have been reported to improve Phase 1 success rates to 80-90%, compared to the industry average of 40-65%.
- 3 Maximising resource efficiency:** AI is claimed to reduce the number of R&D full-time equivalents (FTEs) required per programme by up to 20%, freeing up capacity for other activities.

Want to find out more?

Contact us to discover how L.E.K. helps biopharma leaders navigate the challenges of the AI Delta – the gap between AI's theoretical potential and real-world impact. We collaborate with clients to develop tailored strategies that consolidate AI's role across the R&D value chain, balance external partnerships with in-house investments and embed AI as a transformative driver of productivity. Explore our Look Forward series to learn why 2025 is the year AI transforms industries.



The AI-enabled asset pipeline has grown at

20%

annually over the past decade, with 70+ assets now in clinical development



AI can reduce the number of control patients needed by

20-50%



To drive R&D innovation, leading biopharma companies have each executed

15+
AI partnerships

Sources: L.E.K. research and analysis, ScienceDirect, Nature

Explore the Look Forward series

