

AI & Biopharma R&D: 5 Key Leadership Questions for Your Organization

Artificial Intelligence (AI) is transforming biopharma R&D, redefining how new therapies are discovered, developed, and delivered. Unlike prior digital tools, AI promises to accelerate core scientific discovery and clinical execution with profound implications for competitive advantage.

Funding dynamics in the industry highlight both opportunity and caution. While broad biotech IPO and funding activity has slowed in recent years, AI-native and TechBio (AI-enabled biopharma) ventures surged: global venture capital in AI related startups nearly doubled from \$55.6 billion in 2023 to nearly \$100 billion in 2024¹. Yet in 2025, investors have adopted a more cautious approach, pulling back until companies can demonstrate proof of concept and tangible outcomes. The industry now faces a critical inflection point.

[Approaches to AI integration](#) differ sharply by company type. Smaller, more agile biotechs and emerging TechBio players are embedding AI natively into discovery workflows, often leveraging flexible leadership models and digital-first structures. This has created speed and focus advantages, but scaling sustainably requires more than technical hires

- it demands intentional integration of talent and culture to avoid fragmentation. Large biopharma companies, by contrast, have relied on partnerships and acquisitions to access AI capabilities, leaving many with bolt-on solutions rather than deeply embedded competencies.

In this context, biopharma organizations are coming to recognize that rethinking leadership, talent, and operating models is now an urgent priority. In the last 12 months alone, Russell Reynolds Associates' biopharma R&D engagements have quadrupled, underscoring the growing demand for leaders who can translate technological promise into strategic impact. Yet according to [RRA's H1 2025 Global Leadership Monitor \(GLM\)](#)², the leadership gap remains stark:

82%*

of healthcare leaders agree that a strong understanding of generative AI will be a required skill for future C-suite members

*Up 10pp since H1 2024

40%**

feel confident they currently have the skills needed to implement AI effectively within their organization

**Up 7pp since H1 2024

As a result, the war for scarce AI and computational biology talent is intensifying, with both large and small firms competing to attract, onboard, and retain leaders capable of bridging science and technology.

To help leadership teams navigate this inflection point, we outline five key questions that should guide how biopharma organizations attract, develop, and empower AI-enabled talent in R&D.

1. What results are we leveraging AI to deliver within R&D?

Without clear focus, AI risks becoming a solution in search of a problem. Leaders must articulate whether AI will address core scientific discovery challenges, streamline operations, or unlock new business models. It is therefore imperative for leaders to display **strategic vision and practical implementation**. Defining outcomes enables prioritization of resources and prevents fragmentation into scattered AI pilots with limited impact.

Across the R&D value chain, AI is already demonstrating impact. In discovery, models can screen billions of compounds in silico, opening opportunities beyond the approximately 863 known FDA targets and surfacing underexplored protein families³. In clinical development, machine learning is improving patient recruitment, adaptive trial design, and monitoring, helping reduce costly late-stage failures that average \$2.2 billion per drug⁴. In data integration, AI platforms are unifying real world evidence, genomic datasets, and preclinical results, generating insights in days rather than months. Crucially, these insights can now be fed back into early discovery, creating a virtuous cycle that continuously enhances research productivity and strengths portfolio decision making.



A lot of the challenges we face are around adapting our processes and ways of working to embed this system properly... Beyond the data storage, compute, methods, and data generation challenges, we have to make this model work from a people and process perspective."

John Marioni

SVP and Head of Computational Sciences, Genentech⁵

Our research, however, highlights a readiness gap: only [43% of healthcare executives believe their organizations have forward-thinking leadership aligning resources to AI](#), and a mere 28% believe their organization has employees with the right technical skills required to implement generative AI solutions.⁶ Leaders who can set a clear AI agenda and link it to strategy and upskilling throughout the organization will provide the clarity needed to drive adoption at scale.

2. How should our R&D organizational model transform to integrate AI?

Embedding AI in biopharma R&D requires more than bolt-on capabilities. Sustainable adoption calls for redesigned organizational models that integrate technology, data science, analytics, and biostatistics across the R&D spectrum, and it also requires leadership to **balance rapid experimentation with robust governance**.

Approaches diverge between large and small players. Large pharma must rewire entrenched innovation models, moving from externally sourced, bolt-on capabilities toward embedding AI across discovery and development. Smaller biotechs and TechBio ventures, by contrast, often adopt digital-native structures that allow for faster experimentation, but they face scaling risks: fragmented teams, unclear governance, and difficulty institutionalizing practices as they grow. In both cases, organizational design must evolve deliberately to integrate AI while preserving scientific rigor.



AI can accelerate breakthroughs, but the science must stay at the center. Leaders have to ensure we're not blinded by the technology and keep our standards high."

George Yancopoulos
Chief Scientific Officer, Regeneron⁷

There's also a meaningful concern around skills atrophy associated with AI. Our research finds that 55% of life sciences executives worry that over-reliance on AI could undermine their people's critical thinking and judgement, reinforcing the need for careful design of organizational models.² Ensure a dual-track approach – one that values both fast experimentation alongside rigorous oversight – to help leaders avoid both reckless adoption and risk-averse paralysis.

3. Who will be responsible for AI's successful implementation?

Organizations often assume that appointing a chief AI officer or digital leader will solve the challenges of integration. In reality, no single executive can bridge all silos. Success depends on distributed accountability, with **clear executive sponsorship and a culture of shared enterprise ownership** underpinned by trust and ethics.

Trust is a particularly acute issue for TechBio as AI touches sensitive areas such as patient recruitment and trial enrollment. Leaders must ensure transparency, avoid bias, and engage directly with regulators and patients.



Building trust is essential. Our leaders are out front, engaging with regulators, partners, and patients to make sure our use of AI is transparent and ethical."

Kim Branson
Senior VP and global Head of AI/ML, GSK⁸

Yet governance gaps remain: only 37% of healthcare leaders agree that their organization provided the right level of guidance to harness generative AI ethically and safely, and further only 31% of healthcare leaders agree that their organization has the processes in place to protect itself against AI misuse and mishaps.² Addressing this gap requires not just assigning responsibility, but aligning stakeholders across functions and levels of the enterprise.



4. What is the AI-enabled R&D leader's success profile?

The profiles of effective AI leaders vary widely. Some combine deep computational expertise with domain knowledge, while others bring a transformation perspective, connecting R&D with enterprise strategy.

The common thread across successful leaders? The **ability to effectively lead cross-functional, tech-integrated teams.**

R&D leaders must be organizational translators, ensuring that data scientists, biologists, and clinical experts work seamlessly together. This imperative is heightened by the breadth of AI's impact across the value chain. Leaders must understand how discovery, clinical development, and data integration connect, designing teams that capitalize on the virtuous cycle of feedback loops. In practice, this means building organizations where insights from late-stage trials can inform early discovery, and computational platforms are designed with clinical applications in mind.



We believe 45% of our work will be AI-assisted by 2030. That means every leader needs to be a digital leader, not just the CIO."

Stephane Bancel

Chief Executive Officer, Moderna⁹

5. How will we set new leaders up for success?

Even the most capable leaders will likely fail without clear expectations, resources, and governance. Organizations must provide **quality data, modernized platforms, and assemble an 'AI Cabinet'** of internal experts and external partners to accelerate transformation. CEO and board sponsorship is also pivotal. The Harvard Business Review's "30% rule"¹⁰ suggests senior executives need not be data scientists, but should reach baseline AI literacy to make informed decisions and credibly oversee AI initiatives.

Board directors are also increasingly joining R&D committees, complementing scientific expertise with digital and data fluency to help these leaders be successful. Boards themselves are also transforming: through RRA's biopharmaceutical board evolution analysis, we learned that, since 2015, the percentage of biopharma board members with technology backgrounds has grown by 331%.¹¹ This is better equipping biopharma boards to monitor the pace and scope of adoption, align initiatives with long-term strategy, and safeguard ethical use.

What's next? Empowering your biopharma organization's AI transformation

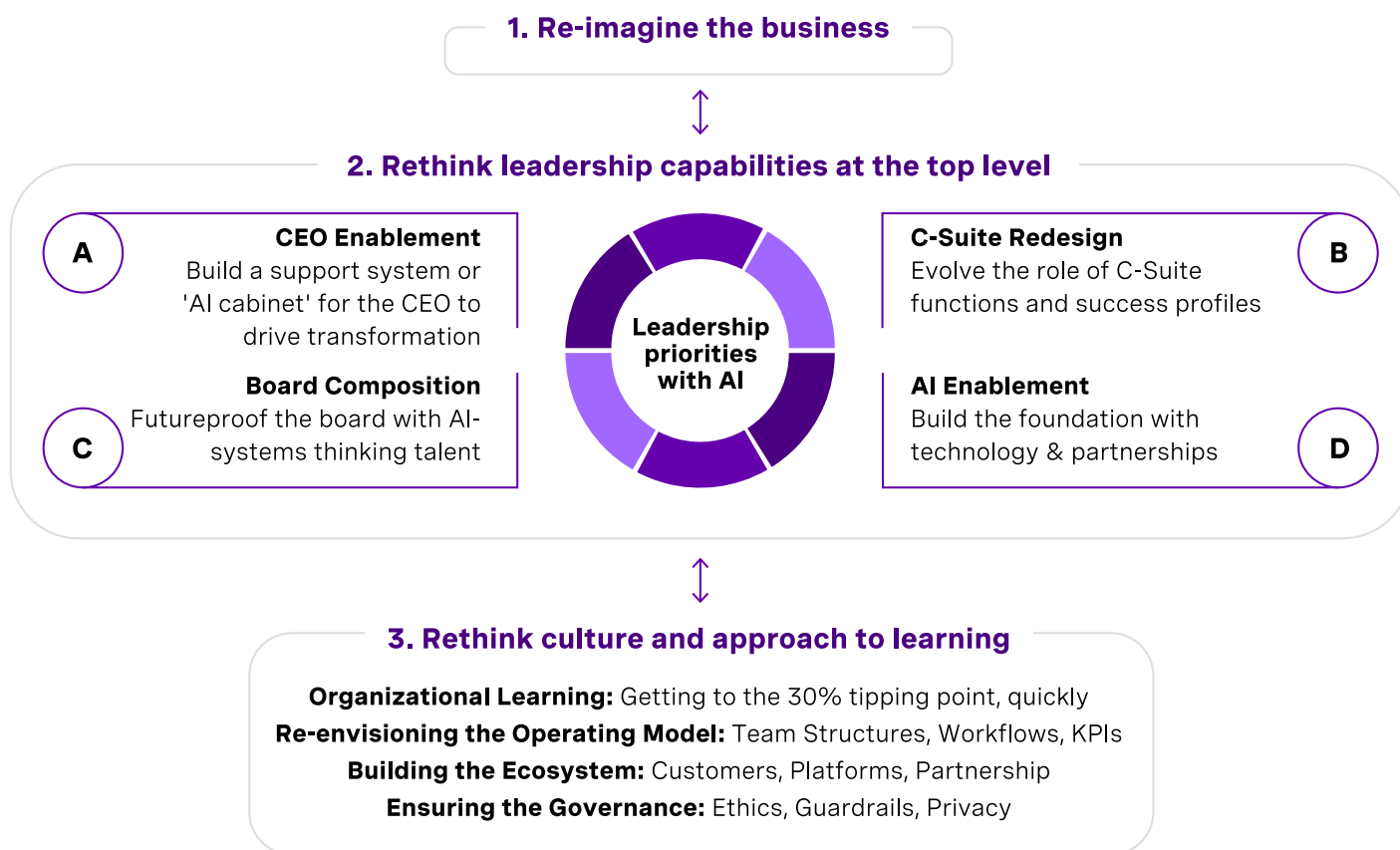
AI is redefining the pace, economics, and risk profile of biopharma R&D and is leading organizations to pursue aggressive transformations. However, the most effective transformations are not siloed – they empower leaders across the organization to drive coordinated, business-wide challenges.

This requires [leaders who take an enterprise approach](#) to AI ownership, usage, and literacy; leaders with incisive views on their current talent pool's capabilities and are committed to developing future-focused, [inclusive succession pipelines](#); and leaders with [high executive potential](#), who can both navigate change and keep their organizations steady through the day-to-day.

For those looking to take the next step, visit the [RRA Systems View](#) for a practical blueprint on leading AI transformation with discipline and intent.

The enterprise of the future: RRA Systems View on leading through AI transformation

RRA Systems View on leading through AI transformation



Source: "[Decoding the Future: The RRA Systems View on Leading Through AI Transformation](#) | Russell Reynolds Associates"
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Stay tuned for our upcoming interview series with top R&D leaders in biopharma, discussing the quickly evolving impacts of AI on the sector.

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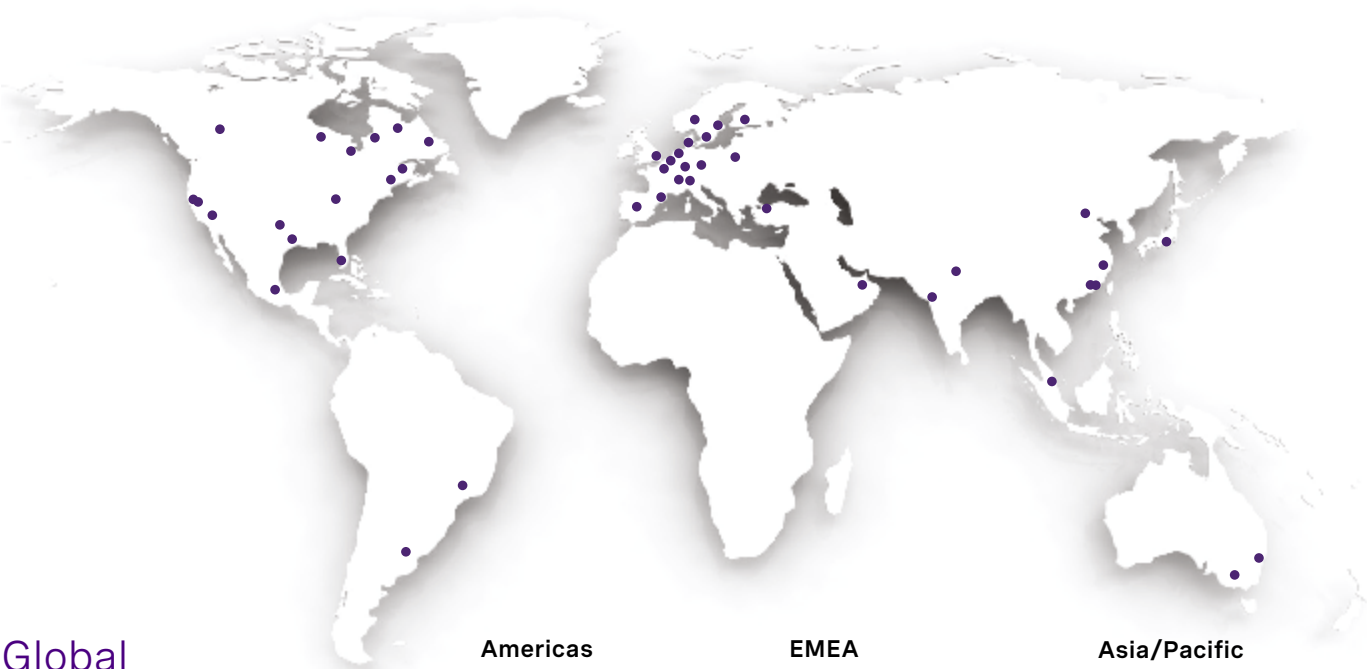
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About Russell Reynolds Associates

Russell Reynolds Associates is a global leadership advisory firm. Our 500+ consultants in 47 offices work with public, private, and nonprofit organizations across all industries and regions. We help our clients build teams of transformational leaders who can meet today's challenges and anticipate the digital, economic, sustainability, and political trends that are reshaping the global business environment. From helping boards with their structure, culture, and effectiveness to identifying, assessing and defining the best leadership for organizations, our teams bring their decades of expertise to help clients address their most complex leadership issues. We exist to improve the way the world is led

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