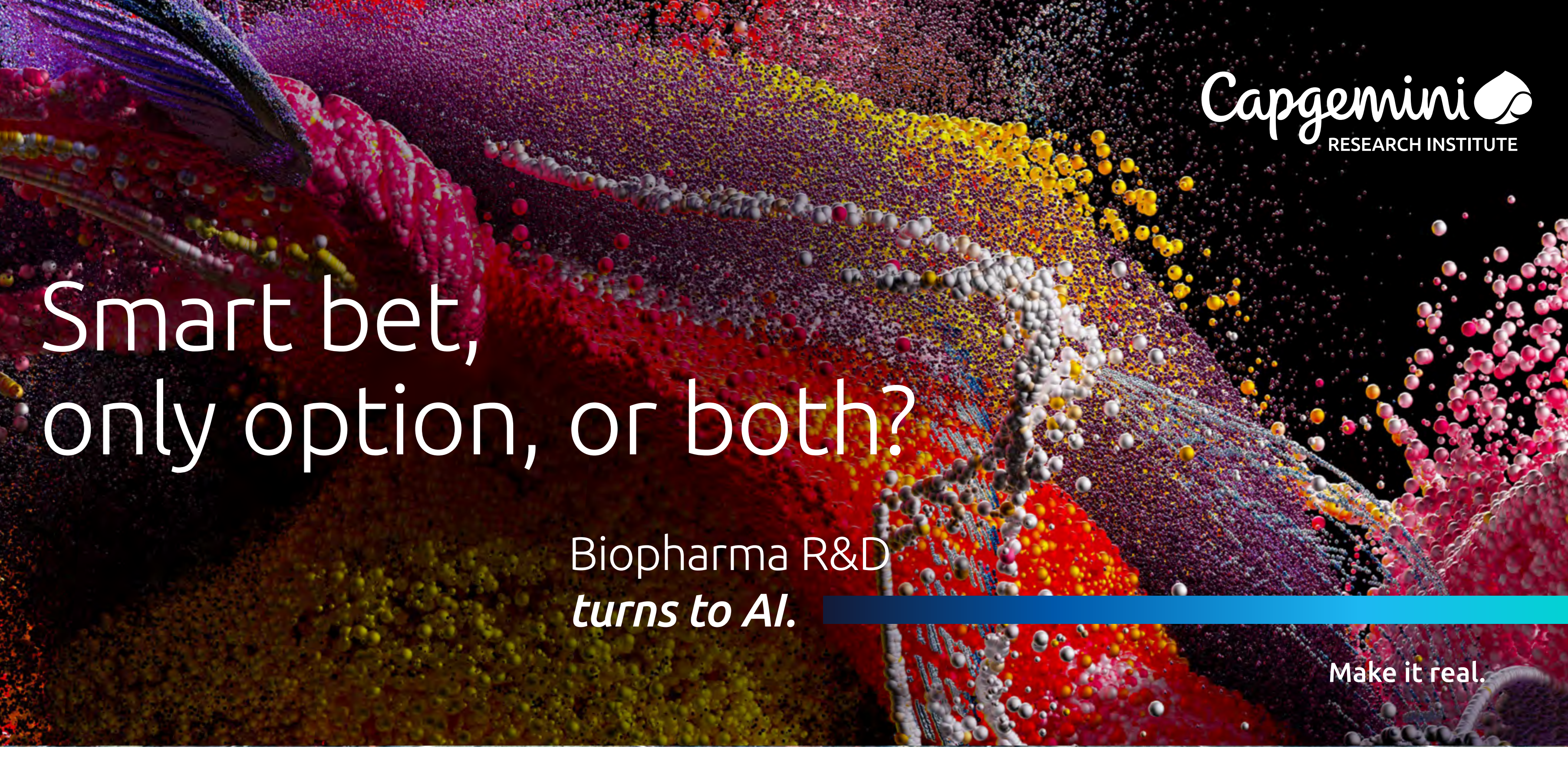
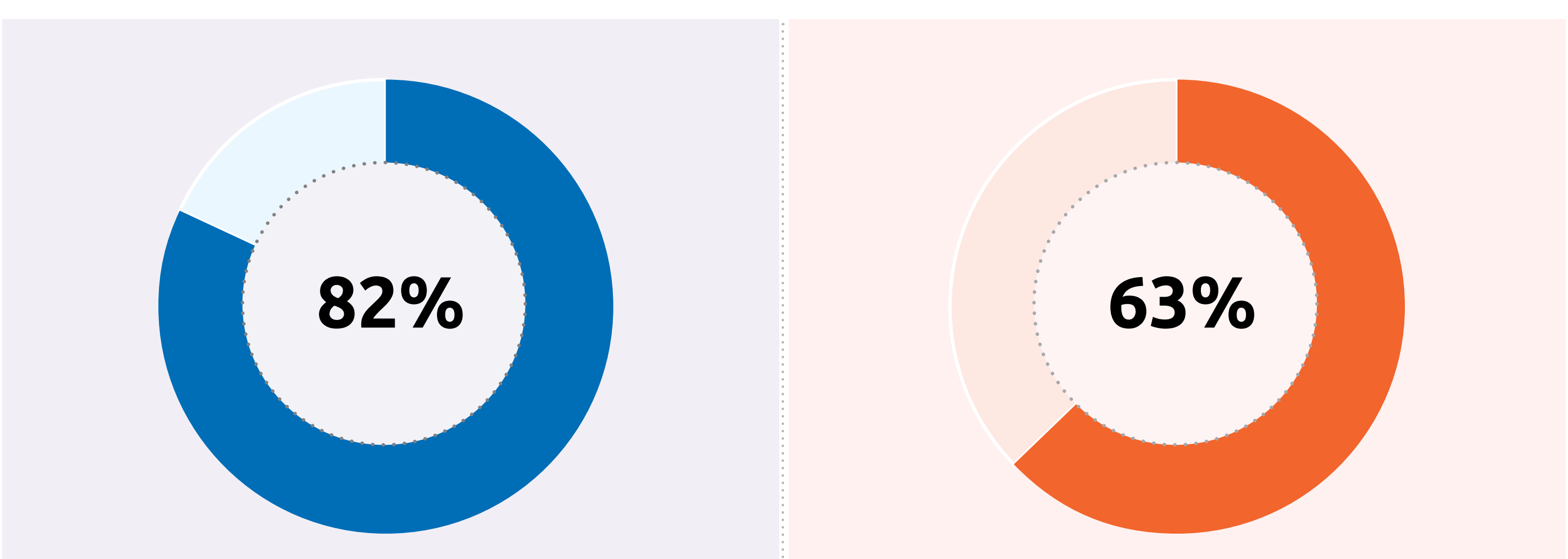


Smart bet, only option, or both?

Biopharma R&D
turns to AI.

AI is the biopharma industry's prescription for ailing innovation

Companies will use AI to rebuild drug discovery and development, or quickly fall behind



82% of executives believe that AI will fundamentally transform biopharma R&D

63% of executives warn that organizations failling to scale AI will fall behind in innovation and market relevance

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=500 pharmaceutical and biotechnology executives.

The forecast gains outweigh the perceived risks

Expectations of widespread AI-driven R&D transformation reflect a growing consensus on risk and reward.

63% of executives agree that most new molecular entities (NMEs) will originate from AI-driven platforms within the next decade.

61% of executives agree that the technology will dramatically accelerate drug discovery process.

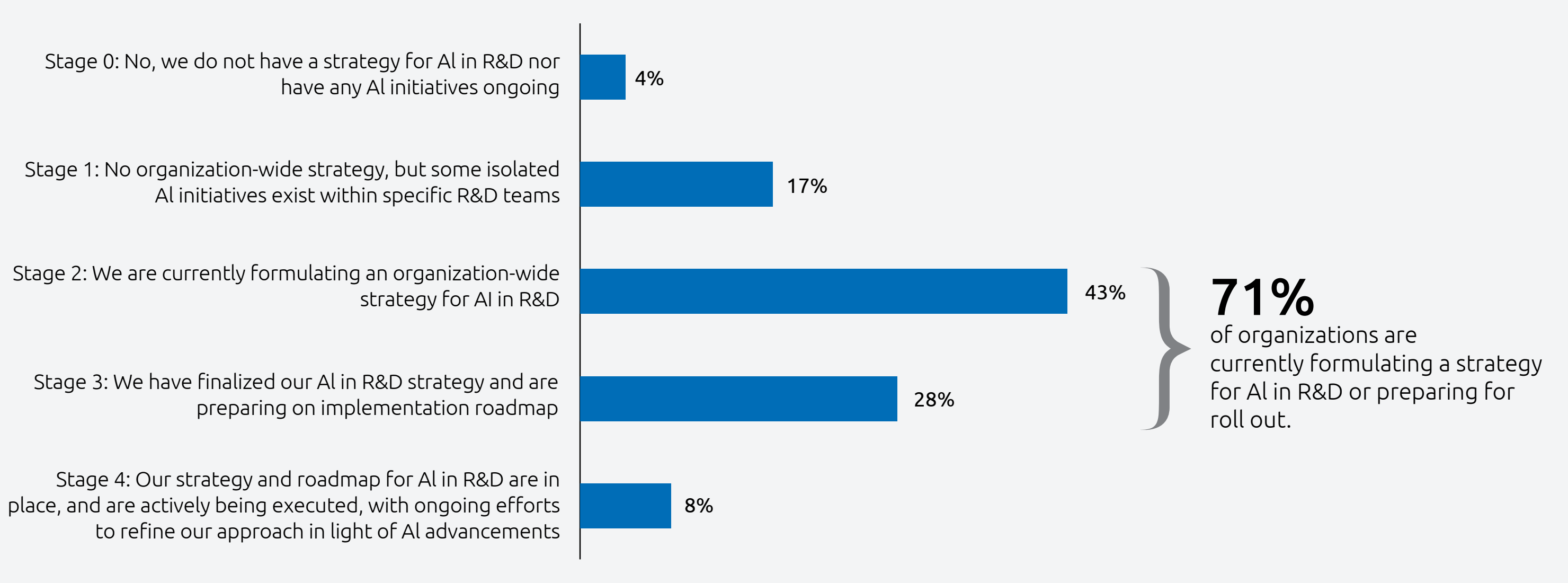
22% of executives agree that the cost and risk of implementing AI outweigh its current benefits for their R&D pipeline.

The share of AI-generated targets is expected to rise from **12%** today to **60%** over the next decade.

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=500 pharmaceutical and biotechnology executives.

Laying the groundwork for big bets on AI in R&D

Most biopharma companies are setting or beginning to implement strategy



71% of organizations are currently formulating a strategy for AI in R&D or preparing for roll out.

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=500 pharmaceutical and biotechnology executives.

Biopharma organizations expect that today's investments in AI in R&D are just the beginning

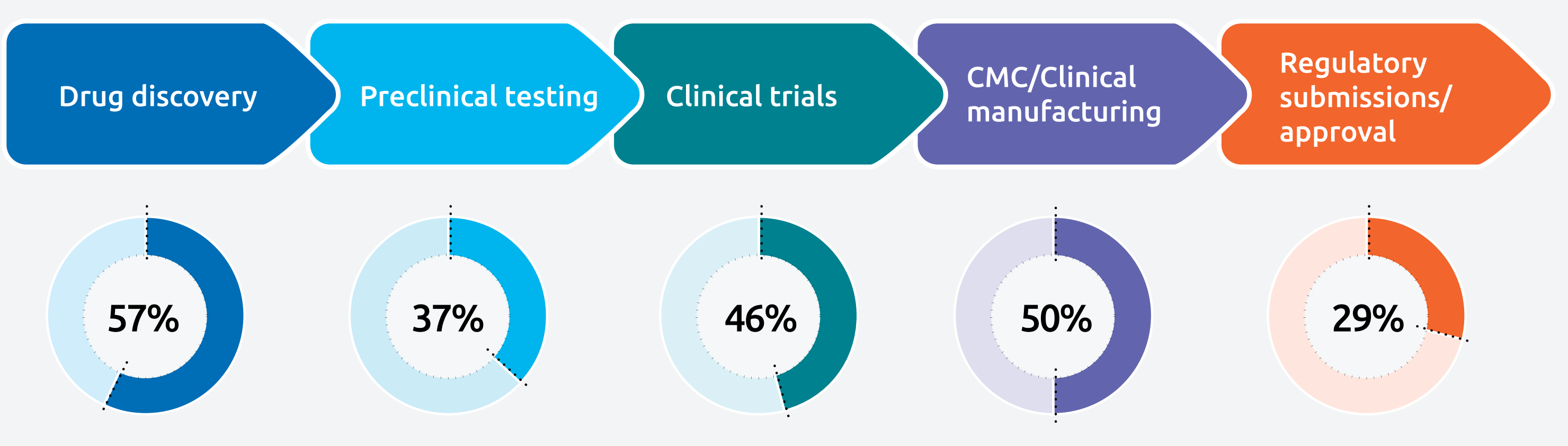
Over two-thirds of executives (68%) expect their corporate AI investment in R&D to increase between 2025 and 2026. Of all companies surveyed, the average forecast increase is **12%**. Larger companies are making bigger proportional bets on the technology.

Company size (annual revenues in USD)	$500 mn - 1 bn	$1 - 5 bn	$5 - 20 bn	$20 bn+
Average share of total AI investment dedicated to R&D, 2025	34%	36%	50%	47%

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=239 pharmaceutical and biotechnology organizations.

AI investment is most common in drug discovery but should be the norm across the value chain in five years

Of surveyed organizations, the majority are currently investing in AI for drug discovery.
Percentage of executives highlighting their organization's current investment in AI by various phases of the R&D value chain:



Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=450 pharmaceutical and biotechnology executives.
CMC: Chemistry, manufacturing, and controls.

How AI is reshaping parts of the R&D value chain today

The impact of different forms of AI will vary across R&D phases

01 Gen AI

74% of executives see Gen AI transforming drug discovery.

52% of executives see Gen AI transforming CMC/clinical manufacturing.

02 ML

66% of executives see ML transforming clinical trials.

03 NLP

51% of executives see NLP transforming preclinical testing.

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=478 pharmaceutical and biotechnology executives.
*ML: Machine learning.
**NLP: Natural language processing.

Most organizations are exploring or piloting AI agents in R&D

Approximately a third of organizations **(34%)** are piloting or atready using AI agents in R&D.

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=500 pharmaceutical and biotechnology executives.

Barriers to biopharma realizing AI's potential

Data preparedness and cultural and operational readiness are key weaknesses

Barriers to AI adoption and scaling

<50% Fewer than half of organizations feel prepared for eight of the 11 data elements essential for AI in R&D.

45% Of executives agree that their organization is culturally and operationally ready to scale AI in R&D.

Source: Capgemini Research Institute, Impact of AI on R&D productivity survey, August–September 2025, N=500 pharmaceutical and biotechnology executives.

Recommendations: How biopharma organizations can accelerate and scale AI in R&D

- **01** Ensure top-down support with senior leadership buy-in
- **02** Assess organizational risk profile and define clear goals
- **03** Balance building core AI capabilities with strategic partnerships
- **04** Build a data-and digital-savvy workforce
- **05** Advocate for organizational data readiness and industry data standards

Source: Capgemini Research Institute analysis.

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