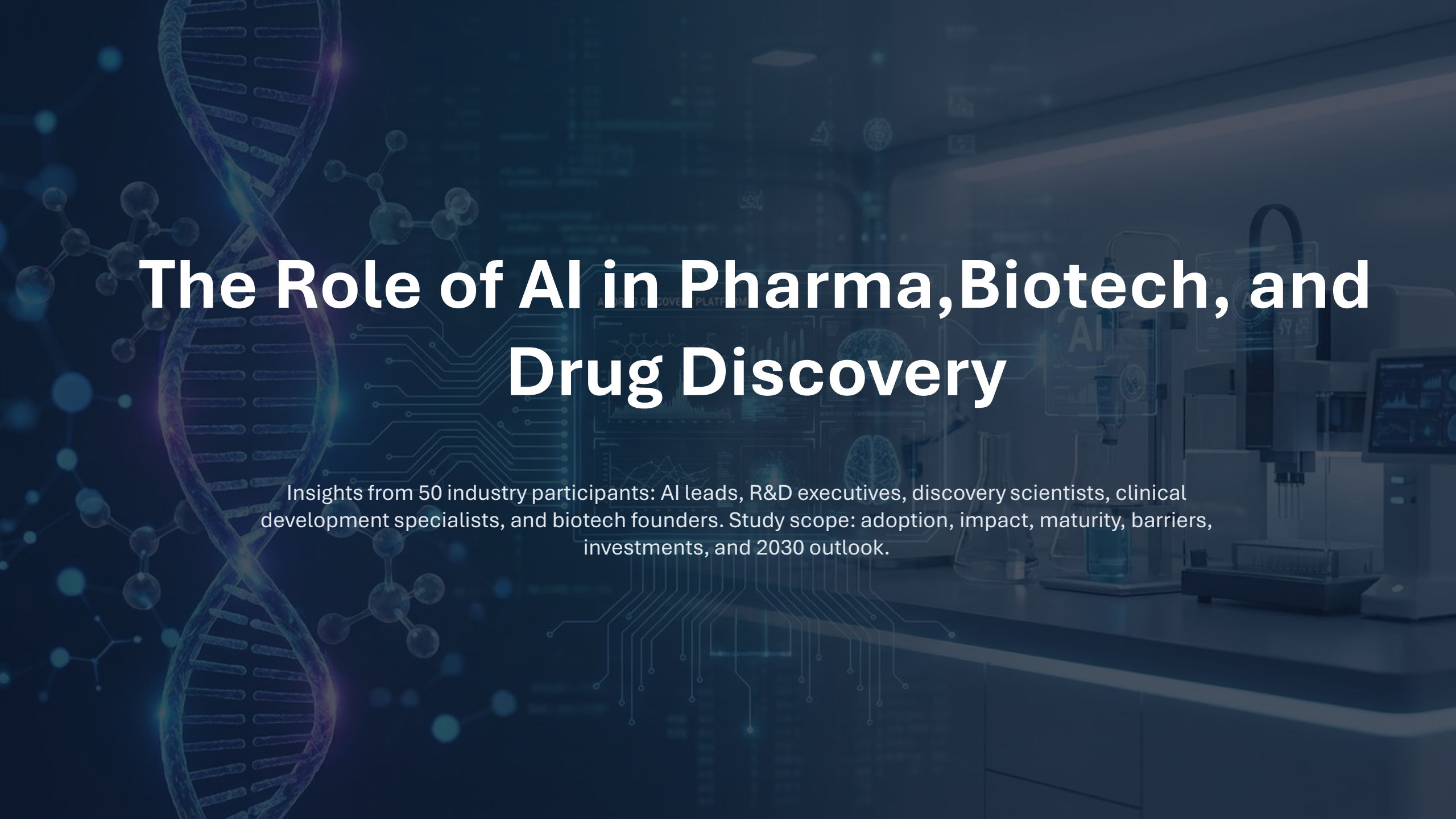


The Role of AI in Pharma,Biotech, and Drug Discovery

Insights from 50 industry participants: AI leads, R&D executives, discovery scientists, clinical development specialists, and biotech founders. Study scope: adoption, impact, maturity, barriers, investments, and 2030 outlook.

Executive Summary

Current AI Adoption

76% actively use AI in at least one discovery function. Top areas: Target ID/Validation (72%), Virtual Screening (68%), Preclinical/Tox modeling (61%), Lead Optimization (54%), Experimental Design (38%).

Realized & Projected Impact

Current: 10–22% faster early discovery. By 2030: 30–50% shorter discovery/preclinical timelines; up to 45% cost savings in hit identification.

Maturity Levels

22% PoC only, 40% early implementation, 26% scaling across workflows, 6% fully integrated. Only ~1 in 3 organizations are scaling beyond pilots.

Key Barriers to Scaling

Data fragmentation (4.6/5), regulatory uncertainty (4.2/5), talent gaps (4.1/5), workflow integration (3.8/5), trust in AI design (3.5/5).

Investment Priorities

Shifting toward AI-ready data platforms, generative AI for chemistry/biology, ML-based decision support, partnerships with AI-native discovery companies, and workforce upskilling.

Current AI Adoption Across Discovery

AI USE CASE	% OF ORGANIZATIONS
Target Identification & Validation	72%
Hit Discovery / Virtual Screening	68%
Early Preclinical Modeling & Toxicity Prediction	61%
Lead Optimization (e.g., generative ML models)	54%
Experimental Design & Automation	38%

Measured and Expected Impact

Timeline Reduction Potential

Current Realized Impact

10–22%

Acceleration in early discovery timelines

Projected Impact by 2030

30–50%

Reduction in discovery and preclinical development timelines

Cost Reduction Potential by Stage

Hit Identification

Current: **15–25%**

↓

By 2030: **35–45%**

Lead Optimization

Current: **10–20%**

↓

By 2030: **25–40%**

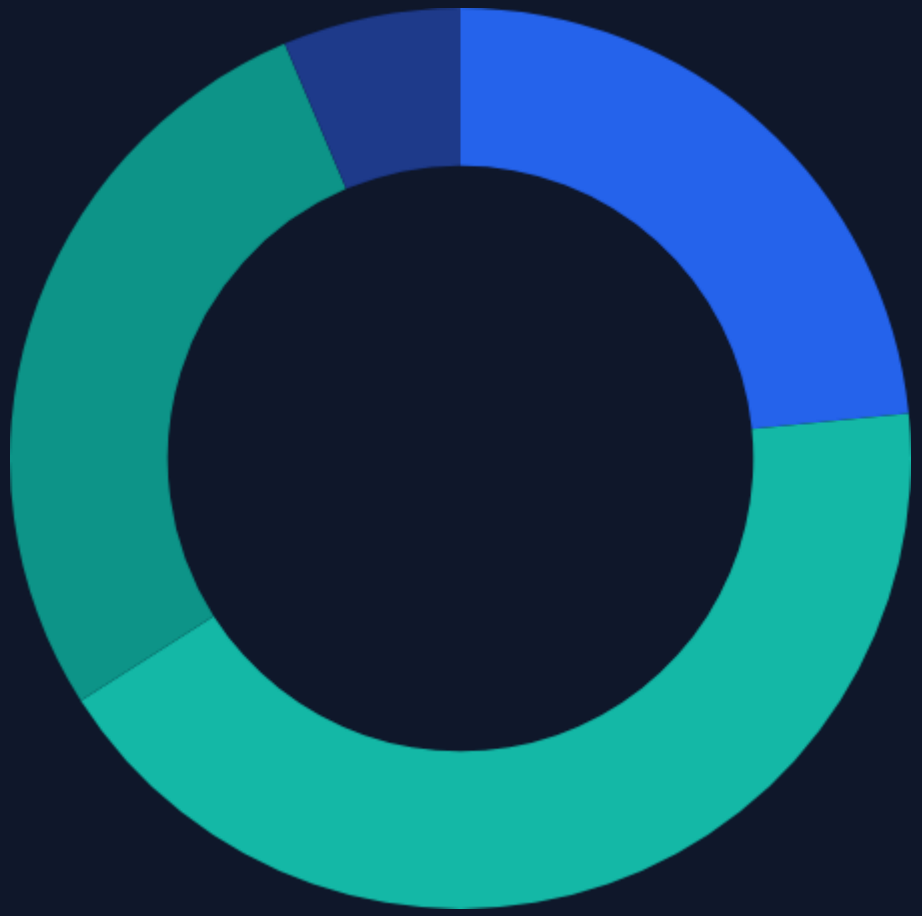
Toxicology & Preclinical Experiments

Current: **5–15%**

↓

By 2030: **20–35%**

Maturity of AI Adoption



Proof-of-concept only
22%

Early implementation in select use cases
40%

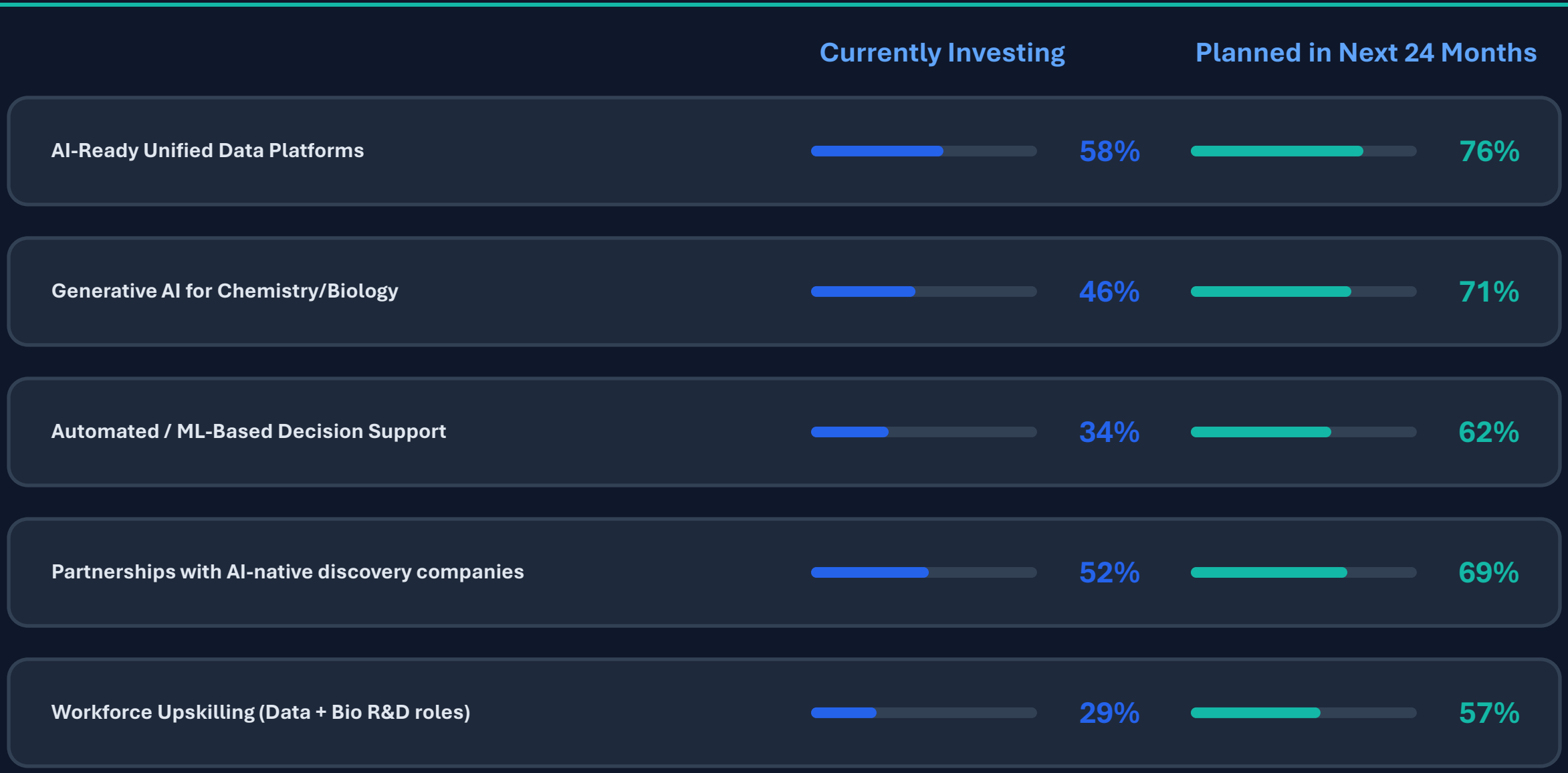
Scaling across discovery workflows
26%

Fully integrated, enterprise-wide
6%

Key Barriers to Scaling AI in Drug Discovery

Data fragmentation and poor interoperability	4.6/5
Lack of validated regulatory frameworks	4.2/5
Talent and skills gap (AI + biology hybrid roles)	4.1/5
Integration with existing platforms and workflows	3.8/5
Limited trust in AI-driven molecular design	3.5/5

Investment and Capability Focus



Future Outlook by 2030

Faster identification of novel targets	84%
Higher probability of clinical success	72%
Algorithm-driven molecular design replacing traditional screening	69%
Significant reduction in lab-intensive experiments	61%
Personalized/precision drug design	58%

Quantitative Outlook at a Glance

Active AI Adoption

68%

Organizations actively applying AI in chemical/biological design workflows

Timeline Reduction by 2030

30–50%

Expected reduction in discovery timelines across the industry

Hit Identification Savings

Up to 45%

Cost savings projected in hit identification by 2030

Lead Optimization Savings

25–40%

Cost reduction expected in lead optimization workflows

AI impact is strongest in early discovery and preclinical modeling, with higher probability of success entering clinical phases

Final Insight

AI is shifting from experimental to essential in pharma and biotech R&D

Scalable, Interoperable Data Infrastructure

Regulatory Alignment and Validated Frameworks

Hybrid Talent: AI × Biology × Translational Science

Call to Action

Invest now to operationalize AI across discovery and preclinical workflows. Organizations that build these capabilities today will define the next generation of drug discovery competitiveness.