Rhino
Federated Computing

Scaling AI with Science: Building the Pharma AI Stack

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Introduction

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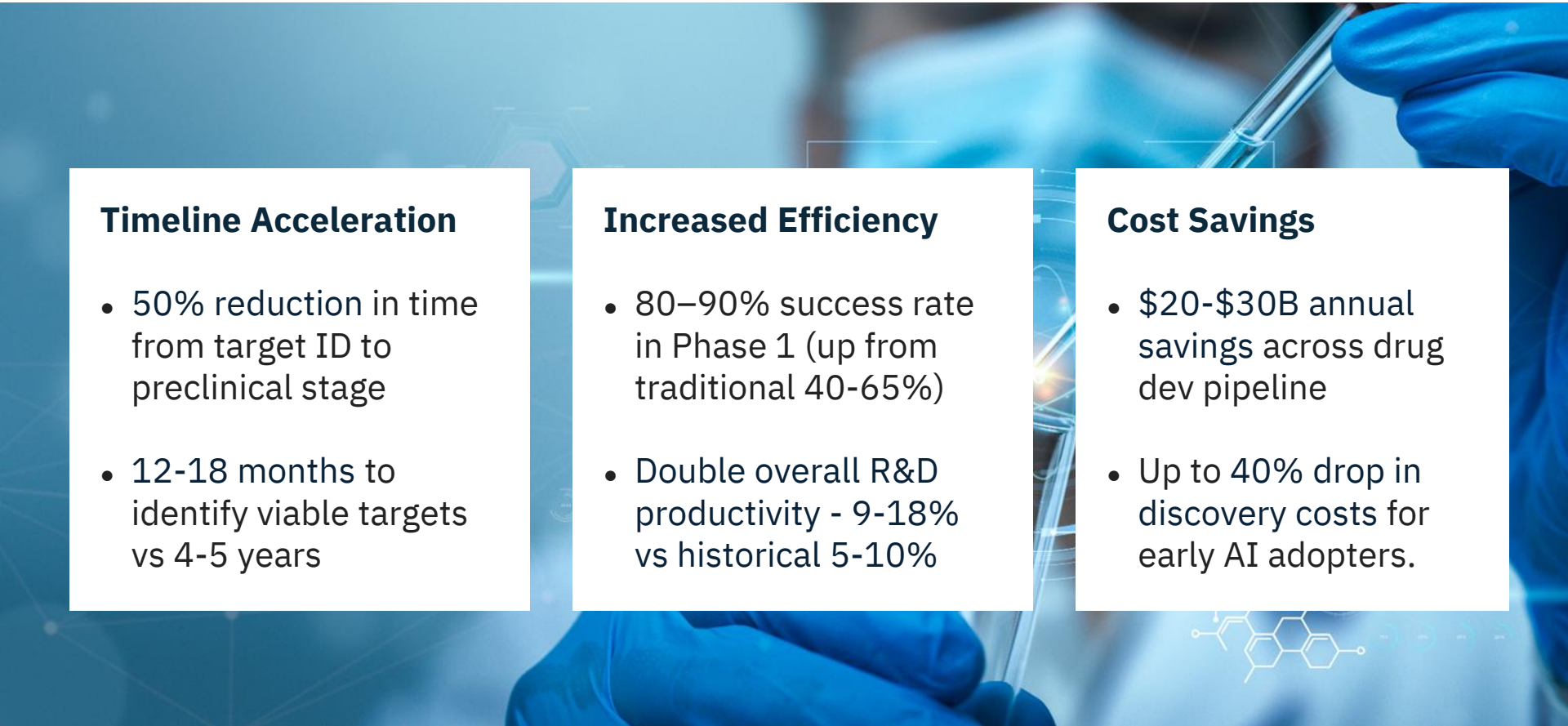
- Previously Director of Mass General's Center for Clinical Data Science.
- Previously core member of BCG's health advisory.
- Previously physician researcher at Harvard Medical School, focus on Federated Learning, Imaging AI and medical ethics.
- Medical Doctorate from the Hebrew University, public health and data science studies at Johns Hopkins Bloomberg School of Public Health.

Rhino Federated Computing

- Inspired by the landmark EXAM Study (Nature Medicine 2021) in collaboration with NVIDIA Corporation.
- Pioneers of secure and private Federated Computing.
- Experienced with constructing IT-, geographic- and stakeholder-agnostic networks that fit biopharma needs.
- Platform + solutions to enable biopharma AI workflows.

AI's Promise in Drug Discovery & Development



Timeline Acceleration

- 50% reduction in time from target ID to preclinical stage
- 12-18 months to identify viable targets vs 4-5 years

Increased Efficiency

- 80–90% success rate in Phase 1 (up from traditional 40-65%)
- Double overall R&D productivity - 9-18% vs historical 5-10%

Cost Savings

- $20-$30B annual savings across drug dev pipeline
- Up to 40% drop in discovery costs for early AI adopters.

AI Adoption in Pharma

High adoption:
In 2024, an estimated 80% of pharmaceutical and life sciences professionals were using AI for drug discovery.

Investment:
95% of pharmaceutical companies are investing in AI capabilities to accelerate their work.

Future projection:
The global market for AI in drug discovery alone is projected to reach approximately $13 billion by 2032.

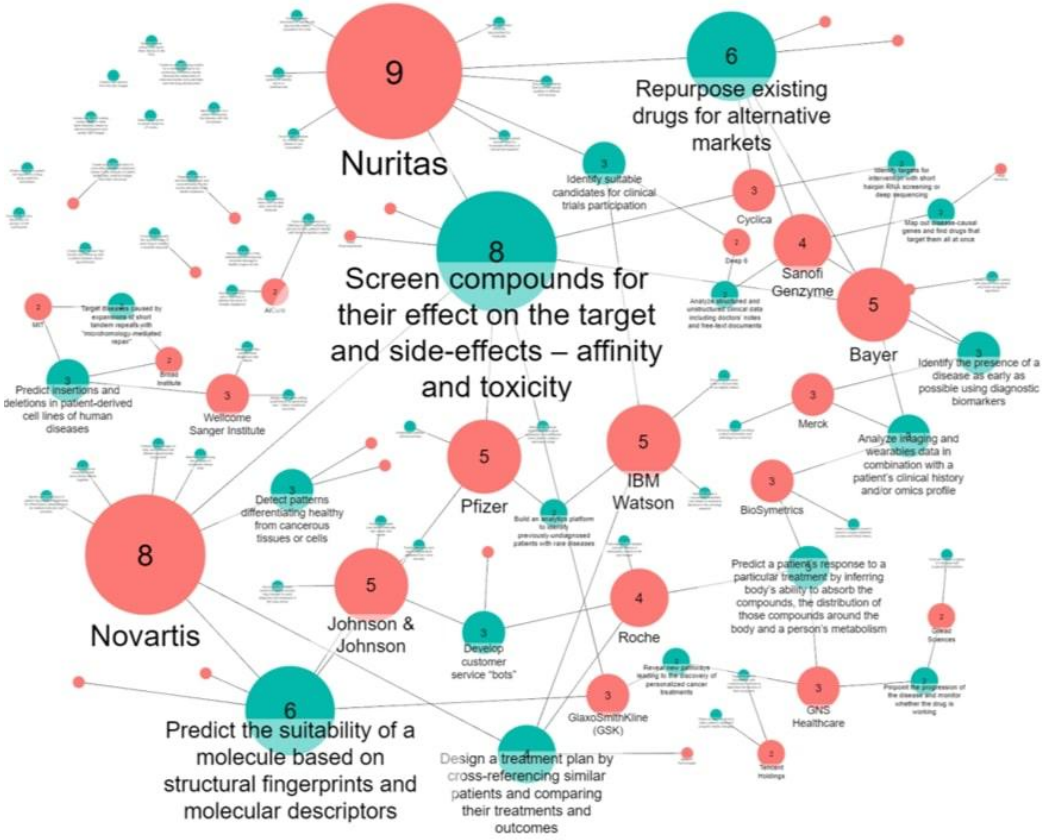
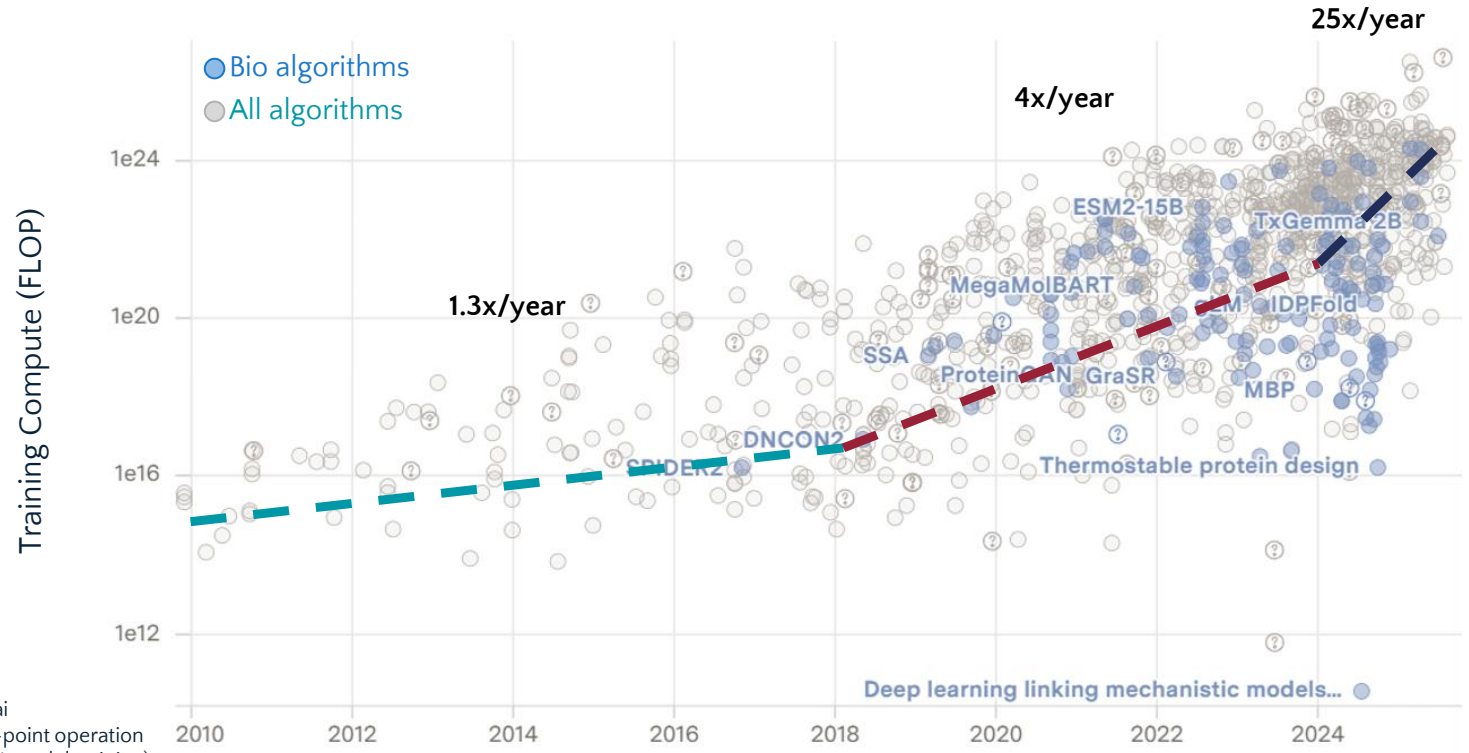


Image Source: https://www.datascience.ch/articles/ai-trends-pharmaceutical-industry

Advances in AI models and the explosion of datasets signify a new phase of Artificial Intelligence application to R&D



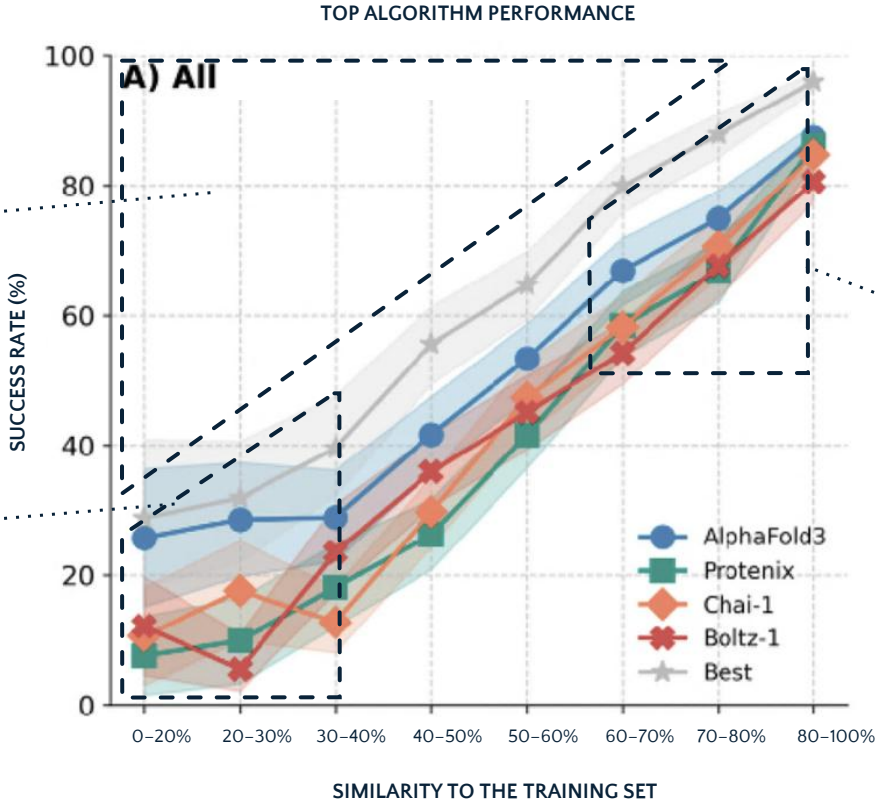
Source: epoch.ai
FLOP = floating-point operation
(a measure of AI model training)

However, paucity of *accessible* data is a major impediment, especially given the high velocity of scientific discovery

UNTAPPED OPPORTUNITY to move the needle

Low Success Rate in Proteins that are not Well-Studied

"UNDRUGGABLE TARGETS"



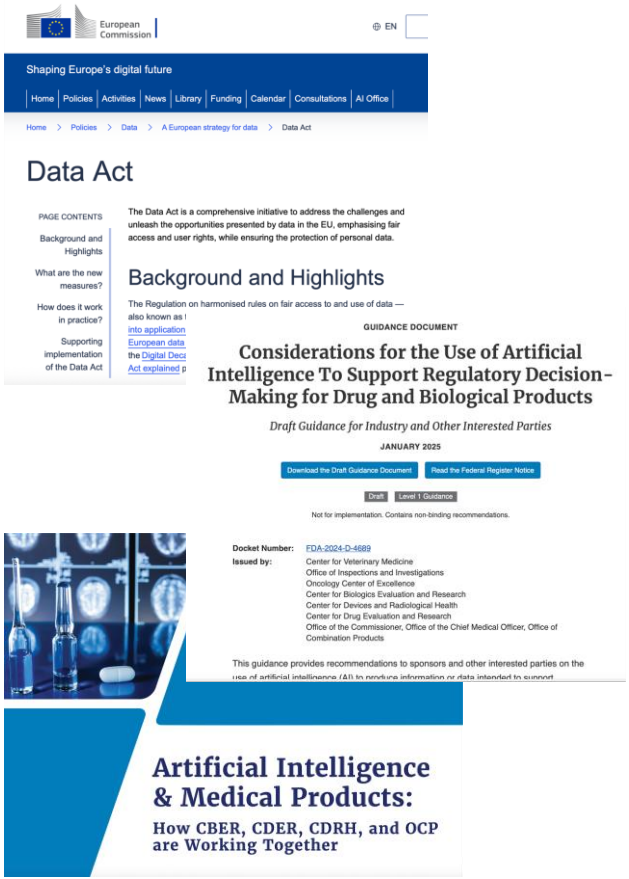
High Success Rate in Well-Studied Proteins

KNOWN "DRUGGABLE TARGETS"

Evidenced by state-of-the-art protein algorithms: Alphafold (Google DeepMind), Proteinx (Bytedance), Boltz (MIT), Chai (Chai Discovery)
Source: Skrinjar et. al., BioRxiv, 2025

Increasing AI & Data Regulations

- Growing compliance requirements for data and AI with evolving global frameworks and data protection laws.
- Focus on data and model workflows being traceable, auditable, and explainable.
- The shift toward regulated AI is accelerating demand for transparent, interpretable, and privacy-preserving compute infrastructures.



Requirements from the Science-Ready AI Stack

AI requires infrastructure that aligns with scientific workflows, regulatory realities, and data integrity. The challenge isn't AI adoption — it's unifying the ecosystem behind it.

1. **Composable Components**
   Integrate data, models, and workflows flexibly.
2. **Embedded Governance**
   Compliance, security, and auditability by design.
3. **Model Lifecycle Continuity**
   From lab R&D to production and post-market.
4. **Cross-Functional Accessibility**
   Scientists, IT, engineers, researchers on one platform.

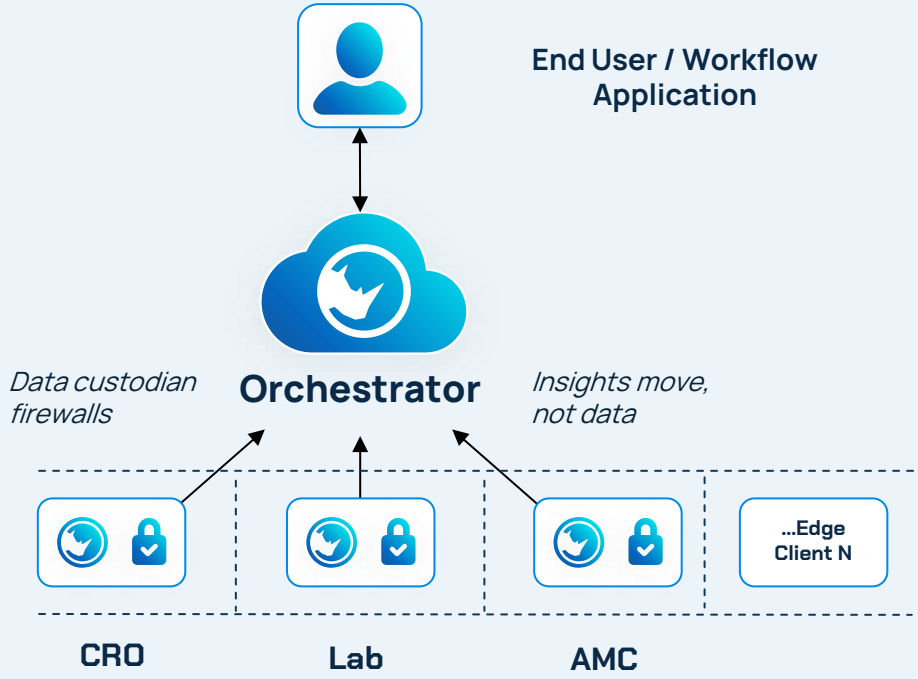
Federated Computing: A New Path Forward

Intersection of **Edge Computing**, **Federated Learning**, and **Privacy-Enhancing Technologies.**

Compute travels to data – not the other way around

- Data stays **behind firewalls**
- Compute **'travels' to the data**
- Privacy-preserving **insights are shared**
- Unlocks collaboration while **preserving compliance and privacy**

Common Orchestrator, Edge Execution

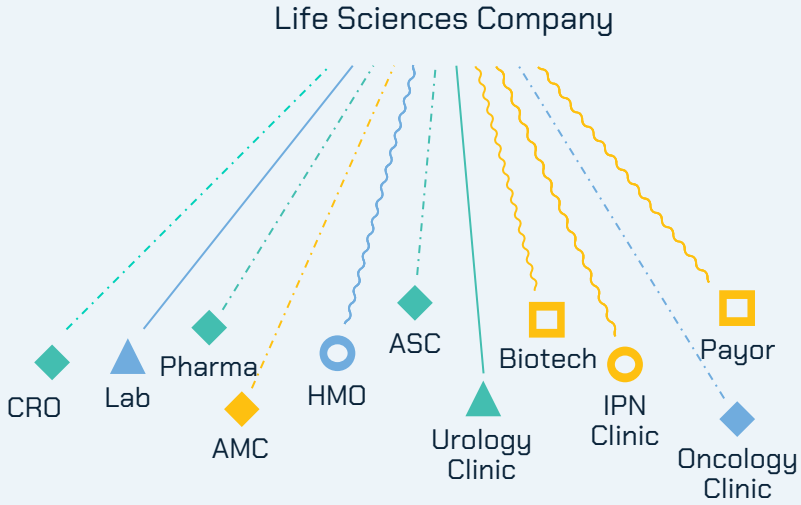


Data is "connected" through secure, privacy-preserving edge compute clients. Aggregated insights fed through single control pane - orchestrator.

Centralized architectures fall short, in an industry that requires global footprint, emphasizes collaboration and is deeply regulated

- Massive, siloed, multi-modal data across discovery, development, and real-world evidence.
- Regulation, compliance, trust and cyber-risks limit data centralization.
- Fragmented IT and scientific systems hinder model deployment.
- Scaling AI requires data, compute, and compliance to be *in sync*.

Illustrative Data Ecosystem



Every data source requires **complex and non-standard** management, technology and policies

The Pharma AI Stack: Flexible, Governed, Collaborative

Application Intelligence Layer

- ‘Copilots’ (research, clinical, data harmonization)
- Agentic AI and workflow automation
- Domain-specific scientific applications
- Plugin ecosystem + API-driven extensions

Federated Control Plane - ‘OS’

- Identity, policy, and access control
- Data & model lifecycle governance (lineage, provenance, versioning)
- Distributed workflow and resource scheduling
- Observability, audit logging, and compliance automation
- Contract enforcement (legal, jurisdictional, consent, SLAs, quotas)

Distributed Compute & Data Foundation

- On-prem, private cloud or sovereign cloud enabled
- Multi-cloud compute orchestration (AWS / GCP / Azure / GPU)
- PETs, confidential computing and local execution guarantees
- Direct connectivity to clinical, research, and enterprise systems

Federated Networks are rationalized by different business needs

Biopharma Consortia-
Pre-competitive ‘rising tides float all boats’ (e.g., MELLODDY, FAITE, AISB)

Internal federation-
Unlocking data silos, enabling new technologies

New product dissemination with primary and secondary value unlocked (eg., Eli Lilly TuneLab)

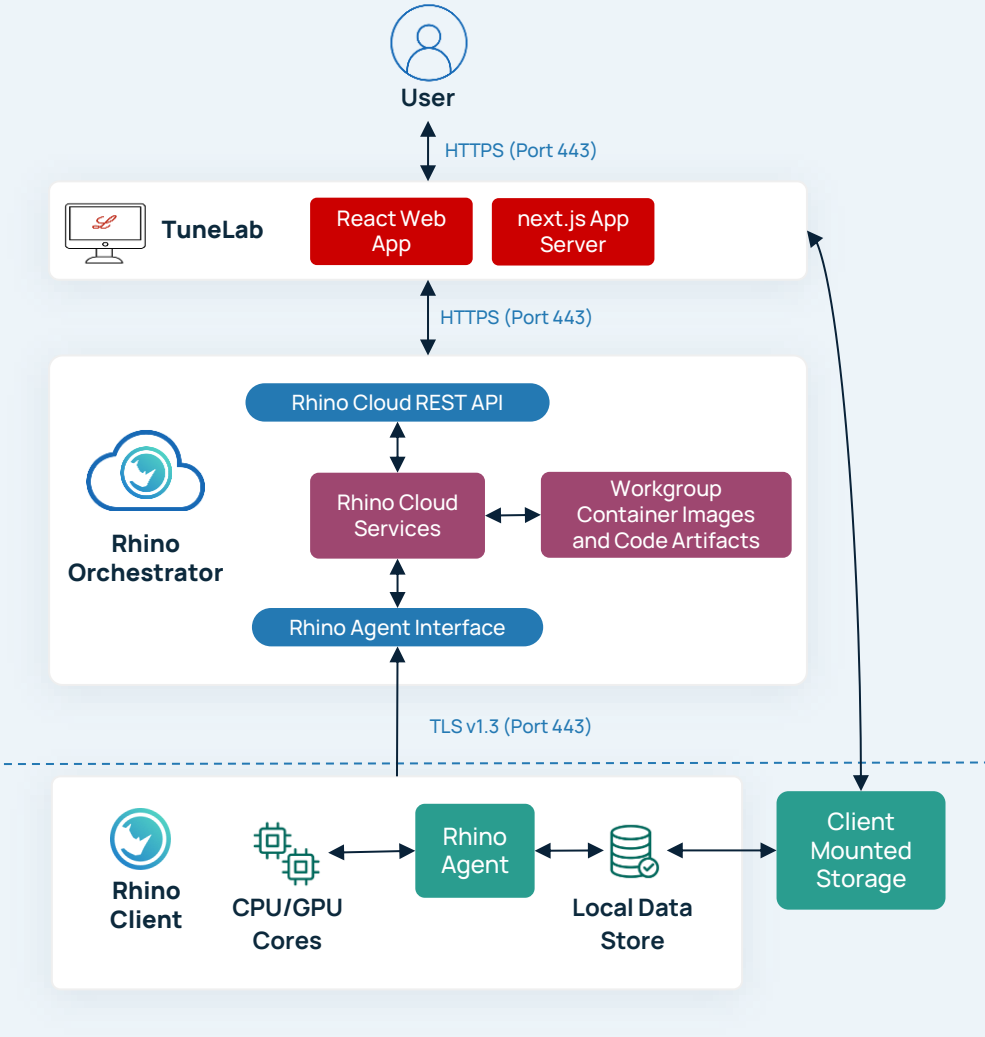
**Global ‘real world’ data collabs-
Avoiding centralization costs, unlocking data value**

Real World Example: Lilly's TuneLab builds on the Rhino Tech Stack, making AI accessible & impactful without sharing data

Thousands of End Users - *not developers*, with readily available access to dozens of workflow integrated AI models.

Single Control Plane - controlled access to global infrastructure at the distance of one 'API call'.

Hundreds of 'Immobile' Data Sources, 'activated' with on-demand GPU powered VMs.



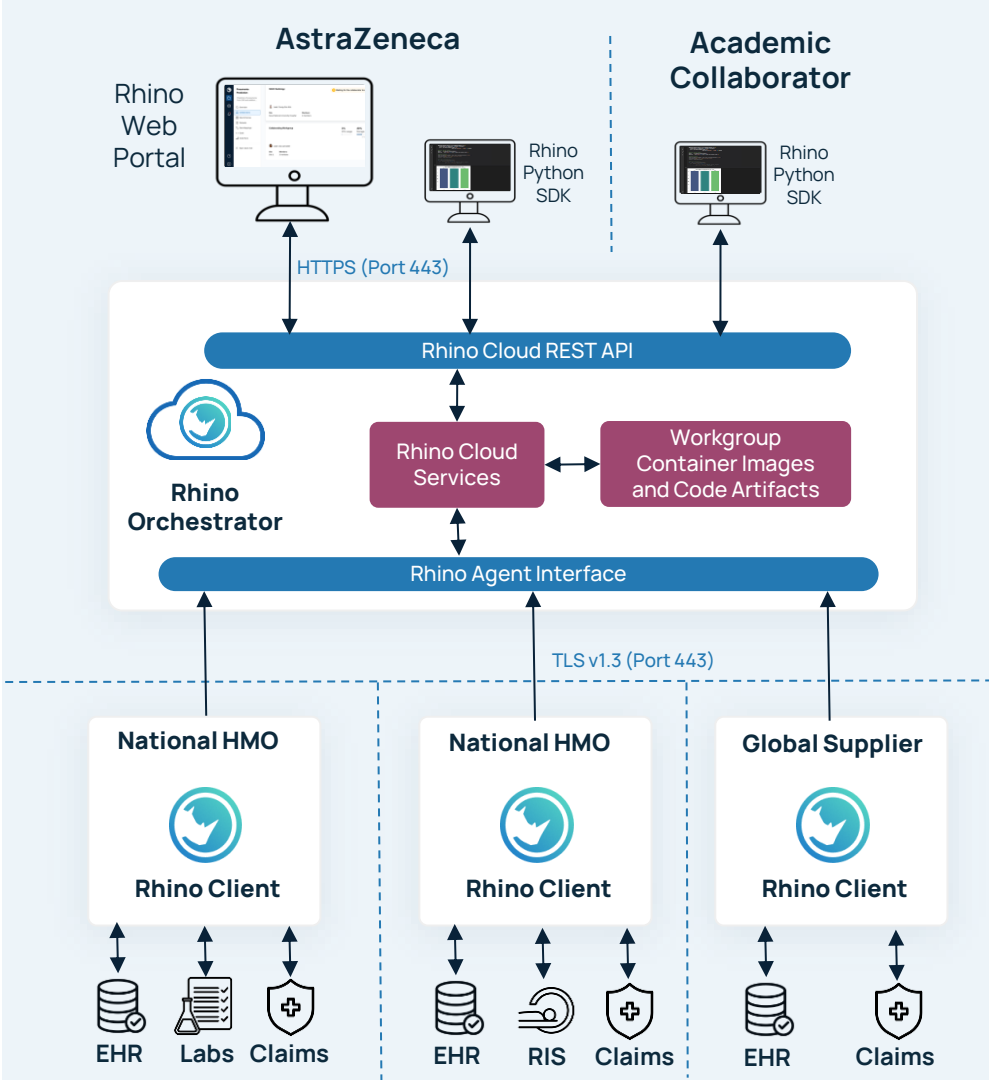
Real World Example: AstraZeneca's BEAM project - a global data network

Need to create evidence from regional and global data suppliers (AMCs, HMOs, insurers etc.)

Objectives of:

- Comparing different regions and registries (e.g., data availability)
- Moving from 'meta analysis' to row-level 'federated analysis'
- Apply diagnostic guideline to improve identification of relevant populations
- Increasing national capture rate in order to increase cohort size and gain better understanding of the ecosystem

Beam
Illuminating Healthcare Through Data



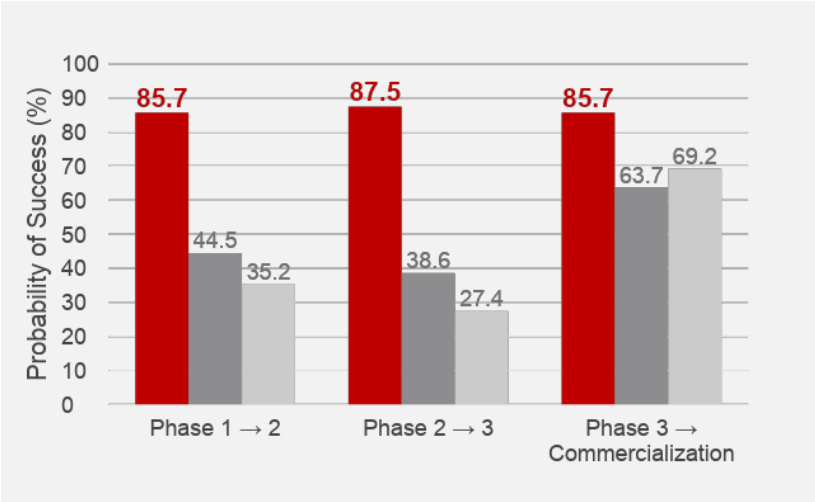
The Future is Federated, Living AI Systems

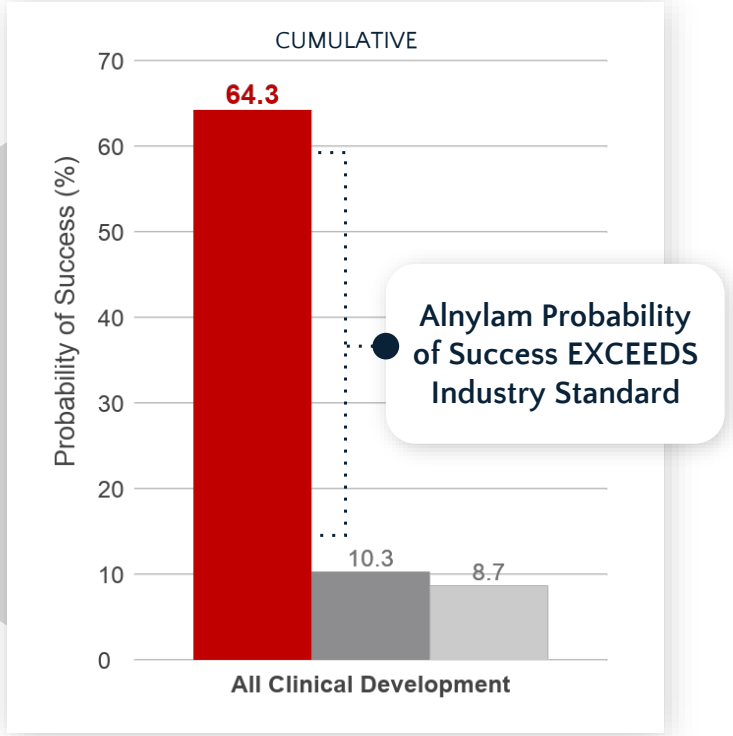
- Continuous learning from data networks and shared insights.
- Collaboration across organizations and geographies.
- Infrastructure that evolves at the pace of science & technology.
- Embedded compliance that does not encumber innovation.

Thank You!

Human data–grounded drug discovery moves the needle; >4x improved probability of success for drug programs that begin with human data

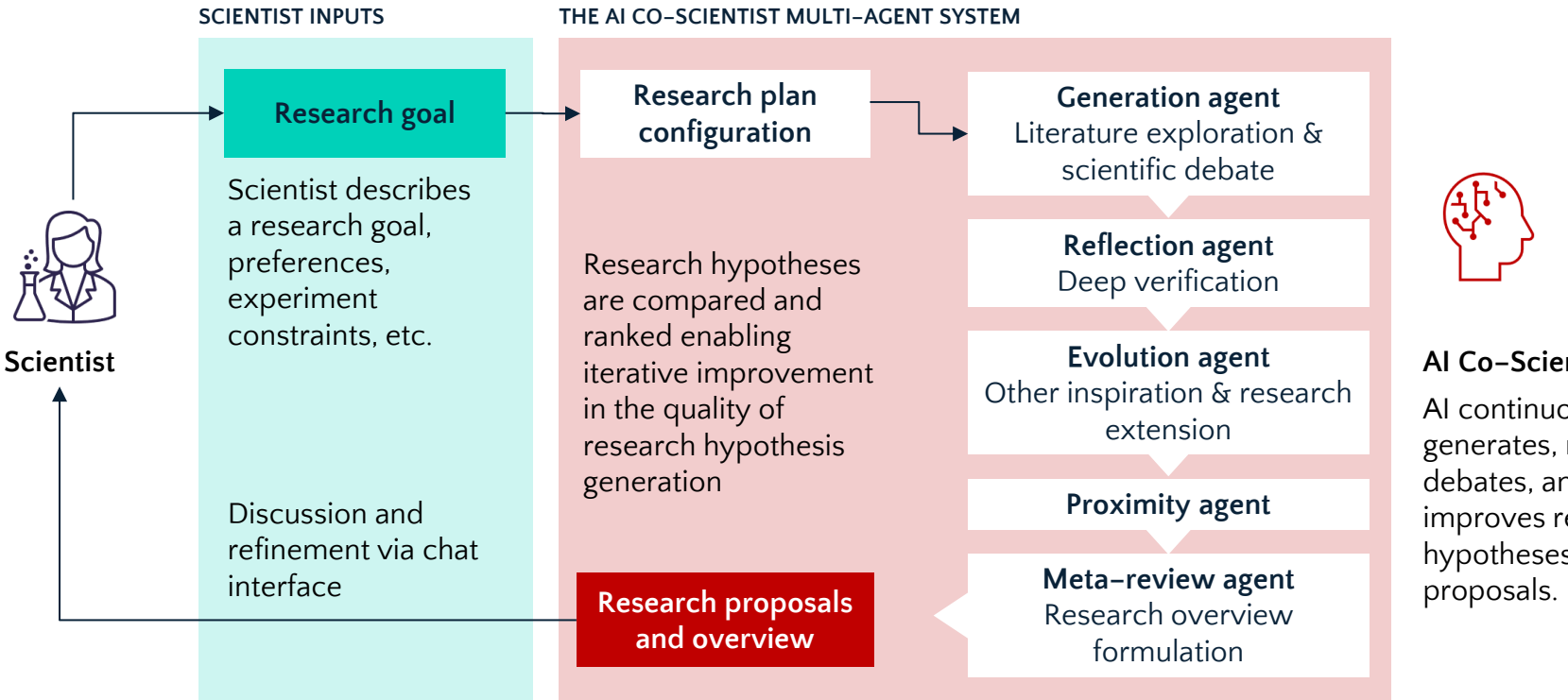
Evidenced by Alnylam's track record with genetically validated targets





Source: Alnylam Pharmaceuticals, 2023

Innovators like Google are bringing scale to the industry. AI co–scientists will amplify and accelerate scientists' drug development expertise



AI Co–Scientist

AI continuously generates, reviews, debates, and improves research hypotheses and proposals.

Source:
Gottweis et al, 2025