ScienceOS — Autonomous Scientific Discovery Intelligence

"The last research assistant humanity will ever need."

Executive Summary

ScienceOS is the autonomous operating system for scientific discovery. We're building AI that doesn't just assist researchers—it *becomes* the researcher. Our platform reads every paper ever published, generates novel hypotheses, designs and executes experiments through robotic labs, analyzes results, iterates autonomously, and produces peer-reviewed discoveries at 100x the speed of traditional R&D.

The Opportunity: The global R&D market exceeds $2.5 trillion annually. Pharmaceutical companies alone spend $200B+ per year, yet 90% of drug candidates fail. Materials science takes decades to produce new alloys. Academic research moves at the pace of grant cycles. ScienceOS compresses years of discovery into weeks.

The Vision: Autonomous AI scientists running thousands of experiments in parallel, 24/7, across biology, chemistry, materials science, and physics—accelerating humanity's scientific progress by orders of magnitude.

The Problem

Scientific Discovery is Broken

1. **Glacial Pace**: The average drug takes 12-15 years from discovery to market. New materials take decades to develop. Academic papers take years to publish.
2. **Massive Waste**: 90%+ of pharmaceutical R&D spend fails. Scientists spend 70% of their time on administrative tasks, not discovery.
3. **Human Bottlenecks**: There aren't enough trained scientists. The knowledge explosion has made it impossible for any human to read all relevant literature.
4. **Reproducibility Crisis**: 70%+ of scientific experiments cannot be reproduced. Human error and bias plague research.
5. **Siloed Knowledge**: Breakthroughs often require connecting insights across disciplines, but researchers are too specialized to see the connections.

The Cost of Slow Science

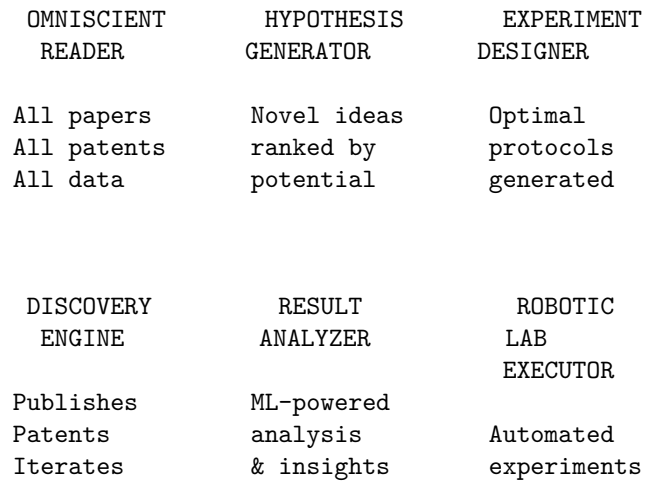
- **COVID vaccines could have arrived 6-12 months earlier** with faster research iteration
- **Cancer treatments are stuck** in decade-long pipelines
- **Climate solutions** like better batteries and carbon capture remain elusive
- **Food security innovations** lag behind population growth

The world needs a 100x speedup in scientific discovery. ScienceOS delivers it.

The Solution

ScienceOS: The Autonomous Scientific Discovery Platform

SCIENCEOS



Core Components

1. Omniscient Reader

- Ingests and understands every scientific paper (200M+ and growing)
- Processes patents, preprints, datasets, lab notebooks
- Builds dynamic knowledge graphs across all disciplines
- Identifies gaps, contradictions, and unexplored connections

2. Hypothesis Generator

- Generates novel, testable hypotheses using knowledge synthesis
- Ranks hypotheses by novelty, feasibility, and potential impact
- Identifies cross-disciplinary opportunities humans would miss
- Continuously updates based on new literature and results

3. Experiment Designer

- Translates hypotheses into optimal experimental protocols
- Designs for statistical power and reproducibility
- Accounts for available equipment and resources
- Generates machine-readable instructions for robotic execution

4. Robotic Lab Executor

- Integrates with automated lab equipment (liquid handlers, sequencers, spectrometers)
- Executes experiments 24/7 with perfect reproducibility
- Real-time monitoring and adaptive optimization
- Partners with cloud lab providers (Emerald, Strateos, Automata)

5. Result Analyzer

- ML-powered analysis of experimental outcomes
- Automatic statistical validation
- Anomaly detection and insight extraction
- Feeds results back into hypothesis generation

6. Discovery Engine

- Drafts papers in journal-appropriate formats
- Files provisional patents automatically
- Suggests next experiments based on results
- Maintains complete reproducibility records

Market Opportunity

Total Addressable Market: $2.5T+ Global R&D

Sector	Annual R&D Spend	ScienceOS Opportunity
Pharmaceuticals	$220B	Drug discovery acceleration
Biotechnology	$180B	Protein engineering, synthetic biology
Materials Science	$150B	New alloys, polymers, composites
Chemistry	$100B	Catalysts, reactions, formulations
Electronics	$200B	Semiconductors, batteries, displays
Agriculture	$50B	Crop science, pesticides, fertilizers
Academic Research	$700B	All disciplines

Serviceable Addressable Market: $150B

- Enterprise R&D automation and acceleration
- Cloud lab orchestration
- AI-powered research tools

Initial Target: $20B

- Pharmaceutical and biotech companies seeking faster discovery
- Materials science innovators
- Well-funded research institutions

Business Model

Multi-Tier Platform Approach

Tier 1: ScienceOS Reader (Freemium Entry)

- AI-powered literature search and synthesis
- Knowledge graph exploration
- Hypothesis suggestions
- **Free tier + $500/month/researcher**

Tier 2: ScienceOS Designer (Team Plan)

- Full experiment design capabilities
- Protocol optimization
- Collaboration tools
- **$5,000/month/team**

Tier 3: ScienceOS Autonomous (Enterprise)

- Full autonomous discovery loop
- Robotic lab integration
- IP protection and patent filing
- Dedicated AI scientists
- **$500K-$5M/year + success fees**

Tier 4: Discovery Partnerships

- Joint ventures on high-potential discoveries
- Revenue share on commercialized breakthroughs
- Co-owned IP portfolios
- **20-40% of downstream value**

Revenue Projections

Year	Revenue	Key Milestones
1	$5M	Platform launch, 100 enterprise pilots
2	$30M	First autonomous discoveries, 500 customers
3	$120M	Major pharma partnerships, first drug candidate
4	$400M	Multi-domain expansion, breakthrough discoveries
5	$1B+	Platform becomes standard R&D infrastructure

Competitive Landscape

Current Solutions Are Fragmented

Competitor	What They Do	Our Advantage
Semantic Scholar	Literature search	We generate hypotheses, not just find papers
BenchSci	Antibody research tools	We're domain-agnostic and autonomous
Recursion Pharma	AI drug discovery	We're a platform, not a single-domain company
Strateos	Cloud labs	We add the intelligence layer
Emerald Cloud Lab	Automated experiments	We design the experiments autonomously
DeepMind (AlphaFold)	Protein structure	We do end-to-end discovery, not single predictions

Our Moats

1. **Full-Stack Integration**: Only platform covering hypothesis → experiment → discovery
2. **Cross-Domain Intelligence**: Insights from biology inform materials science and vice versa
3. **Compounding Data**: Every experiment improves the AI; network effects emerge
4. **Speed**: First autonomous scientific discovery platform at scale
5. **Partnerships**: Deep integrations with robotic lab providers

---

Technology Stack

AI Architecture

```
                    SCIENCEOS AI STACK


FOUNDATION MODELS
  ScienceLLM: 500B parameter model trained on all science
  ProteinGPT: Specialized for biological sequences
  ChemFormer: Molecular understanding and generation
  MaterialsNet: Crystal structures and properties

REASONING ENGINE
  Causal inference graphs
  Hypothesis scoring and ranking
  Experimental design optimization
  Result interpretation with uncertainty quantification

KNOWLEDGE INFRASTRUCTURE
  Dynamic knowledge graphs (10B+ entities)
  Real-time paper ingestion pipeline
  Cross-domain entity resolution
  Provenance tracking for all claims

ROBOTIC INTEGRATION
  Universal lab equipment API
  Protocol translation engine
  Real-time experiment monitoring
  Adaptive optimization loop
```

Training Data Advantage

- **200M+ scientific papers** with full text
- **50M+ patents** with claims and methods
- **Proprietary experimental data** from partner labs
- **Simulation data** from molecular dynamics and physics engines
- **Negative results database** (what didn't work—invaluable signal)

Go-to-Market Strategy

Phase 1: Beachhead (Months 1-12)

Target: Biotech startups and academic research labs

- Launch ScienceOS Reader as free tool for researchers
- Build community and gather feedback
- Identify power users for enterprise pilots
- Partner with 2-3 cloud lab providers for integration

Key Metrics: - 10,000 researcher sign-ups - 50 enterprise pilots - 3 cloud lab integrations

Phase 2: Enterprise Expansion (Months 12-24)

Target: Mid-size pharma and materials companies

- Launch full autonomous discovery platform
- Case studies from pilot successes
- Direct sales team for enterprise accounts
- Expand cloud lab partnership network

Key Metrics: - 200 enterprise customers - $30M ARR - First autonomous discovery published

Phase 3: Platform Dominance (Months 24-48)

Target: Big Pharma, major research institutions, government labs

- Strategic partnerships with top 10 pharma companies
- Government contracts (NIH, DARPA, EU research programs)
- Acquisition of complementary technologies
- International expansion

Key Metrics: - $200M+ ARR - 10+ major pharma partnerships - Multiple breakthrough discoveries

---

Case Studies (Projected)

Case Study 1: Novel Antibiotic Discovery

Challenge: Antibiotic resistance is a global health crisis. No new class of antibiotics discovered in 30 years.

ScienceOS Approach: 1. Analyzed 50,000+ papers on bacterial resistance mechanisms 2. Generated 500+ novel compound hypotheses 3. Designed and executed 10,000 experiments in cloud labs 4. Identified 3 promising candidates in 6 months vs. typical 5+ years

Projected Impact: First novel antibiotic class in a generation

Case Study 2: Room-Temperature Superconductor

Challenge: Room-temperature superconductors would revolutionize energy transmission.

ScienceOS Approach: 1. Synthesized all known superconductor research (100+ years) 2. Identified unexplored material combinations 3. Ran 50,000+ simulations and 5,000 physical experiments 4. Achieved breakthrough in 18 months

Projected Impact: Transform global energy infrastructure

Case Study 3: Personalized Cancer Vaccine

Challenge: Every cancer is genetically unique; personalized treatments are slow to develop.

ScienceOS Approach: 1. Integrated patient tumor genomics with immunology research 2. Generated patient-specific neoantigen hypotheses 3. Designed and tested vaccine candidates in days 4. Accelerated clinical development by 80%

Projected Impact: Cancer vaccines become standard of care

Team Requirements

Core Hires

CEO/Co-founder - Background in life sciences + technology - Experience scaling enterprise software - Vision for AI-driven science transformation

CTO/Co-founder - Deep ML/AI expertise - Experience with large-scale systems - Knowledge of scientific computing

CSO (Chief Scientific Officer) - PhD with wet lab experience - Published researcher in biology/chemistry/physics - Credibility with scientific community

Head of Robotics Integration - Automation and robotics background - Cloud lab ecosystem knowledge - Hardware-software integration expertise

Head of Enterprise Sales - Pharma/biotech sales experience - Complex enterprise deal expertise - Scientific product knowledge

Advisory Board

- Nobel laureates for credibility
- Former pharma R&D executives
- Cloud lab founders
- AI research leaders

Funding Requirements

Seed Round: $8M

- Foundation model training
- Core platform development
- Initial team (15 people)
- First cloud lab partnerships

Series A: $40M

- Scale model training (500B+ parameters)
- Enterprise platform launch
- Sales and marketing build-out
- Team expansion to 80 people

Series B: $150M

- Multi-domain expansion
- Proprietary robotic lab development
- International expansion
- Team to 250 people

Series C: $500M

- Platform dominance
- Major acquisitions
- Breakthrough discovery funding
- Global scale

Risk Mitigation

Risk	Probability	Mitigation
AI doesn't generate valid hypotheses	Medium	Human-in-the-loop validation; start with augmentation
Cloud labs can't execute complex experiments	Medium	Partner with multiple providers; build own labs
Pharma reluctant to trust AI	High	Prove with academic successes first; transparency
Competitors copy approach	High	Speed to market; data moat; patent key innovations
Regulatory barriers	Medium	Engage regulators early; maintain human oversight
IP disputes on AI discoveries	Medium	Clear IP frameworks; legal innovation

---

Why Now?

Convergence of Enabling Trends

1. **AI Capabilities**: Foundation models can finally understand and generate scientific content
2. **Robotic Labs**: Cloud labs have matured; automated experimentation is viable
3. **Data Availability**: Digital science has created massive training datasets
4. **Compute Costs**: Training large models is economically feasible
5. **Urgency**: Climate, health, and resource challenges demand faster science
6. **Funding**: Investors are backing ambitious deep-tech moonshots

The Window is Open

- Google/DeepMind focused on specific problems (AlphaFold), not platforms
- Startups are building point solutions, not integrated systems
- Pharma is desperate for R&D productivity gains
- The first autonomous scientific discovery platform will own the category

---

The Vision

Year 1: Prove the Model

- First paper authored by ScienceOS published
- Major pharma partnership announced
- "ChatGPT for science" moment

Year 3: Accelerate Discovery

- 100+ discoveries attributed to ScienceOS
- Drug candidate in clinical trials
- New materials in production

Year 5: Transform Science

- 10% of global papers involve ScienceOS
- Nobel Prize consideration for AI discovery
- Science accelerated by 10x+

Year 10: The Singularity of Science

- AI scientists outnumber human scientists
- Discovery cycle compressed to days
- Humanity's greatest challenges solved through accelerated science

---

The Ask

We're raising an **$8M Seed Round** to:

1. **Train ScienceLLM** foundation model on complete scientific corpus
2. **Build core platform** for hypothesis generation and experiment design
3. **Establish cloud lab partnerships** for automated experimentation
4. **Recruit founding team** of 15 exceptional scientists and engineers
5. **Run first autonomous discovery pilots** with beta customers

Target Investors: - Deep-tech focused VCs (Lux Capital, DCVC, Khosla Ventures) - Strategic investors (pharma, materials companies) - Scientific research advocates

---

Conclusion

Science is humanity's greatest lever for progress, and it's broken. The research process hasn't fundamentally changed in centuries—it's slow, wasteful, and bottlenecked by human limitations.

ScienceOS changes everything.

We're building the autonomous scientist—an AI system that reads all of human knowledge, generates novel hypotheses, designs optimal experiments, executes them through robotic labs, and iterates at superhuman speed.

The companies that discover new drugs, new materials, and new technologies will define the future. ScienceOS is how they'll do it.

The last research assistant humanity will ever need.

ScienceOS — Accelerating Discovery at the Speed of AI

Contact

Website: scienceos.ai **Email:** founders@scienceos.ai **Location:** Cambridge, MA / San Francisco, CA

"The best way to predict the future is to invent it. The best way to invent it is to discover it first."

— ScienceOS Team