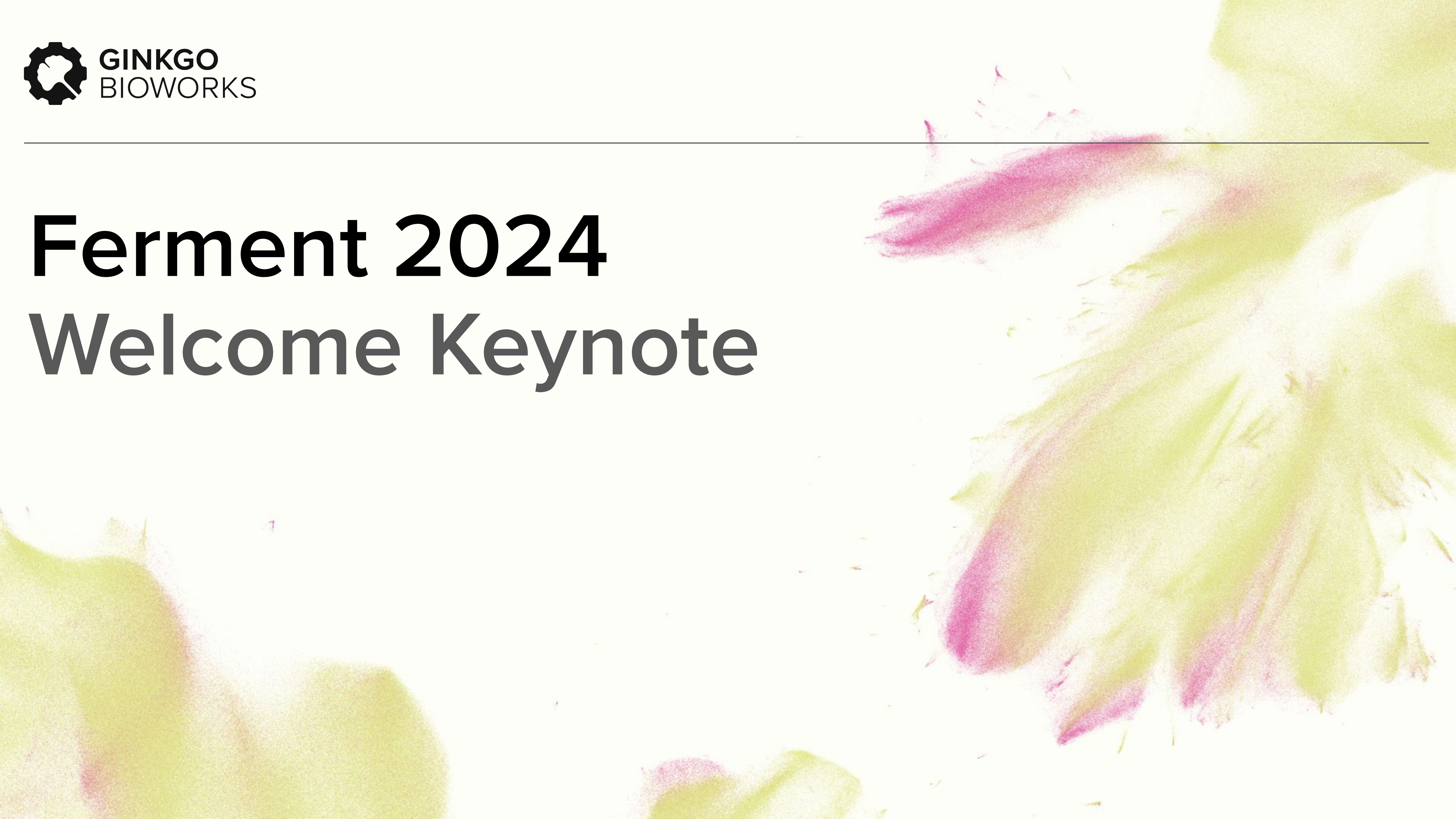


Ferment 2024

Welcome Keynote



Forward-Looking Statements

This presentation contains certain forward-looking statements within the meaning of the federal securities laws, including statements regarding our plans, strategies, operations, and potential for customer success, including successful application of our current or future offerings by our customers, the future applications of the digital biology industry, plans to develop and deploy AI tools for biology and biosecurity and the market environment, all of which are subject to known and unknown risks, uncertainties and other factors that may cause our actual results, performance or achievements, market trends, or industry results to differ materially from those expressed or implied by such forward-looking statements. These forward-looking statements generally are identified by the words "believe," "can," "project," "potential," "expect," "anticipate," "estimate," "intend," "strategy," "future," "opportunity," "plan," "may," "should," "will," "would," "will be," "will continue," "will likely result," and similar expressions. Forward-looking statements are predictions, projections and other statements about future events that are based on current expectations and assumptions and, as a result, are subject to risks and uncertainties. Many factors could cause actual future events to differ materially from the forward-looking statements in this presentation, including but not limited to: (i) volatility in the price of Ginkgo's securities due to a variety of factors, including changes in the competitive and highly regulated industries in which Ginkgo operates and plans to operate, variations in performance across competitors, and changes in laws and regulations affecting Ginkgo's business, (ii) the ability to implement business plans, forecasts, and other expectations, and to identify and realize additional business opportunities, (iii) the risk of downturns in demand for products using synthetic biology, (iv) the uncertainty regarding the demand for passive monitoring programs and biosecurity services, (v) changes to the biosecurity industry, including due to advancements in technology, emerging competition and evolution in industry demands, standards and regulations, (vi) the outcome of any pending or potential legal proceedings against Ginkgo, (vii) our ability to realize the expected benefits from and the success of our Foundry platform programs, (viii) our ability to successfully develop engineered cells, bioprocesses, data packages or other deliverables, and (ix) the product development or commercialization success of our customers. The foregoing list of factors is not exhaustive. You should carefully consider the foregoing factors and the other risks and uncertainties described in the "Risk Factors" section of Ginkgo's annual report on Form 10-K filed with the U.S. Securities and Exchange Commission (the "SEC") on February 29, 2024, and other documents filed by Ginkgo from time to time with the SEC. These filings identify and address other important risks and uncertainties that could cause actual events and results to differ materially from those contained in the forward-looking statements. Forward-looking statements speak only as of the date they are made. Readers are cautioned not to put undue reliance on forward-looking statements, and Ginkgo assumes no obligation and does not intend to update or revise these forward-looking statements, whether as a result of new information, future events, or otherwise. Ginkgo does not give any assurance that it will achieve its expectations.

ON STAGE (lightning talks)

OFF STAGE

Let's meet and learn from each other!

Cell Engineering Solutions applies broadly across biotech

Non-exhaustive

Property of Ginkgo Bioworks

	PHARMA		INDUSTRIAL BIOTECHNOLOGY					AGRICULTURE
LARGE COMPANIES								

STARTUPS

WELCOME KEYNOTE

2023 was a breakout year for Ginkgo services in the biopharma industry

Pfizer hooks up with Ginkgo for \$331M biobucks deal on unspecified targets.

[LEARN MORE](#)

FIERCE BIOTECH — Sep. 27, 2023

Busy dealmakers Ginkgo, Boehringer Ingelheim sign one together with \$406M for undruggable targets.

[LEARN MORE](#)

FIERCE BIOTECH — May 8, 2023

Merck, Ginkgo Bioworks strike deal worth up to \$490M to ‘optimize’ biologics manufacturing.

[LEARN MORE](#)

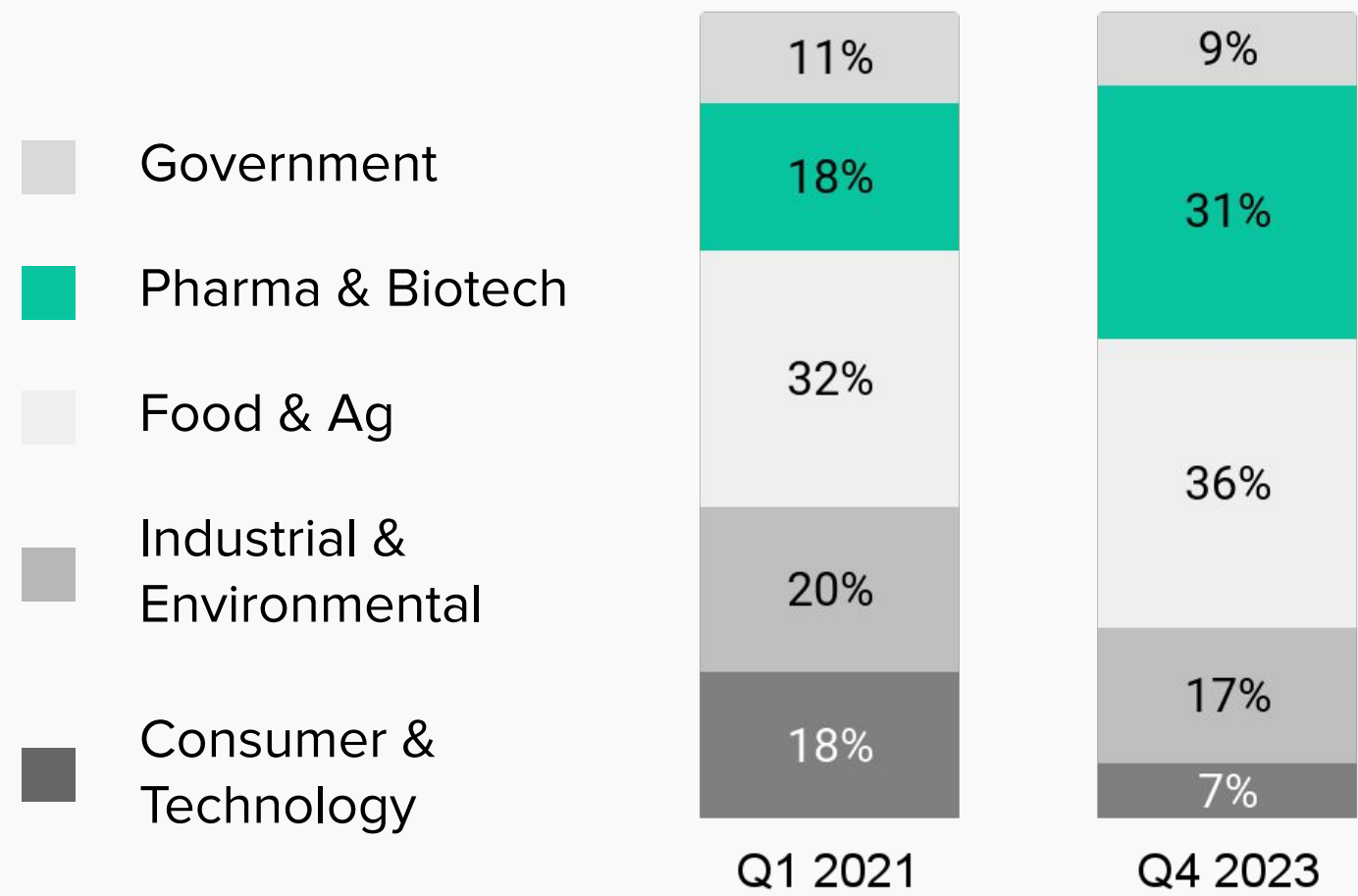
FIERCE BIOTECH — Aug. 7, 2023

Successful completion of Biogen collaboration focused on enhancing productivity of AAV production platform.

[LEARN MORE](#)

GINKGO NEWS — Jan. 4, 2024

ACTIVE PROGRAMS



Our pharma program mix **grew over 70%** in the last two years

Biopharma revenue grew over

40%

in 2023⁽¹⁾

(1) Biopharma (i.e. Pharma & Biotech) revenue correlates to the portion of Ginkgo cell engineering revenue that is attributable to biopharma customers inclusive of DVS.



Productivity Redefined

Paving the Way to Sustainable
Pharma Innovation

"...we are eager to explore more flexible models for external partnerships and this agreement allows Novo Nordisk to start more projects with Ginkgo in a faster and more agile manner."



Marcus Schindler

Marcus Schindler, PhD

Executive Vice President & Chief
Scientific Officer, Novo Nordisk

Jennifer Wipf

Chief Commercial Officer,
Ginkgo Bioworks



Cell engineering solutions are solving common problems across modalities

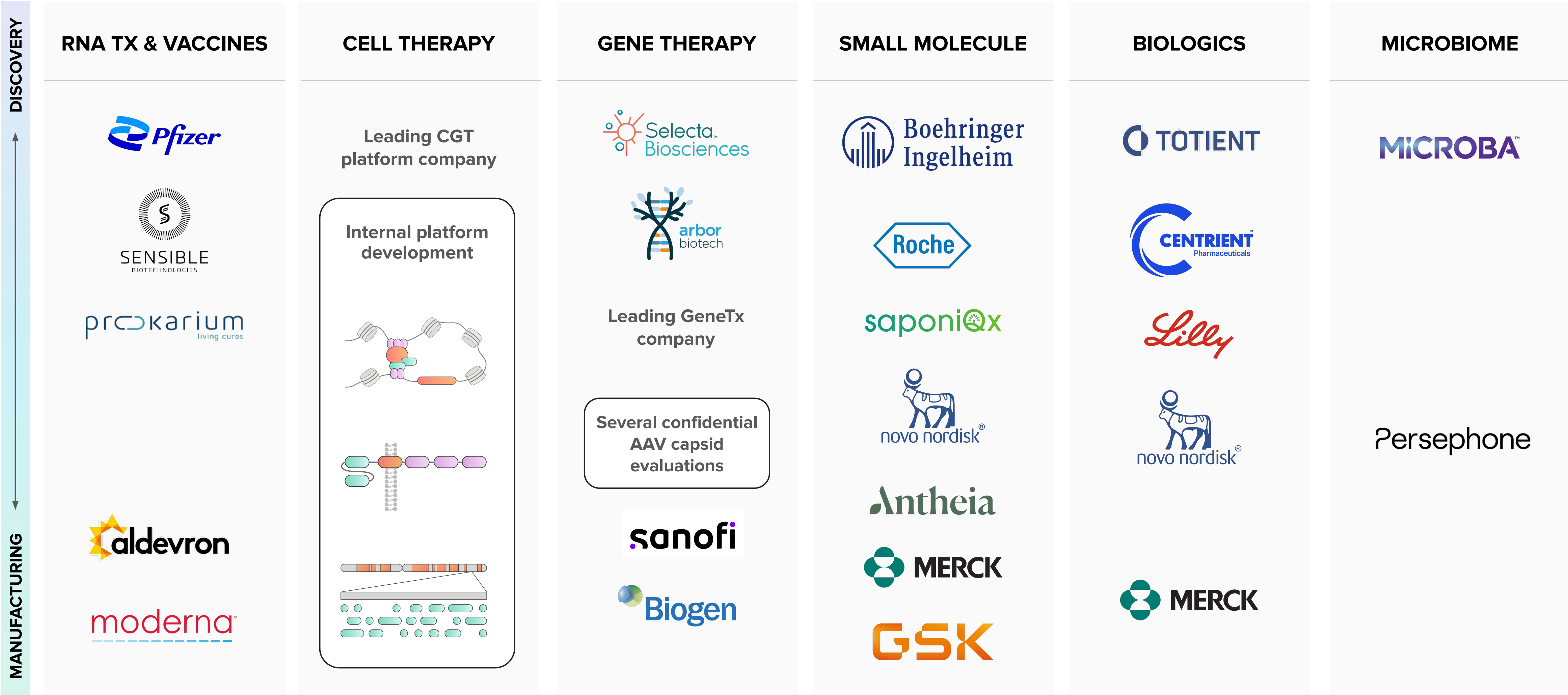
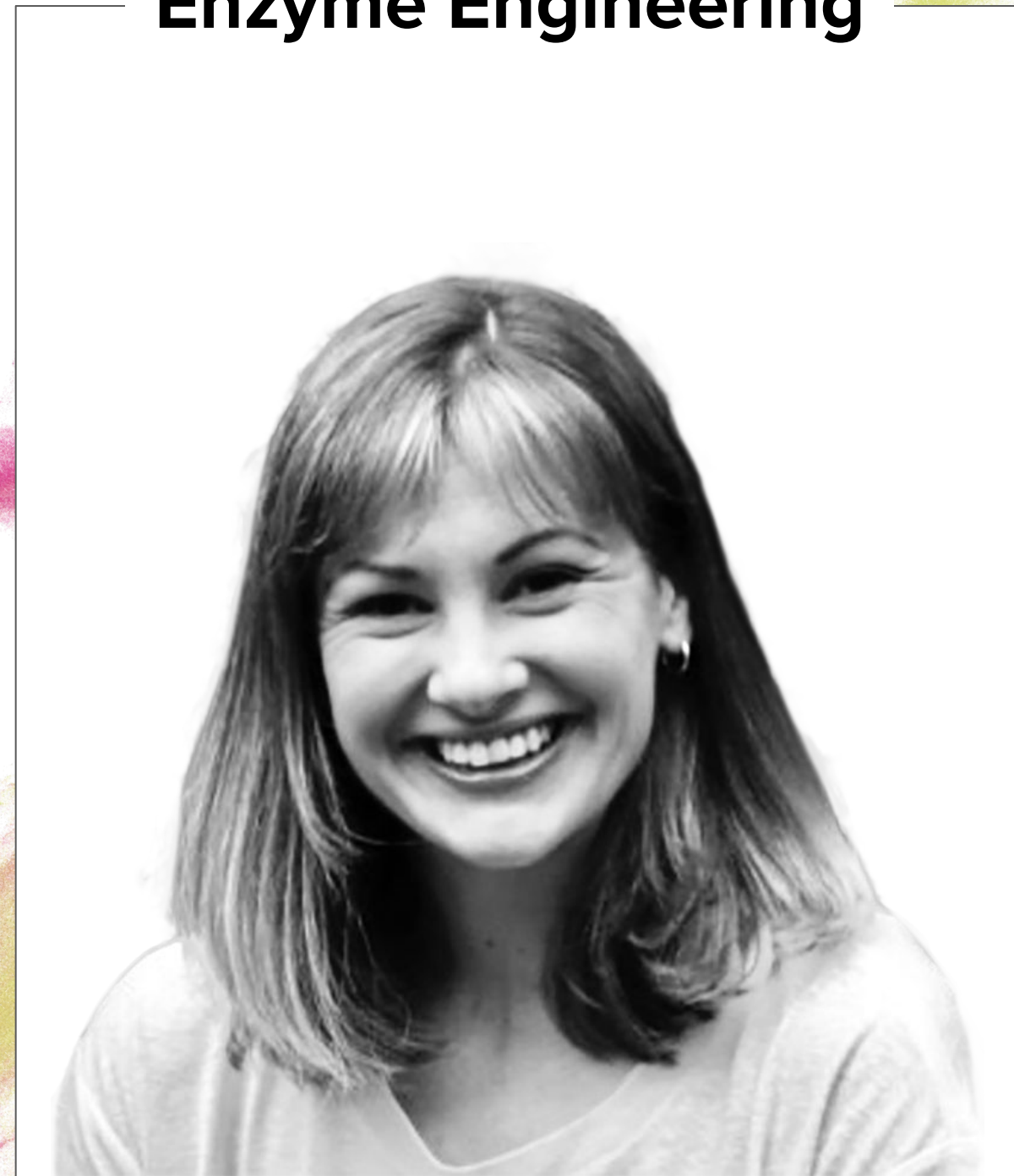


Figure is non-exhaustive

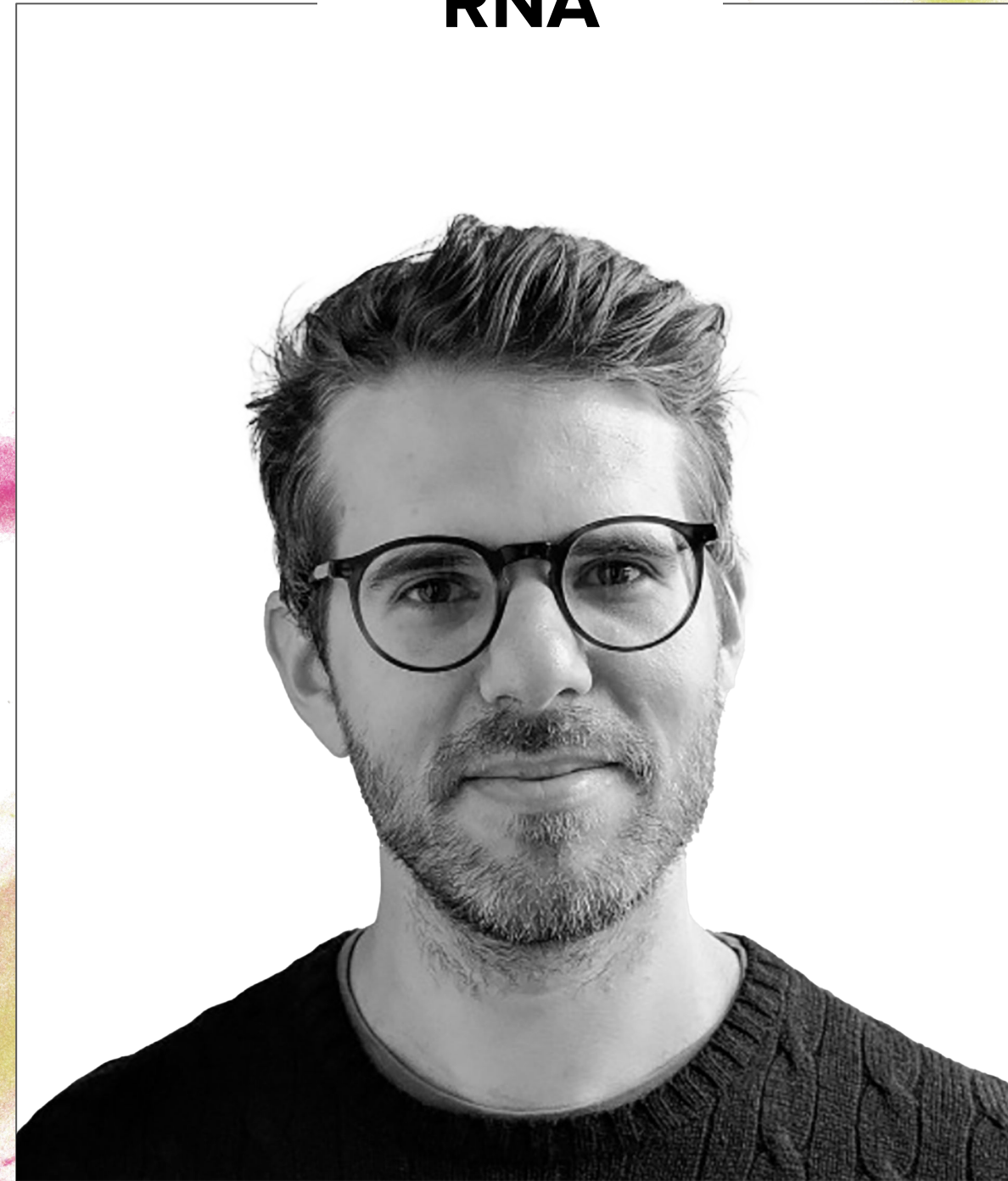
Cell engineering solutions are solving common problems across modalities

Enzyme Engineering



Emily Wrenbeck, PhD
Head of Protein Engineering

RNA



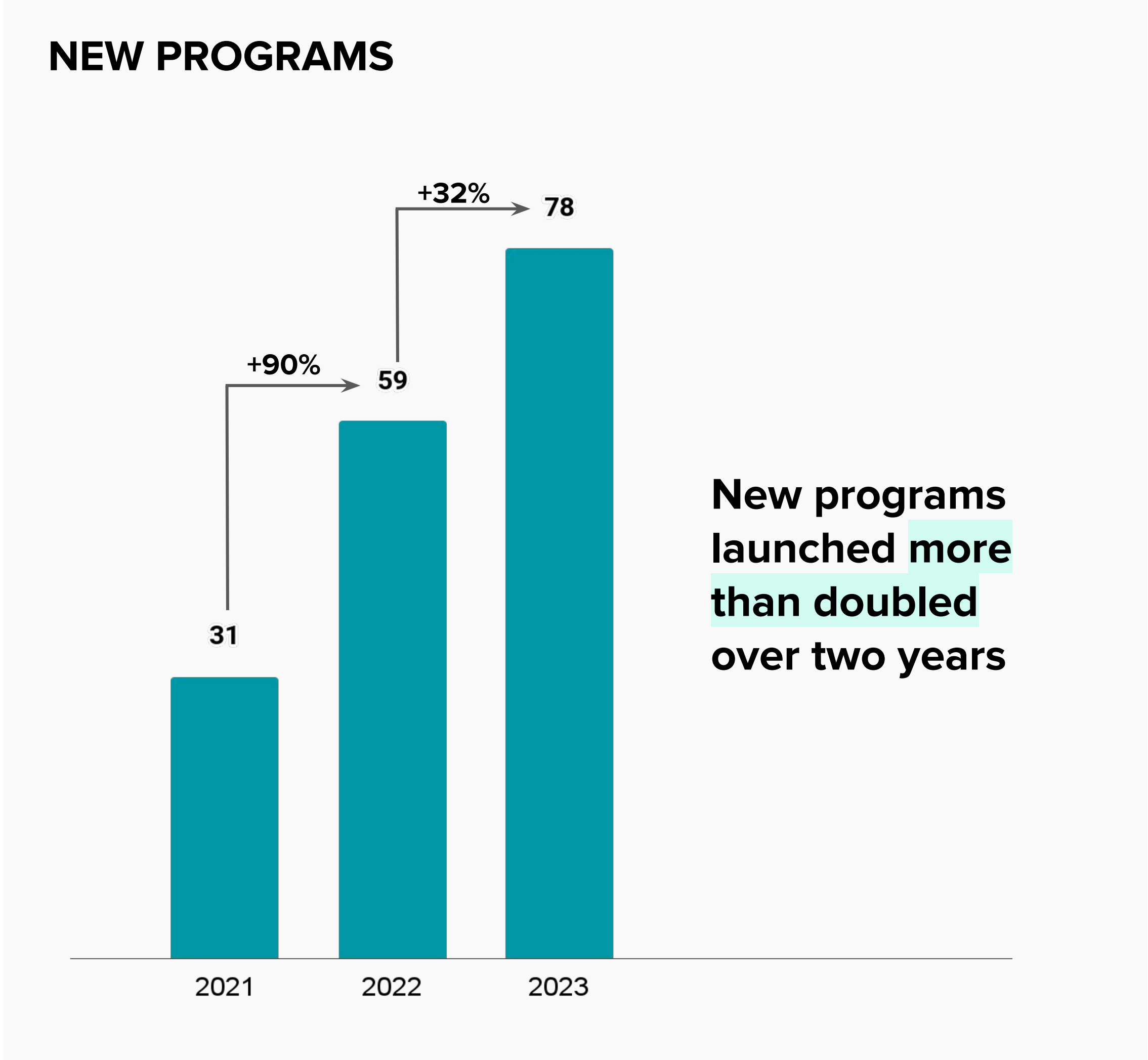
Uri Laserson, PhD
Senior Director, AI Research
Former CTO of Patch Biosciences

Cell Therapy



Shawdee Eshghi, PhD
Senior Director,
Mammalian Engineering

We continue to see significant growth in new programs in cell engineering solutions



LIGHTNING TALKS

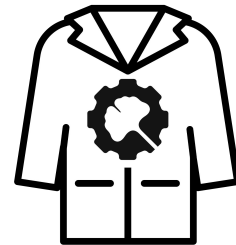
(1) Does not include DVS

Ginkgo is opening up our platform directly to you today

If biotech wants to move as fast as tech we need to open up our platforms so other companies can innovate on them directly.



NETFLIX

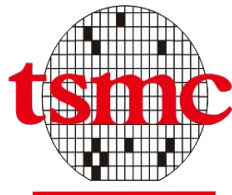


Ginkgo Scientists Your Scientists

scale



Google Cloud



ASML

SYNOPSYS

**Ginkgo Foundry
& Codebase**

WHY ARE WE OPENING OUR PLATFORM?

What we're hearing from all of you

AI needs lots of data.

AI will matter in biotechnology but we need more data—well structured, multimodal data sets connecting genetic designs to many measures of their performance.

CROs need to modernize.

Traditional CROs are a part of pre-clinical research but are behind in the latest technology, don't play well with other novel tech providers, don't integrate well with in-house data management, and domestic options are more limited.

"Where do I think the next amazing revolution is going to come? And this is going to be flat out one of the biggest ones ever.

There's no question that digital biology is going to be it."

"Biology has the opportunity to be engineering not science. When something becomes engineering not science it becomes... exponentially improving, it can compound on the benefits of previous years."

Jensen Huang

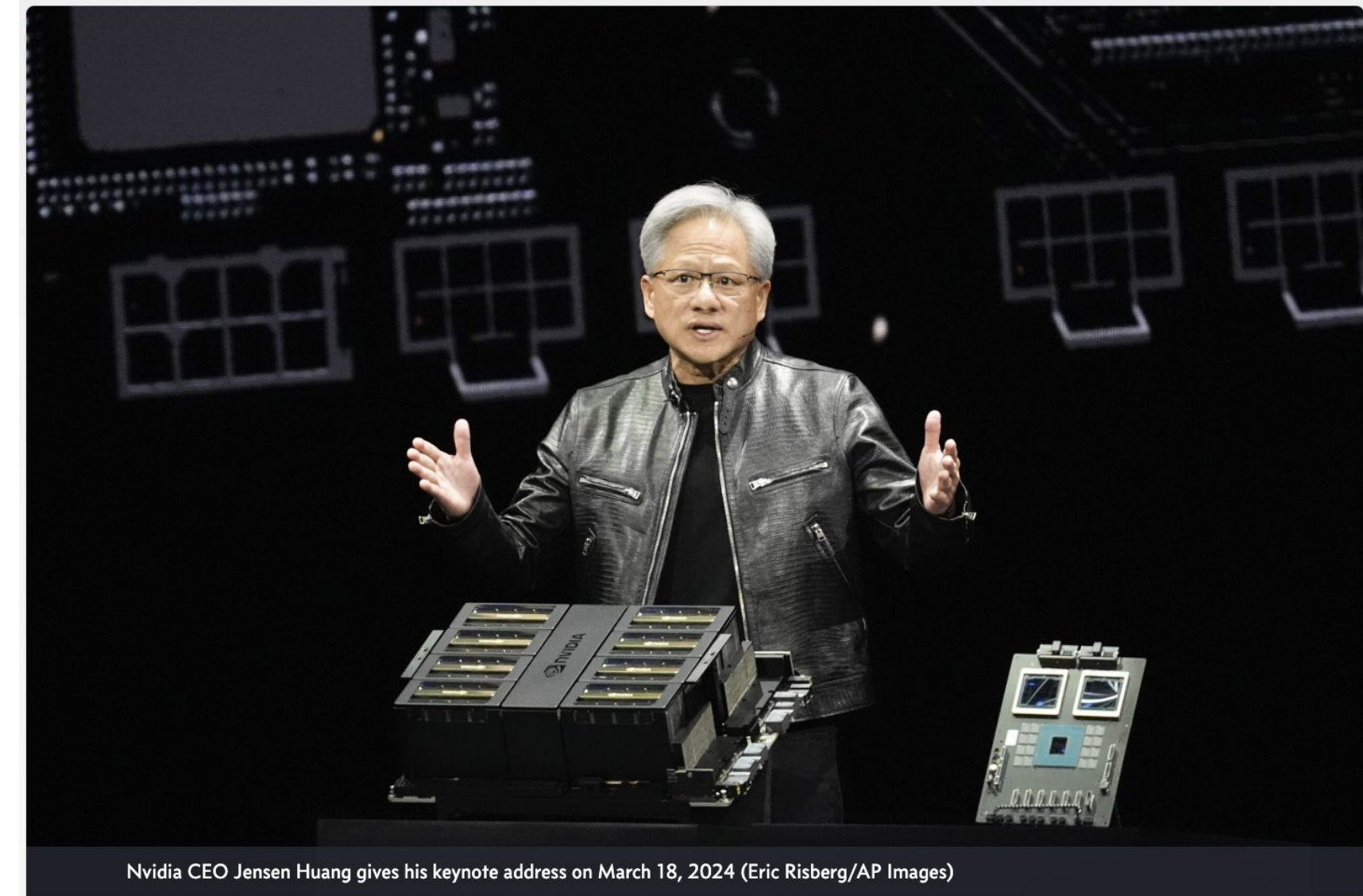
ENDPOINTS NEWS

CHANNELS ▾

WEBINARS

BIOPHARMA JOBS

MORE ▾



Nvidia CEO Jensen Huang gives his keynote address on March 18, 2024 (Eric Risberg/AP Images)

March 19, 2024 11:32 AM EDT | AI

[in](#) [X](#)

'An AI foundry': Nvidia's Jensen Huang pitches biotech on easy AI, with focus on software going beyond chips



Andrew Dunn

Senior Biopharma Correspondent

“Our strategic partnership with Ginkgo is a first-of-its-kind for Google Cloud, underscoring our confidence that Ginkgo will play a critical and pioneering role in the life sciences space, leveraging AI to reshape humanity’s understanding of biology.”

THOMAS KURIAN
CEO



Reverie Labs

OCTOBER 30, 2023

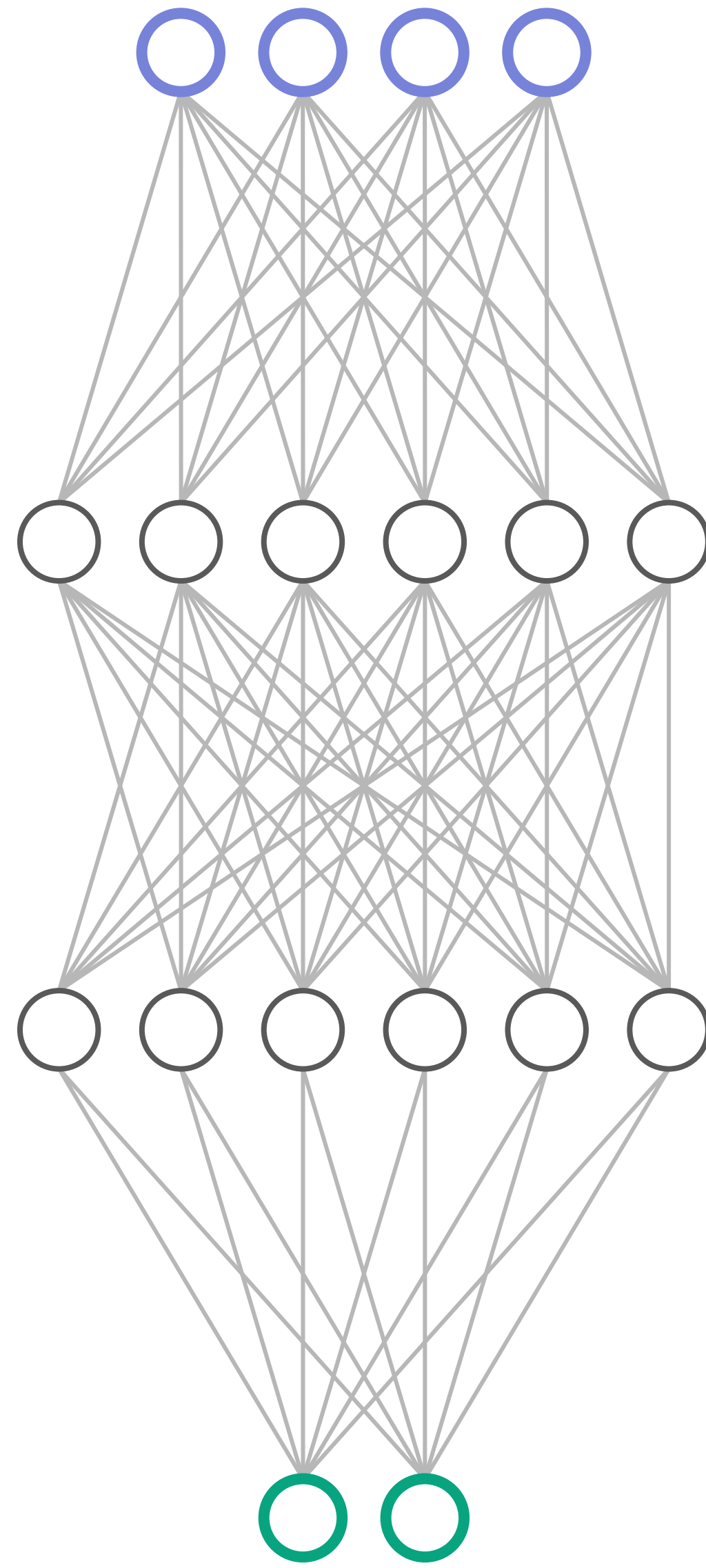
Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence



► BRIEFING ROOM

► PRESIDENTIAL ACTIONS

(i) any model that was trained using a quantity of computing power greater than 10^{26} integer or floating-point operations, or using primarily biological sequence data and using a quantity of computing power greater than 10^{23} integer or floating-point operations; and



UNSUPERVISED LEARNING

GPT-3 training data

Dataset	# tokens	Proportion within training
Common Crawl	410 billion	60%
WebText2	19 billion	22%
Books1	12 billion	8%
Books2	55 billion	8%
Wikipedia	3 billion	3%

REINFORCEMENT LEARNING WITH HUMAN FEEDBACK (RLHF)

scale

Opening Ginkgo's Data: Use Ginkgo's DNA data, compute power, and expertise to train your model.

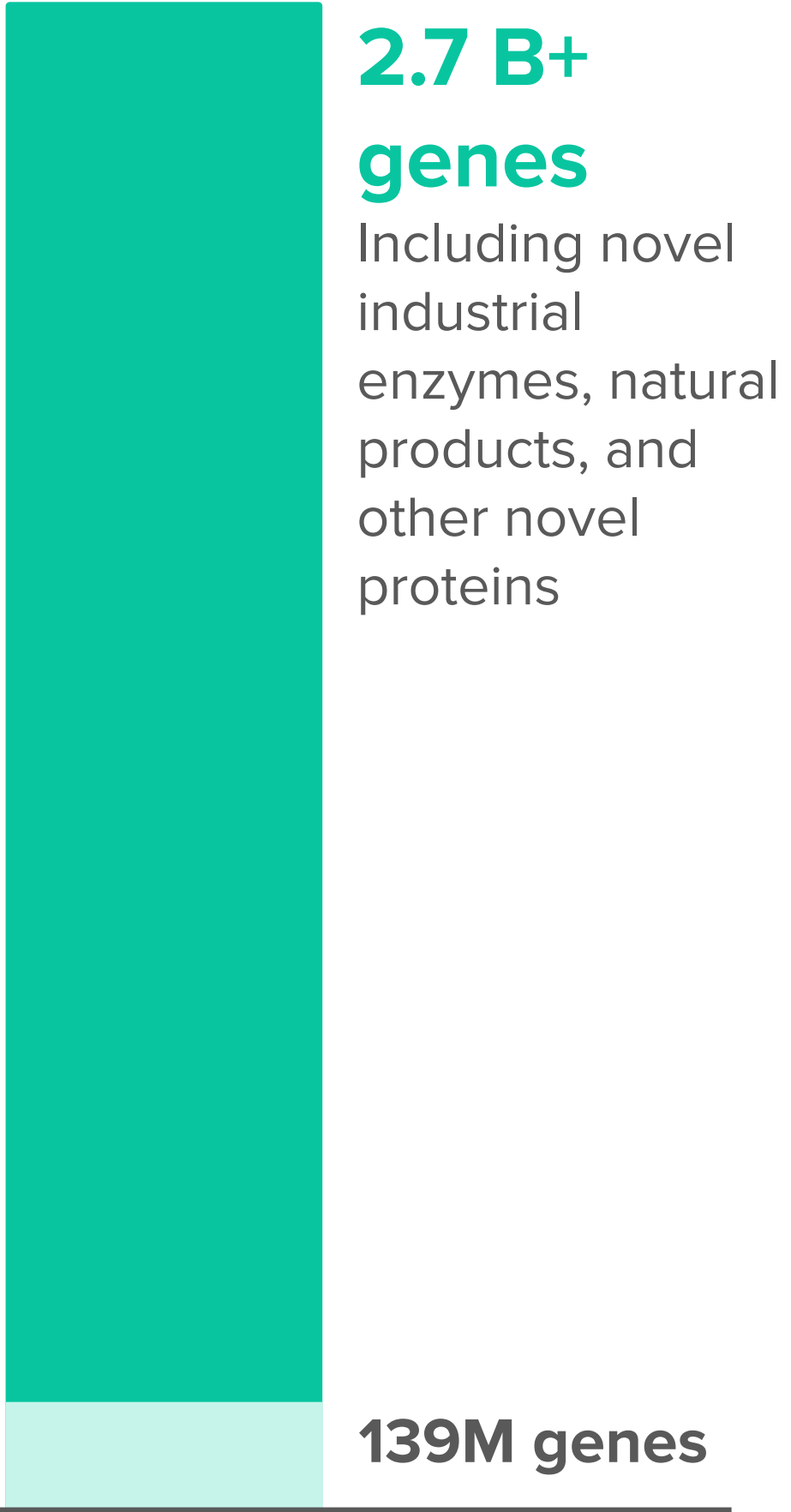
A Ankit Gupta
7:12 PM Today

i cant emphasize enough - we have an **outrageous** amount of compute power. we should advertise this more forwardly.

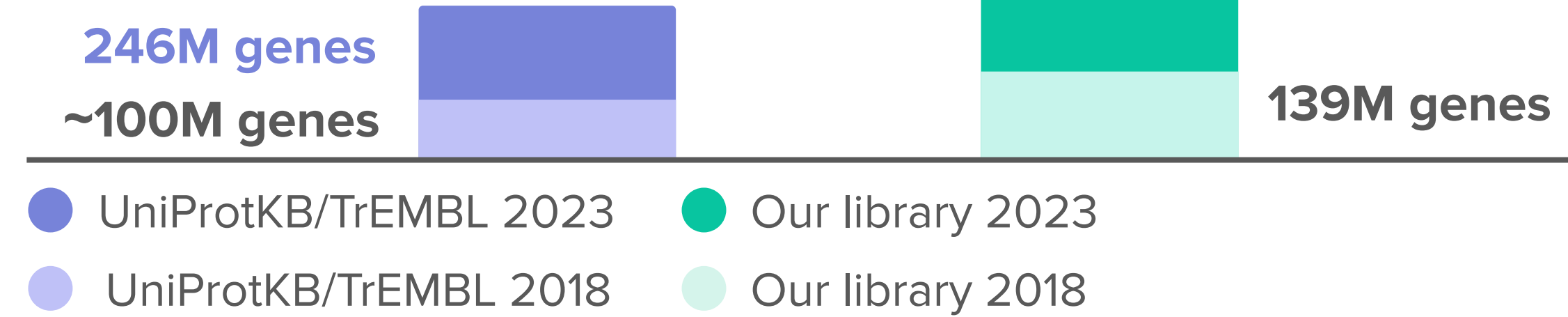
Reply or add others with @

Agreed Ok

Several hundred of both GPUs and TPUs.
Can scale that up to 10x as needed.

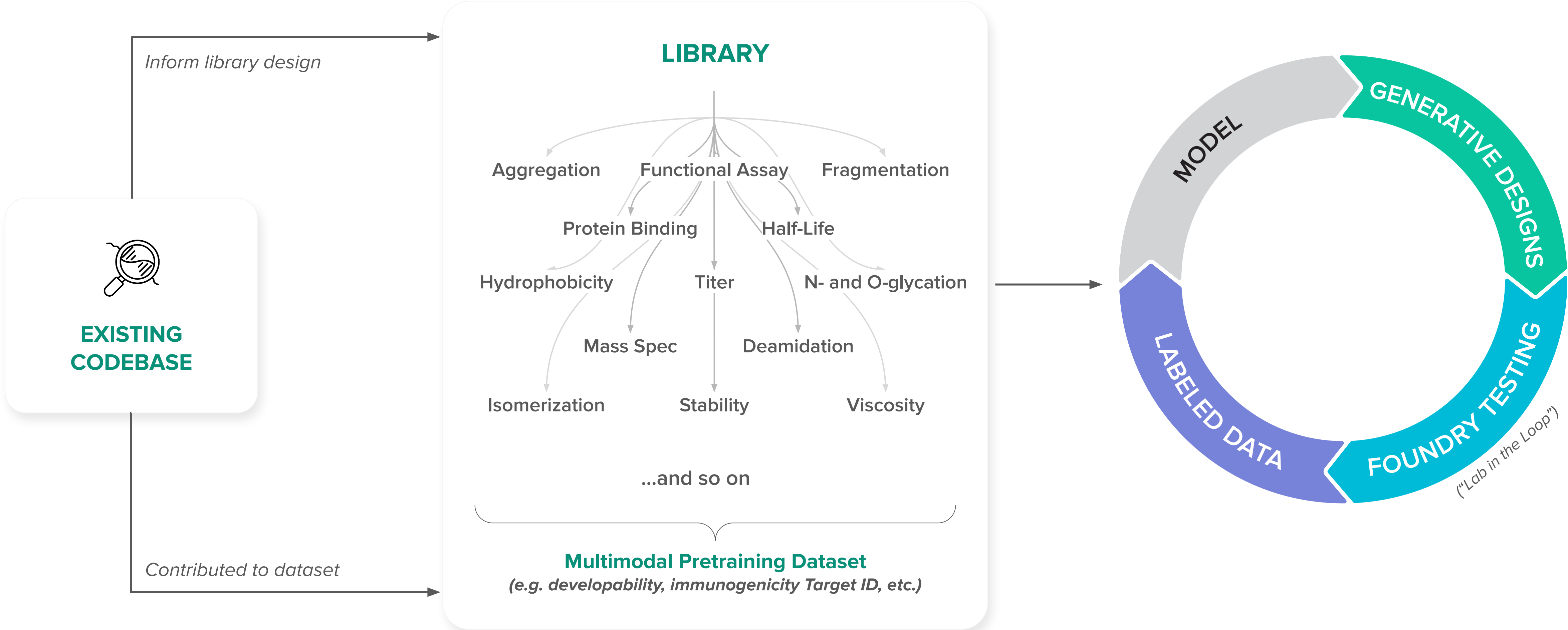


2.7 B+ genes
Including novel industrial enzymes, natural products, and other novel proteins



Opening Ginkgo's Foundry: Lab Data as a Service

Reinforcement learning requires lab data on the performance of generated DNA designs—and lots of it. So we're making our foundry available to you directly.



Ginkgo's proprietary data to serve as pretraining set for active learning

Ginkgo can work with you to create large, multimodal datasets customized to address your biggest challenges

Lab Data as a Service offers "lab in the loop" capabilities to enable supervised learning

Beyond Bits and Bases

AI's Path to Unlocking the Mysteries of Biology

Karen Akinsanya, PhD

President of R&D, Therapeutics,
Schrödinger

Molly Gibson, PhD

Origination Partner, Flagship
Pioneering and Co-Founder
& Chief Innovation Officer,
Generate Biomedicines

Iya Khalil, PhD

Vice President and Head of Data,
AI & Genome Sciences, Merck

Debora S. Marks, PhD

Professor of Systems Biology,
Harvard Medical School

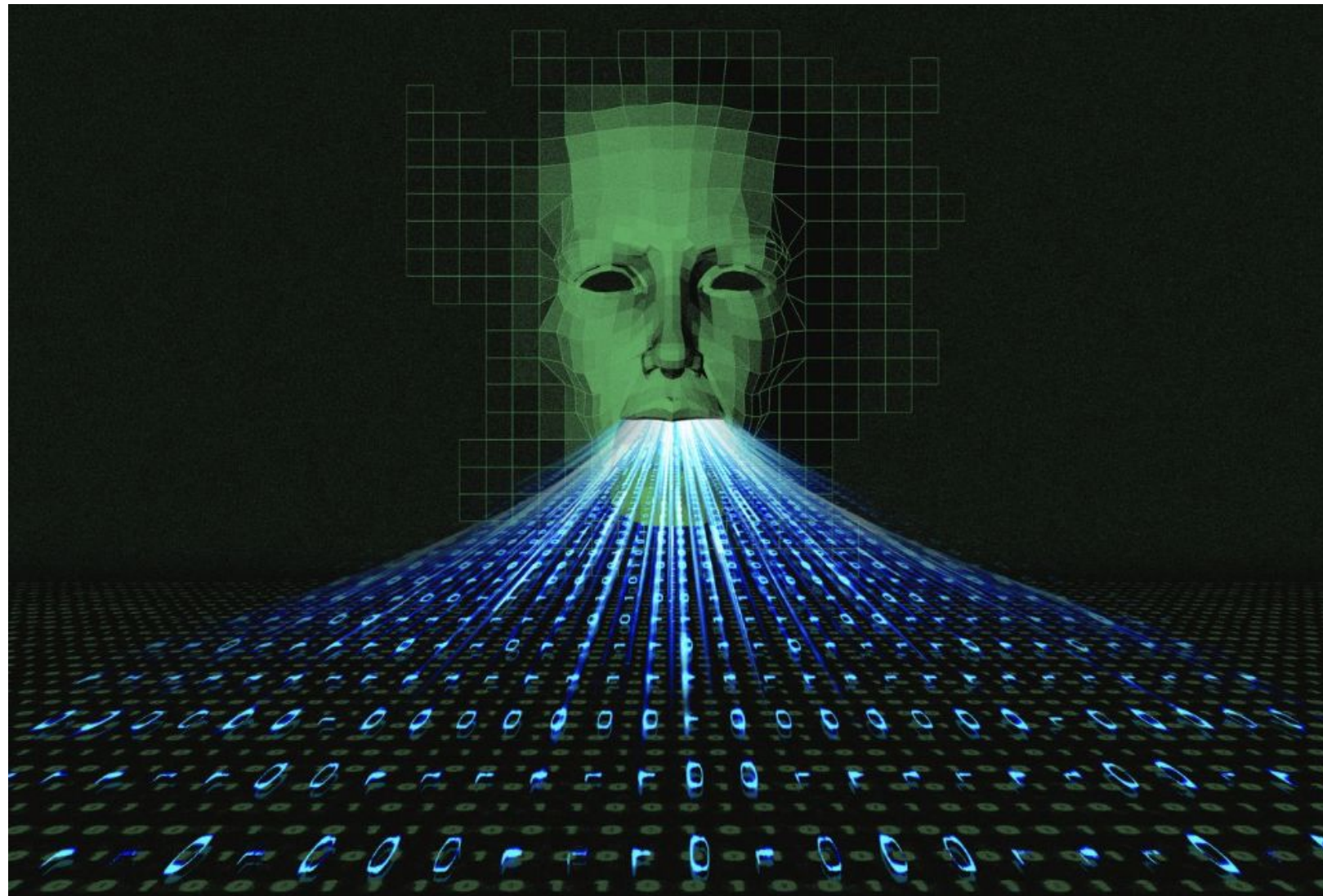
Anna Marie Wagner

SVP, Head of AI and Head of
Corporate Development,
Ginkgo Bioworks





WSJ



Data is among several essential AI resources in short supply. EMIL LENDOF/THE WALL STREET JOURNAL, ISTOCK

For Data-Guzzling AI Companies, the Internet Is Too Small

Firms such as OpenAI and Anthropic are working to find enough information to train next-generation artificial-intelligence models

Ferment

FIRESIDE CHAT

Big Data, Big Questions

The Potential of AI, Data Sharing, and Public-Private Partnerships

Renee Wegrzyn, PhD
Director, Advanced
Research Projects Agency
for Health (ARPA-H)

Jon Terrett, PhD
Head of Research,
CRISPR Therapeutics

Michael Specter
Staff Writer, The New Yorker;
Visiting Scholar, MIT Media Lab





GINKGO
BIOSECURITY

BOSTINNO

Ginkgo Bioworks aims to use AI to predict measles outbreaks, thanks to the Gates Foundation

April 10, 2024 | 6:54 AM EDT

(i) any model that was trained using a quantity of computing power greater than 10^{26} integer or floating-point operations, or using primarily biological sequence data and using a quantity of computing power greater than 10^{23} integer or floating-point operations; and

Global Biosecurity in Practice

Nikki Romanik

Special Assistant to the President,
Deputy Director and Chief of Staff,
the Office of Pandemic
Preparedness and Response Policy
(OPPR)

Wilmot James, PhD

Professor of Practice in Health
Policy, Services and Practice &
Senior Advisor for Pandemics and
Global Health Security at the School
of Public Health, Brown University

Cindy Friedman, MD

Founding Director, CDC's Traveler-
based Genomic Surveillance
Program (TGS)

Alison Snyder

Managing Editor, Axios



WHY ARE WE OPENING OUR PLATFORM?

What we're hearing from all of you

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CROs should be more like foundry services

Build like a Ginkgo organism engineer.

Internally, we use the foundry as a collection of CRO-like service functions.

Data on demand.

Generate as little or as much as you want, as easily as ordering cloud compute.

Cheaper with scale.

Data generation gets more efficient with investments in infrastructure.

Connect to the TechNet.

The Ginkgo Technology Network supports integration of the best of the ecosystem.

Generate AI-Ready Data.

Multimodal, interoperable data that plays well with your data science team.

Transparent Pricing and Turnaround Time.

We've laid it all out on our website.



www.ginkgobioworks.com/ondemand

ANTIBODY DEVELOPABILITY

Expression

96 samples	\$48,000	5 wks
384 samples	\$154,000	5 wks
1596 samples	\$499,000	5 wks

Target binding

96 samples	\$86,000	6 wks
384 samples	\$249,000	6 wks
1596 samples	\$844,000	7 wks

Thermostability

96 samples	\$63,000	6 wks
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ENZYME PERFORMANCE

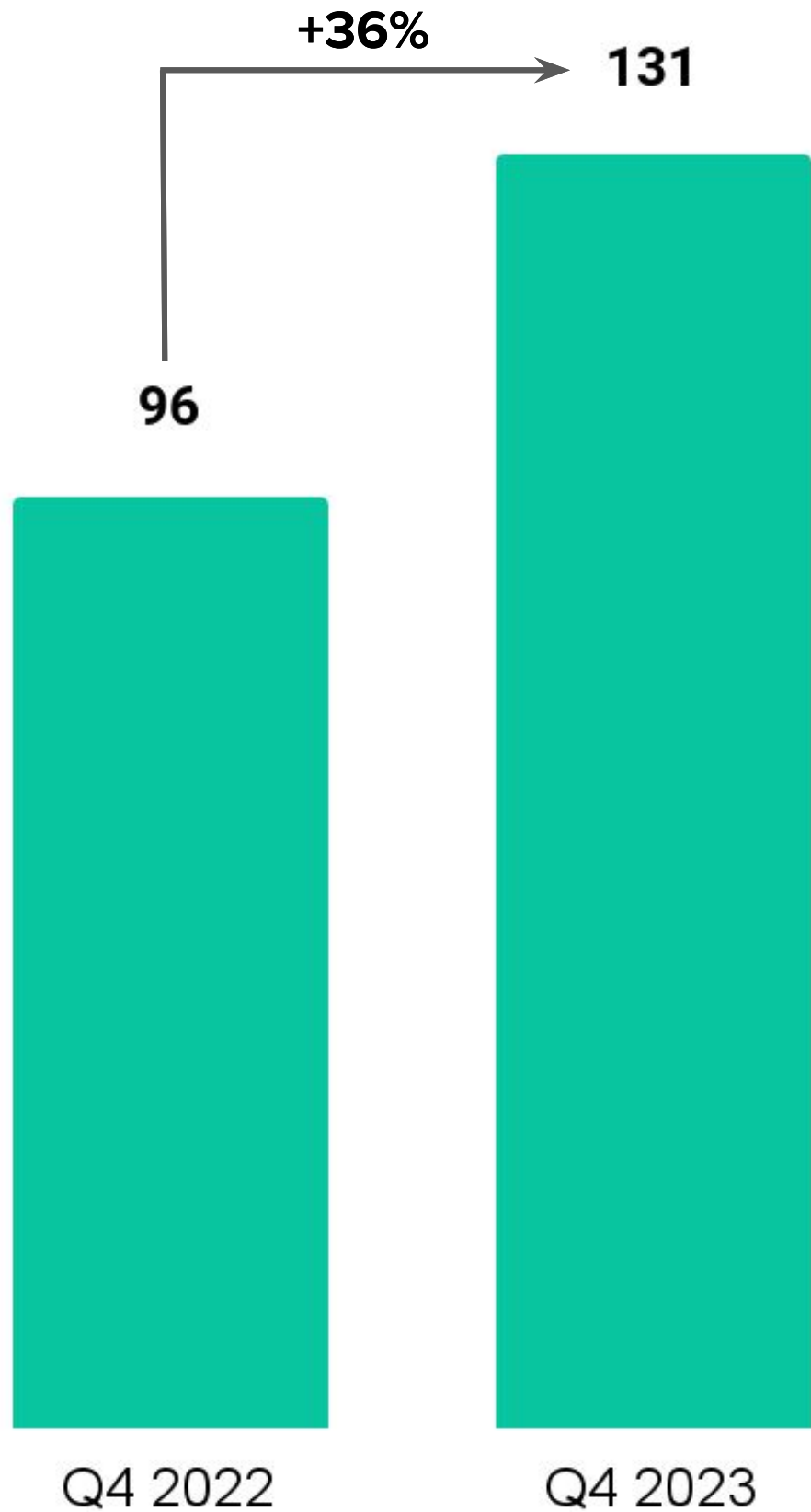
Activity	Solvent Tolerance
Expression Level	Specificity
pH Optimization	Stability
Salt Tolerance	Thermotolerance

96 samples	\$78,000	6 wks
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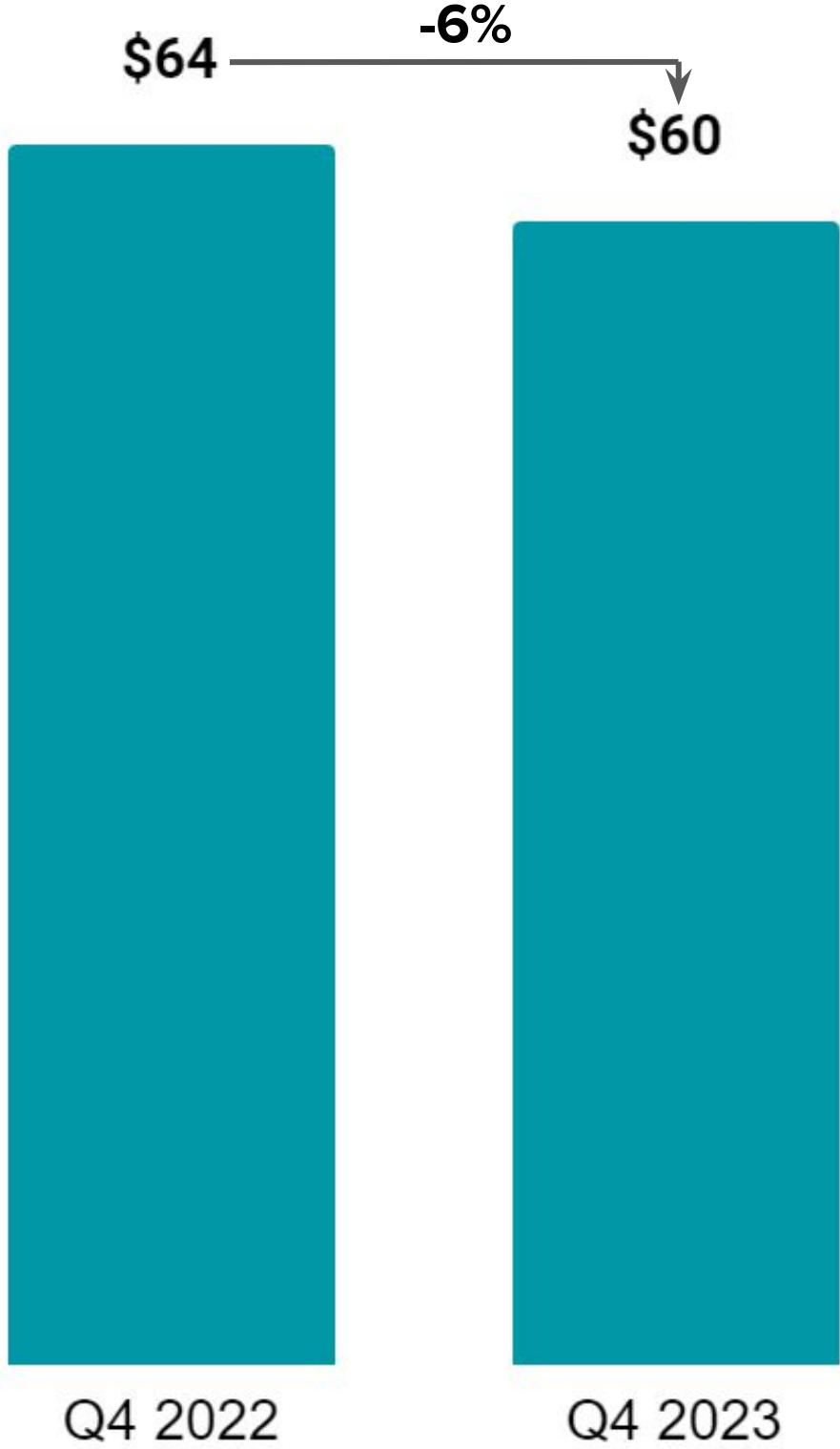


Ginkgo cell engineering efficiency improves with scale

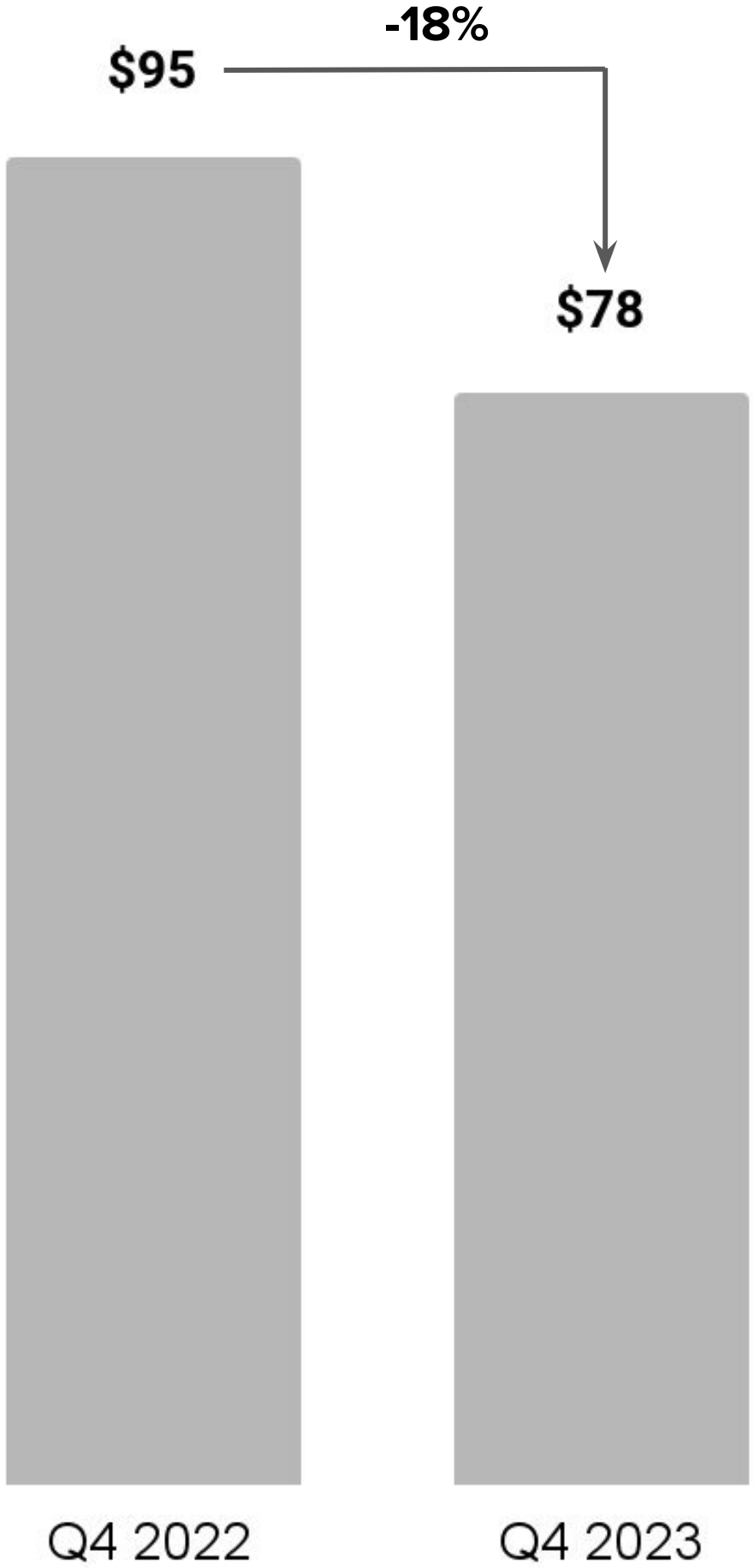
Active Programs



Cell Engineering Segment G&A Expense (\$M)^{1,3}



Cell Engineering Segment R&D Expense (\$M)^{2,3}



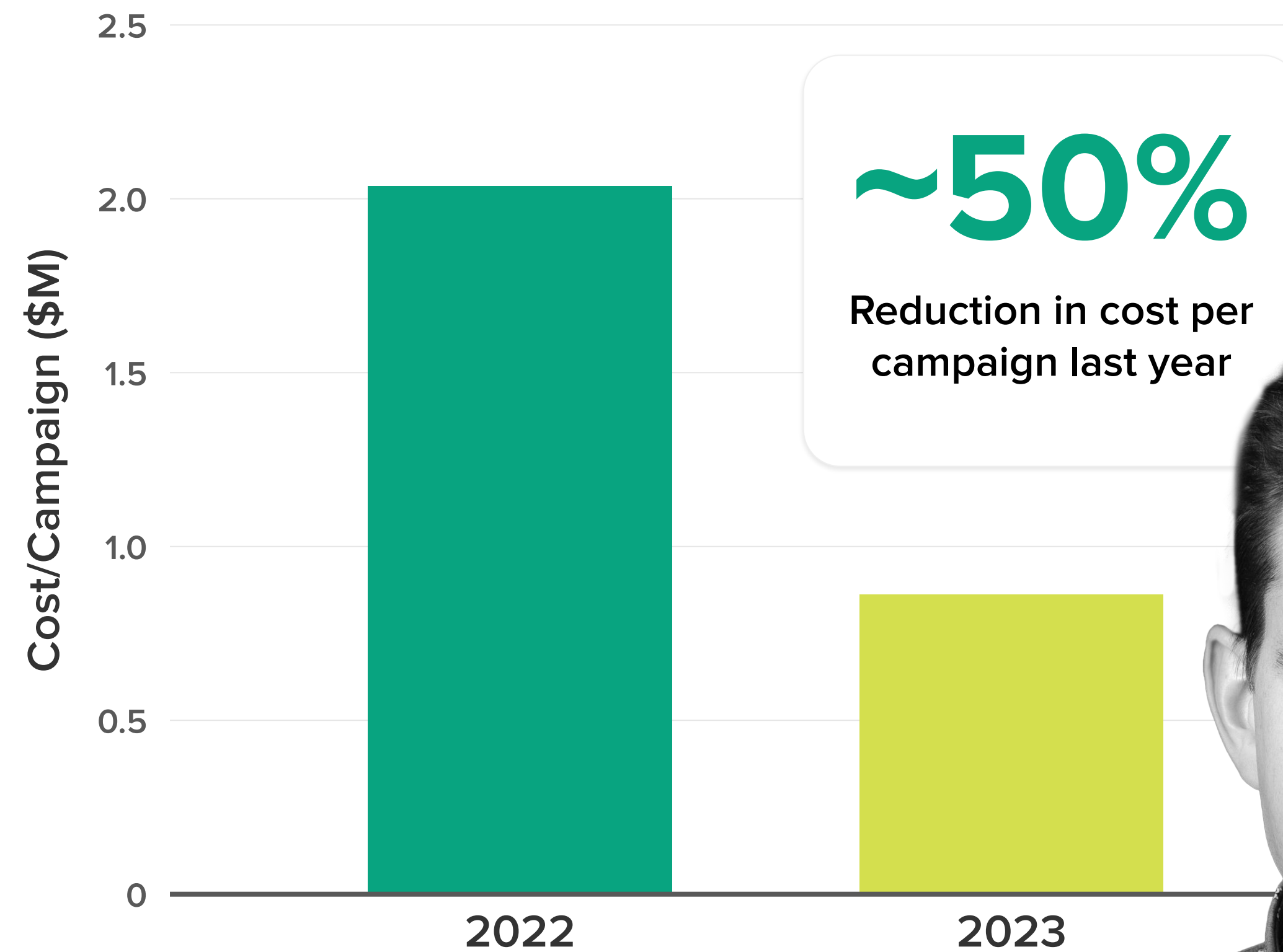
(1) Includes M&A related expenses of \$17 million in Q4 2022 and \$19 million in Q4 2023
(2) Includes M&A related expenses of \$9 million in Q4 2022 and \$5 million in Q4 2023
(3) Excludes stock-based compensation and depreciation & amortization





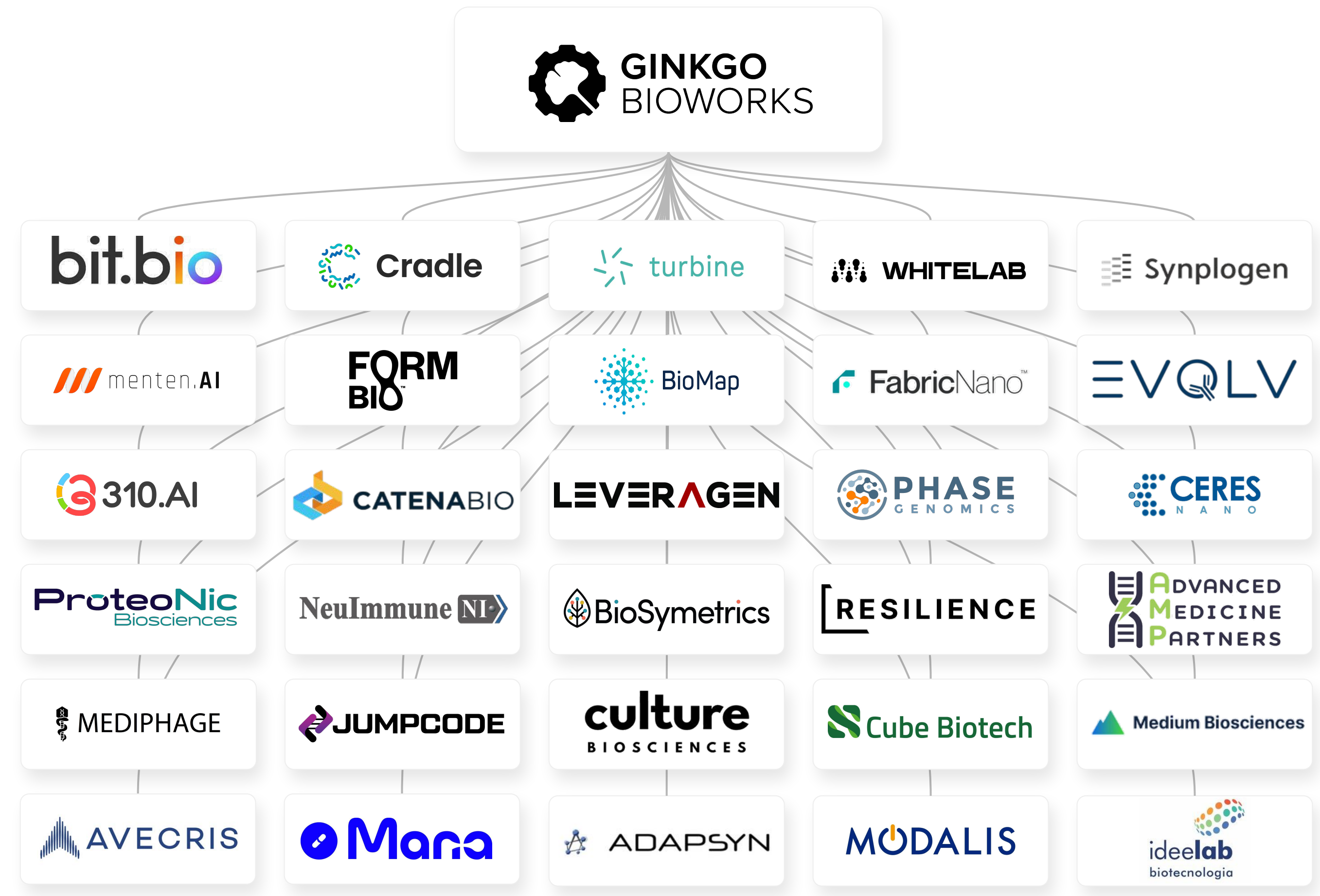
The cost to generate lab data improves with scale due to operations, process improvements, and automation

Cost/Campaign Decreasing Over Time

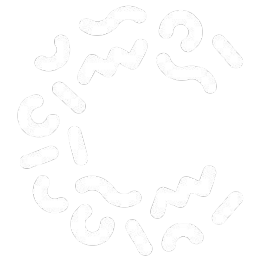


TECHNOLOGY NETWORK

You can expand your business on top of Ginkgo's lab data as a service or by connecting your service to our network



...and many more to come!



Protein AI

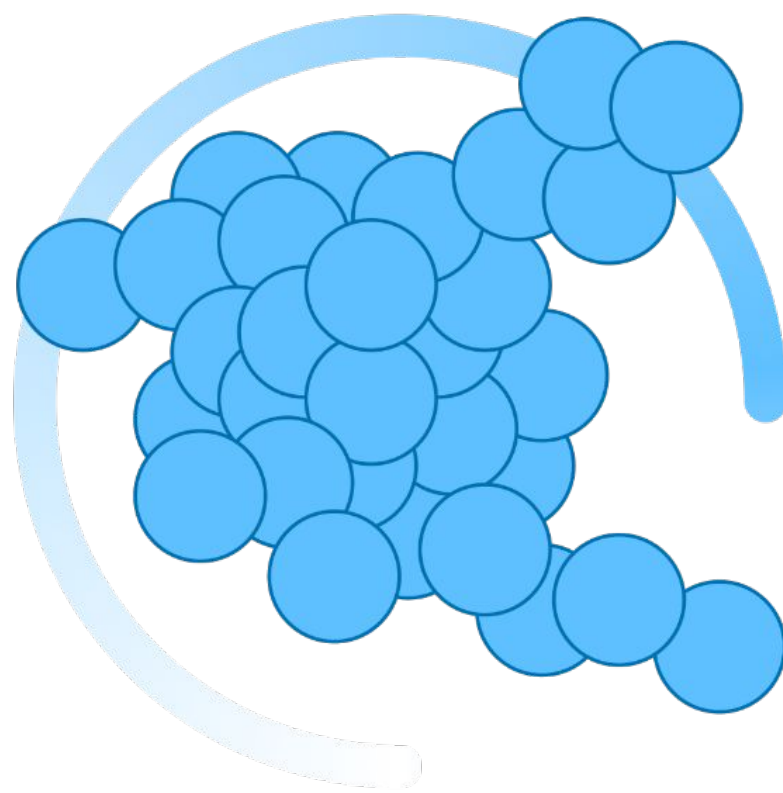


Stef van Grieken
Co-founder & CEO of Cradle



Generative protein design tools in your browser.

cradle.bio



ML Generated sequences



No installs. Just your browser.

Multi-property assays by  **GINKGO BIOWORKS**

affinity



Activity



Solubility



Thermal stability

Thermal stability



Structure prediction

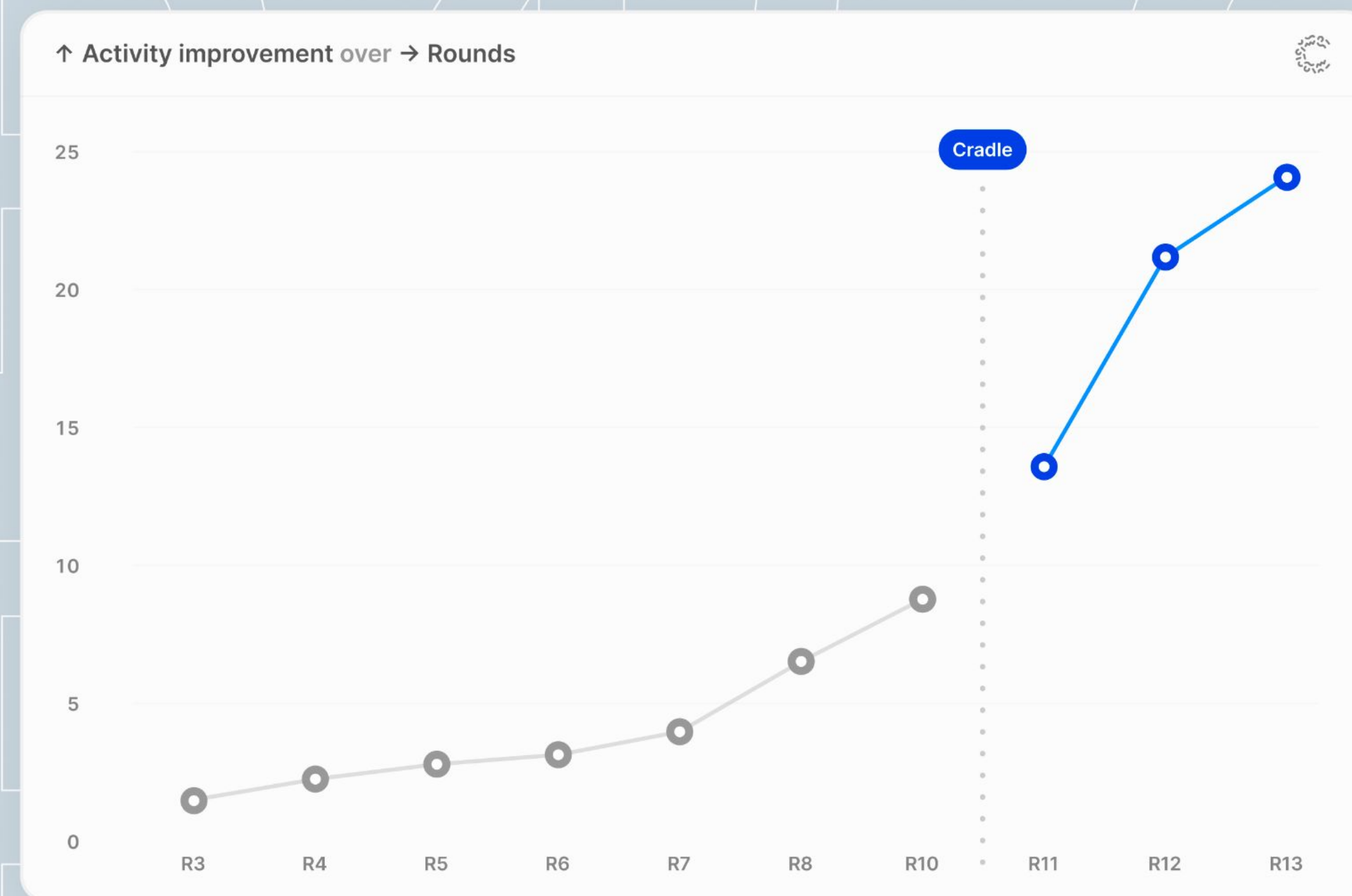


Speed

CASE STUDY

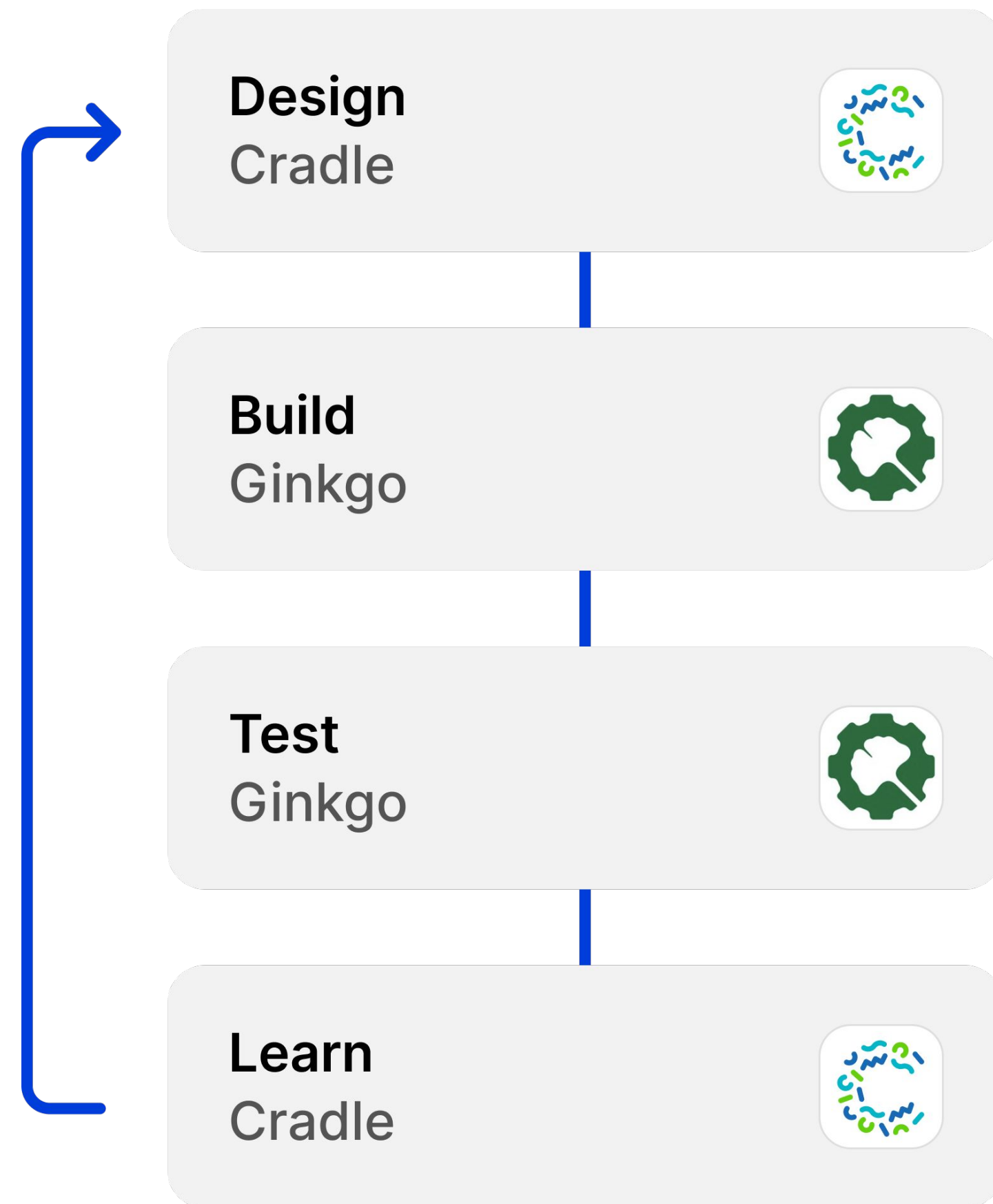
Cradle increased P450 activity by 300% in record time.

“Cradle's AI-based approaches were invaluable in enhancing our enzyme's activity. We were particularly impressed by its ability to effectively leverage our historical data.”



E2E Cloud lab

Cradle x Ginkgo workflow overview



Before

- ✘ Low quality data
- ✘ Long test cycles
- ✘ Limited lab capacity

After

- ✔ Best-in-class data
- ✔ 6 week turnaround
- ✔ Scalable & predictable lab cost



Activity

Data

Rounds

Round 1

In review

Sequence generation

Sequence review

Rerun generation

Build at Ginkgo

Forecast


Edited 4 minutes ago

Sequences 96

Generated 12 hours ago by Cradle

Lab testing Complete previous step

Round insights Complete previous step

← Configure lab testing 

Lab testing

Round 1

Lab data


Build at Ginkgo
From \$800 per variant


In-house
Test in your own lab


How many variants to test?

96 variants 384 variants 1536 variants

Assay setup


By  Ginkgo Bioworks · ★ 4,9 (2k)


 Activity >


 Thermal stability >

Add more

Summary

 6 week turnaround

Cost per variant 

Total cost 

Place order and start testing



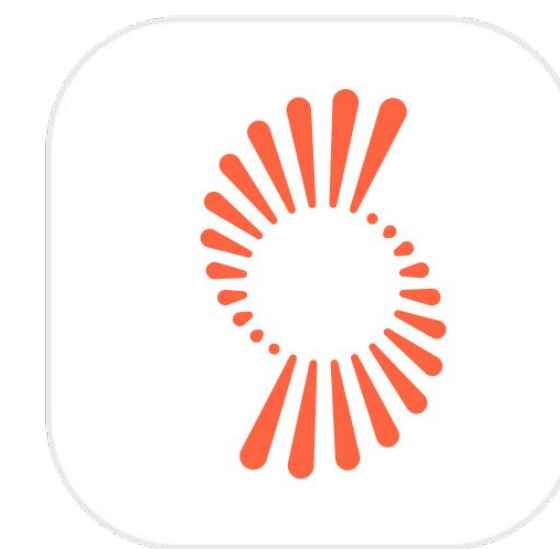
Cradle

ML-based designs



Ginkgo Bioworks

Lab data as a service



Syensqo

Deliver impactful results

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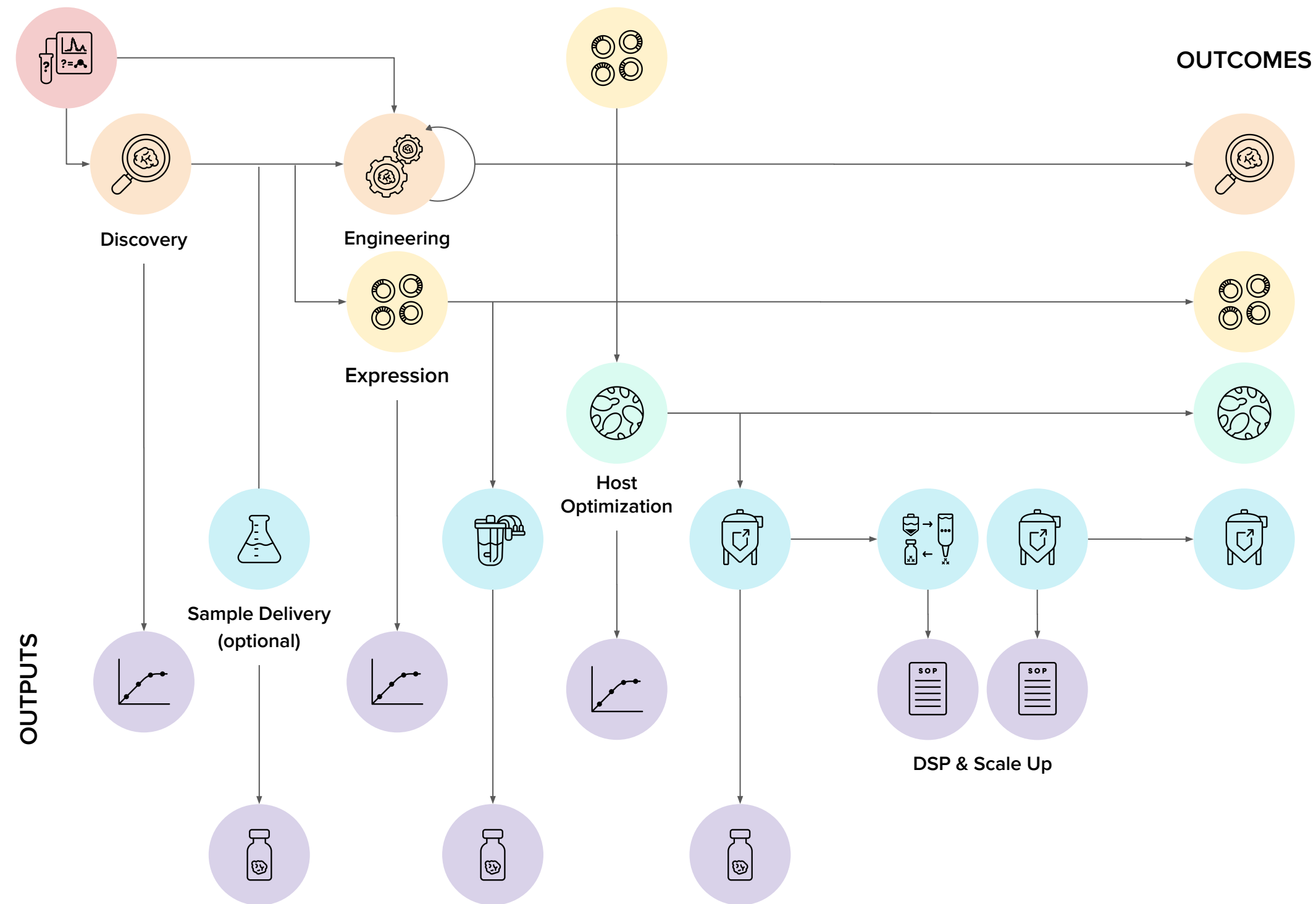
Traditional CROs are a part of pre-clinical research but are behind in the latest technology, don't play well with other novel tech providers, don't integrate well with in-house data management, and domestic options are more limited.

New Offering: Lab Data as a Service

CELL ENGINEERING SOLUTIONS



Assay Development



Your end-to-end R&D innovation partner

Find your needle in our tech stack. Supercharge your R&D team by deploying unparalleled Foundry scale to get traction against your thorniest problems.

LAB DATA AS A SERVICE



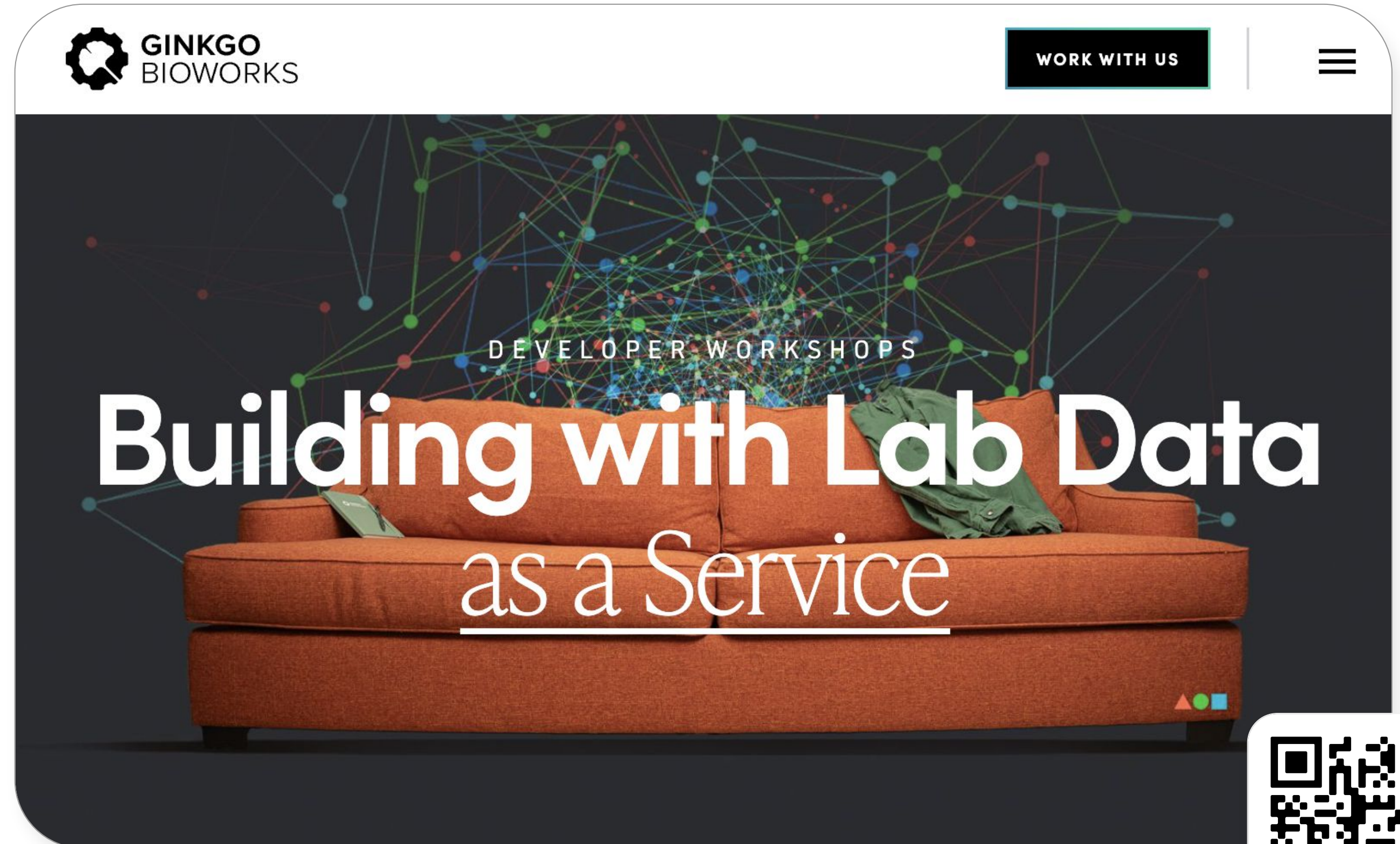
Your data, on demand

Testing a biological hypothesis should be as easy as clicking a button. Access the same data generation capabilities that power Ginkgo's scientists, no matter how big or small your question.



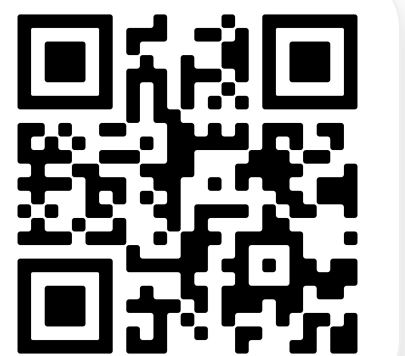
WORKSHOPS

Sign up for a Developer Workshop and meet scientist-to-scientist to better understand our current services.



The image shows a screenshot of the Ginkgo Bioworks website. At the top left is the Ginkgo Bioworks logo, which consists of a gear icon with a leaf inside, followed by the text "GINKGO BIOWORKS". To the right of the logo is a black button with the text "WORK WITH US" in white. Further right is a hamburger menu icon. The main content area features a dark background with a network diagram of colorful nodes and lines. In the center, there is a large orange sofa with a green jacket draped over it. The text "DEVELOPER WORKSHOPS" is written in small white capital letters above the sofa. Below that, the main headline reads "Building with Lab Data as a Service" in a large, white, serif font. In the bottom right corner of the screenshot, there is a QR code.

www.ginkgobioworks.com/learn/workshops

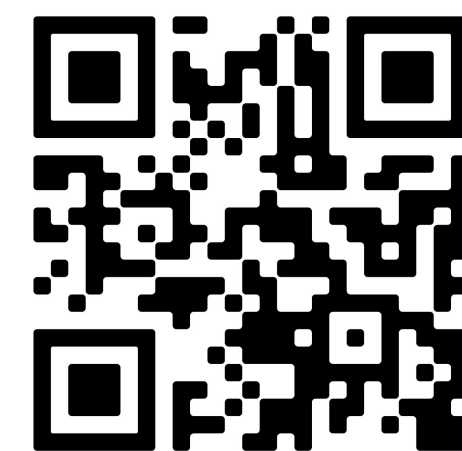




Ginkgo Open House

Friday, April 12

8am - 12pm EDT



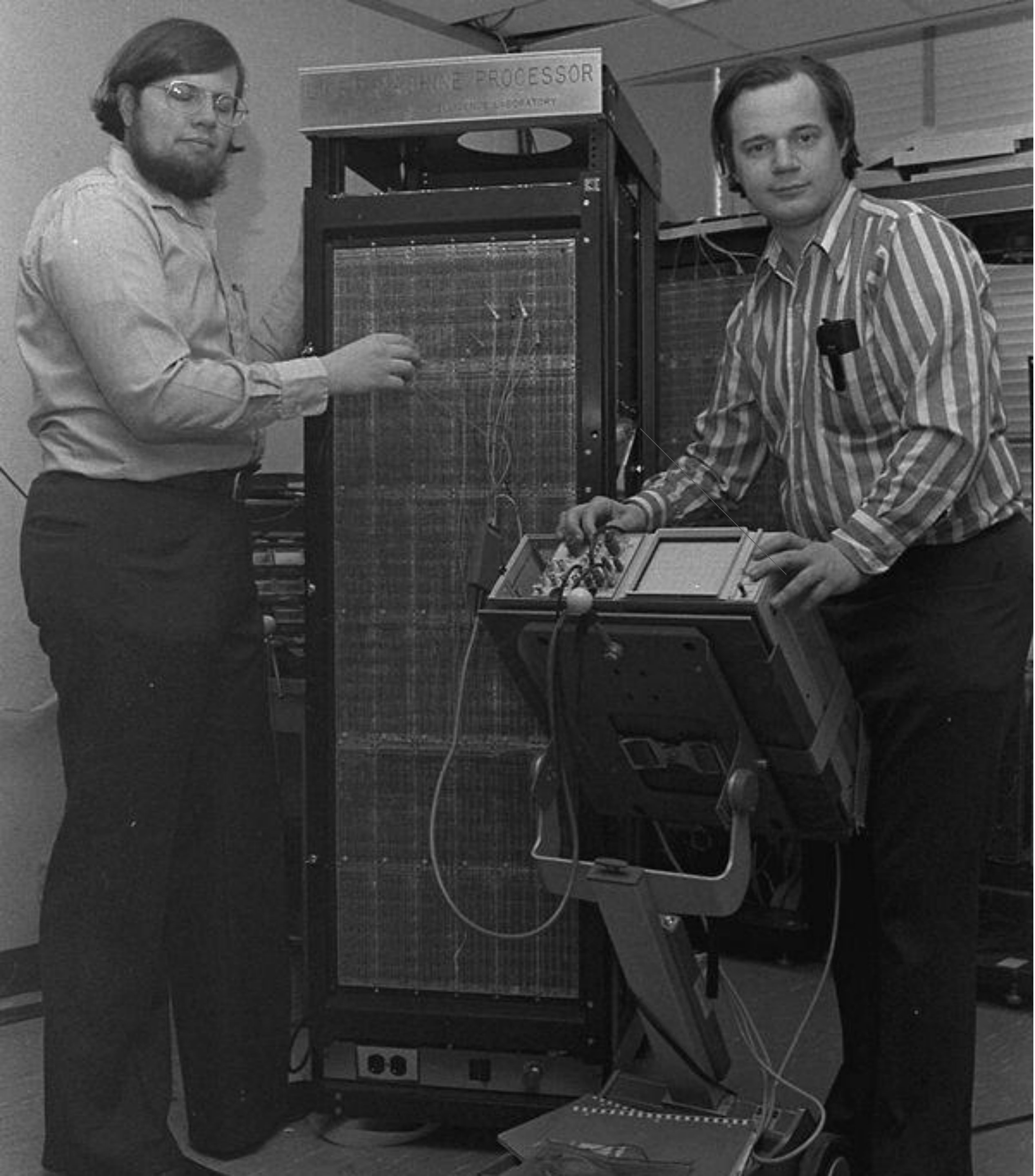


GROW

"In synthetic biology, the way forward may not be a matter of producing at scale but rather **inquiring at scale, changing the volume at which we converse with the living world.."**

Claire L. Evans
Against Scale





light.bio

The Firefly Petunia is here today

Keith Wood, PhD | Founder and CEO, Light Bio



Ferment

PANEL

Building Biological Worlds

A conversation about the future with the Creators of "Vesper"

Alexis Perrin

Producer, Vesper and Founder,
Rumble Fish Productions

Kristina Buožytė

Director, Vesper and Chief
Executive Officer,
NATRIX NATRIX

Bruno Samper

Director, Vesper and Co-
Founder & Chief Executive
Officer, Nedd

Christina Agapakis, PhD

Senior Vice President of
Creative & Marketing, Ginkgo
Bioworks



**Making biology easier to engineer
means making it easier for all of you.**

www.ginkgobioworks.com