Black in Deep Tech Summit

LIFE SCIENCES

Dec 9

DCVC x BVCC

Malcolm Robinson – Background

Education

- Florida A&M University – BS, Business Administration
- Wharton, University of Pennsylvania – MBA

Investment Professional (25+ years experience)

- Multiple Asset Classes
- USA and Asia (16 years)

Last Role

- Managing Partner of $5bb+ of capital
  - Invested in private equity, mezzanine loans and distressed debt
  - Managed 110 people in 9 offices based in 8 countries across Asia

Current Role

- Executive Director, Black Venture Capital Consortium
- Angel Investor

Black Deep Tech Summit

Genesis of the Black Deep Tech Summit

- BVCC and DCVC came together to launch the BDTS in 2020 to address lack of resources for Black founders

- The summit's **MISSION** is to build a robust startup ecosystem within the Black STEM community by bringing the following 3 groups together

- 1st Group - Black STEM community
  - Prominent professors, scientists, engineers, professionals and entrepreneurs in deep tech
  - Postdocs, grad and undergraduate students
  - Math sciences, physical sciences, energy sciences and life sciences
- 2nd Group - Venture Capital firms
  - DCVC
  - Breakthrough Energy Ventures, Material Impact, Bessemer Venture Partners
- 3rd Group - Deep tech companies

Black Deep Tech Summit

Steps to achieve BDTS' Mission

- **Create a pathway for members of the Black STEM community to launch startup companies**
- **Foster collaboration between the Black STEM community and deep tech companies**
- **Networking**

Frequency of BDTS

- Winter
  - Half day
  - Online virtual summit
- Summer
  - Full day
  - In person summit

AGENDA

Black in Deep Tech:
Life Sciences Summit

1:00p ET: Introductions

1:10p ET: Dr. Kiersten Stead of DCVC Bio

1:35p ET: David Berry, GP of Flagship Pioneering

1:55p ET: Jason Pontin of DCVC

2:30p ET: Dr. Lisa Dyson of Air Protein

3:00p ET: 10 Minute Break

3:10p ET: Philip Johnson & Brad Robling of Lilly – Strategic Perspective

3:40p ET: CH4 Global Inc – Steve Meller, CEO

4:20p ET: Totus Medicines – Neil Dhawan, CEO

5:00p ET: Closing Remarks / Networking

The Summit Leadership Council

Dr Carol Espy Wilson, UMD

Merline Saintil

Dr Bill Massey, Princeton

Dr Bill Wilson, Harvard

Dr. Lisa Dyson, MIT

Dr. Moses Asom, Chair

Black in Deep Tech Summit

LIFE SCIENCES

Dec 9

DCVC x BVCC

Building companies at the intersection of deep tech and biotechnology

Dr. Kiersten Stead, Managing Partner
DCVC Bio

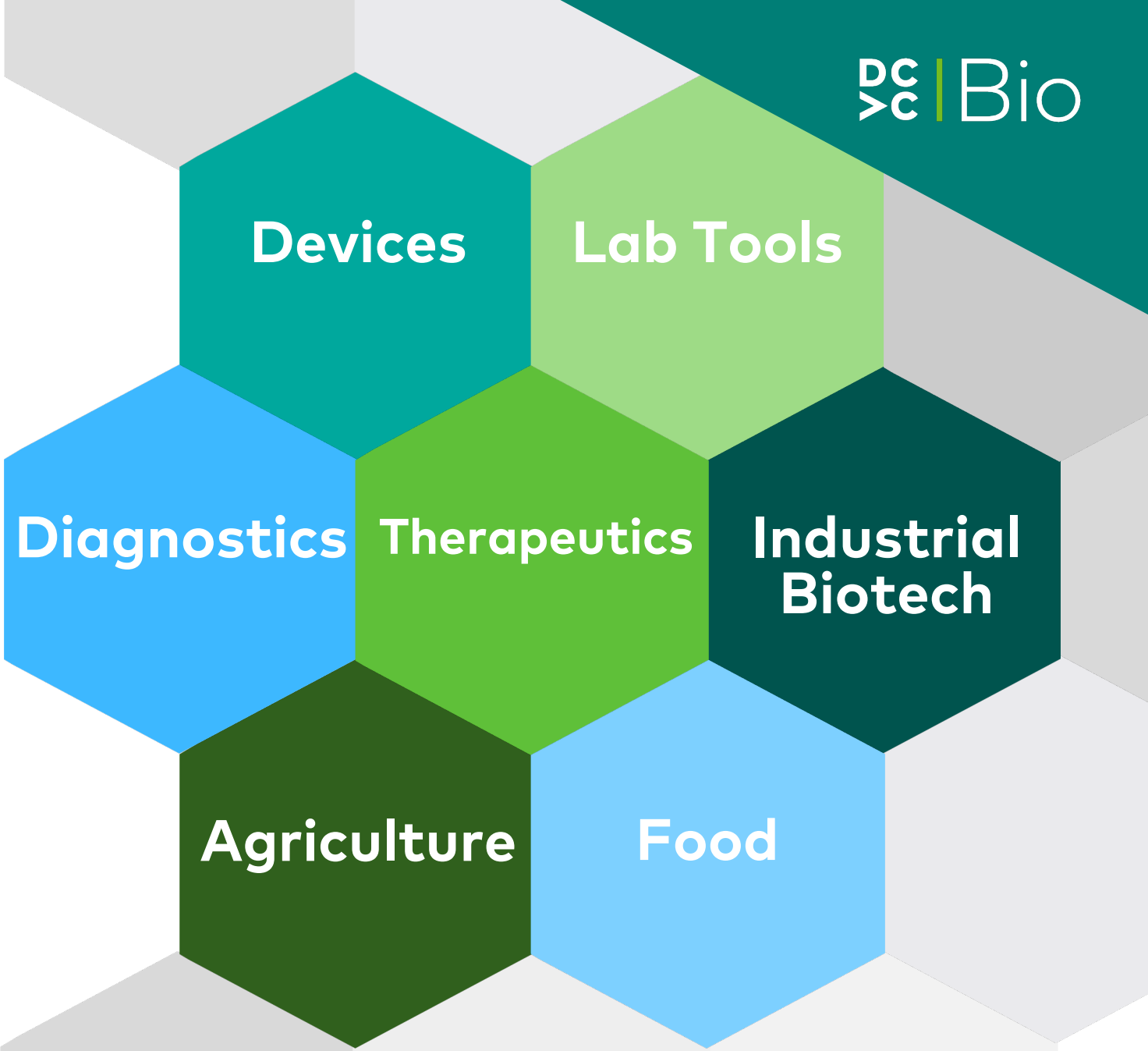
DCVC | Bio

Building companies at the intersection of deep tech and biotechnology

Dr. Kiersten Stead, Managing Partner
DCVC Bio

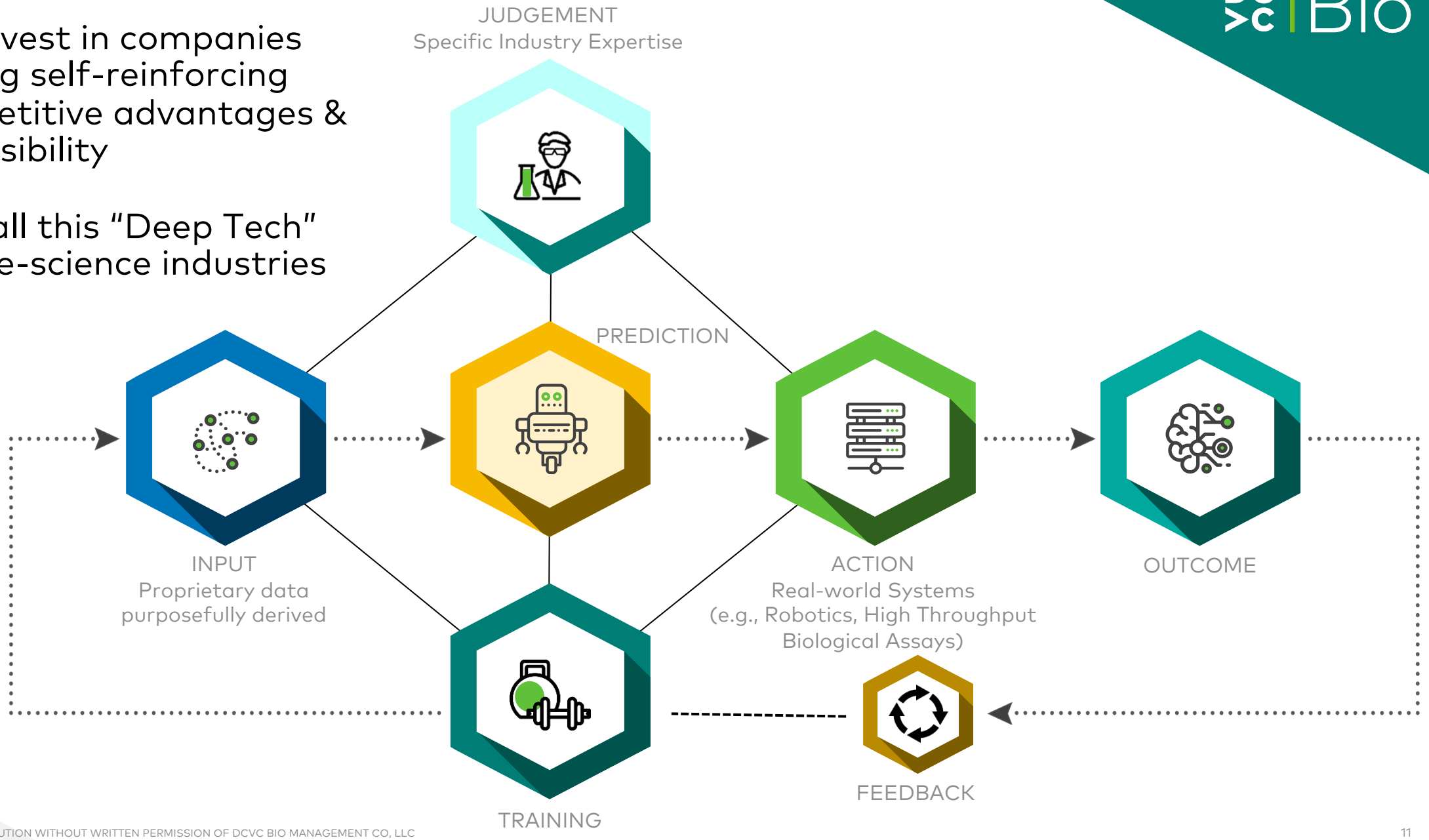
Traditional Life Science Investment Landscape

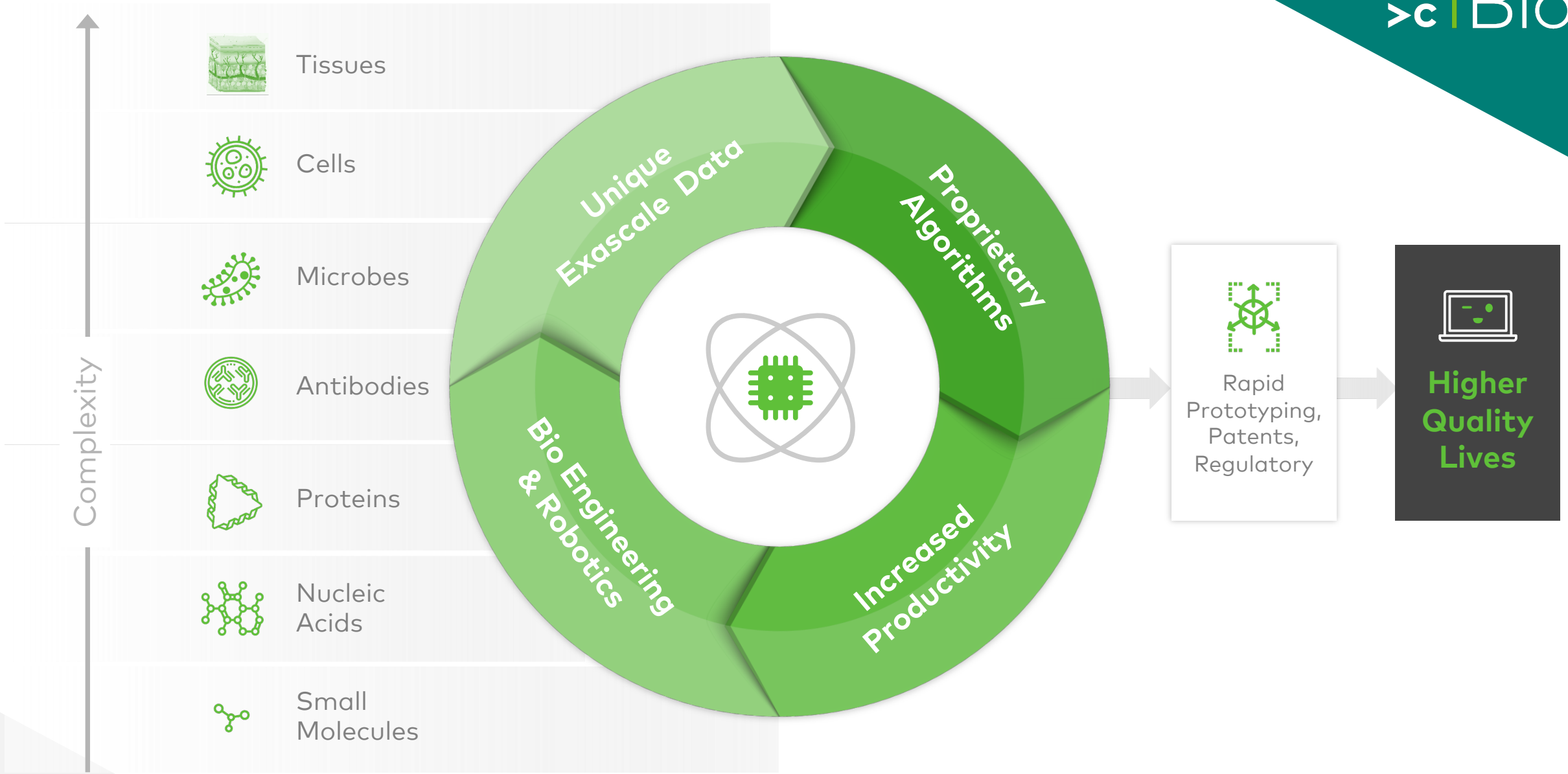
- Each sector requires different expertise
- Varying economics and capital structure requirements
- Different people and company builds
- Various business models within each sector



We invest in companies uniting self-reinforcing competitive advantages & defensibility

We call this "Deep Tech" for life-science industries




Complexity
Tissues
Cells
Microbes
Antibodies
Proteins
Nucleic Acids
Small Molecules
Unique Exascale Data
Proprietary Algorithms
Increased Productivity
Bio Engineering & Robotics
Rapid Prototyping, Patents, Regulatory
Higher Quality Lives

Deep Tech for the Life Sciences

Novel Drug Modalities

Plexium

Frontier MEDICINES

10+US

AI & Human Genetics

EMPIRICO
A NEXT GENERATION THERAPEUTICS COMPANY

Deep Search in Antibodies

AbCellera

Nasdaq: ABCL

ALCHEMAB THERAPEUTICS

Revolutionizing Clinical Trials

UNLEARN

AI Drug Development

X37

RECURSION

Nasdaq: RXRX

Atomwise
Better medicines faster.

CREVION

Living Medicines

NOVOME BIOTECHNOLOGIES

Umoja

orcabio

Biomaterials

zymergen

Nasdaq: ZY

MYCOWORKS

Super-Human Agriculture

SABANTO

BLUE RIVER TECHNOLOGY

Acquired: Deere & Co

VERDANT ROBOTICS

PIVOT BIO

Critical traits

- Critical attributes
- Academic initiated
  - Typical trajectory
- Seed stage
- Series A stage

Challenges for investing at the intersection of engineering and life sciences

- Transparency, honesty, & coachability
- Ability to recruit at high levels
- Geography
- Misalignment of capital requirements vs opportunity
- Velocity, capital efficiency, and commercial discipline

AbCellera

Computational platform that discovers and develops next-generation therapeutic antibodies for hard to drug targets

First commercial treatment for COVID-19

IPO in Dec 2020, Market Cap $6.4B

BioPhero

Synthetic biology platform for producing insect mating pheromones to safely control damaging pests in food production

MYCOWORKS

DCVC | Bio

Bioindustrial platform producing fine mycelial leather for luxury fashion brands

Advanced breeding and material engineering underway to produce novel products

HERMÈS PARIS

Life Sciences Technology and Investing Landscape

David Berry, Flagship Pioneering

The Investor's View Life Science Companies

Jason Pontin, DCVC

The Investor's View
Life Science Companies

1996-2002

Editor of Red Herring, the bible of the dot.com boom

Founder of Acumen, a life sciences journal

2004-2017

Editor-in-chief and publisher of the MIT Technology Review

Writer for New York Times, and Wired

Founder of Solve, MIT's open innovation platform, which deploys capital and other resources toward solutions to grand challenges

2017

Senior Partner at Flagship Pioneering

2019

Founding Board Member and 1st Investor in Totus Medicines

Investor in Menten AI

2021

Partner at DCVC, led the investment in Equilibrio, Kanvas, and ZwitterCo. Board member at DCVC companies, including Strateos where he is Chair

Jason Pontin

Partner, DCVC

Investor, Science and Technology Writer

Thinking Like an Investor

The Stepping-Stones of Valuation

Develop an idea and a strategic plan for killer experiments that would falsify your exploration.

PRE-SEED/INCUBATION

$500k-$1M

Create a platform and select 1 – 3 validating programs that are proofs-of-concept and serve unmet needs.

SEED

$2M-$10M

Advance lead programs into the clinic, demonstrating safety and efficacy with animal studies and xenografts.

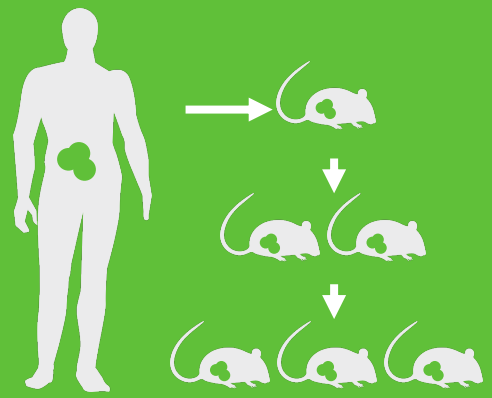
Scale the platform to attack more targets.

SERIES A

$40M-$50M

Clinical trials for lead programs.

Expand your pipeline to harder targets.



SERIES B, C/CROSSOVER

>$100M

What is IP in the life sciences?

Defensible patents and the IP that is free and clear

The Company Development Journey

PRE-SEED/INCUBATION	SEED	SERIES A	SERIES B, C/CROSSOVER
Ideation	**Research**	**Team Building**	**Growth**
Company is 1 – 3 cofounders who can design a research program. We're not looking for a company.	An R&D organization of 5 – 15 people that can develop a platform and create 1- 3 validating programs.	Increasingly, a real company of 20 – 40 people with leaders for all the functions of a life sciences business: CSO, CTO, Chief Medical Officer, Chief People Officer.	A commercial operation of >60 people with business leaders committed to future growth: CFO, CBO, Manufacturing.

Company Development

Scaling the organization, evolving from R&D to clinical trials and partnerships and sales

CASE STUDY

TOTUS

CASE STUDY

TOTUS

SERIES A: Q1 2021

Advance lead program targeting the most mutated oncogene in cancer to clinical trials.

Scale Genome-scale Drug Discovery Platform across all mutated cancer targets.

SEED: Q4 2019

Enable Genome-scale Drug Discovery Platform.

Develop 3 novel oncology program for untreatable diseases.

SERIES B: Q2 2022

Advance lead program through Phase 1/2 clinical trials to set up an Accelerated FDA Approval.

Advance 2 follow-on programs to initiation of clinical trials.

Scale Genome-scale Drug Discovery Platform across other disease, including heart disease and neurodegeneration.

Q&A

Fireside Chat

Dr. Lisa Dyson CEO of Air Protein

Dr. Lisa Dyson
Founder & CEO, Air Protein

air protein

Air Protein uses elements of the air to make highly-nutritious, ultra-sustainable meat to help reverse climate threat and food scarcity.

Break

10 Minutes

Life Sciences Strategic Perspective

Philip Johnson & Brad Robling, Lily

Company Presentation:
CH4 Global

Dr. Steve Meller, CEO

CH4 GLOBAL INC

COMMERCIALISING THE KEY TO GLOBAL EMISSIONS REDUCTION

BIDT Life Sciences Summit, December 9th 2021

OVERVIEW

- Market Rationale
- Our Company
  - What we do & how it works
  - Commercial scaling & IP/product description
- A key problem we are wrestling with
  - the nature of the problem
  - Approaches under development
- Q & A

MARKET RATIONALE

“...cutting methane is the strongest lever we have to slow climate change over the next 25 years.....”

May 6, 2021

Inger Andersen, Executive Director of the United Nations Environment Program

https://news.un.org/en/story/2021/05/1091402

Methane and Climate Change

CH4 GLOBAL
Zero Methane Agriculture

United Nations | UN News
Global perspective Human stories

AUDIO HUB SUBSCRIBE

Cut methane emissions to avert global temperature rise, UN-backed study urges

The Economist

The beef with beef

Treating beef like coal would make a big dent in greenhouse-gas emissions

Cattle are a surprisingly large producer of greenhouse gases

REUTERS®

August 9, 2021
12:55 PM PDT
Last Updated 3 months ago

Environment

To save the planet, focus on cutting methane - U.N. climate report

By Valerie Volcovici

Search

Bloomberg

Politics

Climate Pact on Methane Gathers 35 Countries After U.S., EU Push

By John Follain and Jennifer A Dlouhy
October 21, 2021, 5:58 AM PDT

Bloomberg Green

Green

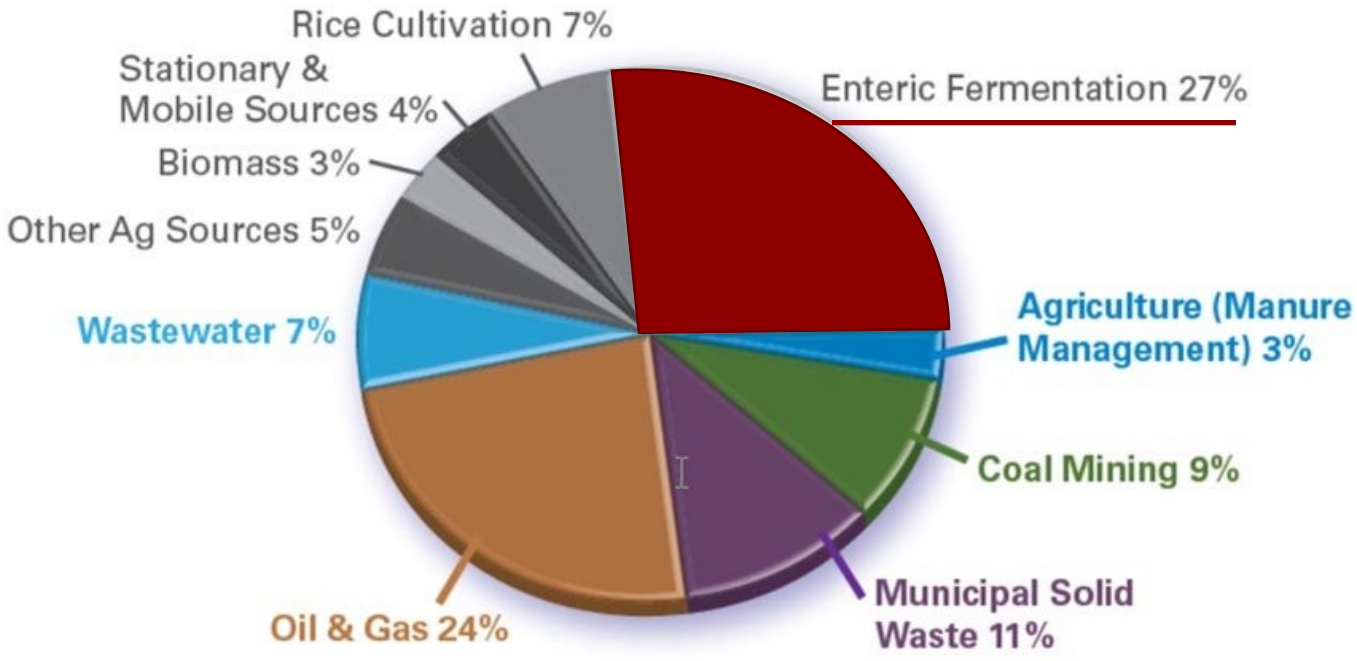
Making It More About Methane as the World Goes to COP26

A letter from the editor of *Bloomberg Green*

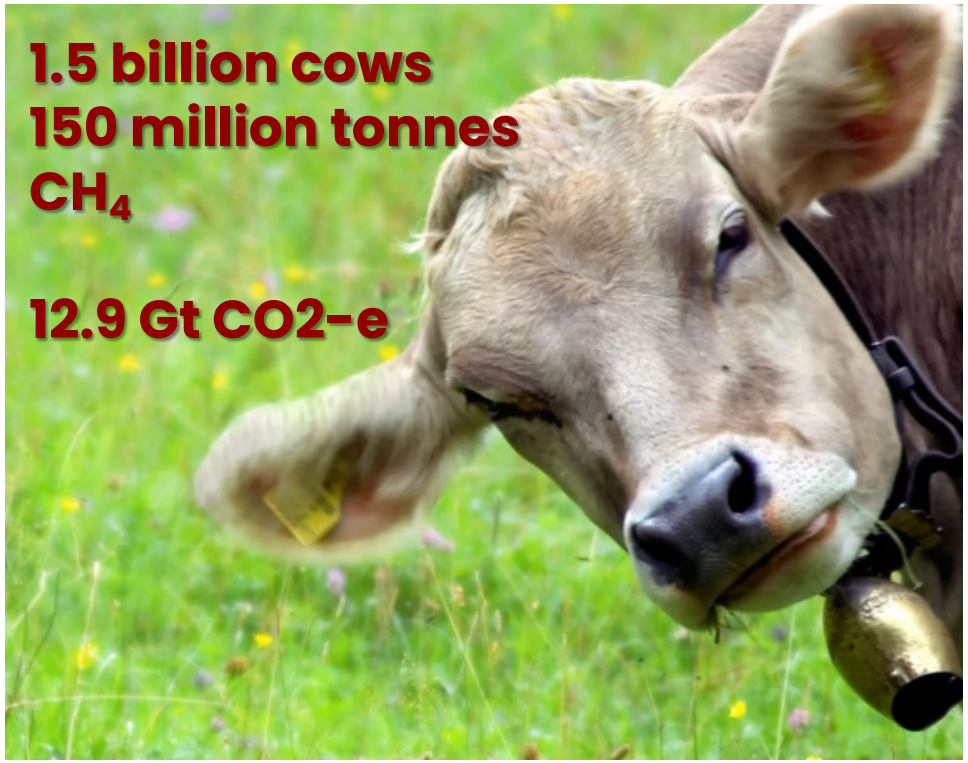
By Aaron Rutkoff +Follow
October 19, 2021, 2:04 PM PDT

Cows: The largest source of Anthropogenic Methane Globally

CH4 GLOBAL
Zero Methane Agriculture



Wang et. al. (2020) Scientific Reports



Are there Actionable Approaches to Ruminant Methane Emissions?

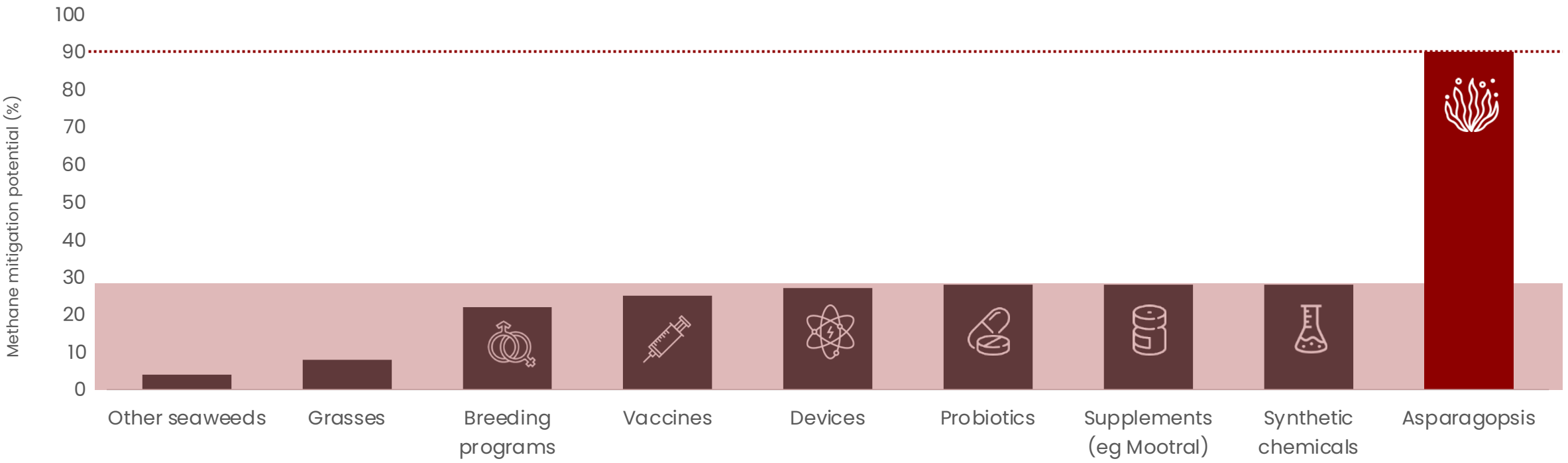
Do they work?

Are they safe?

Are they Scalable?

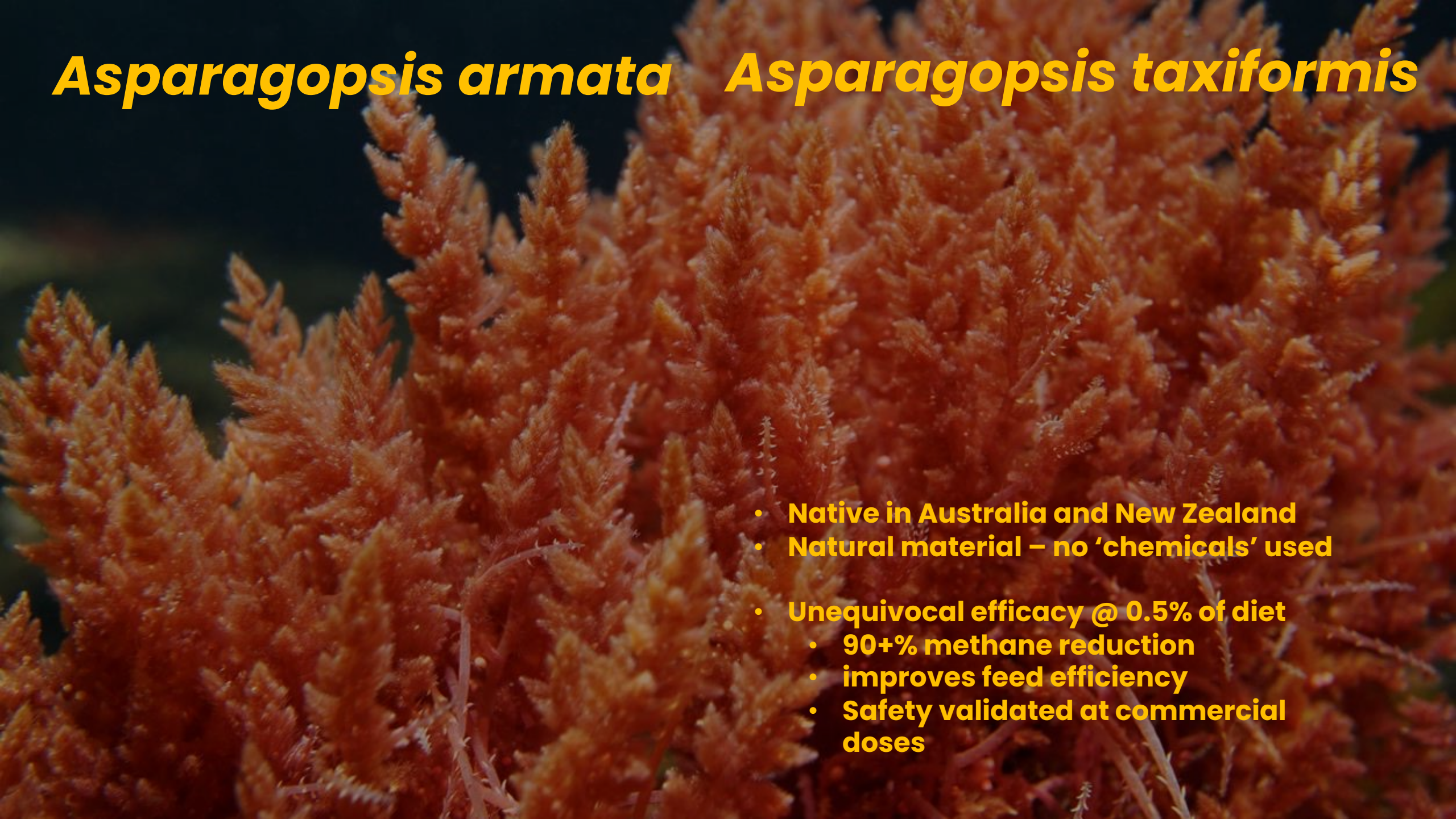
METHANE MITIGATION APPROACHES

ASPARAGOPSIS: ~90% METHANE REDUCTION, SCALABLE, COST-EFFECTIVE & NATURAL



	Other seaweeds	Grasses	Breeding programs	Vaccines	Devices	Probiotics	Supplements (eg Mootral)	Synthetic chemicals	Asparagopsis
Natural Product	✓	✓	✓	✗	✓	✓	✓	✗	✓
Scalable	✓	✓	✗	✗	✗	✓	✓	✓	✓
Inexpensive	✓	✓	✗	✗	✗	✓	✓	✗	✓
Beneficial - Health	✓	✓	✗	✗	✗	✓	✓	✗	✓

OUR PLATFORM



Asparagopsis armata *Asparagopsis taxiformis*

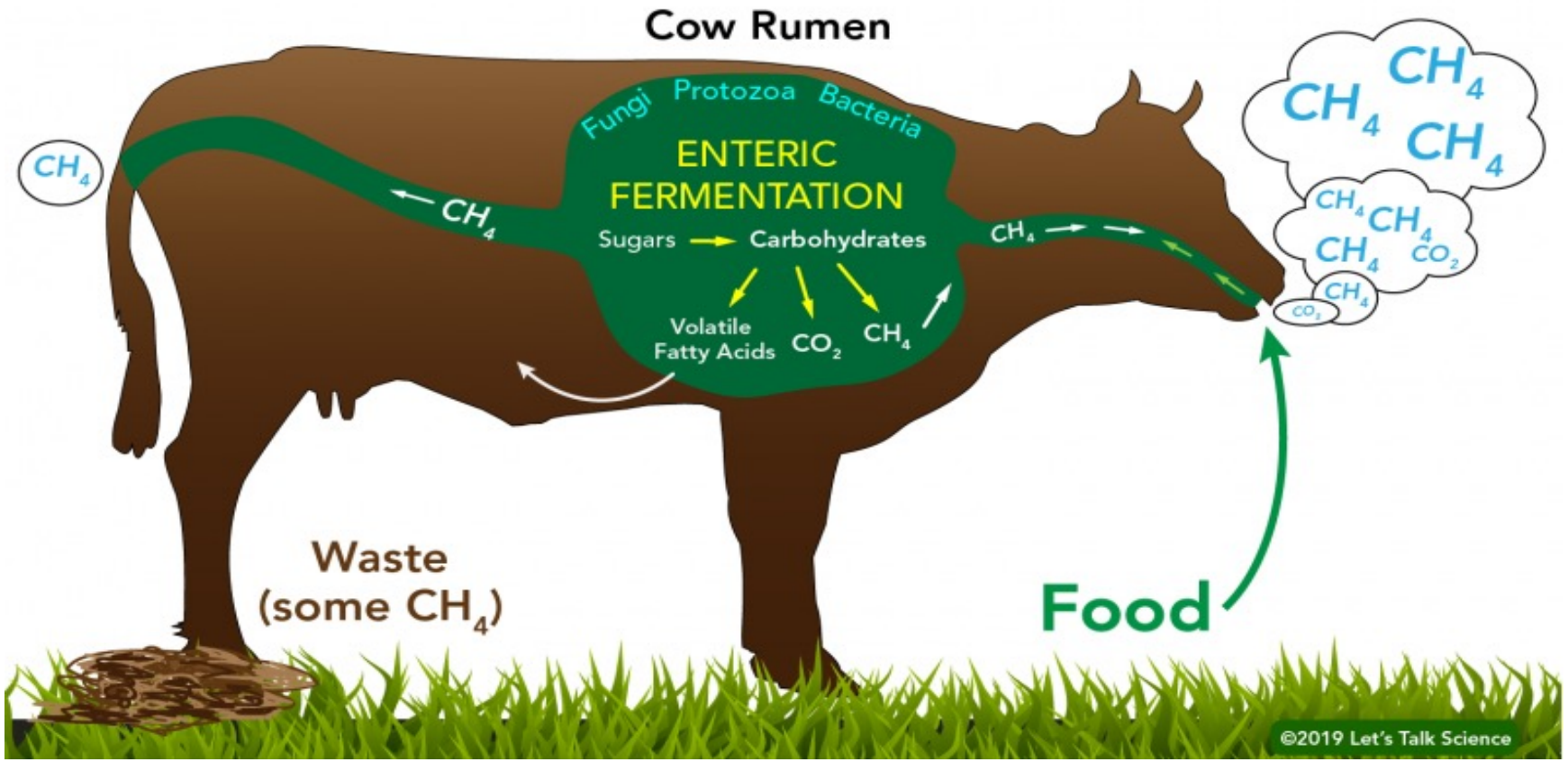
- Native in Australia and New Zealand
- Natural material – no ‘chemicals’ used

- Unequivocal efficacy @ 0.5% of diet
  - 90+% methane reduction
  - improves feed efficiency
  - Safety validated at commercial doses

HOW DOES ASPARAGOPSIS WORK?

CH4 GLOBAL
Zero Methane Agriculture

Naturally occurring bromoform ($CHBr_3$) reacts with vitamin B_{12} to disrupt enzymes in the last step of methanogenesis



WHERE ARE WE IN PROCESS DEVELOPMENT?

FOCUS ON OPTIMIZING PROCESSING THROUGH MUCH OF 2022

CH4 GLOBAL
Zero Methane Agriculture

Hatchery

Consistent spore release triggered to manage lifecycle (trade secrets)

Nursery

Demonstrated growth doubling every 7-10 days and spore attachment

Grow out

Established ocean (10km of line) and tank-based solutions (10 x 20,000L tanks)

Processing

Processed world's largest quantity (>3 tonnes) + installed commercial scale equipment

Formulation

Long term product development for use in animal feed; patents being prepared in 2022

Current Series A focus and milestones:

To mitigate technical and commercial risks

Optimise end-to-end production

Scaled Purchase Orders

GO TO MARKET AND SCALING PLAN

Scaling Product Supply Globally for Impact

CH4 GLOBAL
Zero Methane Agriculture

Optimization

Global Scaling

2022 **2023** **2024**

World's First Commercial Facility

SCALING THE MODEL – BY MARKET SEGMENT

ILLUSTRATIVE OF ROLLOUT POTENTIAL FOR SCALING

	Beef feedlot	Dairy	Free-range
Size (# of cows)	100m	300m	1.1 billion
Size ($ market per annum)	$73 billion	$220 billion	$800 billion
Priority	Initial target	Follow-on	Future
Key market enabler – CH4 specific IP under development	**Stabilised formulation of current product**	**Formulation dose to provide 24 hr delivery when food is in rumen**	**Once per month? dosing plus tech platform to deliver feed to free-range cows**

UNLOCKING THE OPPORTUNITY

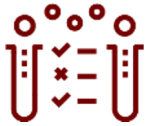
ALL PIECES IN PLACE FOR COMMERCIALISATION ACROSS VALUE CHAIN

License in place to make methane reduction claim in AU and NZ

Regulatory pathway for product in Australia and New Zealand now

Creating own **knowhow and IP** around process and formulation

Initial **offtake agreement** for $7.8 million with growing pipeline of opportunities



Unlocked **technical life-cycle** management resolving issues

Creation of **hundreds of new jobs** that incentivises govt action

Significant **inbound interest globally** for solution

Engagement of global **carbon credit** organization

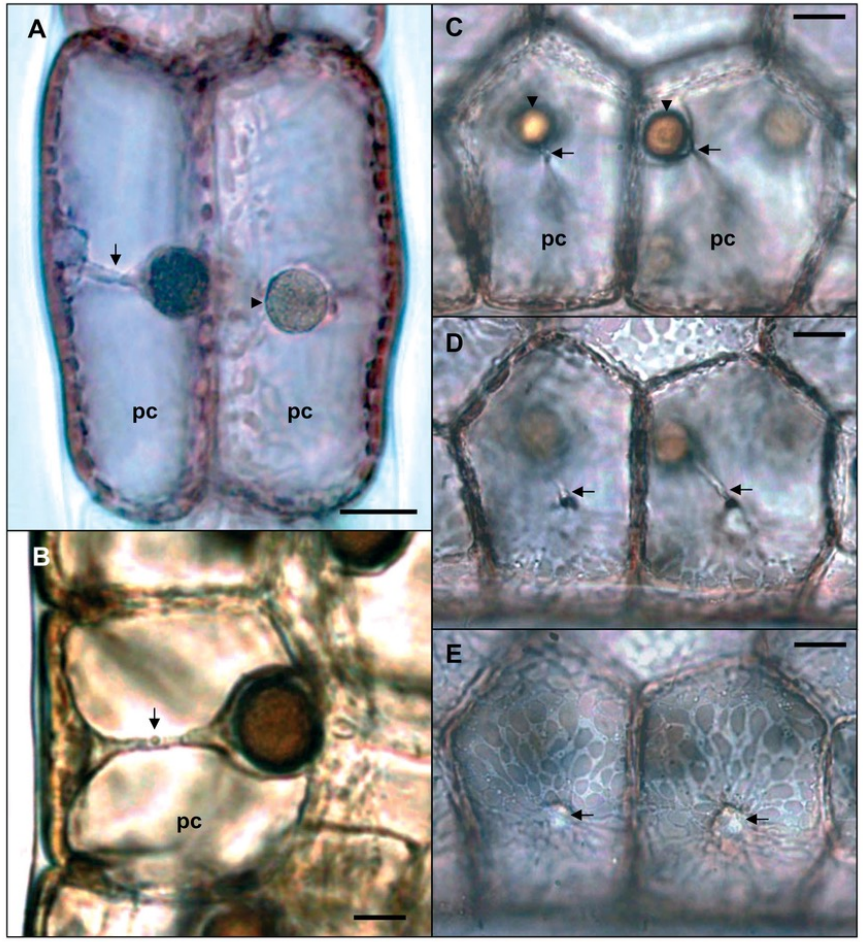
SUSTAINABLE DEVELOPMENT GOALS

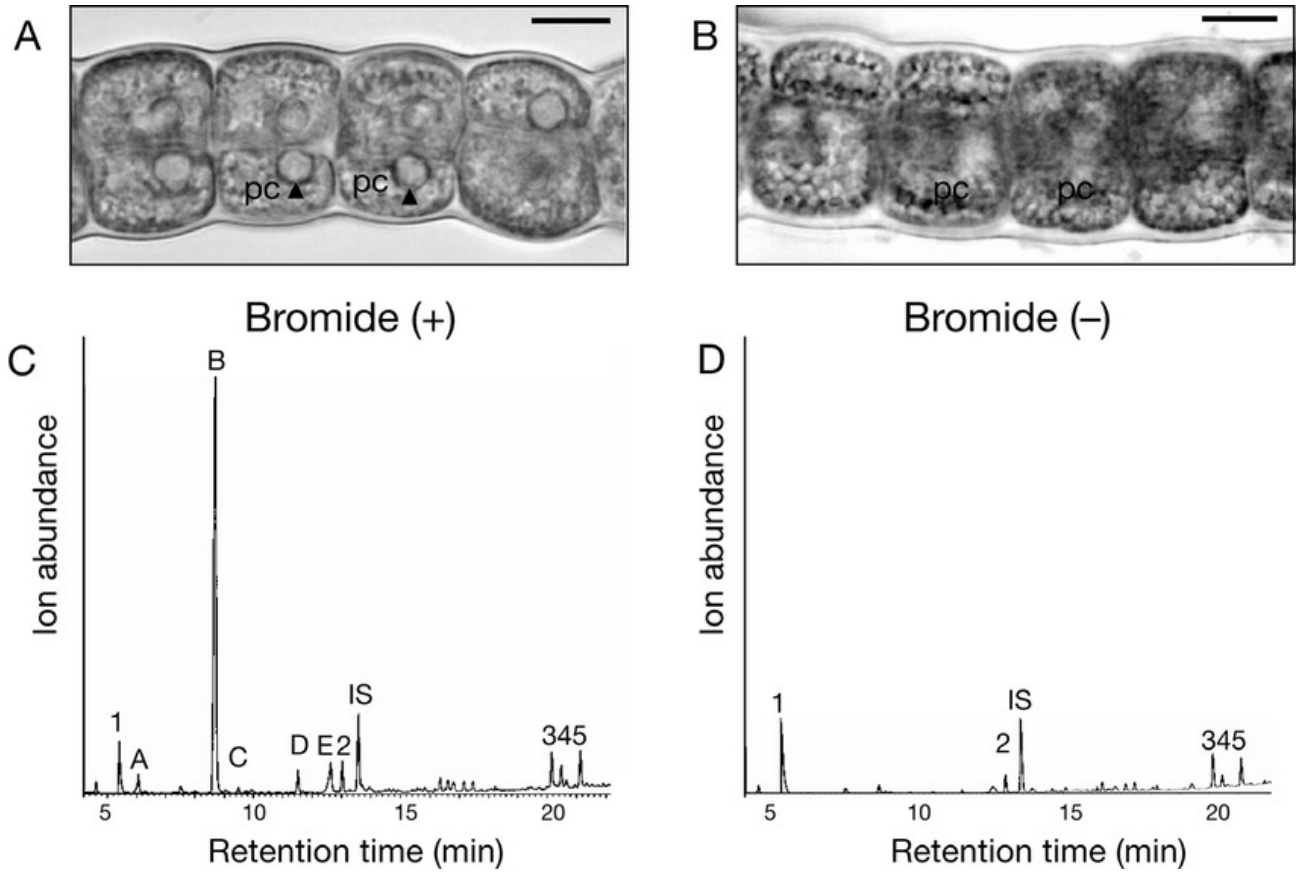
CH4 GLOBAL
Zero Methane Agriculture

THE PROBLEM

- Today we see significant loss (> 50%) of bromoform between harvest and freeze-drying

BROMOFORM


A
pc
pc
C
pc
pc
D
B
pc
E


A
pc
pc
B
pc
pc
Bromide (+)
Bromide (–)
C
D
Ion abundance
1
A
B
C
D E 2
IS
345
5
10
15
20
Retention time (min)
1
2
IS
345

CHALLENGES FOR THE TEAMS

- Develop a hypothesis of why there is bromoform loses during harvest
- Identify an analogous problem that has been at least partially solved
- Recommend a plan of experiments to prove/disprove hypothesis

Enquiries

STEVE MELLER, PHD
PRESIDENT AND CEO
CH4 GLOBAL INC

+1.650.387.0609
STEVE@CH4GLOBAL.COM

Q&A

Company Presentation: Totus Medicines

Dr. Neil Dhawan, CEO

Totus Medicines

Our mission is to create life-changing precision therapeutics rapidly and efficiently through our revolutionary AI-powered drug discovery platform for patients with critical unmet needs.

Fall Private Company Showcase
October 14, 2021

Totus Medicines – The Genome Scale Drug Discovery Company

- Transforming the drug discovery process through our synergistic, 3-component **AI-powered Magellan Platform:**
  - **Exponentially Evolving Covalent Library:** High quality, drug-like library of 15M compounds that is rapidly growing to >500M enabled by automated evolution approach
  - **OmniDEL Genome-Scale Screening Technology:** Revolutionary screening innovation with maximum potential to screen billions of compound across 10,000 targets/week
  - **ML Drug Design Portal:** Analyzes the volume of data to enable rapid, focused translation from hit to candidate
- The Magellan Platform has generated a pipeline of 10 covalent drug programs
- Lead PI3Ka inhibitor is considered best-in-class against the most mutated oncogene in cancer representing a $30B market opportunity
- World leading executive team, BoD and advisors in drug discovery and development

We are Committed to Solving the Major Challenges of Drug Development

1. Standard drug development is **slow**, **unpredictable** and **costly**.

2. **>90% of identified drug targets are considered undruggable** despite advances in drug discovery due to shallow binding sites.

3. **Lack of big "reliable" data has made translation of** ML techniques to biotech difficult.

Imagine if…

1. You could rapidly build targeted drug libraries of hundreds of millions drug-like compounds proven to drug undruggable targets

2. You could rapidly screen them across the entire human genome to identify every target they bind to

3. You could use that data to rapidly advance a robust pipeline of precision medicine therapy

Magellan Platform: A Step Function Change in Efficient, Robust Drug Discovery

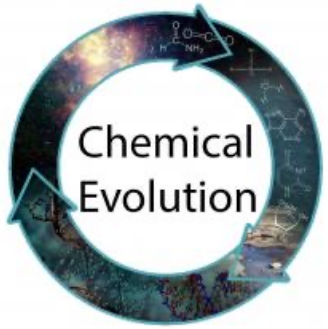
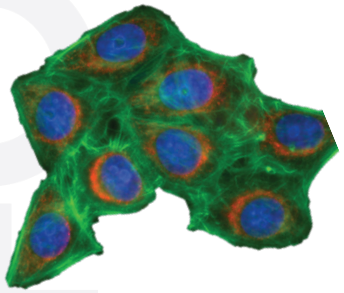
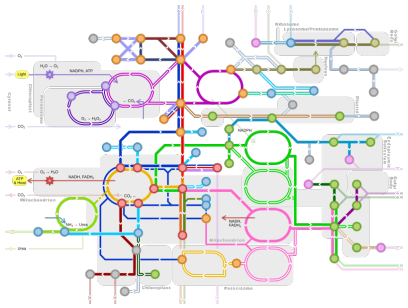
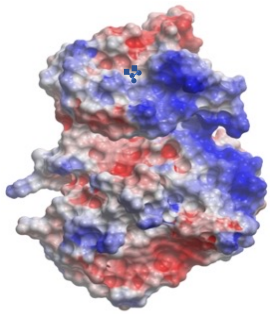
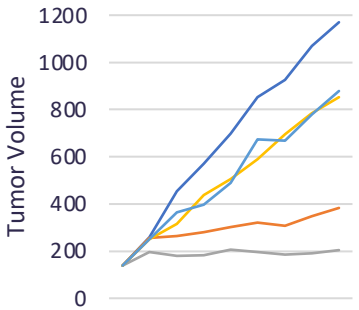
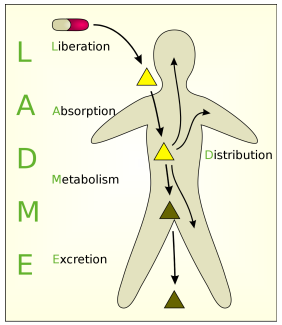
1. **Exponentially Evolving Covalent Library**
2. **Breakthrough Omni-DEL Compound Screening**
3. **Generative AL/ML Drug Design Portal**

Universal Drug-Genome Catalog/Knowledge Base
of Precision Drugs Across any Genome (Human, Viral, Bacterial)

Comprehensive Oncology Pipeline
(Covalent Drugs: Irreversible/Reversible)

Magellan Platform Process: End to End Drug Discovery Platform

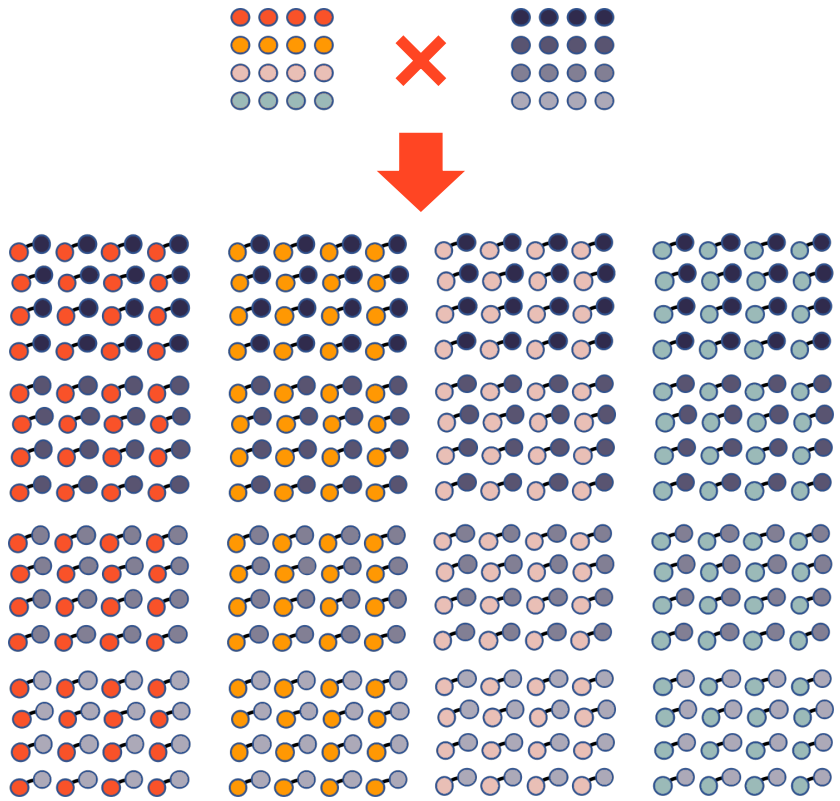
1 Year

Exponential Library Evolution	Omni-DEL Multiplexed Screening	Phenotype-Guided Validation	AI-enabled Computational Prioritization	Focused H2L/ Animal Model	Rapid Development Candidate ID
					
Evolving Chemical Library of 15M compounds that is rapidly expanding to over 500M by end of 2022	Wholly-owned multiplexed technology enabling screening of hundreds of targets per day	Immediate re-synthesis and testing in pathway readouts to rapidly identify drug function	Fully-enabled analysis of volumes of data to prioritize molecule with highest likelihood of success	Focused structure-based H2L to rapidly determine drug efficacy in animal models vs standard of care.	Rapid candidate validation studies (full ADME-tox package) fueled by covalent mechanism and computation

Totus platform works synergistically to rapidly translate exciting targets into druggable candidates for clinical development

Exponential library evolution enables the world's most powerful covalent library

Highly Advanced and Optimized Split-Pool Based Rapid Synthesis



Company	Size	Quality	Screening
Vividion (Acq'd $1.5B)	~0.015M	Fragment	Cell-Based
Frontier	~0.020M	Fragment	Cell-Based
Principia (Acq'd $3.4B)	~0.015M	Fragment	Cell-Based
Totus	15M	Drug-Like	Cell-Based

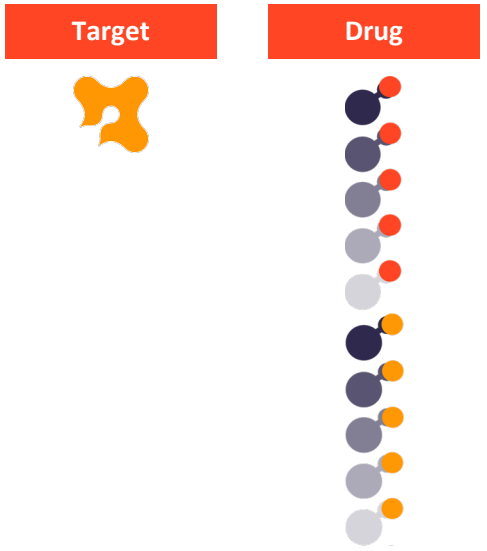
Can we make the other targets more colorful?

Omni-DEL Screening Enables 1st Ever Multiplex DEL Technology

Traditional DEL

- Artificial
- Months lead time
- One target per day
- Requires pure protein

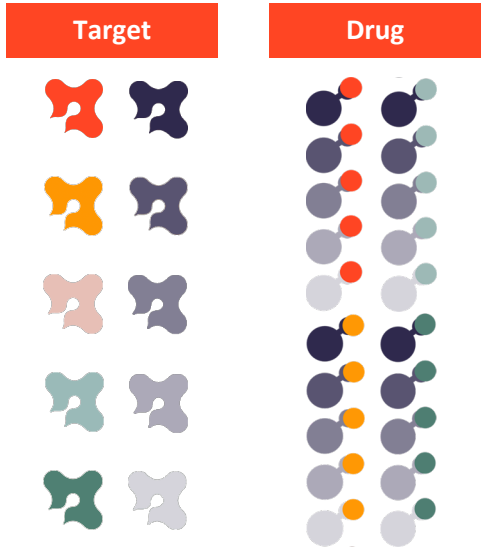
RELAY THERAPEUTICS insitro X-CHEM TAKE THE LEAD. DRIVE DISCOVERY.



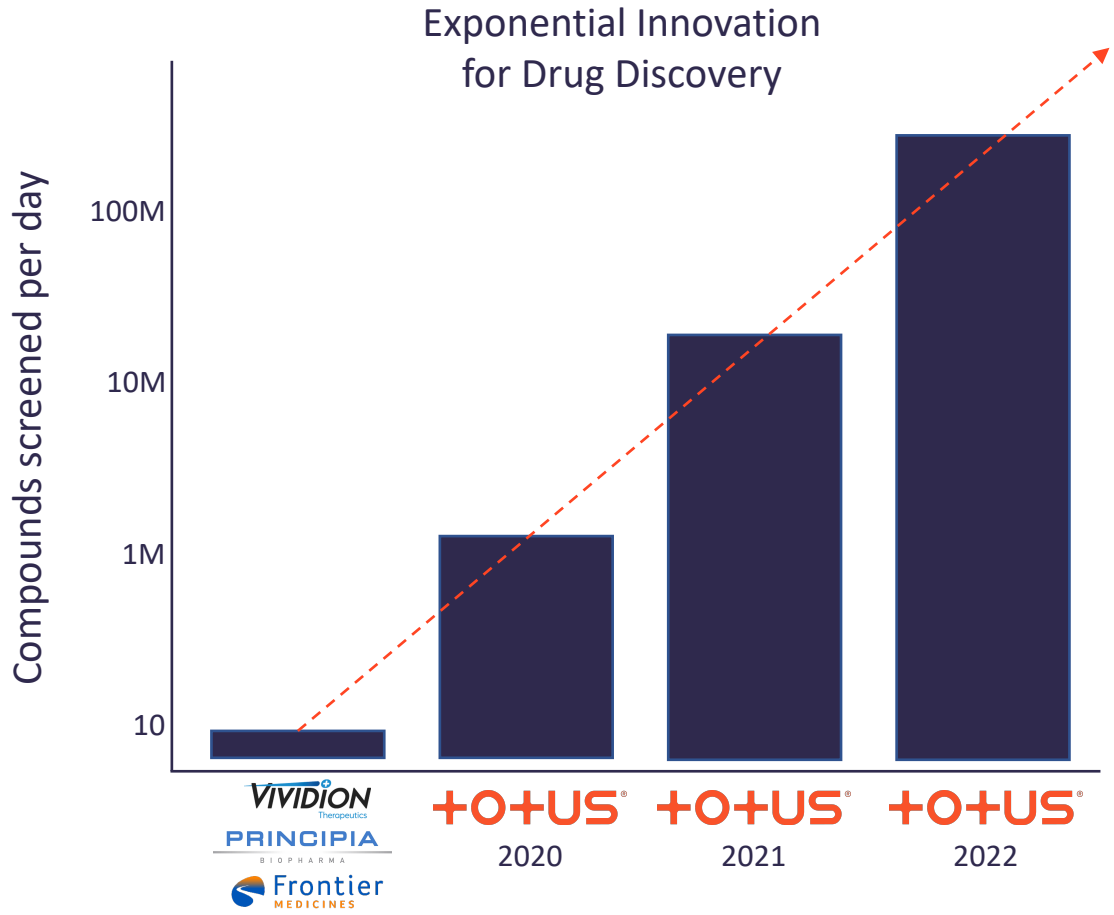
Omni-DEL

- Cell-based
- Days lead time
- 200 targets per day
- Requires DNA only

OTUS



Great AI requires great massive data



Compound Follow-up via GeneBlazer Pathway Analysis

Typical Compound Follow-up

Months

Order Reagents at Scale

Re-Synthesis at Centigram Scale

Compound Purification

In vitro Assay

Cellular Assay

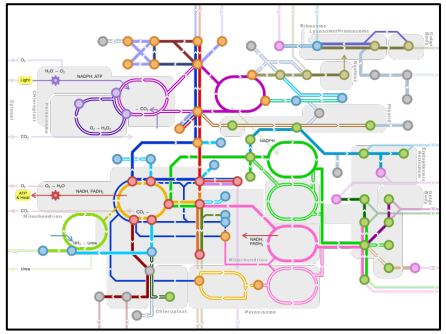
10-15 STEPS TOTAL = costly, slow and weak POS

Totus Compound Follow-up

Two Days

Automated Synthesis at Nanoscale

Robust GeneBlast Multipathway Analysis



Rapidly determining compound function in cells to support advancement of only the best compounds

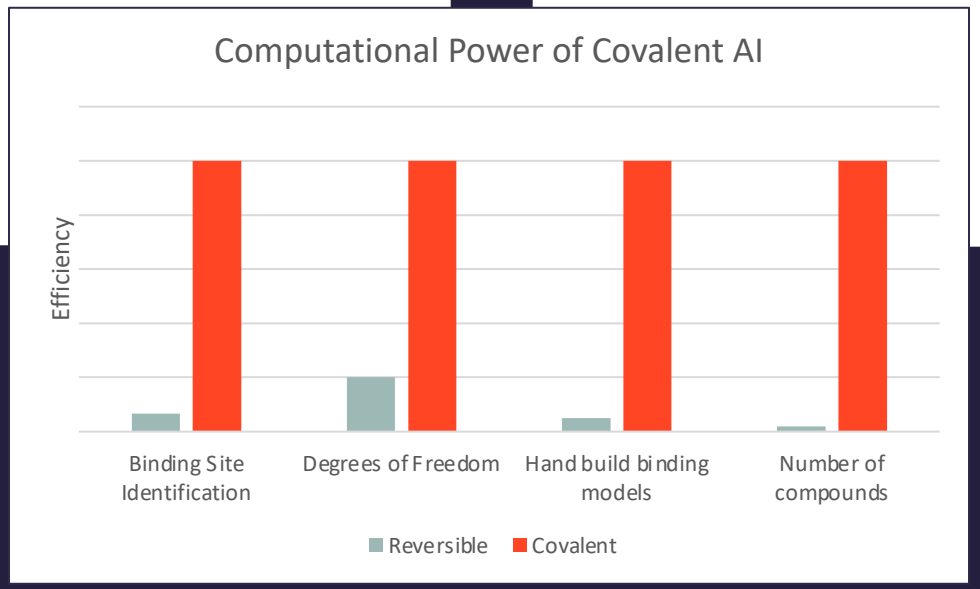
Validated Drug-Like Compounds

Proprietary Covalent AI Approach to Enable Rapid Hit to Lead

Reversible Approach

- x Unspecific Binding
- x Imprecise Binding
- x Weaker Binding

insitro
SCHRÖDINGER
RECURSION



Covalent Approach

- ✓ Specific Binding
- ✓ Precise Binding
- ✓ Strong Binding

TOTUS®

Initial Focus: Covalent Drugs have represented some of the most impactful drugs and serve as excellent starting points to drug discovery

Covalent drugs represent some of the most impactful drugs in our society

	Target	Approval Date	Market Size	Notable Comment
Sotorasib	KRAS	2021	$1B	-
Ibrutinib	BTK	2013	$9.4B	$25B acquisition
Tagrisso	EGFR	2015	$4.3B	-
Carfilzomib	Proteasome	2012	$1B	$10B acquisition
Bortezomib	Proteasome	2014	$1.1B	$8.8B acquisition
Penicillin	Bacterial Wall	1945	$1.5B	1945 Nobel Prize
Aspirin	COX1/COX2	1900	$2.3B	1982 Nobel Prize

Covalent drugs can be both reversible and irreversible, and serve as an excellent starting point to non-covalent drug development

Irreversible Covalents - (Ibrutinib, Tagrisso)

Reversible Covalents - (Bortezomib, PRN-1008)

Covalents as a Starting point for **Non-Covalents** (MRTX-1133)

Totus Value Proposition: The Synergistic Magellan Platform De-risks Every Phase of Drug Development

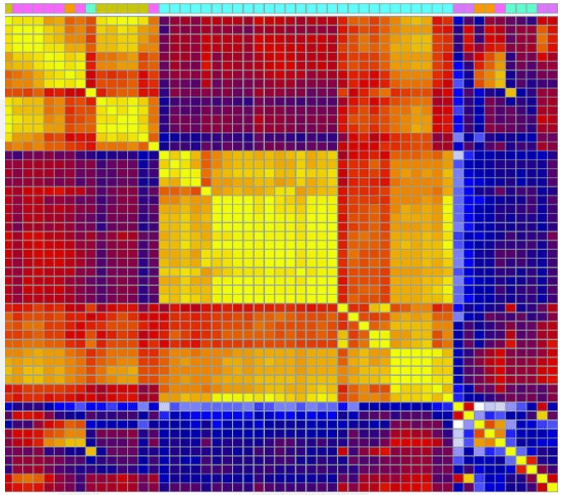
	Target to Lead Time/Cost/POS	Lead to Candidate Time/Cost/POS	Candidate to Approval Time/Cost/POS
TOTUS®	6 months/$200K/50%	6 months/$1M/90%	3 years/$200M/ 50%
Conventional	3 years/$3M/49%	3 years/$5M/31%	8 years/$600M/10%
Examples/ POC for Totus	TOS-358	TOS-358	Ibrutinib/Sotorasib/ Tagrisso

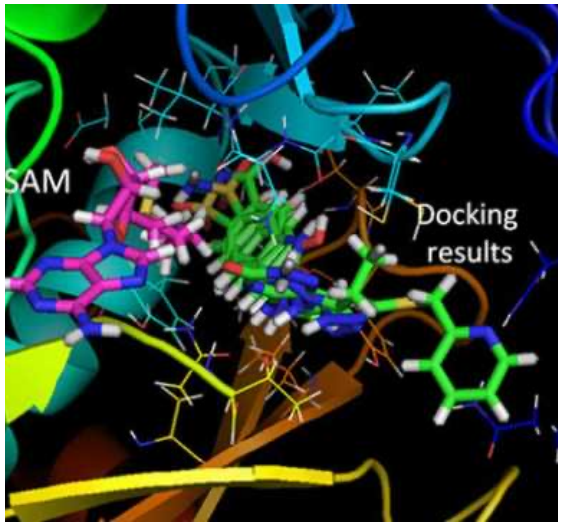
https://www.researchgate.net/figure/Drug-development-cycle-and-the-valley-of-death-The-drug-development-life-cycle_fig1_266969130

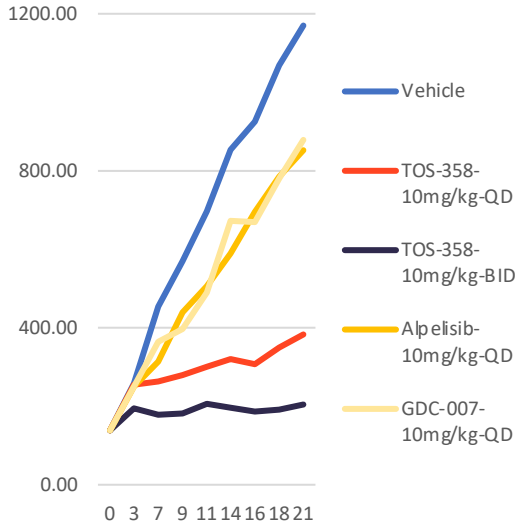
Magellan Platform enabled discovery of best-in-class PI3Kα under 1 year

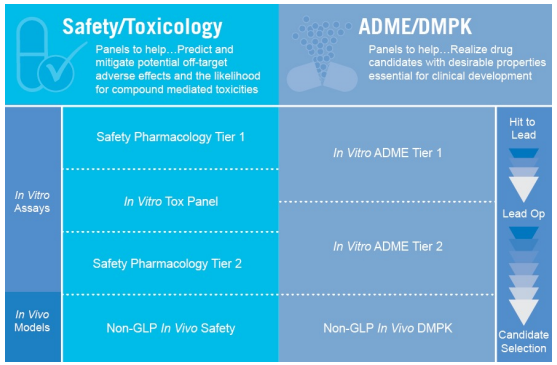
1 Year

Omni-DEL Screen	Focused H2L	*In vivo* Confirmation	Candidate Selection



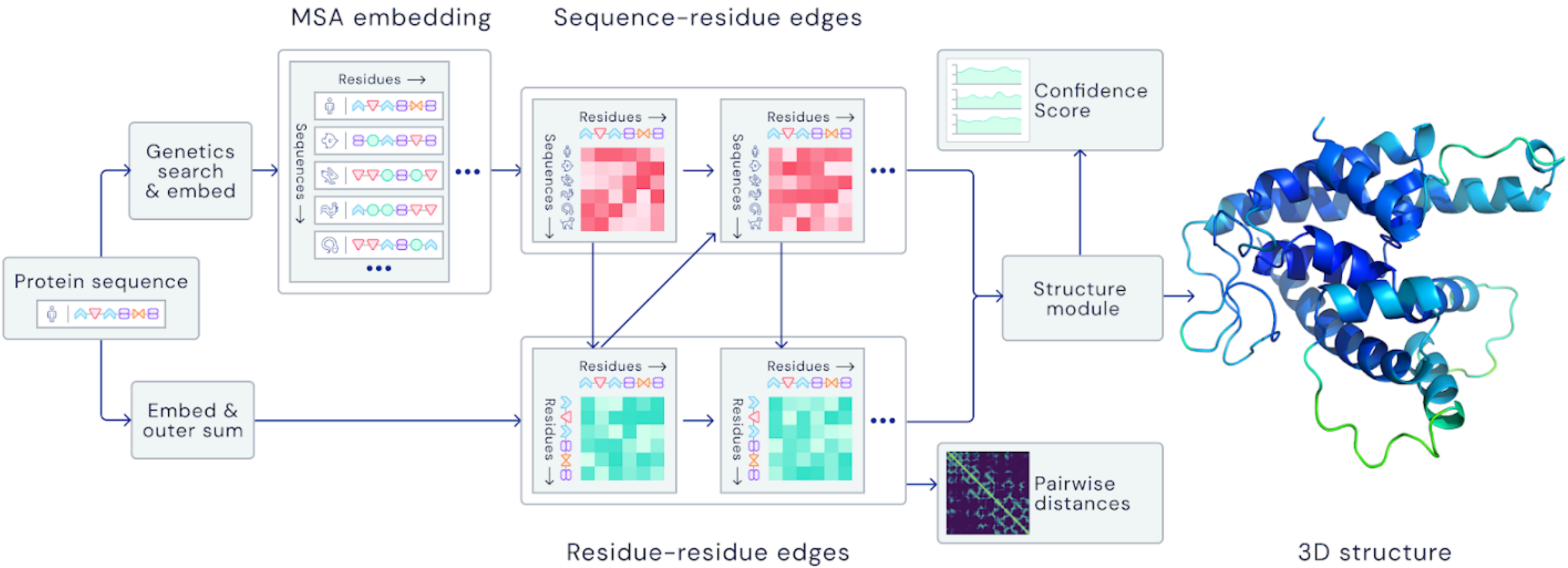






Screening 20,000 custom compounds against PI3Kα in a week	Performed 2 iterative cycles of MedChem to generate lead compound	Confirmed dramatically improved efficacy of lead vs standard of care	Completed critical non-GLP toxicology studies to select development candidate

AlphaFold has unlocked the structure of proteins



AI has cracked a problem that stumped biologists for 50 years. It's a huge deal.

A breakthrough on the "protein folding problem" can help us understand disease and discover new drugs.

By Sigal Samuel | Dec 3, 2020, 2:00pm EST

Oct 3, 2021, 07:34pm EDT | 60,318 views

AlphaFold Is The Most Important Achievement In AI—Ever

Rob Toews Contributor

AI

I write about the big picture of artificial intelligence.

Follow

NEWS | 14 September 2021

What does AlphaFold mean for drug discovery?

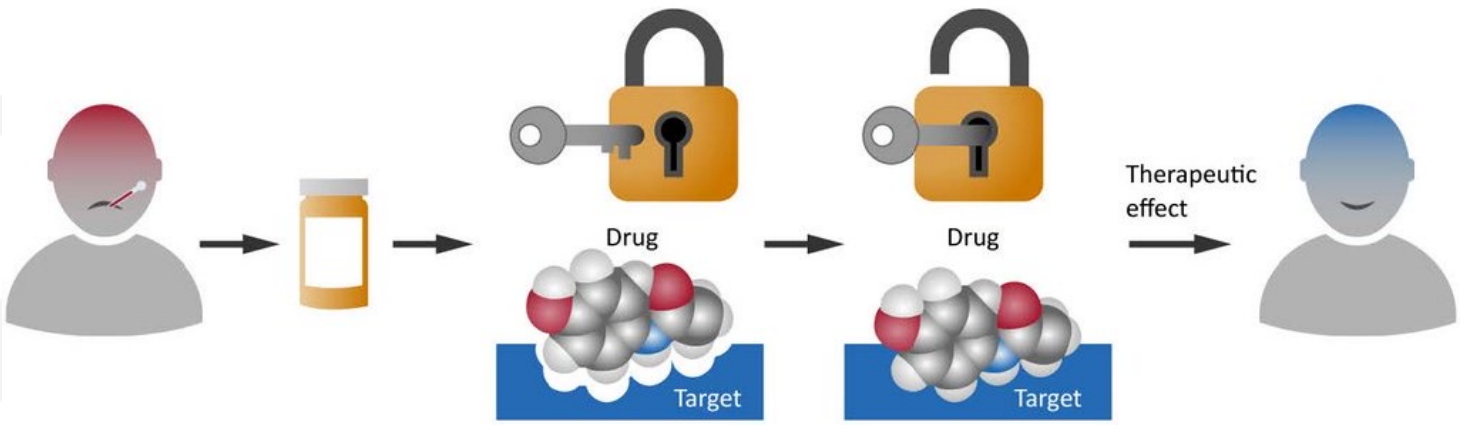
AlphaFold and RoseTTAFold have delivered a revolutionary advance for protein structure predictions, but the implications for drug discovery are more incremental. For now.

Asher Mullard

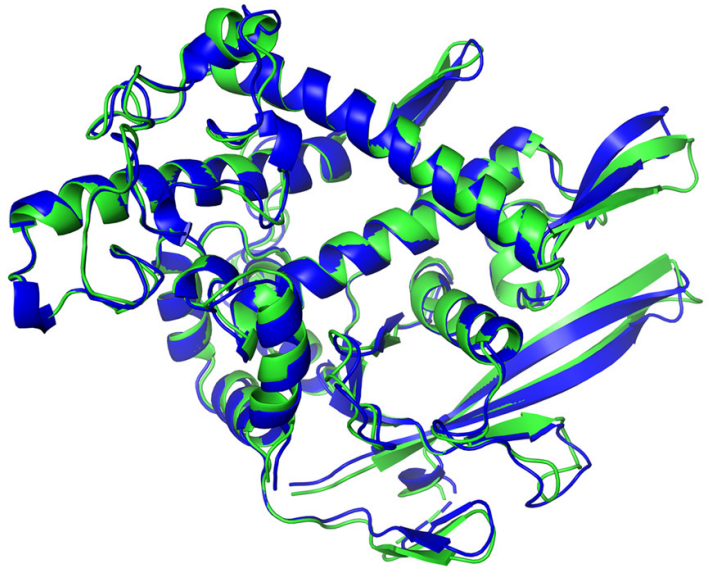
How can we bridge the gap between AlphaFold and Drug Discovery?

- https://lupoglaz.github.io/OpenFold2/

Figure 2: The lock and key analogy for drug-target interactions



Source: GAO analysis of the scientific literature. | GAO-20-215SP



Q&A

Black in Deep Tech Summit

LIFE SCIENCES

Dec 9

DCVC x BVCC

Happy Hour/Networking

Appendix

Confidentiality

These meeting materials contain highly confidential information regarding the business, operations and financial condition of investment funds managed by Data Collective (the "DCVC Funds") and their portfolio companies. This information is for use only by limited partners of the DCVC Funds and their authorized representatives (each, a "Limited Partner") and shall be maintained in strictest confidence. Any disclosure of this information could be damaging to the DCVC Funds or their portfolio companies.

By reading this information, each Limited Partner agrees that it (i) shall use the information contained in the attached documents solely in furtherance of its interests as a Limited Partner and shall not use the information contained in the attached documents for any other purposes, and (ii) shall not, without the prior express written consent of the General Partners of the DCVC Funds, reproduce the attached documents in any manner for, or disclose the information contained in the attached documents in any manner to, any other person other than its advisors who are bound by a duty of confidentiality.

To limit disclosure of any confidential information to persons or entities that are not Limited Partners of the DCVC Funds, Data Collective requests that each Limited Partner, especially Limited Partners that are subject to information disclosure laws or regulations, retain copies of confidential information only for so long as is necessary.

If you receive a request for disclosure of information regarding any of the DCVC Funds or more broadly, venture capital or private equity [illegible]mation, which could include information regarding DCVC Funds or their portfolio companies, we ask that you contact a managing partner of [illegible]C Funds before releasing any such information.