Prof Karen Polizzi
Vice Director Bezos Centre for Sustainable Protein
Co-Director National Alternative Protein Innovation Centre
Imperial College London
k.polizzi@imperial.ac.uk

Our Ecosystem

THE MICROBIAL FOOD HUB

UK Research and Innovation

£14 M

BEZOS CENTRE
FOR SUSTAINABLE PROTEIN

IMPERIAL | BEZOS EARTH FUND

$30 M

National Alternative Protein Innovation Centre (NAPIC)

UK Research and Innovation

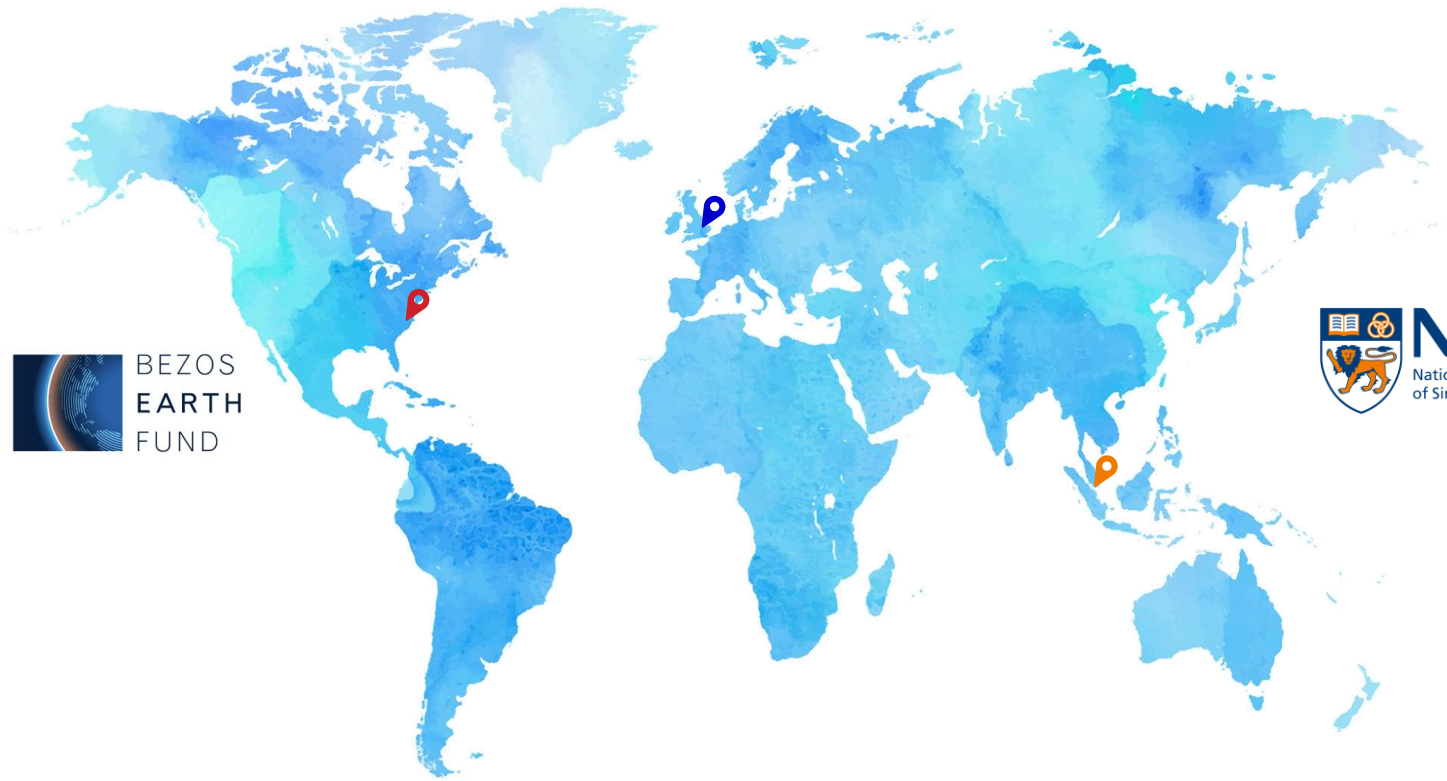
£15 M

IMPERIAL

BEZOS CENTRE FOR SUSTAINABLE PROTEIN

IMPERIAL

BEZOS EARTH FUND



NC STATE UNIVERSITY

BEZOS EARTH FUND

NUS National University of Singapore

BEZOS EARTH FUND

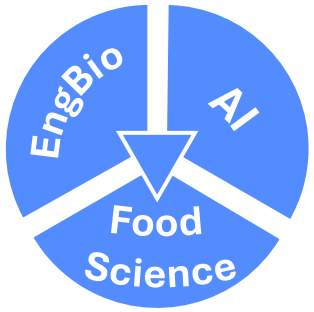
IMPERIAL

Our Vision

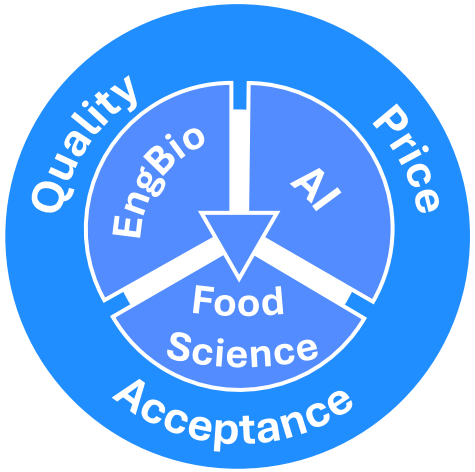
"Facilitate the alternative protein revolution, making our food system sustainable, healthy, productive and reliable"

Our Vision

Enabling Technology

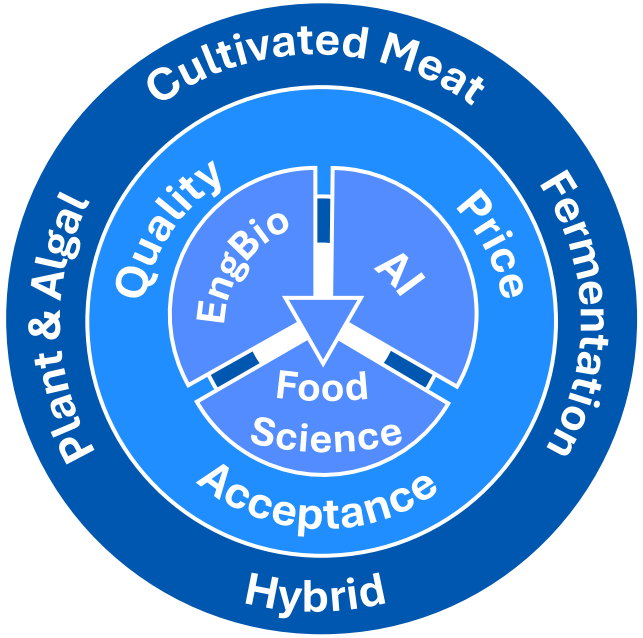


Our Vision



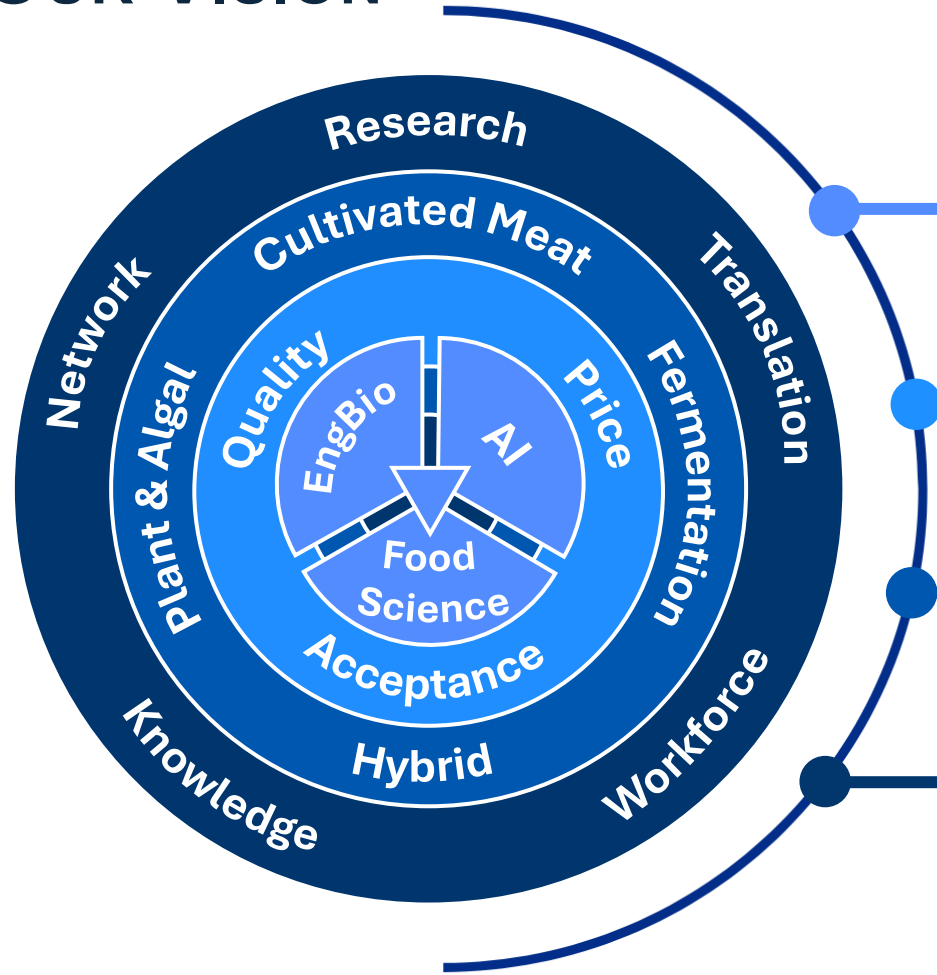
- Enabling Technology
- Challenges

Our Vision



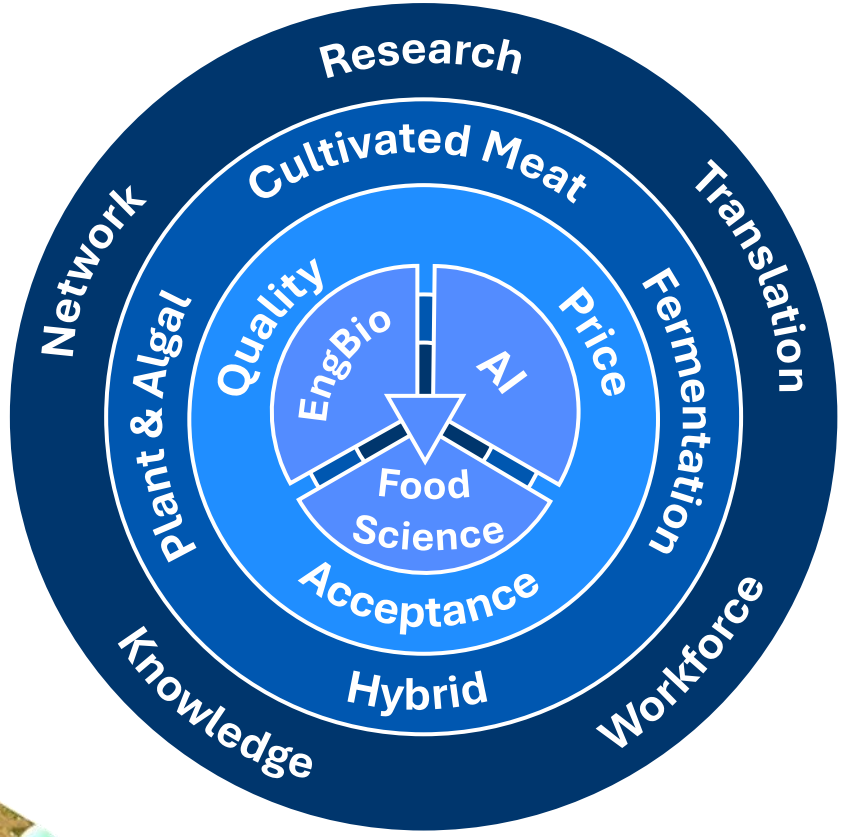
- Enabling Technology
- Challenges
- Solutions

Our Vision



- Enabling Technology
- Challenges
- Solutions
- Pillars

Our Vision



Research

Cutting-edge applied research in all the areas of sustainable foods (Engineering Biology, AI, Automation, etc.)

Education

Training the next generation of Alternative Proteins professionals -> New PhD programme and Masters.

Translation

Maximise commercialisation, licensing, startup creation.

Knowledge & Network

Thought-leader, high-profile voice, respected scientific authority → impact in society, policy and industry.

BEZOS CENTRE FOR SUSTAINABLE PROTEIN

REASEARCH & INNOVATION

FACILITIES

EXISTING AND NOVEL TECHNOLOGIES & TOOLS

AUTOMATION

Scale UP

BIOPROCESS

AI

ANALYTICS

Cell Bank

FEEDSTOCK

Cell Engineering

COMPUTATION

Food Tech

SYNTHETIC BIOLOGY

Nutrition

APPLICATION

RENEWABLE **FEEDSTOCKS** INCLUDING FOOD BYPRODUCTS

CULTIVATED MEAT

PLANT-BASED

FERMENTATION

TRADITIONAL | BIOMASS | PRECISION

HYBRID PRODUCTS

IMPACT UNITS

- Commercialisation
- Sustainability
- Education
- Consumer & Public
- Company Creation
- LMIC Food Security
- Policy, Safety, & Regulation
- Gastronomy

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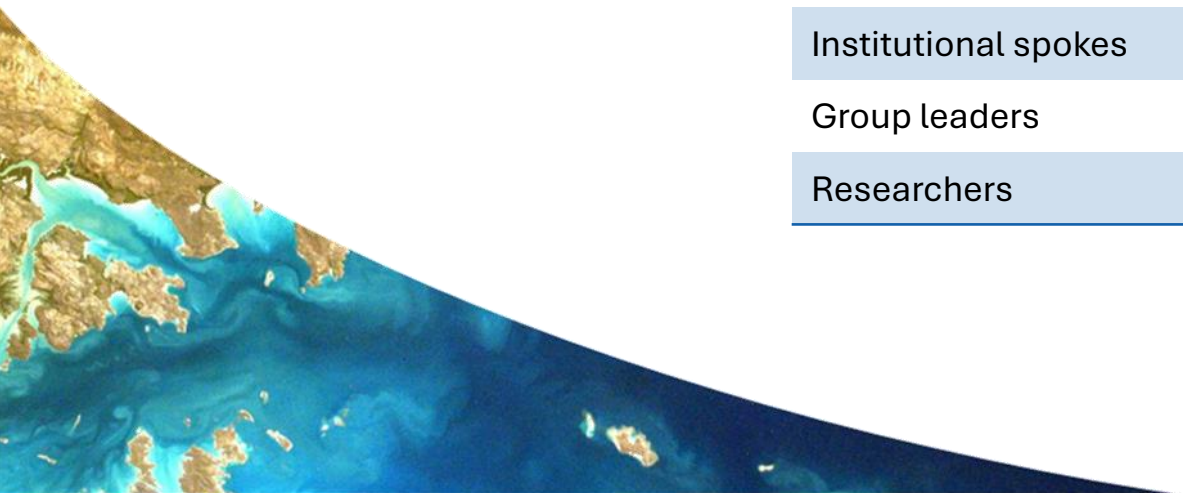
SOME NUMBERS

Metric	#
Total **cash** funding to date	£56,472,574
Total **in-kind**	£27,583,900
Organisations expressing interest	200+
Partnership Letters of Support	86
Institutional spokes	11
Group leaders	40+
Researchers	100+



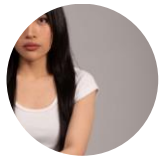
OUR TEAM

Dr Simon Patridge

Centre Manager

Yvonne McMeel

Head of Impact, Growth, and Innovation



Roelle Ann P Santa Maria

Head of Marketing and Communication

Julia Espeso Bischofberger

Senior Translation Officer

John-Felipe Murphy

Alternative Proteins Regulation and Scale-Up Manager

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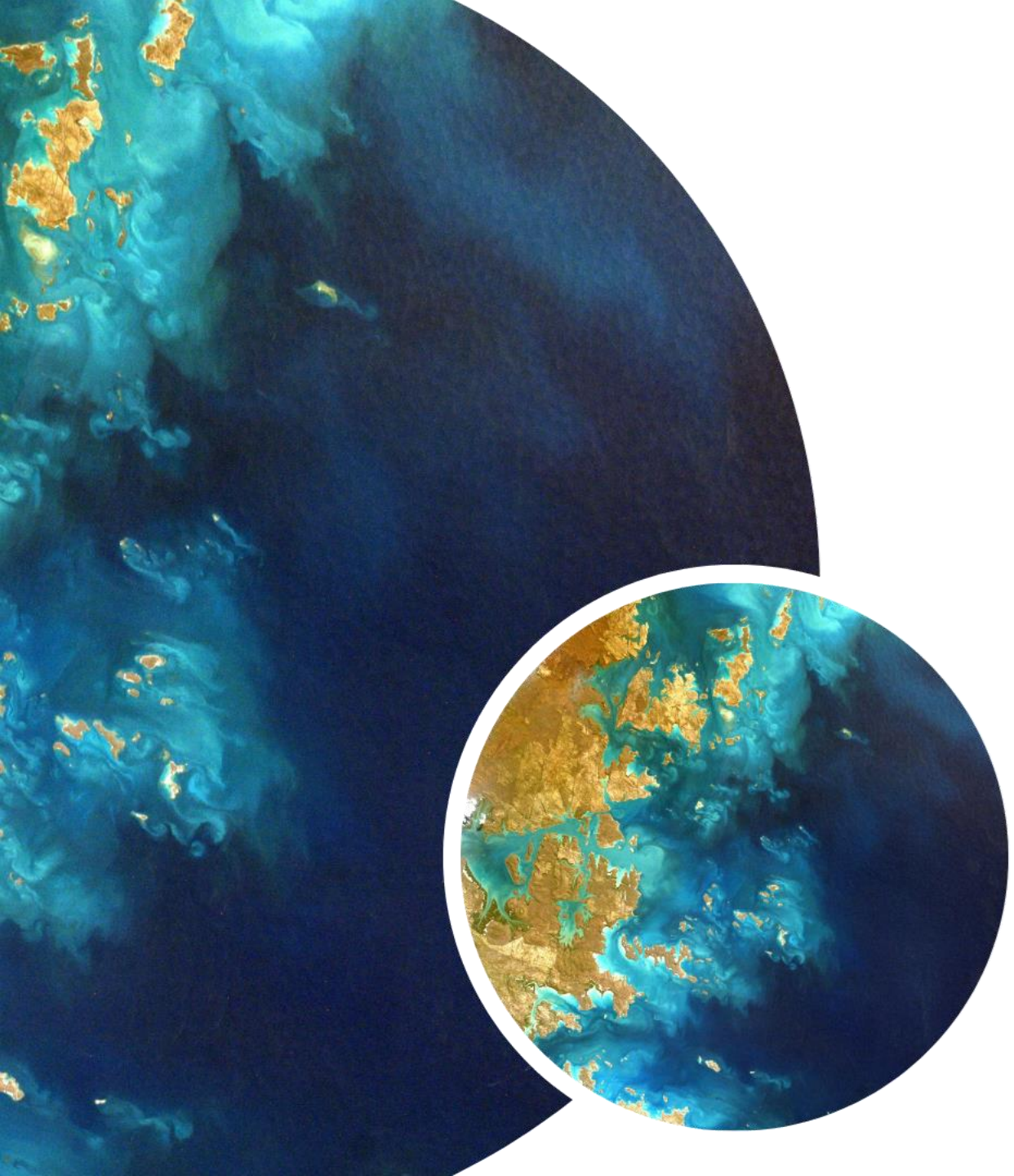
BEZOS CENTRE HUB AND SPOKES

UCL
University of Kent
UNIVERSITY OF GREENWICH
ROTHAMSTED RESEARCH
IMPERIAL
2nd in the world
1st in the UK and Europe
QS World University Rankings 2025
University of Reading
UNIVERSITY OF CAMBRIDGE
PRIFYSGOL ABERYSTWYTH UNIVERSITY
Tufts UNIVERSITY
NUS National University of Singapore
DTU
NIAB

Our Partners



Fermentation and the future of food

ADVANTAGES OF ALTERNATIVE PROTEINS

Sustainable

- Less land and water
- Less emissions
- Can use CO2/waste as feedstock

Nutritious and healthy

- Balanced nutrition
- Micronutrients, fibers and proteins
- Gut for gut health

Security and resilience

- Independent of climate, season, disasters
- Short production cycles
- Scalable on demand

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Challenge
- Cost
- Quality
- Consumer acceptance

Solutions
- Engineering Biology
- Scale up
- Regulation
- Policy

TYPES OF MICROBIAL FOODS

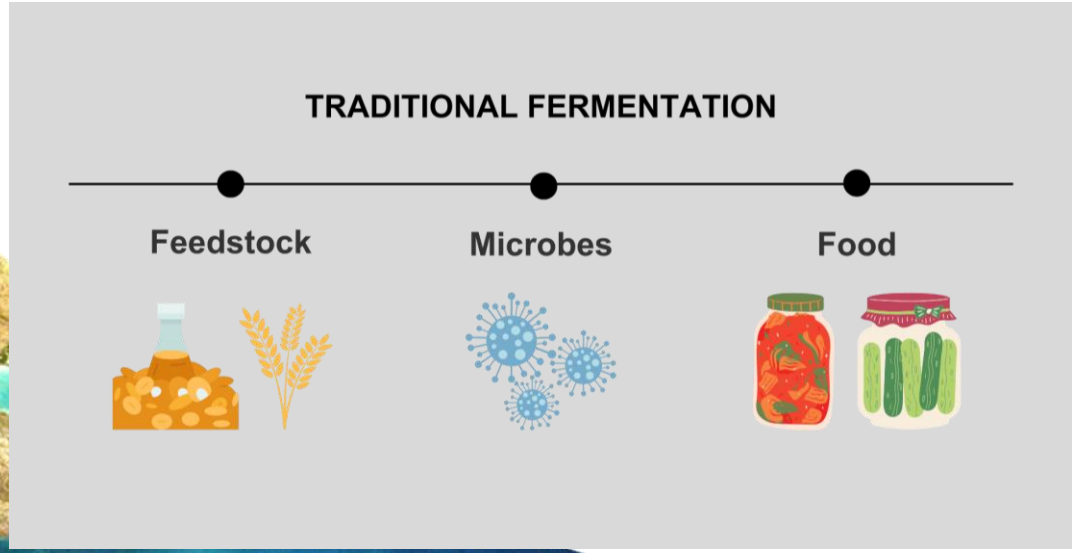
- Traditional Fermentation

- Biomass Fermentation

- Precision Fermentation

TRADITIONAL FERMENTATION

- Accounts for around one-third of our diets globally.
- Enhances food preservation and safety by inhibiting harmful microbes.
- Improves flavour, texture, nutrient availability, and supports gut health.



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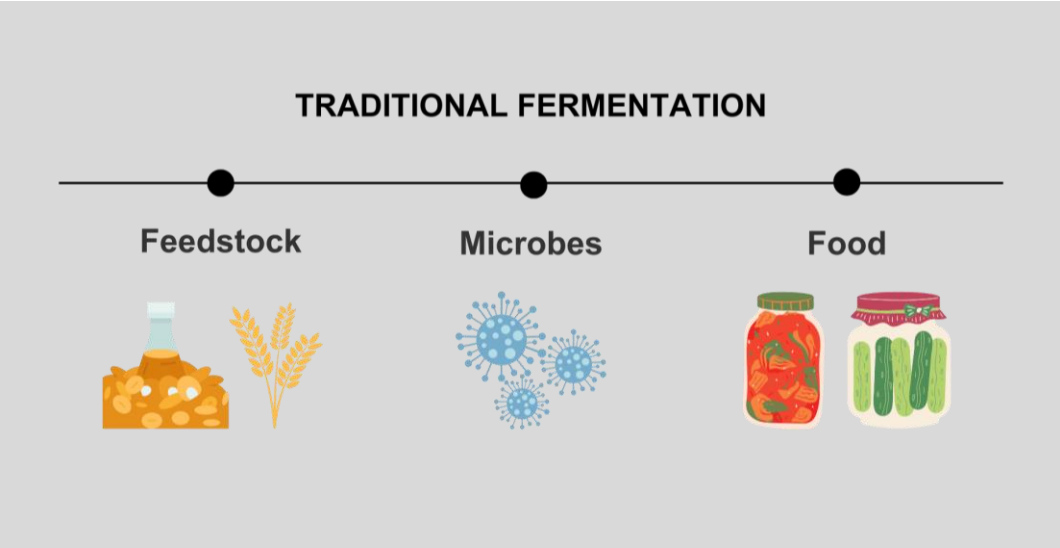


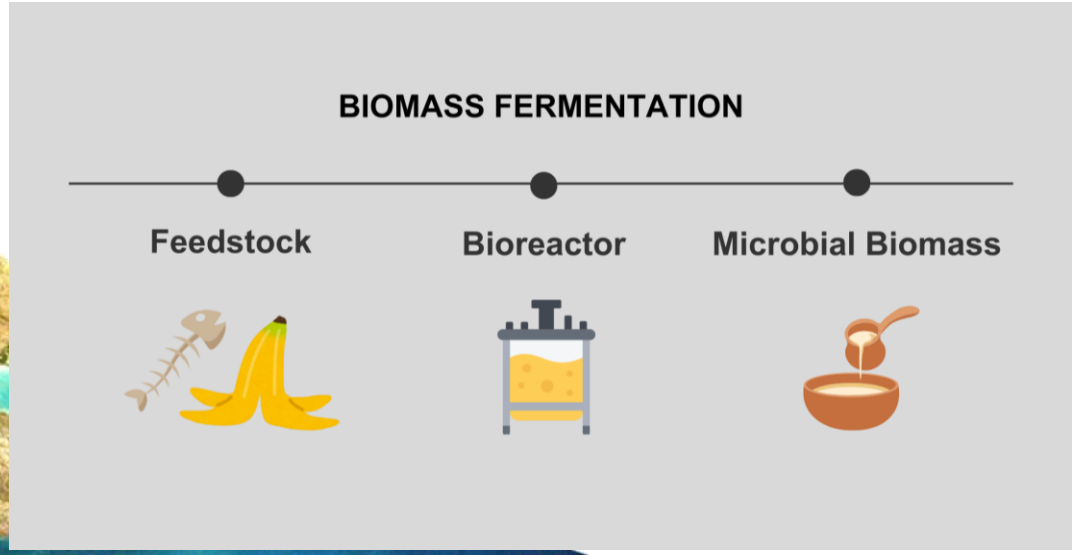
Example of projects

Reimagining:
Kefir
Kombucha
Tempeh

Vegan feedstocks
Texture agents
Enriched nutrients

BIOMASS FERMENTATION

- Uses fast-growing, protein-rich microbes to efficiently produce protein.
- Biomass can be used whole or processed to boost digestibility or protein levels.
- A main ingredient, as in Quorn and Meati's use of filamentous fungi.



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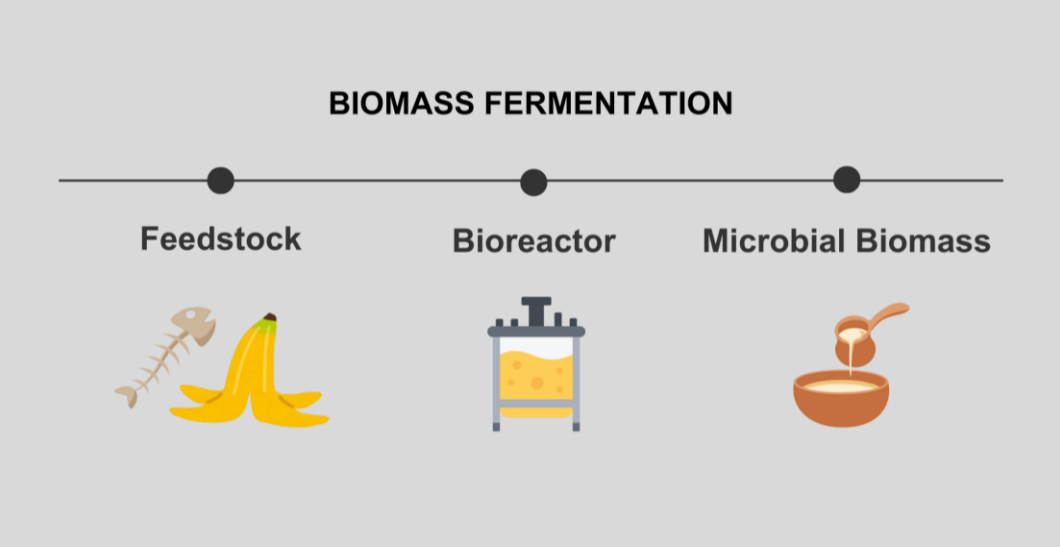
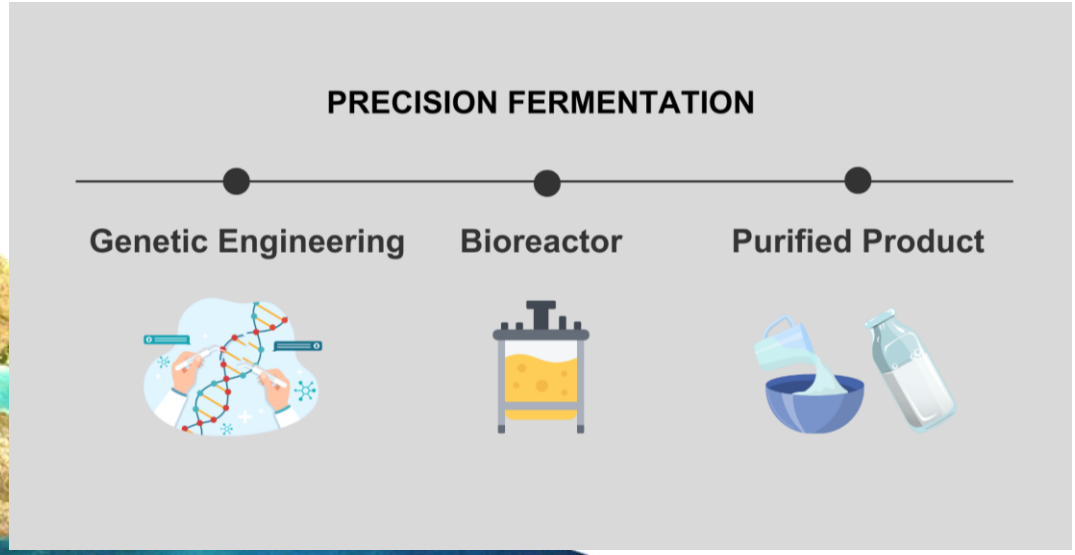


Example of projects

- New Yeast for biomass fermentation
- New fungi for biomass fermentation
- Feedstock expansion
- Enriching nutrition with engineering biology

PRECISION FERMENTATION

- Microbes as “cell factories” to produce specific functional ingredients.
- Used in small amounts to enhance taste, texture, or nutrition.
- Examples: dairy, egg, and heme proteins made by Perfect Day, Clara Foods, and Impossible Foods.



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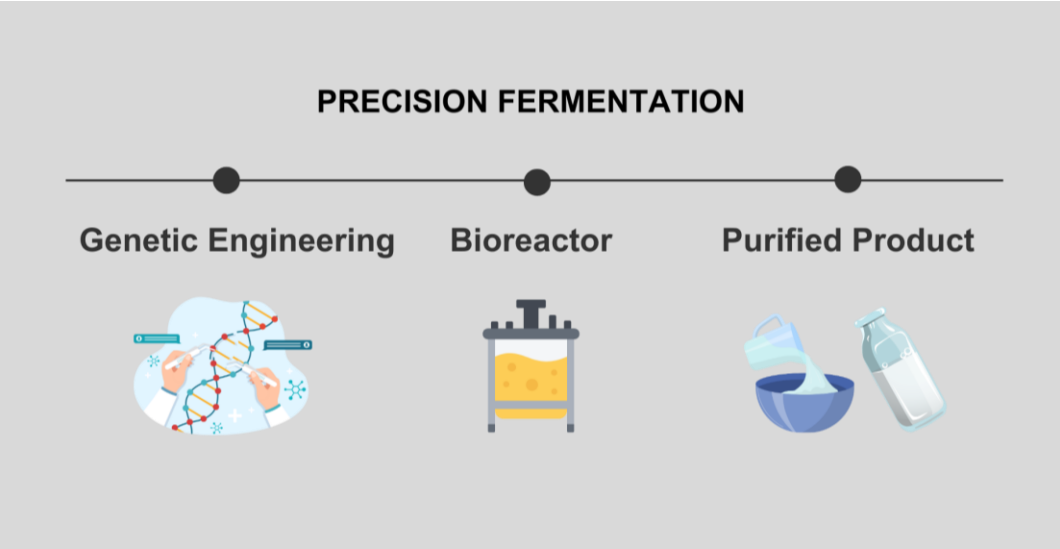


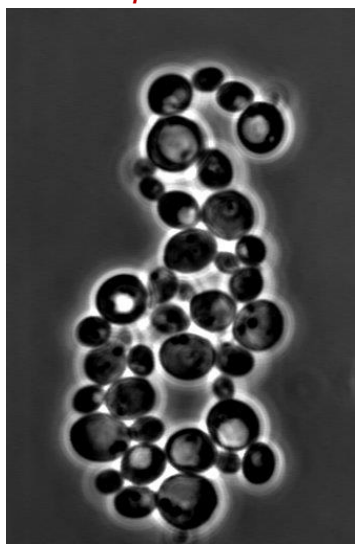
Example of projects

- Host development
- Feedstock optimisation
- Proteins (e.g. milk, muscle, etc)
- Fats
- Micronutrients (e.g. vitamins)
- Additives (e.g. antioxidants, colorants, taste, texture).

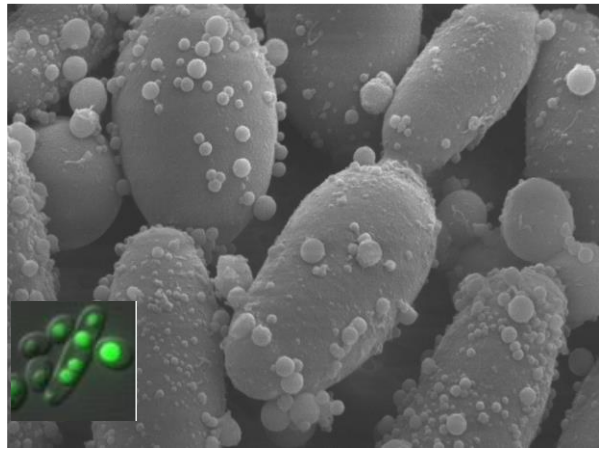
EXAMPLES OF WORK: DIFFERENT HOST CELL CAPABILITIES

Organisms

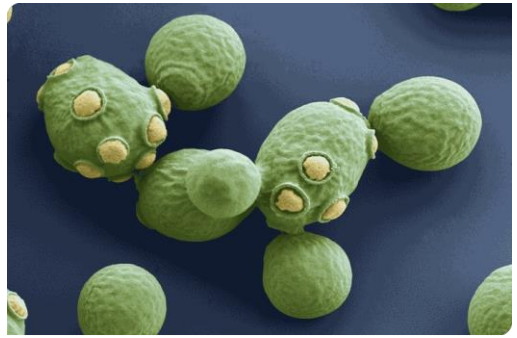
Pichia pastoris



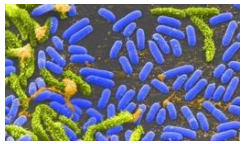
Yarrowia lipolytica



Saccharomyces cerevisiae



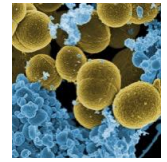
V. natriegens



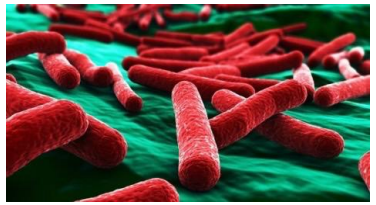
Pseudomonas putida

Synechocystis

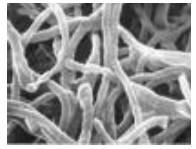
C. acnes



Escherichia coli

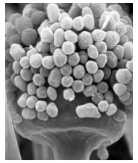


Fusarium



Ashbya

Rhizopus



EXAMPLES OF WORK: DIFFERENT INPUT FEEDSTOCKS

Feedstocks

Sugars

- Hexoses
- Pentoses
  - Xylose (Ledesma-Amaro et al 2016, etc)
  - Arabinose (under review)
- Starch (Ledesma-Amaro et al 2015, etc)

Lignocellulosic materials

- Agave (Niehus et al 2018)
- Multiple sources (Razieh et al 2024)

Food waste

- Waste cooking oil (unpublished)
- Vegetable waste (Razieh et al 2024)

Industrial byproducts

- Raw glycerol (Razieh et al 2024)
- Quorn waste (unpublished)

Urban waste

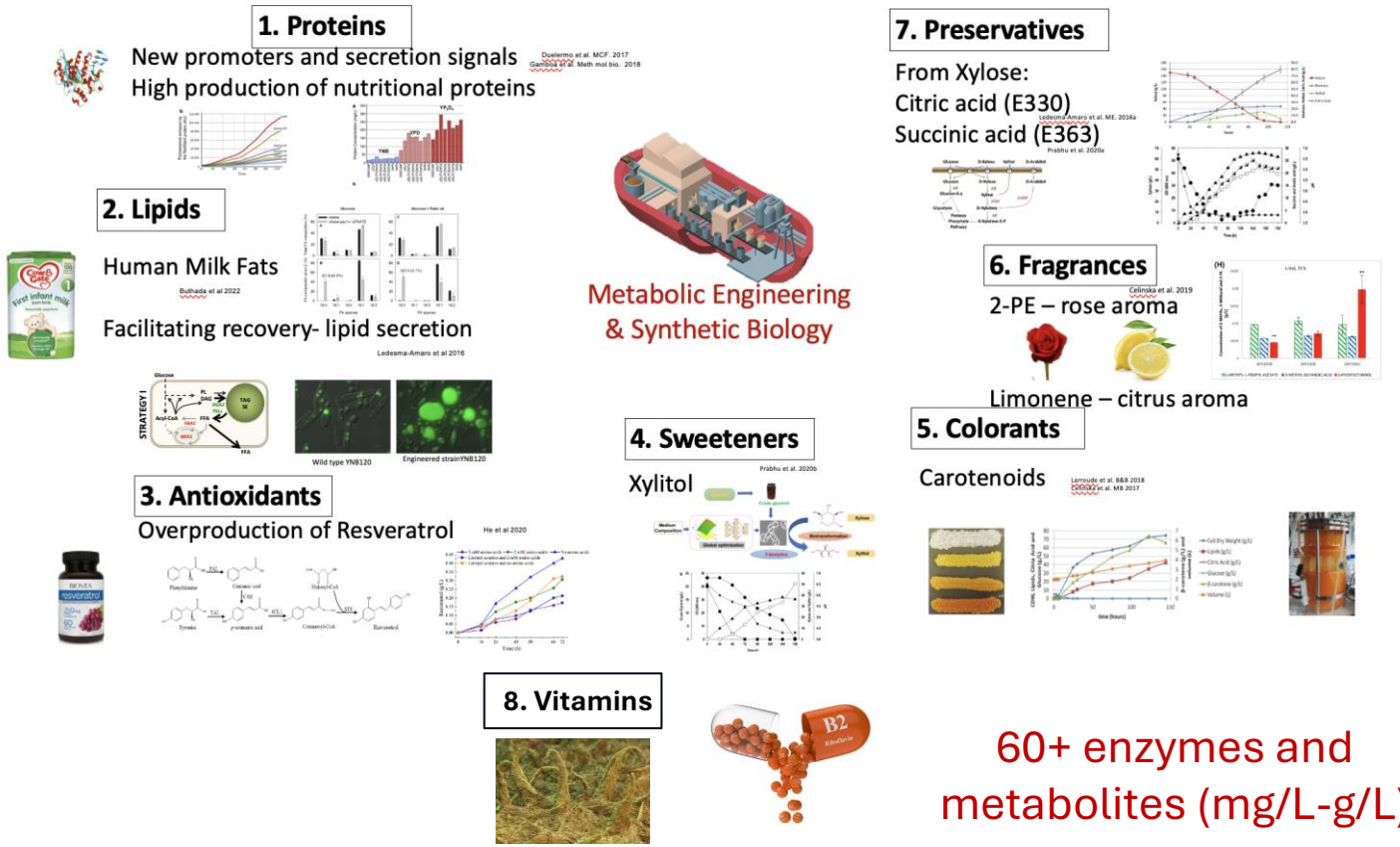
- Urban pruning (Razieh et al 2024)

C1

- Methanol (Wei et al 2025)
- Formate (under review)
- CO2 (Wei et al 2022, Chen 2024)

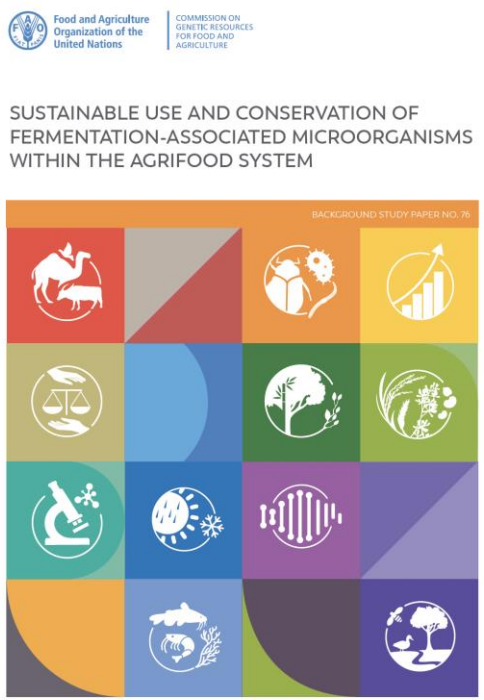
EXAMPLES OF WORK: PRODUCTS

Products



60+ enzymes and metabolites (mg/L-g/L)

EXAMPLES OF WORK: REGULATION



Food Standards Agency
food.gov.uk

NEWS

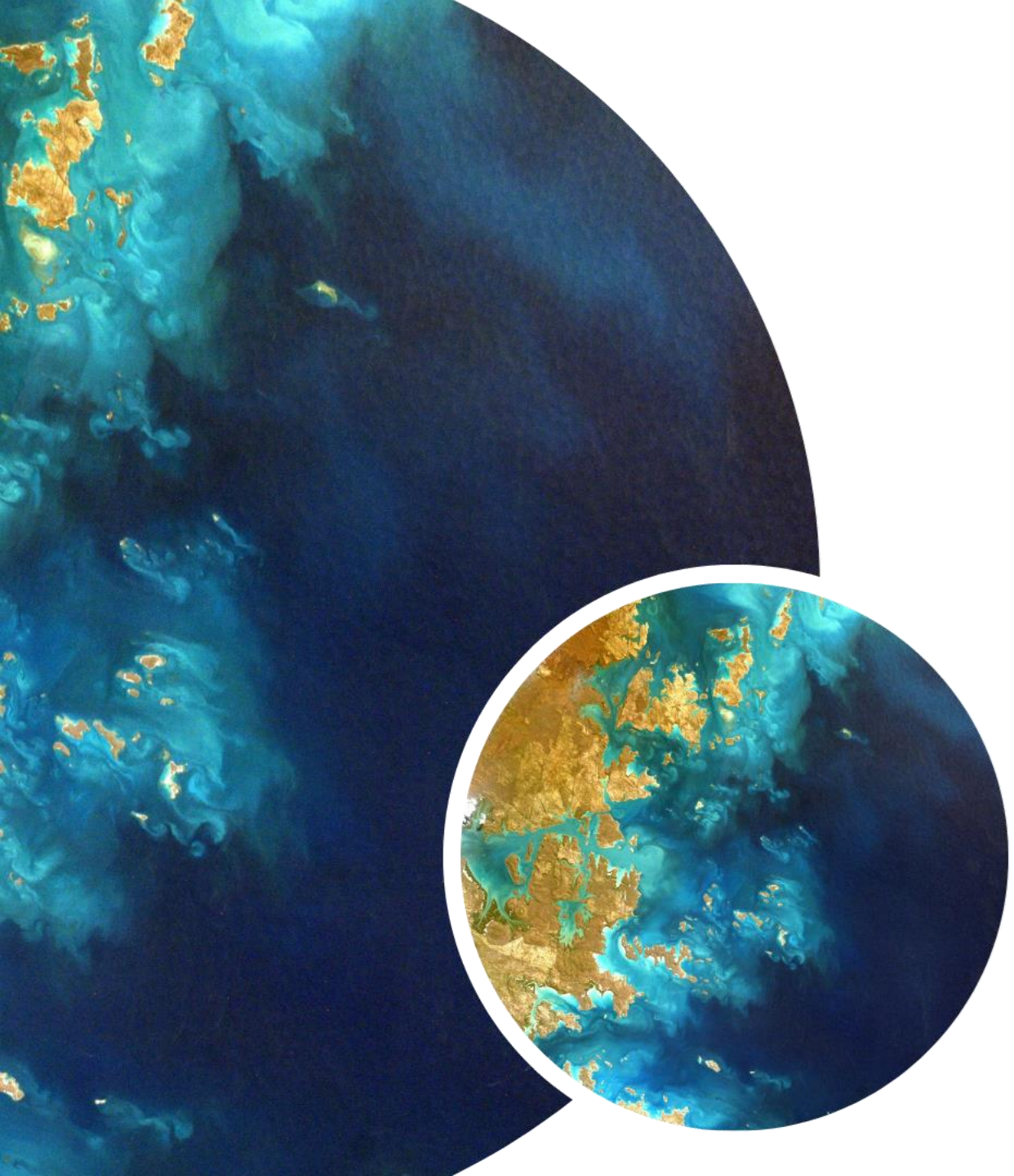
Groundbreaking sandbox programme for cell-cultivated products announced

The Food Standards Agency (FSA) has won a bid to run a programme designed to make sure cell-cultivated products are safe for consumers to eat before they are approved for sale.

UK's first Novel Foods expert network established

RSSL IMPERIAL THE Supplant COMPANY™

EXAMPLES OF WORK: MICROBIAL FOOD IN SPACE



SEEKING NEW COLLABORATIONS

PARTNER ENGAGEMENT

Research

- Access **funding** and **partnership** to accelerate innovation.
- **Share expertise** to shape cutting-edge research and emerging startups.
- **Sponsor** or **co-create** projects aligned with strategic goals attracting top talent and bold ideas.
- Position your business as a **key partner** in **pioneering academic** ventures.

Translation

- **License or acquire IP** when strategically relevant.
- **Invest** in our translational deal flow.
- Sponsor a **Hackathon**.
- **Mentor** entrepreneurs.
- Receive **curated startup deal flow.**
- **Sponsor** the Centre's **Acceleration** and **Incubation** Programmes.

Education

- Engage with **Master's, and PhD** programmes through **lectures, workshops and curriculum** design.
- Offer **internships, placements,** or project-based collaborations to shape future talent.
- Access a pipeline of highly **skilled students** and **researchers** trained by the Centre.
- Co-supervise **PhD projects**.

Network

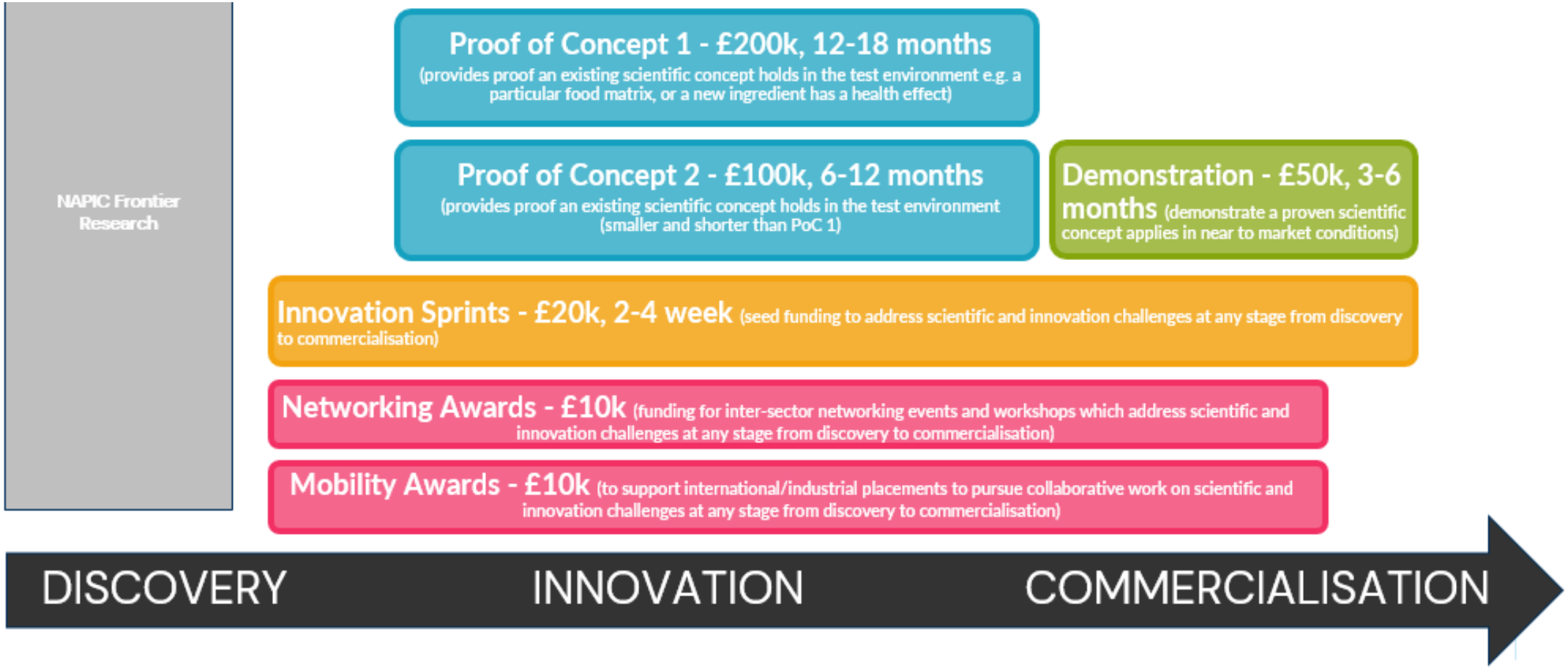
- Join our **Impact Groups** to shape sector-wide initiatives.
- **Co-design** and participate in workshops, networking events and industry forums.
- **Connect** with like-minded innovators and collaborators across the sustainable protein ecosystem.

Knowledge

- Shape Centre strategy by contributing **to Advisory Boards** (select opportunities).
- Share **market insights** and collaborate on real-world testing and validation projects.
- Provide **consultancy,** access to **facilities,** and **supervision**.
- Access **shared resources**, including research databases and market intelligence tools.

RECENTLY LAUNCHED: NAPIC COLLABORATIVE FUNDING PROGRAMME

For more information visit: https://napic.ac.uk/



Upcoming Events: NAPIC Inaugural Conference

National Alternative Protein Innovation Centre (NAPIC)

REGISTER NOW

National Alternative Protein Innovation Centre (NAPIC)

INAUGURAL NAPIC CONFERENCE

15th - 16th September 2025

The Diamond, University of Sheffield

A conference bringing together leading experts from academia, industry, policy, investment, and the broader alternative protein ecosystem to drive discussions, insights, and innovation in the field.

www.napic.ac.uk events@napic.ac.uk www.linkedin.com/company/napic

Plenary: Bruce Friedrich, GFI President

MICROBIAL FOOD HUB

IMPERIAL

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BEZOS CENTRE

FOR SUSTAINABLE PROTEIN

IMPERIAL COLLEGE LONDON

Thank You

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Vice Director Bezos Centre for Sustainable Protein
Co-Director National Alternative Protein Innovation Centre
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