14th CDTI - NEDO Joint Workshop
"Food Technology"
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Unlocking the Full Potential of Microbes for Food

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MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES
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bitBiome was founded to make the bioeconomy a reality

Biotech company founded in November 2018
By a professor at Waseda University

Headquartered in Tokyo, Japan
With presence in the US and the UK

Unique proprietary platform addressing all forms of bio-manufacturing
Allowing flexibility towards the most efficient design

State-of-the-art facilities in Tokyo
Significant cost advantage and operational excellence

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Backed by leading investors and partners

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Developing sustainable materials and next-gen chemicals
Niterra 日本特殊陶業 · tojo · kao Kirei—Making Life Beautiful

bitBiome
AI + Biology Platform

ACADEMIA & RESEARCH
Driving scientific discovery and educating future leaders
TEXAS The University of Texas at Austin · Université de Montréal · JST Japan Science and Technology Agency

INDUSTRIAL & MANUFACTURING
Improving processes, performance, and operational efficiency
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Working with key industry partners in food industry supply chain

"We are confident that by integrating bitBiome's **unique gene database and advanced *in silico* enzyme exploration** technologies, including surface feature analysis, with our AminoScience® technologies, we can unlock new value. This collaboration will **accelerate the development of innovative products** and solutions, delivering enhanced value to our customers and partners."

Shintaro Iwatani, PhD,
The head of Biosolutions Labs.,
Ajinomoto Co., Inc.

bitBiome Announces Major Collaboration Agreement in **Commercial-Scale Bio-Manufacturing of Food-Grade Ingredient**
Mar 03, 2026

By leveraging our proprietary microbial genome database and discovery platform, together with proprietary AI-powered genome-scale bioengineering, we are enabling a commercially viable transition from conventional food production methods to a bio-based supply chain.

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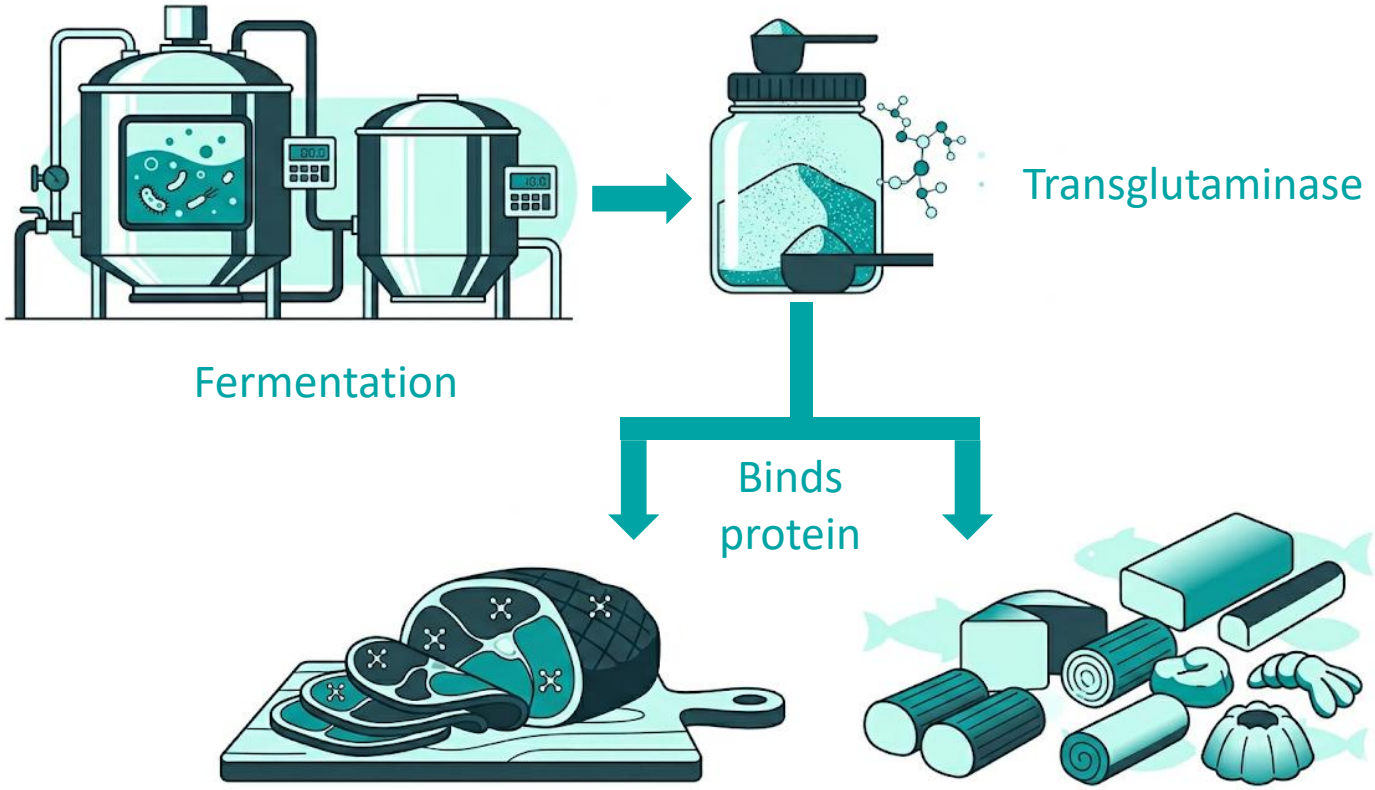
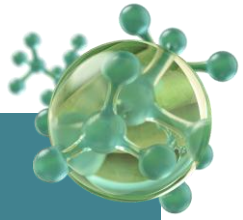
Both Spain and Japan have a long history of utilizing microbes to make food taste even better

Biotech is bringing more ways to add value in the food industry: transglutaminase



bitBiome is unlocking the full potential of microbes



- AI can transform biology, but only with high-quality genome data
- Microbial genomes are earth's richest and most underutilized resources
- But humans have not been able to accurately sequence and analyze them…. Until now

Turning "Impossible" Molecules into Profitable Products through Generative Bio-Design

Platform

- bit-MAP@: **unique, patented single-cell whole-genome sequencing**

Data and AI

- bit-GEM, **3 billion + diverse genomic sequences**
- SENS-AI, generative AI for biology with **prototype showing >15x prediction capability**

IMPACT

Commercial Bio-Production

- Turning biology into **high-value, scalable products**
- 10x improvement in time-to-market

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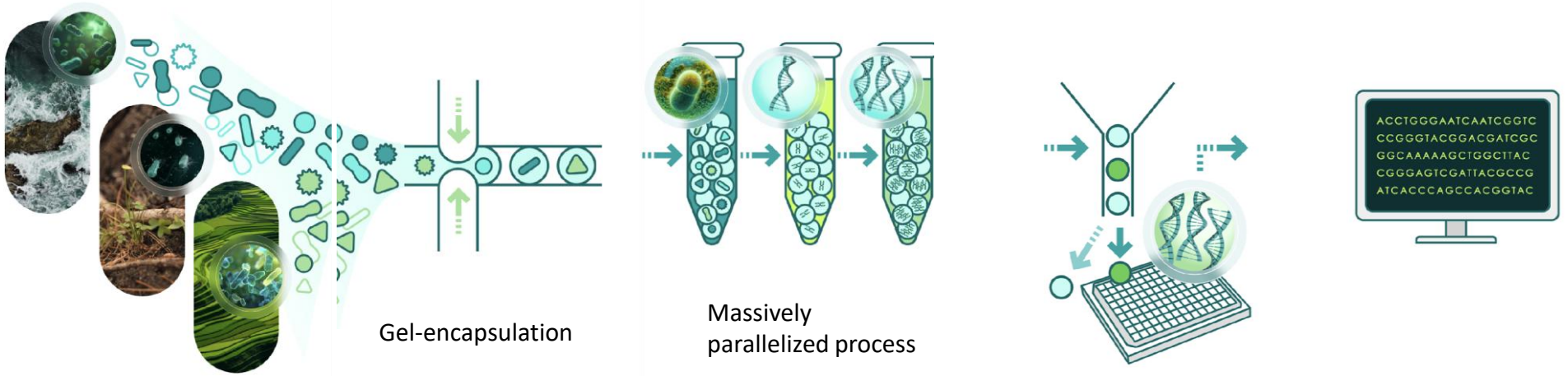
We started with bit-MAP®, single-cell whole genome sequencing, to analyze natural microbes

Sample acquisition & preparation → Microbial isolation → DNA amplification → Gel capsule selection → DNA sequencing & analysis



Gel-encapsulation

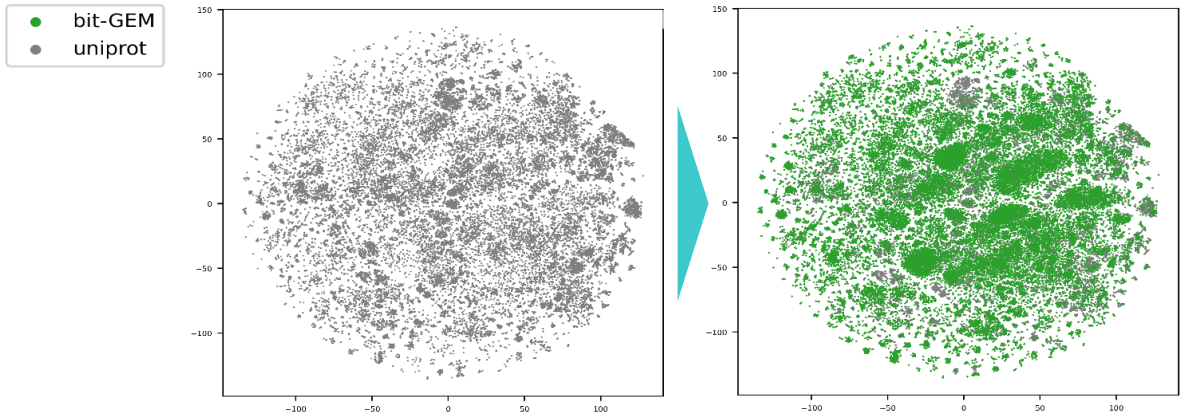
Massively parallelized process

- Unculturable microbes can be sequenced
- Strain-level difference can be analyzed within the same species

bit-GEM's unmatched microbial dataset is redefining the frontier of genome-driven innovation

Comparison of genome clusters

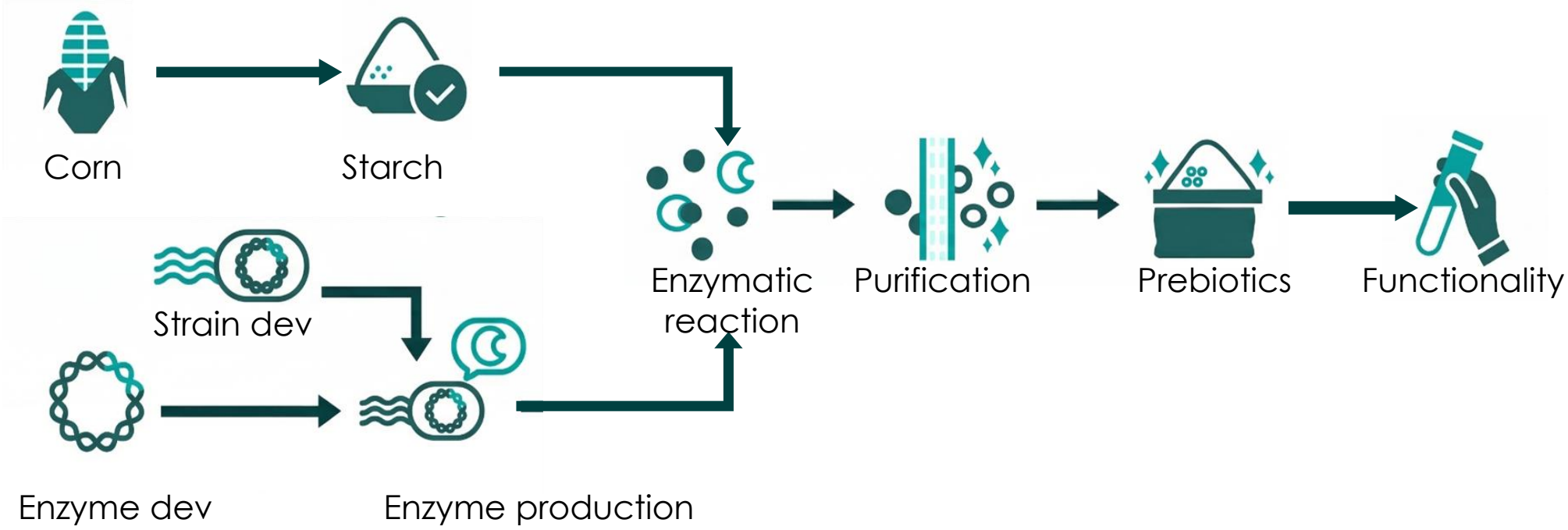
bit-GEM has 3x of enzymes that work on breaking down carbohydrates



Enzyme	Uniprot	+ bit-GEM
GH13_2 CGTase	551	**698**
GH13_5 α-amylase	5,929	**13,772**
GH13_9 Branching enzyme	27,448	**88,810**
GH13_11 Isoamylase	20,240	**60,609**
GH13_14 Pullulanase	10,654	**40,480**
GH13_20 Neopullulanase	6,143	**21,666**

Case study 1: Prebiotics produced with bitBiome's enzymes

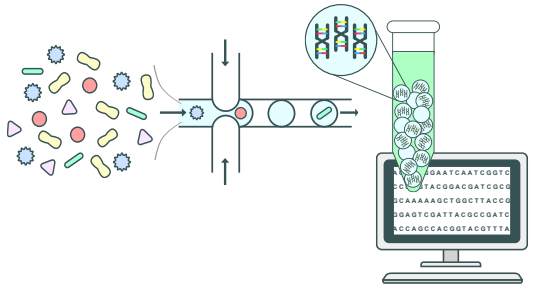
Converting starch into prebiotic fiber can reduce the caloric impact and blood sugar spikes, while providing essential "fuel" to nourish and diversify beneficial gut bacteria



Case study 2: endolysins - enzymes that break down cell walls of target bacteria

Endolysins can rapidly eliminate pathogens and biofilms without harming beneficial microbes

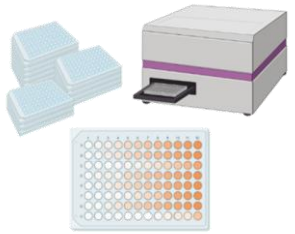
Target search with bit-MAP®



Endolysin gene discovery

EL genes searched from bit-GEM database

Screening



High throughput screening

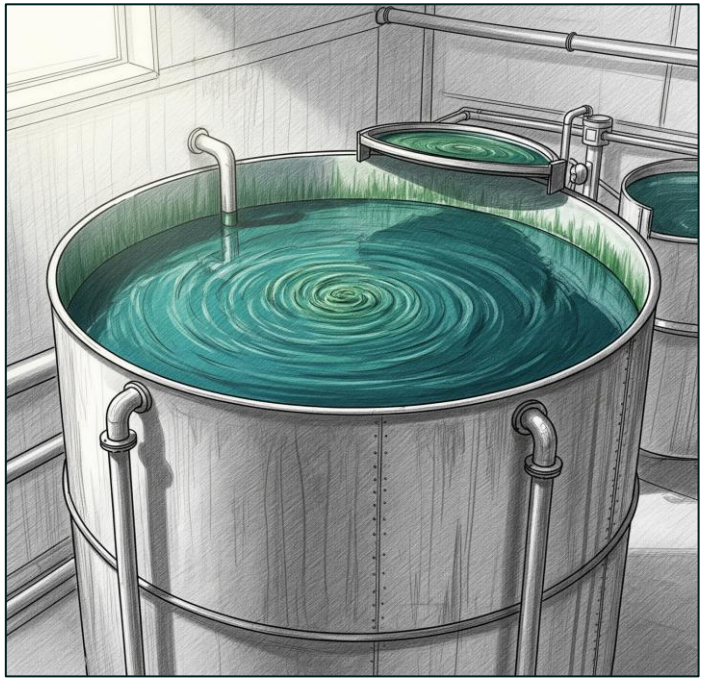
Endolysin

Lyse cell walls

Case study 3: phycocyanin - natural blue coloring

- Consumers are increasingly interested in natural food colorings
- Spirulina is a source of phycocyanin, a natural blue coloring but it is expensive and inconsistent
- Phycocyanin is sensitive to heat and acid

- Natural homologs identified from bitBiome's database
- >100 sequences with full genomic context
- Adaptation to heat expected in sequences collected from hot springs



Collaboration ideas

- ✓ Soil enhancing microbes
  - Drought resistance
  - Nitrogen fixation

- ✓ Fermented peas
  - Spanish version on natto

- ✓ Endolysin
  - Target diseases in olives, tomatoes, kiwis
  - Food spoilage

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Thank you for your attention

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