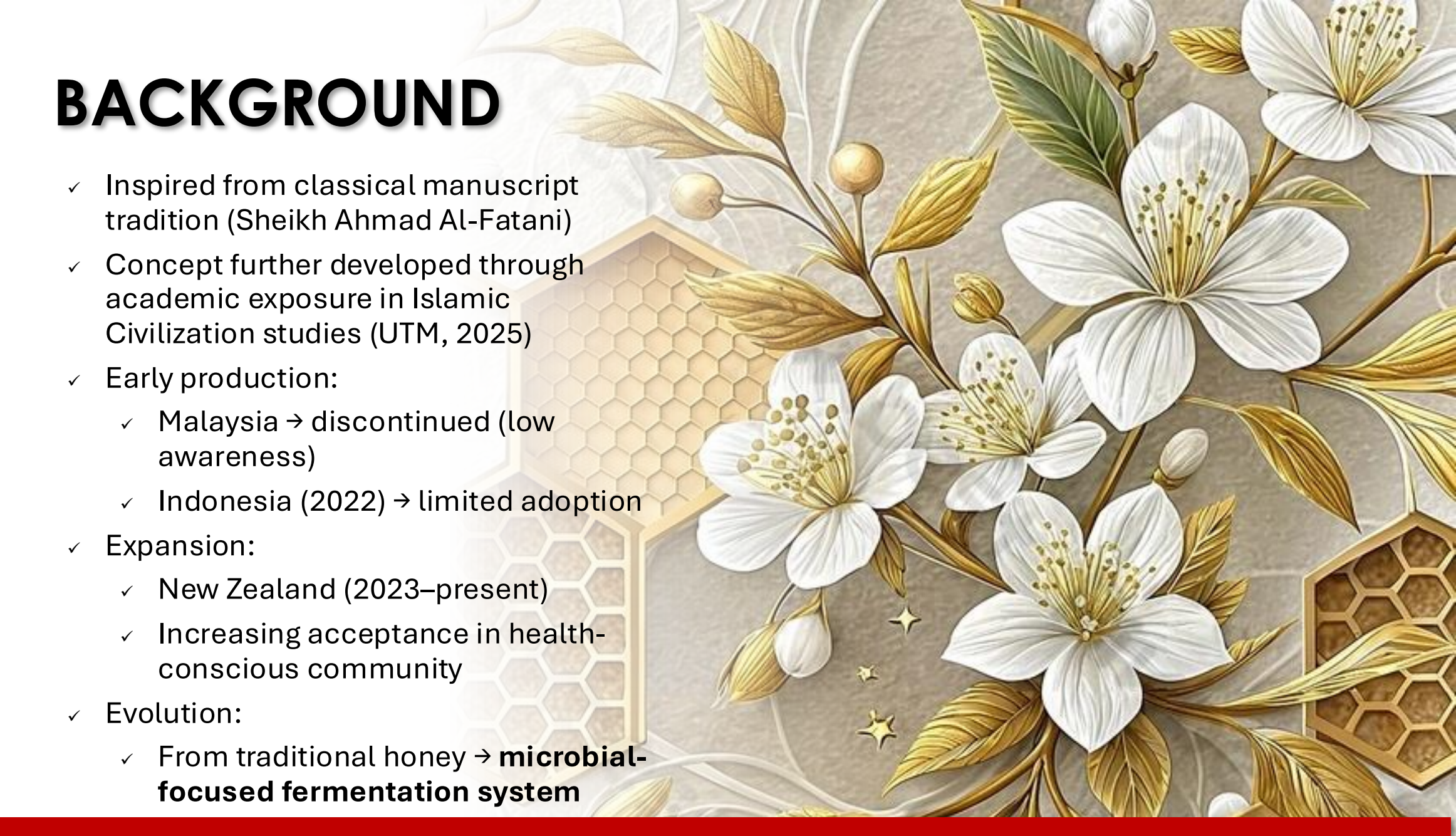
MICROBA

Controlled Fermentation Honey

- Living Biotech System
- Bridging Revelation, Microbiology & Functional Nutrition

BACKGROUND

- Inspired from classical manuscript tradition (Sheikh Ahmad Al-Fatani)
- Concept further developed through academic exposure in Islamic Civilization studies (UTM, 2025)
- Early production:
  - Malaysia → discontinued (low awareness)
  - Indonesia (2022) → limited adoption
- Expansion:
  - New Zealand (2023–present)
  - Increasing acceptance in health-conscious community
- Evolution:
  - From traditional honey → **microbial-focused fermentation system**



A living system designed to regulate cellular balance

THE CORE IDEA

✓ **Milk between blood and waste → Biological filtration system**

- Food undergoes:
  - Absorption → becomes nutrients (blood)
  - Elimination → becomes waste
- Key mechanism: 👉 Microorganisms (microbiome)

✓ **Scientific framing -** Gut microbiota regulates:

- Nutrient absorption
- Metabolism
- Detoxification

✓ **Beneficial microbes:**

- Convert food → bioavailable nutrients

✓ Harmful microbes:

- Produce toxins / inflammation

✓ 👉 **Microba principle:** "Quality of life depends on quality of microbes"

The difference is not the source — but the process

SCIENTIFIC BASIS I

- ✓Human body contains trillions of microbes (gut microbiome)
- ✓Microbes
- ✓Break down nutrients
- ✓Produce vitamins (B, K)
- ✓Support immunity
- ✓Supported by:
  - ✓ Human Microbiome Project (NIH)
  - ✓ Harvard Medical School research

🧬 **1. Microbiome & Human Health**

📎 **Gut microbiome overview (Nature / PNAS level)**

•https://www.nature.com/articles/nature05414

•https://www.pnas.org/doi/10.1073/pnas.1601035113

👉 Key point:

•Microbiome regulate metabolism, immunity, digestion

🧪 **2. Fermentation & Functional Food**

📎 **Fermented foods & health**

•https://www.sciencedirect.com/science/article/pii/S0958166917300053

•https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6723656/

👉 Key point:

•Fermentation produce bioactive compounds

•Improve bioavailability

•Increase antioxidant activity

🍯 **3. Honey & Antioxidant Activity**

📎 **Honey antioxidant studies**

•https://nutritionandmetabolism.biomedcentral.com/articles/10.1186/1743-7075-7-51

•https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5424551/

👉 Key point:

•Honey contains phenolic compounds

•Can reduce oxidative stress

It's not the honey. It's the microbiome.

SCIENTIFIC BASIS II

- ✓Human body contains trillions of microbes (gut microbiome)
- ✓Microbes:
- ✓Break down nutrients
- ✓Produce vitamins (B, K)
- ✓Support immunity
- ✓Supported by:
- ✓Human Microbiome Project (NIH)
- ✓Harvard Medical School research

🐝 **4. Bee Microbiome (VERY IMPORTANT for your concept)**

🧬 **Bee gut microbiota**

•https://www.pnas.org/doi/10.1073/pnas.1216068109

•https://www.nature.com/articles/nrmicro.2016.43

👉 Key point:

•Bees have specialized microbiome

•Microbes help transform nectar → honey

🫁 **5. ROS (**Reactive Oxygen Species**) & Cellular Antioxidant Activity (CAA)**

🧬 **ROS & oxidative stress**

•https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3614697/

🧬 **CAA assay explanation**

•https://pubs.acs.org/doi/10.1021/jf0715166

👉 Key point:

•ROS linked to disease

•Antioxidants neutralize ROS

•CAA = standard cellular antioxidant test

🧠 **6. Microbial Metabolites (Mechanism support)**

🧬 **SCFA & gut health**

•https://www.nature.com/articles/nri2451

👉 Key point:

•Microbes produce:

- short-chain fatty acids
- bioactive molecules

•Affect metabolism & immune system

The real activity happens at the microbial level

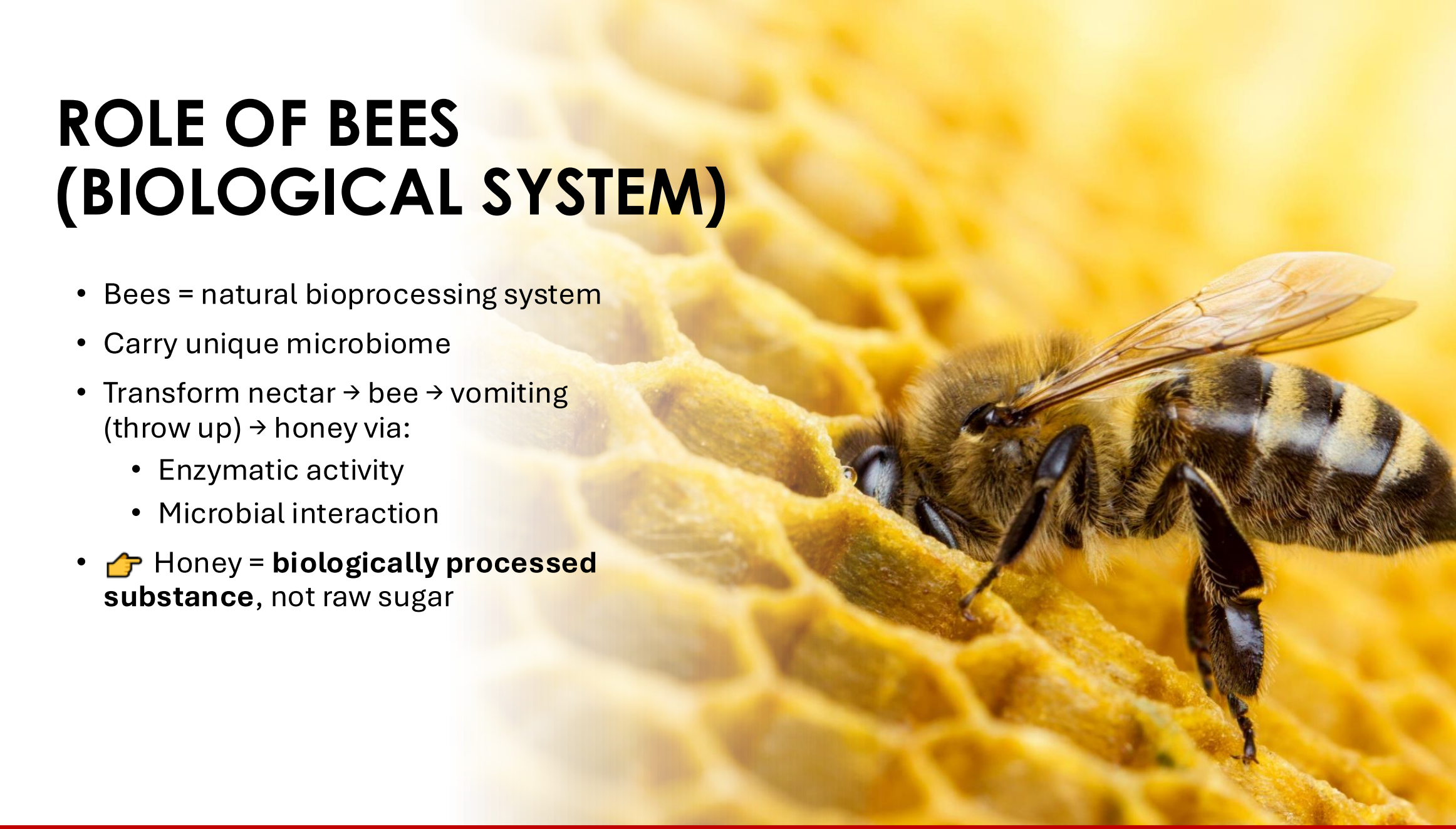
FERMENTATION PRINCIPLE

- Fermentation = microbial transformation
- Two outcomes:
  - Controlled → beneficial (probiotic, enzymes)
  - Uncontrolled → harmful (toxins, alcohol excess)
- 👉 Same raw material → different result
  👉 Depends on **process quality**

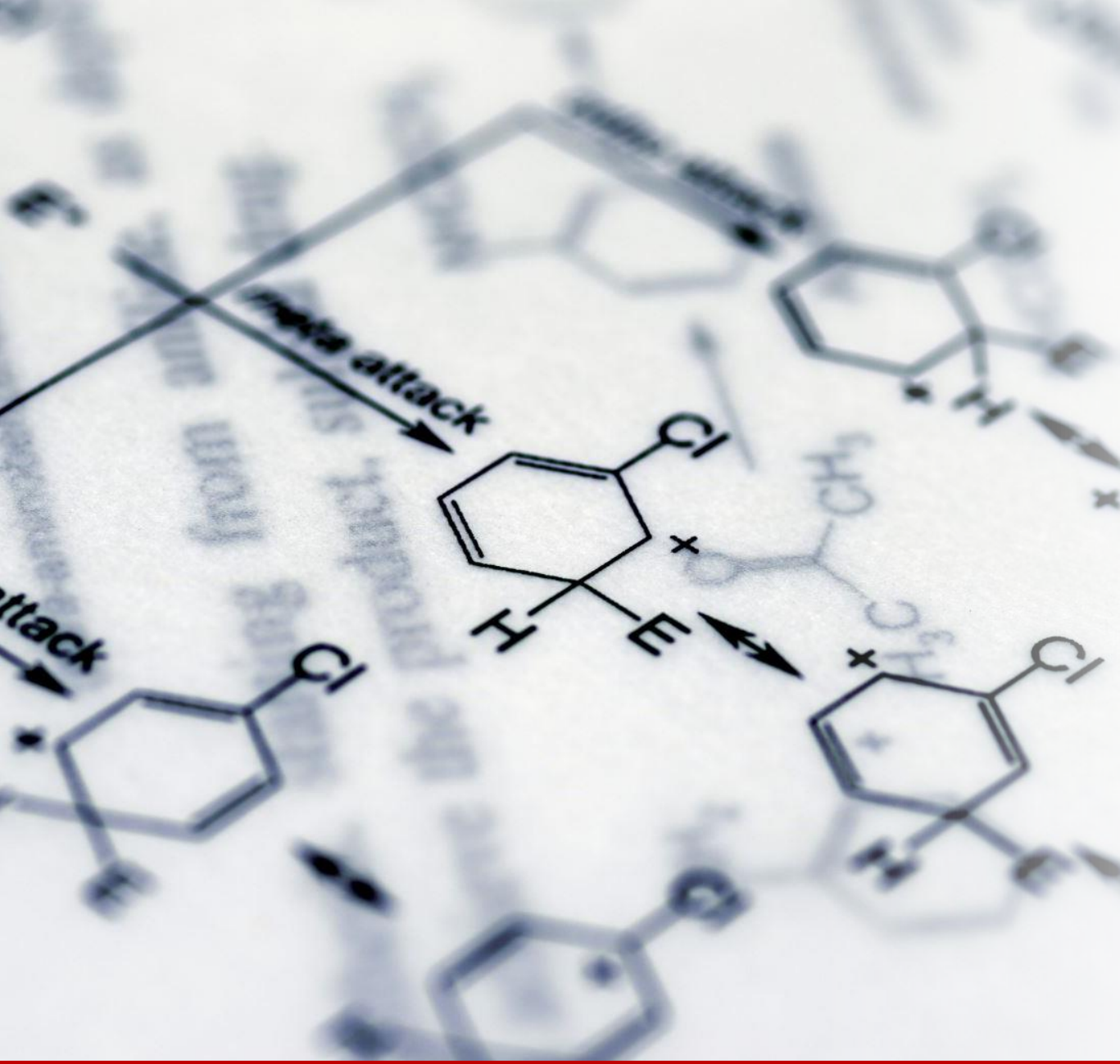
Not the substance. But the microbial transformation

ROLE OF BEES (BIOLOGICAL SYSTEM)

- Bees = natural bioprocessing system
- Carry unique microbiome
- Transform nectar → bee → vomiting (throw up) → honey via:
  - Enzymatic activity
  - Microbial interaction
- 👉 Honey = **biologically processed substance**, not raw sugar



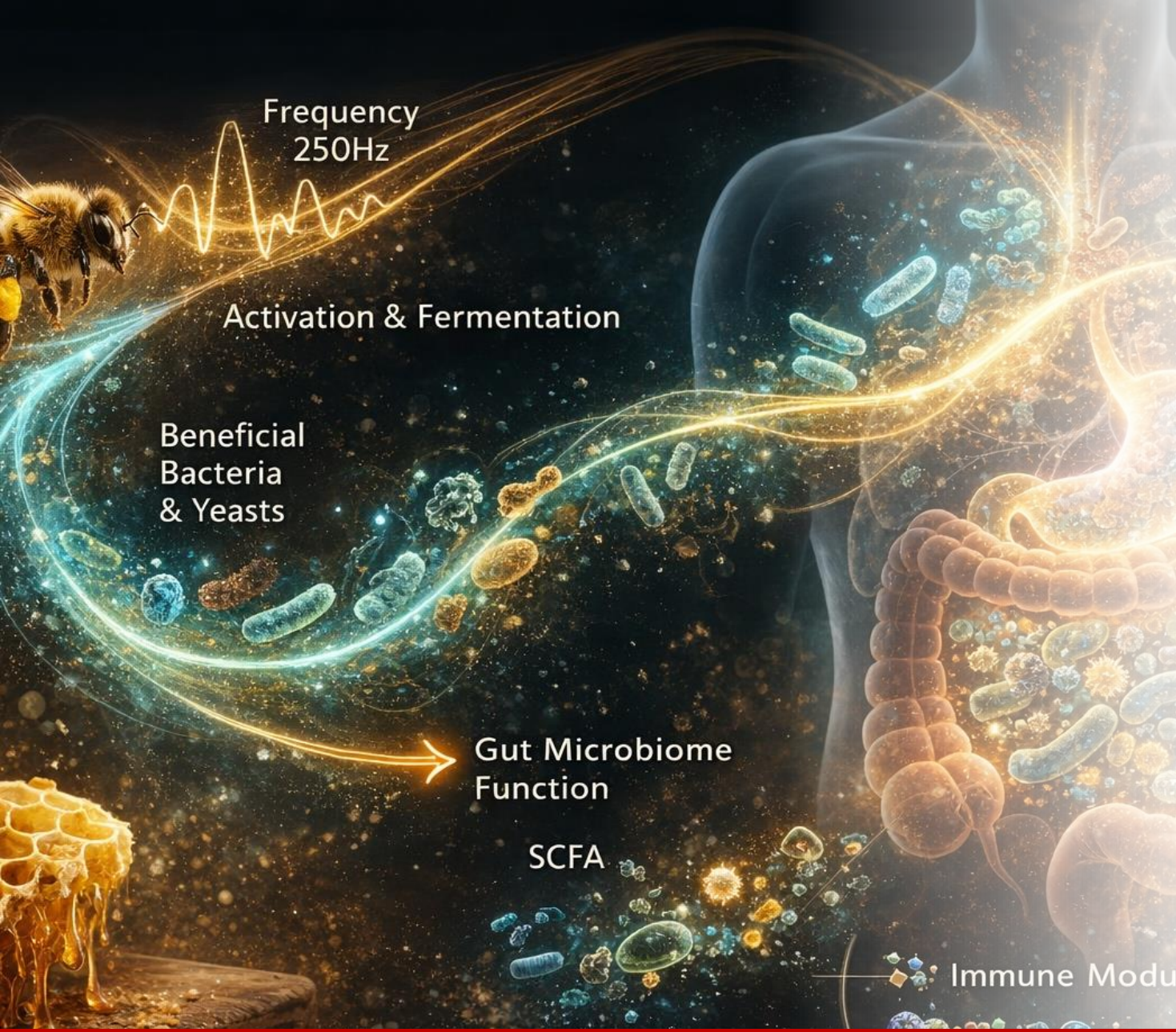
This is where transformation happens



MICROBA DIFFERENTIATION

- Controlled Fermentation System
- Activates beneficial microbes
- Enhances bioactive compounds
- 👉 From:
- Static honey
- 👉 To:
- **Active living system**

Not all processes create the same life



HEALTH RELEVANCE

- Supports gut microbiome balance
- Improves nutrient bioavailability
- Aligns with trend:
  - Organic nutrition
  - Functional food
  - Microbiome-based health
- Antioxidant
- Anti-inflammatory

This is where the difference begins

CASE FOR ACTION

- Rising distrust in chemical-based solutions
- Increasing demand for:
  - Natural
  - Organic
  - Microbial-based nutrition
- 👉 Microba = alternative approach
  👉 Science-aligned, nature-driven

The future of nutrition is not chemical — it is microbial

RESEARCH OPPORTUNITIES

Microbiome profiling	Fermentation optimization
Biochemical analysis	Clinical & functional studies
👉 Open for collaboration	Universities
Research labs	Independent scientists

Built on science. Open to the world.

MICROBIAL PRESENCE & COMPOSITION

🧪 1. Nutritional & Composition Profile

Energy: 30.4 kcal / 100g → Low energy density
Carbohydrates: 7.6 g / 100g → Primary energy source
Protein & Fat: 0 g → Non-protein, non-fat functional liquid
🍯 Sugar Profile (HPLC Analysis)
👉 Key Interpretation: Dominated by simple sugars (fructose & glucose)
Negligible sucrose & maltose → indicates Highly transformed / metabolized sugar system and Consistent with fermentation or enzymatic breakdown
🔥 Scientific Meaning: Suggests a bio-processed substrate, not raw sugar composition → aligns with microbial activity or enzymatic conversion

🫧 2. Microbial Content (Critical Scientific Evidence)

Aerobic Plate Count : 5.80×10^3 CFU/g
Yeast & Mould : 1.10×10^5 CFU/g
Coliform : Absent

🔍 3. Interpretation of Microbial Presence

✅ A. High Beneficial Microbial Load
Presence of Aerobic bacteria and Yeast populations (high)
👉 This strongly indicates: Active microbial ecosystem (fermentation-based system)

🦾 4. Scientific Positioning

🧬 This product is NOT:
Sterile liquid
Chemically isolated supplement
✅ This product is "A living or bio-active microbial system"

⚡ 5. Deep Scientific Meaning

🫧 High Yeast Count (10^5 CFU/g)
This is the strongest signal in the report.
👉 Indicates: Active fermentation, Biological transformation ongoing and Enzymatic activity present
🧪 Aerobic Plate Count (10^3 CFU/g)
👉 Suggests: Controlled microbial balance
Not excessive bacterial contamination
🦾 Combined Interpretation: The product behaves like a functional fermented bio-system

🔥 6. Strategic Scientific Narrative (VERY POWERFUL)

From a scientific + branding perspective:
💡 Microba can be positioned as:
"A bio-active fermented system rich in natural microbial communities that transform substrate into functional compounds."

⚖️ 7. Balance of Safety vs Activity

Microbial Activity : HIGH
Pathogen Risk : LOW (coliform absent)
Biochemical Transformation : Present

🧬 8. Integrated Scientific Meaning (Link with Anti-Oxidant & Anti-Inflammatory)

When combined with your previous SIRIM reports:
👉 Antioxidant → ROS inhibition
👉 Anti-inflammatory → NO inhibition
👉 Microbial presence → fermentation system
🔥 This creates a complete system narrative:
Microorganisms → produce bioactive compounds →
→ reduce oxidative stress →
→ modulate inflammation →
→ support cellular function

🚀 9. Premium Scientific Statement

"SIRIM analysis confirms that the system contains active microbial populations, including yeast and aerobic bacteria, with no harmful coliform contamination. This indicates a controlled, biologically active fermentation system capable of generating functional bioactive compounds."

💥 10. High-Level Conclusion

Microba is Microbially active, Biologically safe (tested) and Functionally relevant (linked to antioxidant & anti-inflammatory effects)

Where living microbes transform nature into measurable biological impact
- Aerobic Plate Count = 5.8 mil per gram

SCEINTIFIC ANTIOXIDENT VALIDATION

🔬 Test Framework

- Conducted by: **SIRIM Berhad – Industrial Biotechnology Research Centre**
- Method: **Cellular Antioxidant Activity (CAA) Assay**
- Model: **Human keratinocyte cells (HaCaT)**
- Stress Inducer: **tert-Butyl hydroperoxide (tBuOOH)**

📊 Key Scientific Findings

- **ROS Inhibition up to 61.7%**
- Strong correlation: **R^2 = 0.9802**
- **IC50: 11.4 ± 0.63%**
- Demonstrates **dose-dependent antioxidant response**

🧫 Cell Safety Profile

- No cytotoxicity observed (0.78% – 25%)
- Cell viability maintained:
  - **>85% (baseline)**
  - Up to **114.5% (enhanced viability)**

⚡ Scientific Interpretation

- Acts as **ROS scavenger at cellular level**
- Supports **oxidative stress regulation**
- Indicates presence of **bioactive fermentation compounds**


SIRIM Berhad
Industrial Biotechnology Research Centre, Building 19

TEST REPORT

REPORT NO: R0448/22/B/19/33 PAGE: 1 of 6


TEST REPORT

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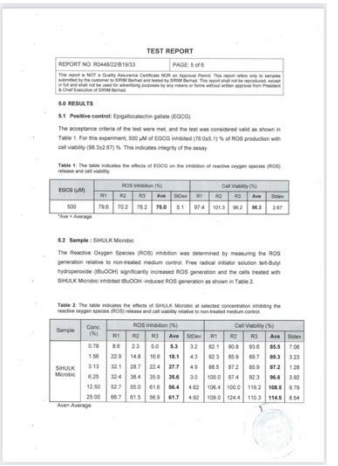
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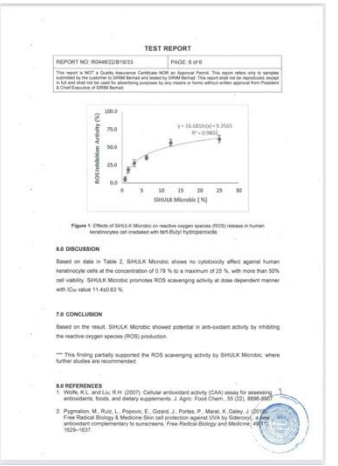
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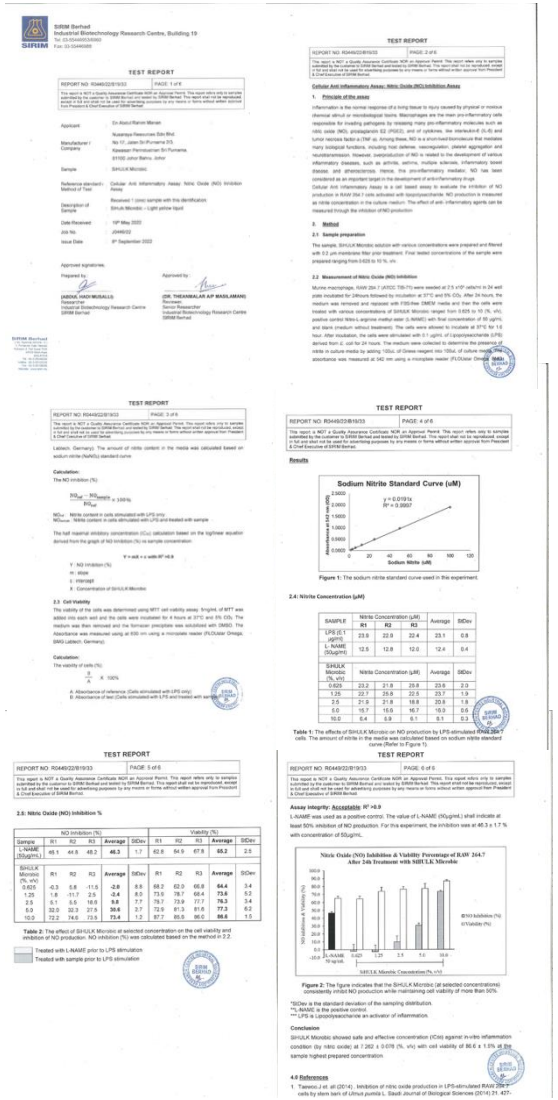
"Scientifically validated controlled fermentation system with measurable cellular antioxidant activity."

ANTI-INFLAMMATORY EVIDENCE



🧪 **1. Mechanism: Anti-Inflammatory Activity (Nitric Oxide Inhibition)**

Assay used: Cellular Anti-Inflammatory Assay (Nitric Oxide Inhibition)

Cell model: RAW 264.7 macrophage cells (immune cells)

Induced inflammation: Lipopolysaccharide (LPS) stimulation → simulates inflammatory response

👉 **Key Mechanism:**

- The product reduces the production of **Nitric Oxide (NO)**
- NO is a key mediator in inflammation

📌 **Interpretation:**

Microba functions as an **anti-inflammatory agent at the cellular level**

📊 2. Anti-Inflammatory Strength (Dose Response)

👉 **Key Insights:**

Clear **dose-dependent response** At 10% concentration → **73.4% inhibition (very strong)**

📌 **Benchmark (Positive Control):** L-NAME: **46.3% inhibition**

🔥 **Meaning:**

Microba (10%) **outperforms the standard control**, indicating **strong anti-inflammatory potential**

⚖️ 3. Safety Profile (Cell Viability)

👉 **Key Insights:**

No cytotoxic effects observed

Cell viability increases with concentration

📌 **Interpretation:**

The product is not only effective but also **maintains cellular health**

📉 **4. IC_{50} (Key Scientific Value)**

IC_{50}: ~7.26% (v/v)

👉 **Meaning: Only ~7% concentration is required to achieve:**

<u>50% anti-inflammatory effect</u>

🔥 **Scientific Significance: Indicates an efficient bioactive system at relatively low concentration**

📈 **5. Graph Interpretation (Key Scientific Insight)**

👉 **Observed Trend: NO inhibition increases with concentration Cell viability remains high (>50%)**

📌 **Interpretation: Microba demonstrates a dual-function biological profile:**

Suppresses inflammation

Preserves cellular integrity

🔥 **Scientific Importance:**

Many compounds are either: "Potent but toxic, Safe but weak"

👉 **Microba: Strong and safe simultaneously**

🧬 **6. Biological Significance (Deep Interpretation)**

Nitric Oxide (NO) plays a critical role in Inflammation, Immune signaling, Overproduction of NO is associated with diseases such as Arthritis, Asthma, Inflammatory Bowel Disease (IBD) and Atherosclerosis

👉 **Conclusion:**

Microba may function as a modulator of inflammatory pathways, suggesting potential applications in functional nutrition and therapeutic support

"Microba demonstrates a controlled bioactive response by reducing nitric oxide production in activated macrophages while preserving cellular viability — indicating a balanced anti-inflammatory system driven by fermentation-derived metabolites."

PHILOSOPHY

Microb Existence

Fermentation Process

Bee the Transporter

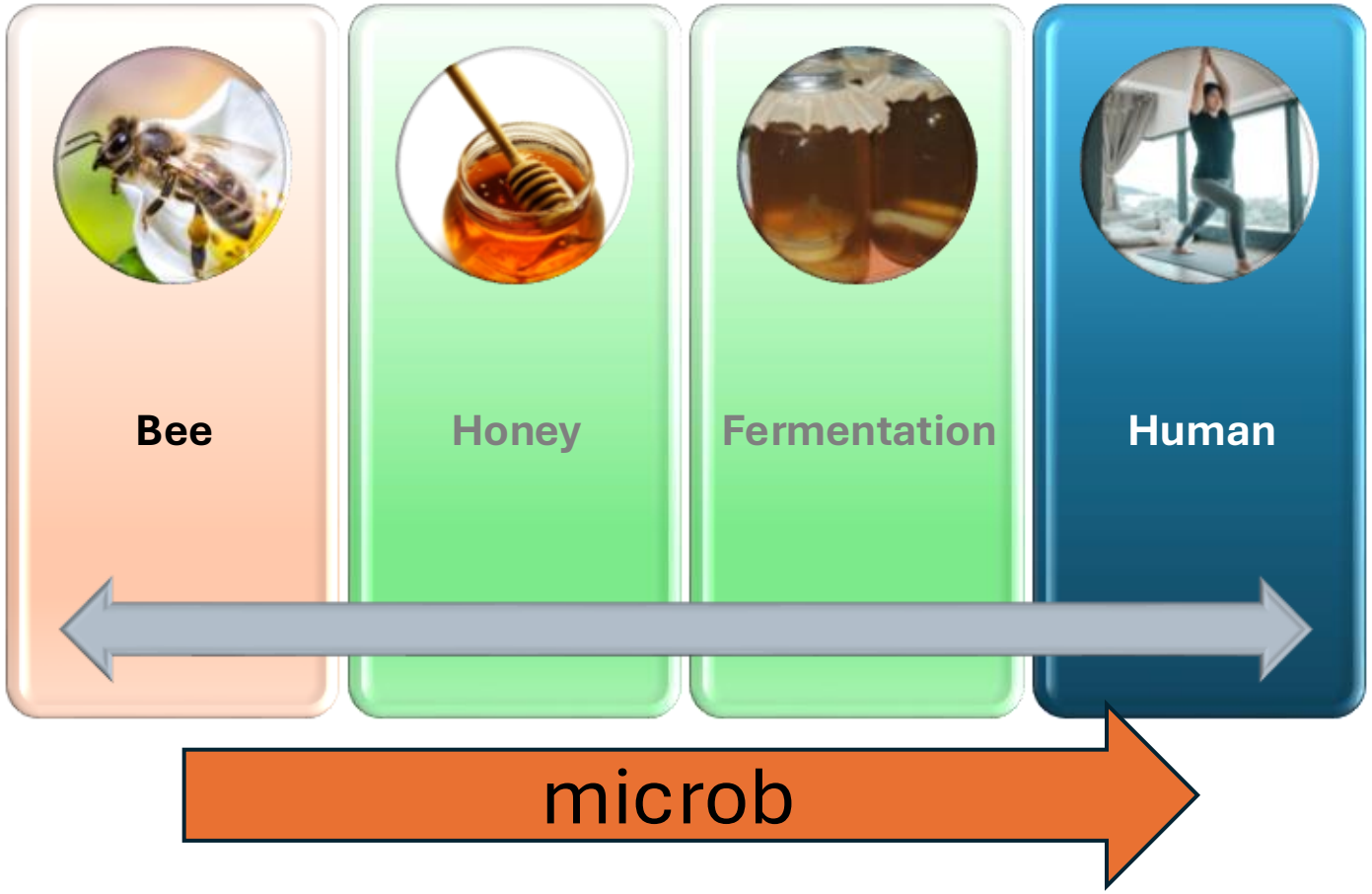
Frequency Transfer

- Life depends on Microbes, Process, Transporter, Balance
- 👉 Key principle: **“It’s not what you consume, but how it is processed.”**

Health is not consumption — it is conversion

CONCLUSION

- **Microba** =
  concept + application
- **Combines:**
  - Natural systems
  - Microbial science
  - Controlled fermentation
- 👉 A **living system approach to nutrition**



Engineering life's smallest systems for the biggest human impact.