

To forever secure the basis of microbial diversity to support health globally

THE PROBLEM

1. Microbial diversity is crucial for both human and planetary health.
2. Microbial diversity is globally threatened by westernization, urbanization, and environmental change proceeding at an unprecedented pace, resulting in risks and lost opportunities.
3. The Microbiota Vault preserves One Health by preserving microbial diversity.

THE SOLUTION

The Microbiota Vault initiative is establishing a backup biobank and databank in Switzerland for long-term preservation of microbial biodiversity that is critical for human and planetary health. Inspired by the Svalbard Global Seed Vault, we are constructing an institution for the safe storage and preservation of microbiota samples and collections from around the world. Samples are stored on behalf of local working collections for future resuscitation, culturing, and research. Data cataloguing the microbial genetic diversity stored in the Microbiota Vault are released to the world, to fuel fundamental research of global biodiversity.

APPROACH

A global ecosystem supporting One Health:

Collect. The Microbiota Vault closely interacts with local collections and research efforts all over the world.

Preserve. The Microbiota Vault acts on behalf of the local working collections, providing safe backup storage and a framework for data services and collaboration.

Disseminate. Provide interconnected and interoperable datasets for research, adhering to the fair principles of data access and to the principles of open science, while respecting the rights of specimen donors.

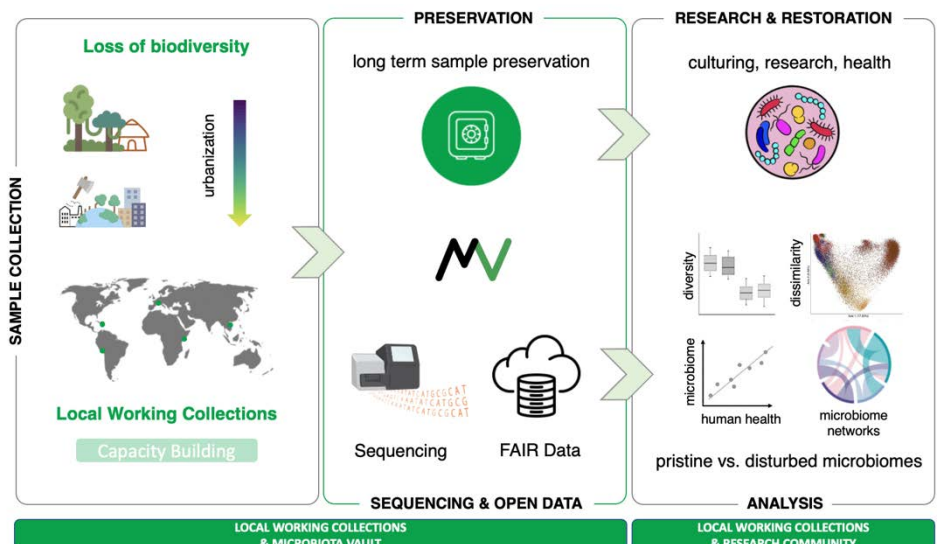
Enable. The Microbiota Vault empowers the research of the local working collections, helps set protocols and standards, preserves the biodiversity of microbiota, and allows future restoration of health.

Thus, the Microbiota Vault supports One Health.



RESEARCH ECOSYSTEM

We are establishing a holistic monitoring system allowing detailed insight into microbial biodiversity and genetic novelty on a global scale. Global monitoring occurs via partnerships with local experts in the Microbiota Vault network. Samples are collected across a range of systems (human, agricultural, environmental) to preserve the microbiome from natural systems where the microbiome is still fully intact. Multiple DNA sequencing and metabolomics technologies are used to catalogue the genetic and biosynthetic diversity of samples stored in the Microbiota Vault, which will be released publicly as a reference dataset with extremely high potential for open research re-use. In analogy to the Human Genome Project or Human Cell Atlas, the Microbiota Vault database will comprise a blueprint of the microbiota of humans, plants, animals, soils, and natural environments on a truly global scale, catalyzing future research, innovation, conservation, and restoration.



TEAM



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Launch Team

2021-2024 LAUNCH PHASE WITH VAULT SITE IN SWITZERLAND

Main funding:



Status: Ongoing collection and preservation of > 1300 human gut microbiota samples from local working collections located worldwide (Laos, Ethiopia, Peru, Switzerland) and > 200 fermented food samples of high cultural and nutritional value (Laos, Thailand, Switzerland).

Goal: Proof-of-concept for interaction with local collection efforts and biobanks, setup of vault sites using cryopreservation and lyophilization, development of collection, shipping and storage processes.

KEY PROGRESS

- 2019: Incorporation of a US 501(c)(3) non-profit Inc
- 2020: Completed and published a theoretical feasibility study
- 2021: Successfully fundraised sufficient funding for the Launch Phase
- 2022: Launch Phase formally initiated, with first samples arriving in the Microbiota Vault Q2 2023

KEY ANTICIPATED IMPACT

- Building a global repository of microbial genetic diversity relevant to human and planetary health.
- Accessibility of digital metagenomic data in an open access manner to accelerate research into and translation of microbiome science
- Local capacity building: enable local working collections to collect and store valuable microbial diversity in standardised manner

Now is the time to ensure the initiative can grow towards long-term sustainability

	Launch Phase	Growth Phase I
Type of vault	Research labs 	Dedicated repository
Timeframe	2021-2023	2024-2029
Estimated cost	(2 years)	(4-5 years)
Samples	3 established collections (ca. 2,000 samples)	20+ novel collections (>10,000 samples)
Financing	Foundations, Philanthropists	Foundations, Philanthropists, Governments

Biobanking

Infrastructure (e.g. bunker) & equipment, digital platform

One Health

Widening scope to environmental samples, storage protocols

LWCs, Capacity Building

Assisting LWC collection efforts, education, sequencing

Vault operations

Secretariate, legal, regulatory, outreach, fundraising