BIOME-Preserve Microbiome Collection Kit

A collection kit for culturing the microbiome

The BIOME-Preserve Microbiome Collection Kit preserves live microbiome samples for the growth and isolation of anaerobic and facultative anaerobic microorganisms. The product effectively preserves microorganisms under anaerobic conditions at room temperature for up to 5 days without substantial loss of viability. Samples may also be directly frozen in a BIOME-Preserve device for cryogenic storage.

Convenient and cost-effective recovery of live microbiome

The collection and culture of organisms from complex biological samples (e.g., stool) is difficult. Obligate anaerobic organisms are killed in the presence of atmospheric oxygen. Acidic and other metabolic byproducts can also kill microorganisms in the sample if growth continues after sample collection. The proliferation of some fast-growing organisms in a sample prevents the recovery of low abundance, fastidious or slow-growing organisms.

The BIOME-Preserve kit was developed as a practical, low cost and user-friendly system to collect, transport and preserve microbiome samples to culture the microorganisms within the sample. The proprietary and patent-pending collection device preserves the viability of microorganisms temporarily stored in the kit at room temperature for up to 5 days. The same collection medium and container can also be frozen to preserve organisms for future culture recovery.

Product information

Collection device: Stool collection tube with an integrated 1 mL collection scoop attached to the cap. Tube is clear polypropylene plastic filled with 12 mL of the BIOME-Preserve liquid medium.

Preservative: Liquid medium, pre-reduced and anaerobically dispensed into tubes. The medium is a non-nutritive phosphate buffer that contains mineral salts, oxygen scavengers, antioxidants and cryopreservatives.

Storage and shelf life: Product can be stored at room temperature or refrigerated. Avoid freezing prior to use. Once sample is collected, it may be frozen. Short-term exposure to higher temperatures, i.e., during shipping/mailing, will not affect product performance. The BIOME-Preserve kit should be used within 6 months from the date of manufacture. Microbiome samples, when collected prior to product expiration, may be preserved and stored at -80°C for extended periods beyond expiration. Collection tubes are individually packaged in foil pouches under anaerobic conditions.

Sample transport and storage: For optimal recovery, it is recommended to transport and process samples within 96 hours of sample collection. Longer transport times are possible, up to 5 days, with a lower rate of recovery. Samples are intended to be stored and transported at room temperature in a BIOME-Preserve device. Refrigerating the sample is not necessary but may help slow the potential growth or metabolism of organisms. Temporary freezing for the purposes of shipment is not recommended unless samples remain frozen until processing and users should avoid multiple freeze-thaw cycles. Samples may be frozen at -80°C for long-term storage. Check with local, state or provincial, or country regulations for labeling and packaging requirements for shipping stool samples.

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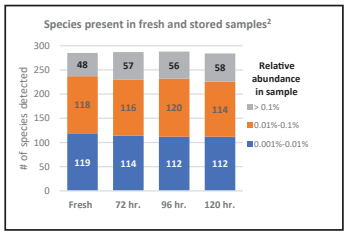
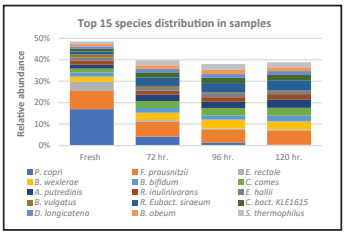
Case study: The recovery of culture from a stool sample held at various time points

Stool from a single donor was homogenized, added to a BIOME-Preserve device in an open-air environment that contains oxygen and stored for various time points. A subset of the tubes was frozen at -80°C for 7 days following storage. All conditions were set up in triplicate. Fresh homogenized stool, stool stored in a BIOME-Preserve device and stool stored in a BIOME-Preserve device then frozen were anaerobically cultured on a variety of solid agar media to compare species recovery. Bacterial growth was harvested and processed for shallow whole genome shotgun sequencing (with an average 4 million reads per sample). Operational taxonomic units (OTUs) identified at the species level following a filtering protocol were analyzed. Species with a relative abundance in harvested bacterial materials > 0.01% were considered successfully recovered.

Microbial diversity maintained in samples held in a BIOME-Preserve device

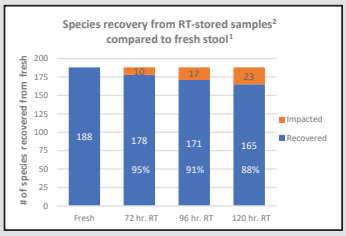
Stool sample population

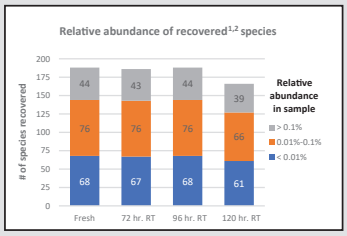




The BIOME-Preserve device maintains culturable diversity of room temperature held samples

Room temperature (RT) culture recovery

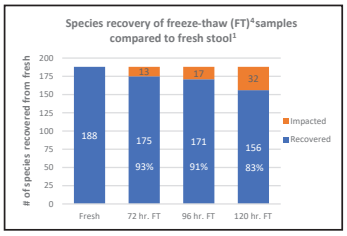


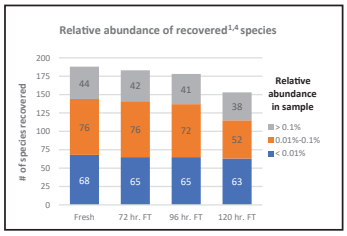


Impacted: Species with a > 10-fold (1-factor) drop in relative abundance in harvested cultured cells as compared to relative abundance in fresh stool culture

The BIOME-Preserve device maintains culturable diversity of samples following -80°C storage[4]

Freeze-thaw (FT) culture recovery





1 Fresh stool sample homogenized and processed for anaerobic culture as described in (3).
2 One gram homogenized stool from (1) added to a BIOME-Preserve device in an open-air environment that contains oxygen. Stored for specified time points at room temperature prior to anaerobic culture as described in (3).
3 Samples spread on a variety of agar media in triplicate, plates incubated anaerobically for 120 hours and bacterial matter from triplicate plates combined for sequencing. Cultivated bacteria were characterized by shallow WGS and analysis. Species detected in culture were considered recovered if > 0.01% relative abundance.
4 Stool stored in a BIOME-Preserve device at RT for specified time, frozen at -80°C for 7 days, then thawed and cultured inside anaerobic chamber as described in (3).

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Distributed by DNA Genotek Inc., 3000 - 500 Palladium Drive, Ottawa, ON K2V 1C2 Canada Tel.: 1-866-813-6354
Manufactured by Anaerobe Systems, 15906 Concord Circle, Morgan Hill, CA 95037 USA
 MK-2755 Issue 1/2024-03