iSWAB™- Microbiome

A snapshot of the microbiome from point of collection to processing

Microbial content and diversity within collected gut, rectal, vaginal, skin, oral, or soil samples can provide a wealth of clues about human and animal health. However, current microbiome collection methods subject the samples to harsh and stressful stabilization techniques such as freezing or harsh organic solvents. Both stabilization approaches have a high probability of altering the microbial representation in the sample, which could lead to misleading results and hinder proper modeling or data analysis.

1- Freezing: Requires well-monitored cold chain storage and transport - Cost associated with cold chain transport - Alters microbial representation from point of collection to processing - Limited to DNA analysis – Thawing sample requires pre-processing which affects DNA quality – Somewhat limits re-culturing of samples, therefore affecting proper modeling or data analysis.

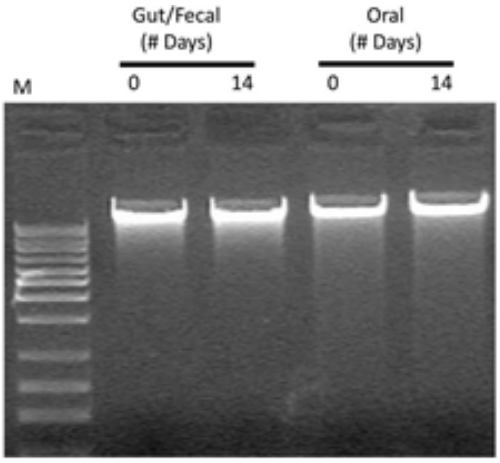
2- Organic solvents: Alters microbial representation from point of collection to processing - Limited to DNA and somewhat for RNA analysis - Limited sample shelf life – Re-culturing is not possible.

Mawi DNA Technologies extends its iSWAB technology into microbiome research. The iSWAB-Microbiome (MB) is a non-lytic technology that enables ambient collection and transport of various biosamples, while maintaining the status quo at the time of collection. iSWAB-MB provides a representative snapshot of the microbial community that remains unchanged from collection to processing of oral, gut/fecal, skin, vaginal, and soil samples. Purified DNA or RNA isolated from collected samples are compatible with qPCR, microarray, and NGS for microbiome research in health, wellness, and forensics.

Features

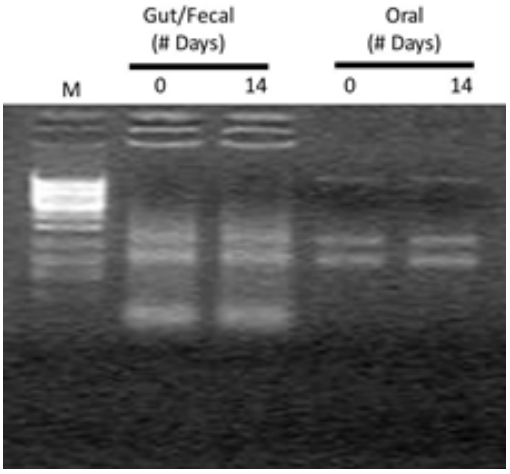
- Microbial presentation maintained intact and viable from time of collection up to 8 weeks (real time testing ongoing).
- Both aerobic and anaerobic bacterial communities stabilized from collection to processing
- Ambient temperature transport and storage with no cold chain involvement
- iSWAB-MB buffer allows selective isolation of bacterial DNA or RNA with minimal or no human genomic DNA contamination.
- No organic hazardous solvent fixatives or detergents.
- The microbial community within the sample will remain in stasis and can only be re-grown if removed from the iSWAB-MB environment and subjected to nutrient media supporting microbial growth.
- Purified DNA or RNA isolated from collected samples are compatible with qPCR, microarray and NGS based applications.
- Scalable and customizable platform capable of stabilizing up to 20g of fecal or soil material in standard collection containers.

Microbial DNA Profile from iSWAB-Microbiome



Purified microbial DNA from iSWAB-Microbiome oral or gut/fecal pooled samples were normalized to 50 ng of DNA/well and loaded on 1% agarose (M: 1KB DNA ladder)

Microbial RNA Profile from iSWAB-Microbiome



Purified microbial total RNA with RNeasy mini kit from iSWAB-Microbiome oral or gut/fecal pooled samples were normalized to 20 ng/well and analyzed by gel electrophoresis (M: 1KB DNA ladder)

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iSWAB™- Microbiome

A snapshot of the microbiome from point of collection to processing

Oral Microbiome

- Six subjects collected oral iSWAB-Microbiome samples per kit instructions.
- Four buccal swabs were collected and their contents released into iSWAB-Microbiome vial as per kit instructions.
- Samples were subjected to actual shipment conditions, by shipping them at room temperature from Hayward, CA to Rockville, MD via FedEx one rate service (3 business days service).
- 6x iSWAB-Microbiome samples were pooled into one 10 mL sample for real time stability studies.
- At each time point three aliquots from each sample was processed as follows:
  1. 50 µL from the iSWAB-Microbiome sample was added to 150 µL PBS to make the total volume 200 µL, then followed by the Mobio Power Soil RNA kit.
  2. 50 µL from the iSWAB-Microbiome sample was added to 150 µL PBS to make the total volume 200 µL, then followed by the Mobio Power Soil DNA kit.
  3. 10 µL from the iSWAB-Microbiome sample was added to 90 µL PBS to make the total volume 100 µL, then followed by spreading the 100 µL on a blood agar enrichment media. The plates where incubated at 37°C overnight; the next day all colonies were counted manually.

Days (#)	Oral bacteria count/ 1 mL iSWAB	DNA Yield (µg)	RNA Yield (µg)	A260/280	A260/230
0	0.9×10^6	5.5	2	1.85	1.8
4*	0.89×10^6	5.9	1.85	1.87	1.76
7	0.91×10^6	5.6	1.9	1.95	2.0
10	0.95×10^6	5.55	1.95	1.89	1.87
14	0.83×10^6	5.8	1.83	1.85	1.65
20	0.93×10^6	5.85	1.7	1.81	1.8
21	0.96×10^6	6	1.73	1.85	1.9
30	0.89×10^6	5.7	1.9	1.79	1.92

* Post Shipping

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iSWAB™- Microbiome

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Gut/Fecal Microbiome

- Six subjects collected fecal iSWAB-Microbiome samples per kit instructions
- Two swabs were collected and their contents released into iSWAB-Microbiome vial as per kit instructions
- Samples were subjected to actual shipment conditions by shipping them at room temperature from Hayward, CA to Rockville, MD via FedEx one rate service (3 business days service)
- Six iSWAB-Microbiome samples were pooled into one 10 mL sample for real-time stability studies
- At each time point three aliquots from each sample were processed as follows:
  1. 50 µL from the iSWAB-Microbiome sample was added to 150 µL PBS to make the total volume 200 µL, then followed by the Mobio Power Soil RNA kit
  2. 50 µL from the iSWAB-Microbiome sample was added to 150 µL PBS to make the total volume 200 µL, then followed by the Mobio Power Soil DNA kit
  3. 10 µL from the iSWAB-Microbiome sample was added to 90 µL PBS to make the total volume 100 µL, then followed by spreading the 100 µL MacConkey agar. The plates were incubated at 37°C overnight; the next day pink color colonies were counted manually.

Gut/Fecal Dry Weight From Pooled iSWAB-Microbiome: 200 mg

Days (#)	Gut/Fecal coli count/ 1 mL iSWAB	DNA Yield (µg)	RNA Yield (µg)	A260/280	A260/230
0	3×10^6	7.5	5	2.01	2.1
4*	3.02×10^6	6.9	4.85	1.65	2.05
7	2.99×10^6	7.6	4.9	1.95	2
10	2.85×10^6	6.55	4.95	1.99	1.55
14	3×10^6	6.8	4.83	1.6	1.65
20	2.93×10^6	6.85	4.7	1.7	1.8
21	2.96×10^6	7.0	4.73	1.83	1.95
30	2.89×10^6	6.7	4.9	1.56	1.69

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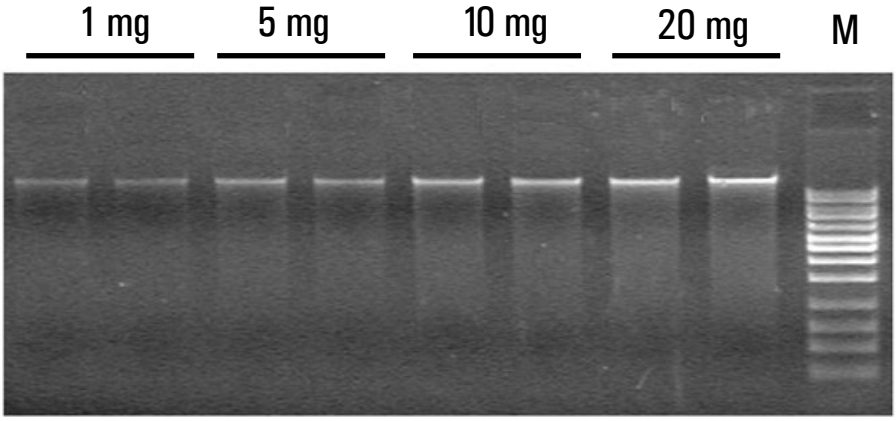
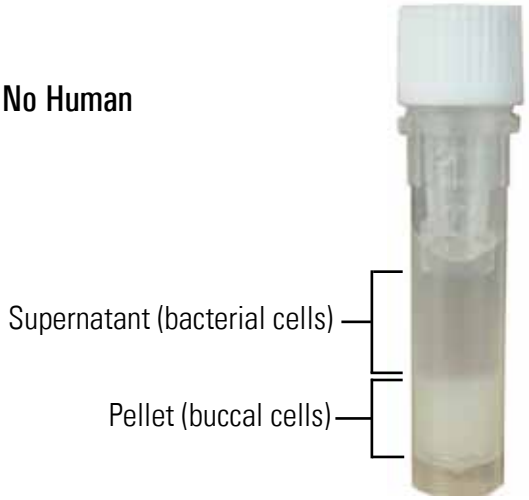
Microbial DNA Profile From Fecal Material Collected With iSWAB-Microbiome



Purified microbial DNA profile from iSWAB-Microbiome from fecal material of different sizes, collected and stored at room temperature (M: 1KB DNA ladder). The samples were processed 3 days post collection and analyzed by gel electrophoresis.

iSWAB-MB appearance
12 hrs post collection



Selective Isolation of Microbial DNA or RNA with Minimal or No Human Genomic DNA Contamination

- 4 swabs were collected from different sides of the mouth
- Collected material from the swabs was released into the iSWAB-Microbiome device per collection instructions
- Collection device was left at room temperature overnight (12 hours)

Customization Options

- iSWAB-Microbiome can be customized with larger or smaller collection devices, depending on your sample size requirements
- Other customization options include labeling, kit contents, or barcodes

Part No.	Product	Collection Volume
ISWAB-MB-1200	iSWAB-Microbiome Collection Kit, 1.0mL	1.0mL
ISM-T-1200-R	iSWAB-Microbiome Collection Tube Rack, 1.0mL x 50	1.0mL

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