Microsynth

Sample Preparation and Shipment Guide for Nucleic Acid Isolation at Microsynth

Please follow the guidelines below to ensure successful sample preparation and shipment:

- **Use only the specified buffers:** Using other buffers might interfere with the isolation process.
- **Homogenize and select carefully:** Thoroughly homogenize your sample (e.g. microbiome analysis). For tissue samples, select a representative region and aliquot the amount listed.
- **Additional services available:** We offer subsampling, specialized handling, method development, and more at an additional cost.
- **Sample biosafety:** We accept samples at biosafety level 1 and level 2. Please consult your local biosafety officer for shipping conditions. Make sure to check the appropriate box for biosafety level and indicate any environmental or human hazard. For more details, please refer to regulatory documents here:
  https://www.efbs.admin.ch/en/topics/transport/regulatory-documents
- **Please use only the specified labware for sample submissions.** Using other labware, such as cryotubes or snap-cap tubes instead of screw-cap tubes, will result in subsampling at Microsynth for an additional fee. The geometry of non-specified labware is incompatible with crucial processing equipment, such as bead beaters and liquid handlers, and most importantly obstructs accurate visual monitoring during sample processing. Ensuring precise sample handling and monitoring is an essential part of our commitment to delivering high-quality results for our customers.

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DNA: Metagenomics

When preparing DNA samples for metagenomic analysis, we require the use of 2 mL skirted screw cap tubes unless otherwise specified. Using other tubes or containers results in additional handling, and a subsampling fee will be applied. Our goal is to ensure your samples arrive in optimal condition for analysis.

Faeces

Refer to the table below to determine the correct shipping method for your sample type.

Applicable for: #20005

Species	Raw Feces Send on Dry Ice	Sample Mixed with Preservation Buffer Send at Ambient Temperature	
		Stool Preservation (1)	DNA/RNA Shield (2)
Mouse	25 – 100 mg (4-10 mouse fecal pellets)	250 µL	750 µL
Rat	50 – 150 mg (1 rat fecal pellet weighs about 100 – 300 mg. If the pellet is big, only submit one half)	250 µL	750 µL
Human	100 – 200 mg	250 µL	750 µL
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube for the requested amount			
Mouse, rat, human	1 – 2 g	1 – 2 mL or whole stool preservation tube	

(1) NorgenBiotek Fecal DNA collection and preservation tubes or DNAGenotek OMNIgene gut: follow manufacturer's instructions.

(2) ZymoResearch #R1100, follow manufacturer's instructions.

Microsynth tip: To maintain sample integrity, avoid urine contamination of collected feces samples.

Soil, Biofilm & Water

Refer to the table below to determine the correct shipping method for your sample type.

Applicable for: #20005

Sample Type	No Buffer Send on Dry Ice	Send at Ambient Temperature	
		Dried (e.g. with desiccant silica gel)	Sample Mixed with DNA/ RNA Shield (1)
Earthy soil (2)	150 - 250 mg	150 – 200 mg	750 µL
Mixed cell cultures, biofilms, sludge (3)	5 – 25 mg wet weight	n.a.	750 µL
Water or any filtered liquid	1 filter of 2 cm2 (4)	n.a.	750 µL (make sure filter is submerged completely (4))
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube for the requested amount			
Soil	1 – 10 g in a 2 – 15 mL tube	1 – 10 g, dried with desiccant silica gel	
Sandy Soil	5 – 10 g in a 10 – 50 mL tube	n.a.	
Water	5 – 50 mL in a 10 – 50 mL tube	n.a.	

(1) ZymoResearch #R1100, follow manufacturer's instructions.

(2) This includes forest soil and garden soil. Optimal for normal garden or forest soil (low loam, peat, silt fraction). Soil with a high amount of inorganic material (clay, high silt, sand) will result in low DNA concentrations and will be processed only on customers risk.

(3) If the biofilm is adhering to a substrate, scrape off the biomass or transfer a piece of the matrix (up to 0.5 x 1.2 cm) into a 2 mL skirted screw cap tube. The matrix must move freely inside the tube.

(4) Place filters with microbe containing side facing inwards (the bottom of the filter sticks to the wall of the tube) or cut the filters into small pieces which will float freely after buffer addition.

Microsynth tip: For best results, the microbiome part must be dominant in your sample (e.g. less than 10% host- or non-microbiome DNA). While the listed matrices have been tested for reliability, please keep in mind that certain treatments—such as autoclaving, antibiotic treatment, or radiation - can significantly reduce the presence of the analyte.

For sample types not covered in this guide — such as cheese, lichen, special soil — please contact your sales representative for assistance.

DNA: Illumina Whole Genome and Resequencing, PCR, qPCR, dPCR

For ready-to-process samples, we require the use of 2 mL skirted screw cap tubes, if not mentioned differently. Using other tubes or containers results in additional handling, and a subsampling fee will be applied.

Bacterial, Yeast, and Eukaryotic Cell Pellets

Collect the necessary number of cells. After collection, wash the cell pellet twice in an appropriate buffer, such as PBS or Tris-HCl, before shipping.

	No Preservation Buffer Send on Dry Ice	**In 1mL 70 – 90% Ethanol Send at Ambient Temperature**
Single strain bacterial cell pellet	$0.5 \times 10^8 – 3 \times 10^9$ cells	
Eukaryotic cell line pellet	$1 – 5 \times 10^6$ cells	
Yeast cell pellet	$5 \times 10^7 – 2 \times 10^8$ cells	
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube		
	Standard grade shipment: send on dry ice	No eco shipment available
Bacteria, eukaryotic cells or yeast	Pellet size deviating from above specifications or cryopreservation buffer or growth medium	n.a.

Microsynth tip: If cell counting is not feasible, please submit a pellet weighing 10–30 mg (wet weight), which is approximately equivalent to 8–10 mL of an early stationary phase bacterial culture. Alternatively, a clearly visible pellet around 4 mm in diameter in a 2 mL tube is also acceptable.

Cells: Buccal Swabs

For dry ice and ethanol shipment: Position the swab head facing down into a 2.0 mL tube and trim the handle so that the swab head can move freely within the tube.
For dried shipment: use an air permeable container, such as a paper envelope or small cardboard box.

Single species	**No Preservation Buffer Send on Dry Ice**	**Send at Ambient Temperature**	
		Dried	**In 1mL 70 – 90% Ethanol**
	1 swab-head		

Insects

Collect the required quantity of insects, ensuring they are no longer viable and prepare them for shipment under the conditions specified below. For larger insects or for those with a high microbiome load (e.g. cockroaches), please dissect and submit an appropriate part, such as the legs.

Single Species	**No Preservation Buffer Send on Dry Ice**	**Send at Ambient Temperature**	
	Native State (Dead)	**Lyophilized / Dried**	**In 1mL 70 – 90% Ethanol**
Small (< 10 mm)	Small insects: as many as necessary to reach ca. 300 µL volume Insects > 5 mm —> ca. 3-5 individuals		
Big (10 – 20 mm)	2 – 3 legs / tube or a piece of ca. 0.5 – 1 cm. The selected piece must contain muscle cells.		
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube			
	No Preservation Buffer Send on Dry Ice	**Send at Ambient Temperature**	
	Native State (Dead)	**Lyophilized / Dried**	**In 1mL 70 – 90% Ethanol**
	e.g. non-dissected large insects		

Vertebrate Tissue

Important: Cut tissue samples into pieces no larger than 0.5 cm in any dimension. Larger pieces may inhibit the preservation buffer from penetrating the tissue quickly, leading to DNA degradation. Ensure the sample is completely submerged in the preservation buffer.
As a reference, a 3 mm cube (27 mm^3) of most tissues typically weighs around 30 – 35 mg.

- Ear punch
- Embryo
- Fish fin
- Heart
- Kidney
- Liver
- Lung
- Mouse tail tip (1.2 cm)
- Muscle
- Rat tail tip (0.6 cm)
- Spleen
- Thymus
- Tissue homogenate (mixed tissue)

Not suitable for:
reptile skin

Single Species	**No Preservation Buffer Send on Dry Ice**	**Send at Ambient Temperature**	
		In 0.5 mL DNA/RNA Shield (1)	**In 1 mL 70 – 90% ethanol**
Any soft tissue listed above	20 – 50 mg		
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube			
	No Preservation Buffer Send on Dry Ice	**Send at Ambient Temperature**	
		In 0.5 mL DNA/RNA Shield (1)	**In 1 mL 70 – 90% ethanol**
Any soft tissue listed above	Large tissue pieces in any suitable tube / container		

(1) ZymoResearch #R1100, follow manufacturer's instructions.

Whole Blood

Single Species	**EDTA Whole Blood, Store Refrigerated < 4° Send on Cold Packs or Dry Ice.**	**EDTA Whole Blood Send at Ambient Temperature**
Non-nucleated blood	100 µL in 1.5 or 2 mL tube	
Nucleated blood (e.g. birds, fish, frogs)	10 µL in 1.5 or 2 mL tube	
Subsampling (at surcharge, #20042): EDTA Whole Blood Tube		
	EDTA Tubes, Store refrigerated < 4° Send on Cold Packs or Dry Ice within 5 Days After Collection	**EDTA whole blood Send at Ambient Temperature within 3 Days After Collection**
Non-nucleated or nucleated blood	1 EDTA whole blood tube	

Example EDTA tubes: *BD Sciences, catalog # 366450*

If the blood was frozen after collection, ship on dry ice. To ensure sample quality, the time from collection to DNA isolation must not exceed:

- **5 days** when stored at 4°C
- **3 days** when stored at ambient temperature

DNA: High Molecular Weight DNA, Long-read Sequencing

Bacteria

Applicable for: #3271

We accept bacteria pellets from pure liquid cultures for most species. However, the following genera are not accepted (please contact your sales representative for a specialized offer):

- Mycobacteria
- Staphylococcus

Ensure that the bacteria have fully synthesized genomes; cultures in the mid-log to early stationary phase are ideal. Please avoid submitting colonies scraped directly from agar plates, as this is not recommended.

Instructions

1. Collect at least **4 x 10^9 cells**, or up to 10 ml of culture, if cell counts are unavailable.
   - An optimal **pellet weight** is **20 – 40 mg** (wet weight), with a maximum pellet weight of 50 mg.
2. Pellet the cells by centrifugation, discard supernatant, and wash the pellet twice with an appropriate buffer (e.g. PBS, Tris-HCl)

No Preservation Buffer Send on Dry Ice	**Send at Ambient Temperature**
Transfer Pellet to a 2 mL Snap-cap or Screw Cap Tube	**Resuspend Pellet in 1 mL NAP-buffer (1) and Transfer to a 2 mL Snap-cap or Screw Cap Tube**
20 – 40 mg pellet weight	

(1) Nucleic Acid Preservation (NAP) Buffer (#MBD0054) from Sigma-Aldrich or purchased at Microsynth. To maintain sample integrity, avoid shipment over weekends and ensure samples arrive at Microsynth within 3 days of shipment.

Plants

Tips for best results:

1. **Dark-treat your plants** for at least 48 hours prior to sampling.
2. Prefer **young leaves** (up to 1cm length). If necessary, collect leaves from multiple plants and combine them into a single sample
3. **Freshly pick the leaves** and immediately flash freeze them in liquid nitrogen to preserve quality.

No Preservation Buffer **Send on Dry Ice** **Transfer Pellet to a Suitable Tube**
1 – 3 g

mRNA: Any Analysis

Maintaining high RNA quality is essential for successful analyses. To minimize the risk of degradation or contamination, please follow this guide carefully:

- **Avoid freeze-thaw cycles**, as they can compromise RNA integrity.
- If your sample is rich in RNases, consider adding **1% beta-mercaptoethanol** to lytic buffers (DNA/RNA Shield, RLT plus).
- Follow the manufacturer's instructions for buffer volumes precisely. Avoid using more buffer than necessary; typically, 300 – 600 µL is sufficient.

For sample types not covered in this guide — such as bone, adipose tissue, very low cell numbers, special preservation buffers, plants, insects, or prokaryotic pathogens inside tissue— please contact your sales representative for assistance.

Accepted tubes
Use 2 mL skirted screw cap tubes, unless specified otherwise. Using other tubes or containers results in additional handling, and a subsampling fee will be applied.

Cells: Eukaryotic Cells

Applicable for: #20011

Please ship your samples in **2 mL barcoded snap-cap or screw-cap tubes or deep-well plates**. For submission of more than 24 samples, you may use a 96-well deep well plate.
Important: When using a 96-well plate, fill the wells column by column. Improperly filled plates will incur additional handling fees.

Single Species	No Preservation Buffer Send on Dry Ice	Send at Ambient Temperature	
		ZymoResearch DNA/RNA Shield (1)	Qiagen RLT plus do not use RLT buffer (2)
High yield cells COS, HUV-EC-C	0.5 * 10^6 – 3 * 10^6 cells		
Medium yield cells HeLa, LMH, Huh, HEK 293, THP1	1 * 10^6 – 5 * 10^6 cells		
Low yield cells NIH, 3T3, PBMC, U-266, primary cells	3 * 10^6 – 5 * 10^6 cells		

(1) ZymoResearch #R1100, follow manufacturer's instructions.

(2) Qiagen #1053393, follow manufacturer's instructions.

Microsynth tip: If your cell line is not listed, check literature to estimate RNA yield.

Cells: Bacteria and Yeast

Applicable for: #20013, #20014

Some bacteria and yeast may remain viable and alter transcription, particularly when using non-lytic preservation buffers. To ensure optimal results, consult relevant literature to confirm the chosen buffer is suitable for your sample type.

Ship your samples in **2 mL barcoded snap-cap or screw-cap tubes.**

Single Species	No Preservation Buffer Send on Dry Ice	Send at Ambient Temperature	
		ZymoResearch DNA/RNA Shield (1)	Qiagen RLT plus do not use RLT buffer (2)
Bacteria	1 * 10^8 up to 2 * 10^9 cells		
Yeast	5 * 10^7 – 2 * 10^8		

(1) ZymoResearch #R1100, follow manufacturer's instructions.

(2) Qiagen #1053393, follow manufacturer's instructions.

If your cells can not be counted, submit 5 – 20 mg pellet.

Important: Please indicate any conditions that might impact RNA content (e.g. rifamycin treatment) in the comments when submitting your order. Incomplete information, incorrect cell numbers, or inaccurate buffer volumes may result in reduced RNA quality and quantity.

Tissue

Applicable for: #20012

Single Species	No Preservation Buffer Send on Dry Ice	Send at Ambient Temperature	
		ZymoResearch DNA/RNA Shield (1)	Qiagen RLT plus (#1053393) do not use RLT buffer (2)
High yield tissue Spleen, Liver, Thymus	10 – 25 mg		
Low yield tissue Brain, Heart, Muscle, Lung, Kidney, Embryo, Ovary	20 – 40 mg		
Subsampling (at surcharge, #20042 / 20043 / 20044): use any suitable tube. Other than the listed buffers are accepted at surcharge.			
	No Preservation Buffer Send on Dry Ice	**Send at Ambient Temperature**	
		ZymoResearch DNA/RNA Shield	**Qiagen RLT plus (#1053393) do not use RLT buffer**
Any soft tissue listed above	Large tissue pieces in any suitable tube / container		

(1) ZymoResearch #R1100, follow manufacturer's instructions.

(2) Qiagen #1053393, follow manufacturer's instructions.

Important: Cut tissue samples into pieces no larger than 0.5 cm in any dimension. Larger pieces may slow the diffusion of preservation buffer into the interior, leading to RNA degradation. Ensure that the entire sample is fully submerged in the preservation buffer.
As a reference, a 3 mm cube (27 mm^3) of most tissues typically weighs around 30 – 35 mg.

Sample Shipment and Order Form Completion

To ensure smooth processing, please follow these guidelines when preparing and shipping your samples:

Containers
Ship your samples in the containers specified in this guide to avoid delays or additional fees.

Duplicates
Whenever possible, provide duplicate samples. Be sure to check the "Backup" box during registration for duplicates. Backup samples are used for an additional free-of charge isolation in the unlikely event of technical failure.

Sample Registration
- Register in Webshop https://shop.microsynth.com/, providing all required information, including exact species, cell line (if applicable), and preservation buffer used.
- Send your samples along with the order printout, ensuring they meet the specified conditions to Microsynth AG.

Labels / Barcodes
- Each sample container needs a **unique barcode**. For backup samples, a separate barcode is needed.
- For shipments with **24 samples or more**, barcoded tubes are mandatory. To request barcodes, please email us at isolation.support@microsynth.ch with the subject line "Barcodes". Include the following:
  - Quantity of barcodes required, (1 barcode per plate, tube, or container)
  - Your project quotation number
  - The complete destination address.

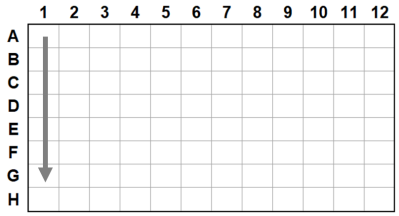
Labeling Guidelines
- The provided barcode labels are suitable for tubes and other hard surfaces. If using on soft surfaces (e.g. plastic bags), ensure the material will not be frozen, as freezing can cause labels to detach.
- Labels may not adhere properly to wet, iced, oily, or dusty surfaces. Apply labels to **dry and clean surfaces**.
  - **Tip:** For frozen tubes, wipe the surface with a tissue soaked in ethanol, followed by a dry tissue, to create a short window for label application.
- Avoid wrapping tubes in tape or parafilm.
- Place barcodes horizontally near the lower end of the tube. Do not apply barcodes vertically.

Plates

When specified, 96-well deep-well plates may be used. Fill plates column by column, starting with column 1 (see arrow).

Important:

- Sticky plastic or aluminium foils may not adequately contain liquid samples. To ensure sampel integrity:
  - Ship frozen samples on dry ice
  - Use heat-sealed foil for plates, ensuring it can be easily removed in the lab. Improper sealing may result in additional charges.
- Plates are accepted for DNA isolation from bacteria and eukaryotic cells and for RNA isolation from eukaryotic cells. When registering your sample in the webshop, use the well-position as the "Sample ID on Label", starting with A01, B01, C01 etc.



Standard Versus Eco Shipment

Shipping Options

- **Dry Ice Shipment**: Samples are shipped on dry ice to ensure optimal preservation
- **Cold Chain Shipment**: Samples are transported in a temperature-controlled environment (e.g., refrigerated or chilled) to maintain stability. Suitable for materials requiring moderate cooling.
- **Ambient Temperature Shipment**: Samples are preserved in a nucleic acid stabilizing buffer or dried, allowing them to be shipped at room temperature or slightly cooler. This sustainable and cost-effective option is typically sufficient for most needs. **Bonus**: Ambient shipments qualify for free shipping via a Microsynth Drop Box.

The customer is responsible for evaluating the feasibility of shipment options other than dry ice, ensuring that they are suitable based on the specific requirements of their samples.

Shipments on Dry Ice

When shipping samples on dry ice, please adhere to the following guidelines:

- Use a minimum of 2.4 kg of dry ice (16mm pellets) per day of transit.
- Pack the dry ice in a Styrofoam box with walls at least 4 cm thick to ensure adequate insulation.
- Place your samples in an additional protective container, such as tubes in a rack, a box, or a plastic bag, to prevent direct contact with the dry ice.
- Avoid scheduling shipments over weekends to prevent delays that could compromise sample integrity.

Shipping Address

Microsynth AG
3.3 DNA/RNA Isolation
Schützenstrasse 15
9436 Balgach
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Need More Information?

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