Nucleic Acid Extraction Sample Submission Guidelines

1. Recommended Submission Quantities & Formats
   These are suggested amounts, we can extract other smaller and larger amounts.

   Sample Type

Blood must be treated with an anticoagulant, preferably EDTA.

Small volume (preferred) – **Mammalian**: 200 µL - 500 µL (Buffy coat: submit no more than 200 µL). **Bird, Fish, Reptile, Amphibians**: 10 µL. Anticoagulated blood should be aliquoted into 1.5 – 2.0 ml DNase/RNase-free microcentrifuge tubes.

Large volume - whole PAXgene or BD Vacutainer collection tubes (up to 10 mL).

- Crude lysates of animal blood are also accepted.

RNA considerations: Blood should be collected in PAXgene Blood RNA Tubes, promptly stored at -80C and submitted to UMGC on dry ice.

HMW DNA submissions: ≥ 500 µL mammalian blood or ≥ 5 µL nucleated blood that has been immediately snap-frozen and stored at -80C, submitted on dry ice.

Saliva should be collected in a stabilization buffer from the following collection kits:

- Oragene & OMNIgene (DNA Genotek)
- SimplOFy (Oasis Diagnostics)
- Saliva DNA Collection & Preservation Device (Norgen Biotek)

Small volume - 500 µL aliquoted into 1.5 - 2.0 mL microcentrifuge tubes.

Large volume - whole collection tubes such as those listed above.

RNA considerations: Collect in an RNA stabilizer such as RNAProtect Saliva Reagent (Qiagen) or ORAcollect•RNA (DNA Genotek). Store at -80C and transport on dry ice.

HMW DNA submissions: Please inquire by sending an email to extract@umn.edu.

Plant tissue should be young, healthy-looking leaves (e.g. avoid browned leaves). We strongly recommend sending duplicates or triplicates in separate tubes/plates.

Preferred Quantities: **Fresh-Frozen**: 50 – 100 mg | **Lyophilized/dried**: 10 mg.

Format: Submitted in 2 ml DNase/RNase-free microcentrifuge tubes or *Qiagen Collection Microtubes and Caps (Qiagen Cat. No./ ID: 19560 & 19566). **Can be provided upon request.*

RNA considerations: Preserve by snap-freezing in liquid nitrogen or with RNALater (Invitrogen), however, note that waxy plant tissues may resist penetration by RNALater. Store at -80C and transport on dry ice.

HMW DNA submissions: Submit more, e.g., ~0.5 – 1 gram of leaves that have been dark treated for 24-72 hours before collection. Immediately shock freeze in liquid nitrogen upon collection, store at -80C and transport on dry ice.

Human / Animal Tissue

- Preferred quantity: 25 mg is enough for most tissues, however, tissue containing lower amounts of nucleic acids such as brain or skin require more, 50 – 100 mg. Store frozen upon collection at -20C or -80C.
- Format: 1.5 - 2 ml DNase/RNase-free microcentrifuge tubes or Qiagen Collection

Microtubes and Caps (Qiagen Cat. No./ ID: 19560 & 19566).
- Tissue can be flash-frozen, stored in ethanol, or in a commercial stabilization solution like AllProtect Tissue Reagent (Qiagen) or RNALater (Invitrogen). We can also accept crude lysates.
RNA considerations: For best results, tissues should be treated with RNALater (Invitrogen) according to the manufacturer's instructions. Tissues flash-frozen in liquid nitrogen are also acceptable. Ensure tissue pieces are small enough (cut if necessary) for RNALater to fully permeate tissue or immediately freeze upon immersion in liquid nitrogen. Store tissues for RNA at -80C and transport on dry ice.
HMW DNA submissions: Fresh-frozen tissue is recommended. Avoid storing tissue in stabilization reagents or ethanol.

Stool / Feces

- Preferred quantity and format: ≥ 250 mg submitted in 1.5 – 2 ml DNase/RNase-free microcentrifuge tubes (preferred). Whole fecal collection tubes are also accepted.
- Stool can be fresh-frozen, stored in ethanol, or in OMNIgene•GUT preservative/collection tubes (OMR-200, DNA Genotek).
- **For other collection formats**, please inquire by sending an email to extract@umn.edu.
RNA considerations: Store in an RNA stabilization solution such as RNALater (Invitrogen) or PowerProtect DNA/RNA (Qiagen). Keep at -80C and transport on dry ice.
- ***Standard processing for fecal samples for 16s is to remove extra liquid. If you want liquid material included in the extraction, please notify staff.***

Soil

- Most clients pass the soil through a sieve (usually ~10 mesh) to remove stones and plant debris, then store frozen at -20C or -80C.
- Preferred quantity and format: 250 mg aliquots submitted in 1.5 – 2 ml DNase/RNase-free microcentrifuge tubes.
- **For other collection formats** and **RNA extractions from soil**, please inquire by sending an email to extract@umn.edu.

Eukaryotic Cells

- Preferred quantity and format: 1x10^6 cells and up to 3-4 x 10^ 6 cells, pelleted with supernatant removed in 1.5 - 2.0 ml DNase/RNase-free microcentrifuge tubes. Store frozen at -20ºC or -80C upon collection. ***- Fewer than 1 million cells generally produce mixed results (and rarely acceptable results below 3,000).***
RNA considerations: Cells should either be flash-frozen in liquid nitrogen or stored in a commercial stabilization solution like RNAProtect Cell Reagent (Qiagen) or RNALater (Invitrogen), then maintained at -80C and transported on dry ice. Alternatively, cells can be submitted lysed in lysis buffer such as Trizol, QIAzol (Qiagen) or Buffer RLT (containing 1% B-Mercaptoethanol, Qiagen) and frozen at -80C. Transport on dry ice.
HMW DNA Submissions: Frozen cells recommended. Avoid stabilization reagents.

Prokaryotic Cells:

- Preferred quantity and format: 1-2 x 10^9 cells, pelleted with supernatant removed in 1.5 - 2.0 ml DNase/RNase-free microcentrifuge tubes. Store at -20C or -80C.
RNA considerations: Cell pellets should either be flash-frozen in liquid nitrogen or stored in

a commercial stabilization solution like RNAProtect Bacteria Reagent (Qiagen) or RNALater (Invitrogen), then maintained at -80C. Transport cells for RNA extraction on dry ice.
HMW DNA Submissions: Inquire by sending an email to extract@umn.edu.

FFPE Tissues:

- Required quantity: 3-8 pieces of 10 µm thick sections with a tissue surface area between 0.5-1 cm^2. FFPE samples for DNA can be transported at room temperature or 4C.
- Format: Submit sections in 1.5- or 2.0-ml DNase/RNase-free microcentrifuge tubes.

RNA considerations: Store and transport FFPE sections at -80C or -20C. Regardless, RNA from FFPE tissues tends to exhibit varying levels of degradation.
Due to the DNA damage caused by chemical fixation of FFPE samples, HMW DNA extraction is not practical.

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2. Submission Process
   a. Forms to complete prior to submission:
      i. **UMGC Nucleic Acid Extraction Sample Submission Form** (required)
         - Download at https://genomics.umn.edu/general/forms by scrolling down to Nucleic Acid Services and clicking "Nucleic Acid Submission Form".
      ii. **UMGC Disclaimer** (*only required if your samples are precious / irreplaceable*).
         - Email extract@umn.edu for a copy.

   b. Send a submission notification email to extract@umn.edu. Attach an electronic copy of the completed Extraction Submission Form and if applicable, the Disclaimer. Once these are received, submit samples by either:

Option i. Dropping off at a UMGC location - let us know which location in the submission notification email, then feel free to drop off the samples.

- Drop-off locations, hours, and phone numbers can be found on our website: https://genomics.umn.edu/hours-locations.

Option ii. Shipping to the address listed below:

- **University of MN Genomics Center**
  ATTN: Jerry Daniel / Veronica Tonnell
  3510 Hopkins Place N. Building 4 Suite W402
  Oakdale, MN 55128
  612-626-9167
- Frozen samples should be shipped on dry ice *pellets* (avoid blocks or slabs of dry ice & ice packs). Samples are retained at -80ºC until we are ready to extract.
- Send shipment tracking number(s) to extract@umn.edu.
- Ship early in the week (Monday-Wednesday).

   c. Upon extraction completion, a QC Report will be sent via email. Quality control required for all submissions:
      - DNA: Nanodrop & Picogreen.
      - RNA: Nanodrop, Ribogreen & Sizing.