



Frozen Bone Marrow Aspirate Collection, Storage, and Shipping Instructions

DOCUMENT NUMBER:

CG-30358

DOCUMENT REVISION:

B

Table of Contents

Revision History	3
Introduction	4
Materials and Equipment	4
Collecting and Storing Bone Marrow Aspirates	5
Packaging and Shipping Instructions	5
Technical Assistance	7
Legal Notice	8
Patents	8
Trademarks	8

Revision History

REVISION	NOTES
A	Initial release.
B	Updated title and content to specify Frozen BMA due to SP-G2 Fresh BMA product launch. Updated Technical Support contact numbers to include Europe. Minor grammatical corrections throughout.

Introduction

This document is intended to give guidance as to the preferred method for isolating, storing, packaging, and shipping **frozen bone marrow aspirates** to preserve DNA quality when transporting. Following these instructions will increase the likelihood that the resulting gDNA will be suitable for Bionano processes.

Materials and Equipment

The following materials are used to collect and store bone marrow aspirates (**Table 1**):

Table 1. Collection and Storage Materials

Item	Description
Bone Marrow Aspirates	≥ 0.8 mL (≥ 1.6 mL preferred)
Collection tube (EDTA or Heparin)	e.g. BD Sciences, catalog # 366450 or 366480
Bionano DNA Stabilizer	Bionano Genomics Part # 20397 or 20398
Cryovials	e.g., ThermoFisher Scientific Catalog # 5011-0012
Disinfecting spray or wipes	10% bleach or equivalent
-80°C freezer	

The following materials are used for shipping frozen bone marrow aspirates to Bionano Genomics (**Table 2**):

Table 2. Shipping Materials

Item	Description
Dry Ice	≥5 lbs. (domestic shipping) ≥15 lbs. (international shipping)
Polystyrene box	At least 1.5 inches thick (2 inches preferred for international shipping)
Hard sided container	e.g., 50 mL conical vials or cryovial storage box
Sealable Biohazard plastic bag	General Supplier
Soft packing material	e.g., packing peanuts or bubble wrap
Absorbent material	Paper towels, Kimwipes, etc.
Customs/Shipping documents	May vary according to country of origin
Dry Ice Label	UN1845 label

Collecting and Storing Bone Marrow Aspirates

Please follow these instructions when collecting bone marrow aspirates (BMA) for frozen storage or shipping.

1. Draw at least 0.8 mL (1.6 mL preferred) of bone marrow into an EDTA or heparin tube.
2. Invert the BMA in the draw tube at least 10 times to fully incorporate the anticoagulant with the BMA, then keep at room temperature until aliquots are created.
3. Aliquot and freeze BMA as soon as possible after draw (but not more than 1 day after draw) following the instructions below:
 - a. Mix fresh BMA thoroughly by placing the tube on a continuously mixing tilting rocker for 10 minutes.
 - b. Processing one BMA sample at a time, transfer a 0.8 ml aliquot into a nuclease-free 2 mL cryovial with a gasket.
 - c. Add 12 µl of DNA Stabilizer (Bionano Genomics, part number 20397 or 20398) into the 2 mL tube containing fresh BMA drawn into the Na Heparin tube.

NOTE: DO NOT add DNA Stabilizer to fresh BMA drawn into EDTA tube(s).

- d. Cap tubes and invert 10 times to mix. Pulse-spin tubes for one second to collect any material from the microcentrifuge tube lids.
- e. Repeat until desired number of aliquots are created, or entire volume of BMA is transferred.

NOTE: Although only one aliquot is required for UHMW DNA extraction, it is recommended to freeze a second aliquot as a backup.

- f. Decontaminate surface of vials using disinfecting wipes. Ensure that sample identifiers are still legible after decontamination.
- g. Freeze the aliquots immediately by placing them at -80°C.
- h. Store samples at -80°C.

WARNING: Once frozen, the BMA may not be thawed until immediately before gDNA extraction with a Bionano-developed gDNA Isolation Protocol. If a larger aliquot has already been frozen, do not thaw and re-freeze the sample to make smaller aliquots. Users should only thaw at the time of gDNA isolation.

Packaging and Shipping Instructions

Packaging materials must be leak-proof and meet the general requirements of UN3373 Category B Biological Substances as described by the [US Postal Service Packing Instruction 6F](#) (346.321) and [International Air Transportation Association Packing Instruction 650](#). Packaging should also comply with UN1845 Dry Ice requirements, as described by the [US Postal Service Packing Instruction 9A](#) and International Air Transportation Association Packing Instruction 954. Requirements of other carriers and customs authorities may apply.

1. Prepare a polystyrene box that is large and thick enough to hold the samples and enough dry ice to keep the samples frozen during transit. Surround the samples with the dry ice.
- For domestic shipping, samples should be shipped in a polystyrene box with ≥ 5 pounds of dry ice. The walls of the box should be ≥ 1.5 " thick.
- For international shipping, samples should be shipped in a polystyrene box with ≥ 15 pounds of dry ice. The walls of the box should be ≥ 2 " thick.
2. Label hard-sided secondary container(s) (e.g., 50 mL conical vials or cryotube box) and sealable plastic bag(s) "Biohazard." Pre-chill both inside the polystyrene box with dry ice.
3. Inspect each cryovial containing frozen sample for leakage. Do not allow sample to thaw.
4. Remove cryovials (primary container) from -80°C storage and immediately place them inside the pre-chilled hard-sided secondary container(s).
- If flip-top microcentrifuge tubes were used instead of cryovials, seal the tubes with parafilm.
5. Securely close the secondary container(s). If using a cryotube box, use tape to prevent the lid from opening during transit.
6. Place secondary container(s) inside a sealable plastic bag, along with enough absorbent material (e.g., paper towels) to absorb any liquid that may leak from the samples.
7. Immediately return the sealed bag containing packaged samples to the polystyrene box containing dry ice.
8. Cover the samples with dry ice. Any remaining empty space within the polystyrene box should be filled with additional dry ice or soft packing material.
9. Place the polystyrene box inside a final cardboard box. The polystyrene box should not be able to move inside the outer cardboard box. If necessary, add cushioning material to fill excess space.
10. Ensure that the polystyrene box and outer cardboard box are secured shut, but not airtight.
NOTE: The dry ice package must be able to vent CO_2 to maintain structural integrity.
11. Apply a Class 9 dry ice label (Dry Ice, UN1845) to the exterior of the box and specify the quantity of dry ice in kilograms.
12. Apply a Category B Biological Substances UN3373 Diamond and add the mark "Biological Substance Category B, UN3373" to exterior of the box, along with the name and phone number of a responsible person.
13. Print a shipping form containing sample information. Place form in a sealed plastic bag and include inside the shipment container (affix to outside lid of polystyrene box).
14. For US domestic shipments, send the package by next-day delivery service (e.g., FedEx Priority Overnight or UPS Next Day Air). For International shipping, choose priority service.

Technical Assistance

For technical assistance, contact Bionano Technical Support.

You can retrieve documentation on Bionano products, SDS's, certificates of analysis, frequently asked questions, and other related documents from the Support website or by request through e-mail and telephone.

TYPE	CONTACT
Email	support@bionano.com
Phone	Hours of Operation: Monday through Friday, 9:00 a.m. to 5:00 p.m., PST US: +1 (858) 888-7663 Monday through Friday, 9:00 a.m. to 5:00 p.m., CET UK: +44 115 654 8660 France: +33 5 37 10 00 77 Belgium: +32 10 39 71 00
Website	www.bionano.com/support
Address	Bionano, Inc. 9540 Towne Centre Drive, Suite 100 San Diego, CA 92121

Legal Notice

For Research Use Only. Not for use in diagnostic procedures.

This material is protected by United States Copyright Law and International Treaties. Unauthorized use of this material is prohibited. No part of the publication may be copied, reproduced, distributed, translated, reverse-engineered or transmitted in any form or by any media, or by any means, whether now known or unknown, without the express prior permission in writing from Bionano Genomics, Inc. Copying, under the law, includes translating into another language or format. The technical data contained herein is intended for ultimate destinations permitted by U.S. law. Diversion contrary to U. S. law prohibited. This publication represents the latest information available at the time of release. Due to continuous efforts to improve the product, technical changes may occur that are not reflected in this document. Bionano Genomics, Inc. reserves the right to make changes in specifications and other information contained in this publication at any time and without prior notice. Please contact Bionano Genomics, Inc. Customer Support for the latest information.

BIONANO GENOMICS, INC. DISCLAIMS ALL WARRANTIES WITH RESPECT TO THIS DOCUMENT, EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THOSE OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE FULLEST EXTENT ALLOWED BY LAW, IN NO EVENT SHALL BIONANO GENOMICS, INC. BE LIABLE, WHETHER IN CONTRACT, TORT, WARRANTY, OR UNDER ANY STATUTE OR ON ANY OTHER BASIS FOR SPECIAL, INCIDENTAL, INDIRECT, PUNITIVE, MULTIPLE OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING FROM THIS DOCUMENT, INCLUDING BUT NOT LIMITED TO THE USE THEREOF, WHETHER OR NOT FORESEEABLE AND WHETHER OR NOT BIONANO GENOMICS, INC. IS ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Patents

Products of Bionano Genomics® may be covered by one or more U.S. or foreign patents.

Trademarks

The Bionano logo and names of Bionano products or services are registered trademarks or trademarks owned by Bionano Genomics, Inc. (“Bionano”) in the United States and certain other countries.

Bionano™, Bionano Genomics®, Saphyr®, Saphyr Chip®, Bionano Access™, and Bionano EnFocus™ are trademarks of Bionano Genomics, Inc. All other trademarks are the sole property of their respective owners.

No license to use any trademarks of Bionano is given or implied. Users are not permitted to use these trademarks without the prior written consent of Bionano. The use of these trademarks or any other materials, except as permitted herein, is expressly prohibited and may be in violation of federal or other applicable laws.

© Copyright 2023 Bionano Genomics, Inc. All rights reserved.