PROQUINORTE
close to you | cerca de ti

NIPPON Genetics EUROPE
INNOVATION FOR YOU

BAMBANKER™ STANDARD

Simple, reproducible, and serum-free cell cryopreservation.
Ready-to-use medium for superior cell recovery.

BAMBANKER™ STANDARD

The recommended option for most cell phone lines.

BAMBANKER™ hRM

For ES and IPS cells.

BAMBANKER™ DMSO FREE

For cells sensitive to DMSO

BAMBANKER™ DIRECT

Simplified workflow without centrifugation.

SERUM-FREE MEDIA

HIGH CELL RECOVERY (> 90%)

QUICK & EASY PROTOCOL

TIME-SAVING

GMP-COMPLIANT

PROQUINORTE
close to you | cerca de ti

For more information, contact your trusted sales representative or visit
proquinorte.com

From routine culture to reliable recovery

Cryopreservation is often the point where cell workflows become unpredictable: small differences in handling and timing can lead to big differences after thawing. This brochure outlines the key steps and control points that determine freeze–thaw success. It shows how Bambanker™ supports consistent recovery and helps reduce variability across users and runs.

What is Bambanker™?

Bambanker™ is a ready-to-use, serum-free cryopreservation medium for long-term storage of cultured cells.

Supported by peer-reviewed literature across **120+ cell and tissue types,** it is designed to improve post-thaw recovery while reducing variability associated with serum-containing media.

How it helps

- **Flexible storage:** freeze directly at −80°C or in liquid nitrogen (LN_2) for long-term storage
- **Simplified workflow:** no programmed/sequential freezing required
- **Consistency over time:** serum-free, defined composition.

Where it fits

- Routine cell banking (working stocks/backup vials for day-to-day culture continuity)
- Master/working cell bank creation for reproducible experiments across users and timepoints
- High-value or "hard-to-replace" cultures (e.g., tumor cells, stem cells, primary cells)

For a detailed cell line list, refer to page 13.

Why freezing consistency matters

Freezing is where most freeze–thaw variability is introduced. Even small variations in handling the cells during freezing (time at room temp, how vigorously you mix, and how fast samples cool down) can strongly affect how well cells recover after thawing. **Bambanker™ simplifies freezing by removing the need for step-wise or programmed freezing**, but consistent handling still matters to keep recovery predictable across vials and users.

Bambanker™ is the workflow anchor for cryopreservation, supported by tools that help keep everyday handling consistent and sterile.

Bambanker™ for every cell

The anchor of cell cryopreservation without serum.

Product	Best for	Key differentiator	When to choose
Bambanker™ Standard	• Majority of cell lines	Versatile medium Broad-use	Default option for routine cell banking
Bambanker™ hRM	• ES (Embryonic Stem Cells) • iPS (induced Pluripotent Stem Cells)	Contains human serum albumin	Animal-component–free approach is preferred
Bambanker™ DMSO Free	• DMSO-sensitive cells	No DMSO	DMSO is undesirable (e.g., protocols minimising DMSO exposure)
Bambanker™ Direct	• Hybridoma cells • High-throughput (HTP) applications	No centrifugation of cells is required	Time-efficient freezing workflow, especially on high-throughput freezing days

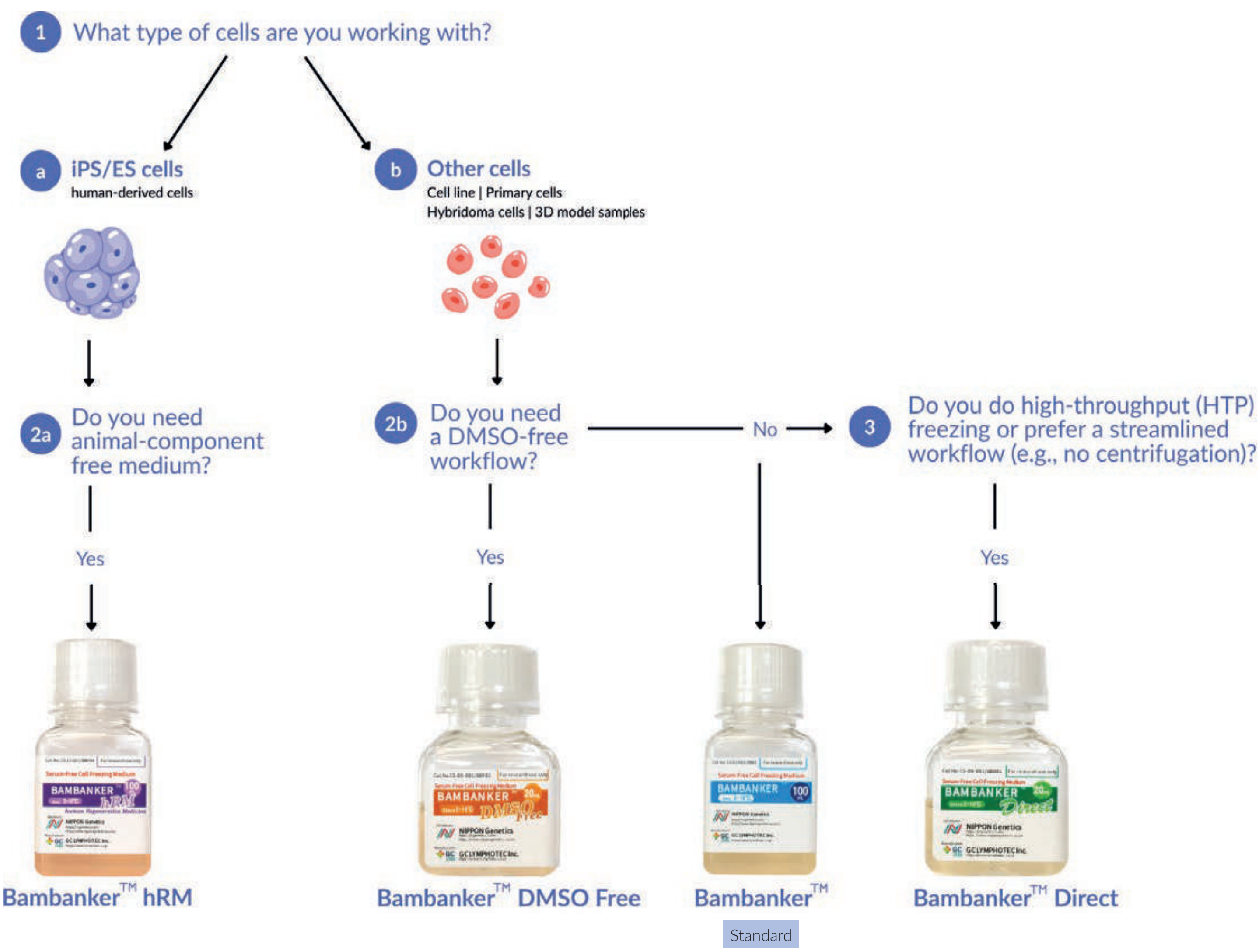
All Bambanker™ types are serum-free, ready-to-use cryopreservation media.

Cell type and handling can influence outcomes.
Use this overview as a starting point and apply your lab's standard controls.

PROQUINORTE close to you | cerca de ti

How to choose the right Bambanker™ type

Find the right Bambanker™ in under 10 seconds.



Quick reference:

- Standard **Bambanker™** → Default choice for the majority of cells
- **Bambanker™ DMSO-Free** → Avoid DMSO
- **Bambanker™ hRM** → Animal-component–free preference
- **Bambanker™ Direct →** HTP/streamlined (no centrifugation)

See Page 14 for catalog numbers and formats.

Still unsure?
Contact our support team (support@nippongenetics.de), or start with Bambanker™ and validate recovery with your lab's standard control points.

The highest-leverage step in freeze–thaw workflows

Most freeze–thaw variability starts at cryopreservation. Standardize this first.

The cryopreservation step is where most freeze–thaw variability is introduced through timing, handling, and protection during freezing. This can translate into lower post-thaw viability and yield, with slower recovery and more repeat work.

Standardizing this step is one of the fastest ways to improve post-thaw recovery and reduce rework.

Common causes of freeze–thaw failures

- **Cells are not in optimal condition at freezing** (stress, over/under confluence)
- **Inconsistent handling** (timing, mixing, temperature exposure)
- **Variable protection during freezing** (inconsistent conditions)
- **Lab-to-lab / user-to-user differences** (same cells, different results)
- **Poor repeatability at scale** (more samples = more chances for variation)

How Bambanker™ supports consistent outcomes

Standardize

Helps makes cryopreservation conditions more **repeatable across users and runs.**

Protect

Supports cells during the freezing step to **reduce avoidable handling-related stress**

Recover

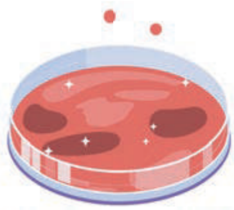
Enables more **consistent post-thaw recovery** return so you can move forward faster

When to prioritize Bambanker™

Use it where cryopreservation variability has the greatest impact on recovery, scale, and repeat work.

Highest leverage step

High-value cells



Inconsistent recovery after thawing

Scaling up across users, projects, or sites

One failed recovery can cost days to weeks. Standardizing the cryopreservation step reduces repeat work and protects project timelines.

Bambanker™ recovery quality

Preserved number and phenotype of the PSCs after thawing

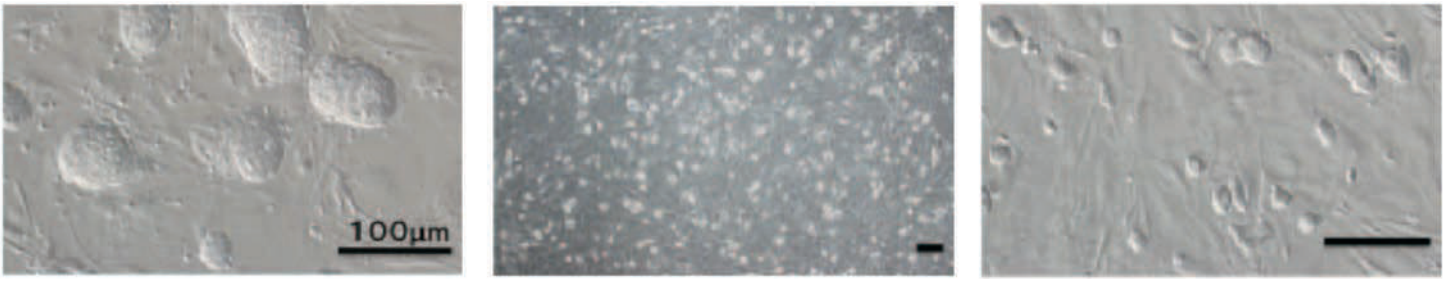
For pluripotent cells, “survival” alone isn’t enough; you need cultures that recover without phenotype drift. This dataset highlights Bambanker™ recovery quality using two practical readouts: post-thaw morphology/cell density and ALP staining (pluripotency-associated).

Cell type	Mouse pluripotent stem cells
Cryomedium	Bambanker™
Readouts	1. Cell density 2. cell phenotype retention

1. Cell density*

Before freezing

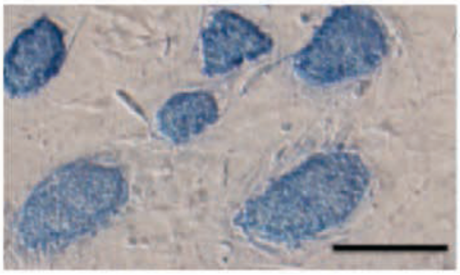
Two days after thawing



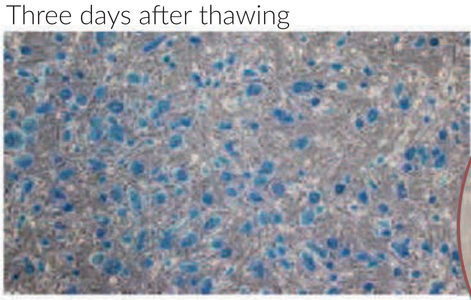
High cell density at Day 2 post-thaw, with **no obvious morphological changes** compared to pre-freeze.

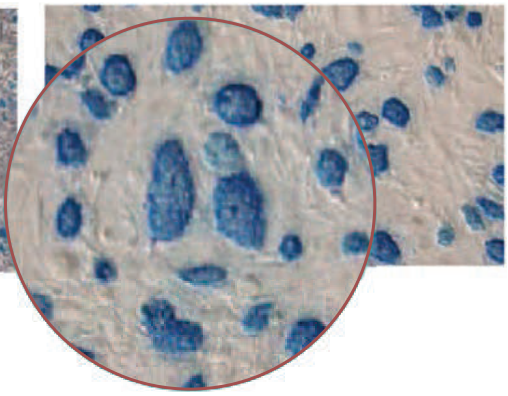
2. Cell phenotype retention*

ALP staining



Three days after thawing





Alkaline phosphatase (ALP) is an enzyme activity frequently used as a practical marker of undifferentiated pluripotent stem cells. Continued strong ALP staining post-thaw supports that cells recover while maintaining a pluripotency-associated state.

Strong ALP staining at Day 3 post-thaw suggests that cells **retain a pluripotency-associated phenotype**, supporting **more predictable recovery outcomes**.

Cells recover at high density with morphology comparable to pre-freeze, and ALP remains strong at Day 3, supporting preserved phenotype during recovery.

**Acknowledgment: Data kindly provided by Dr. Ahn (Tokyo Institute of Technology Graduate School of Bioscience and Biotechnology Department of Biomolecular Engineering, Tagawa Laboratory, Japan).*

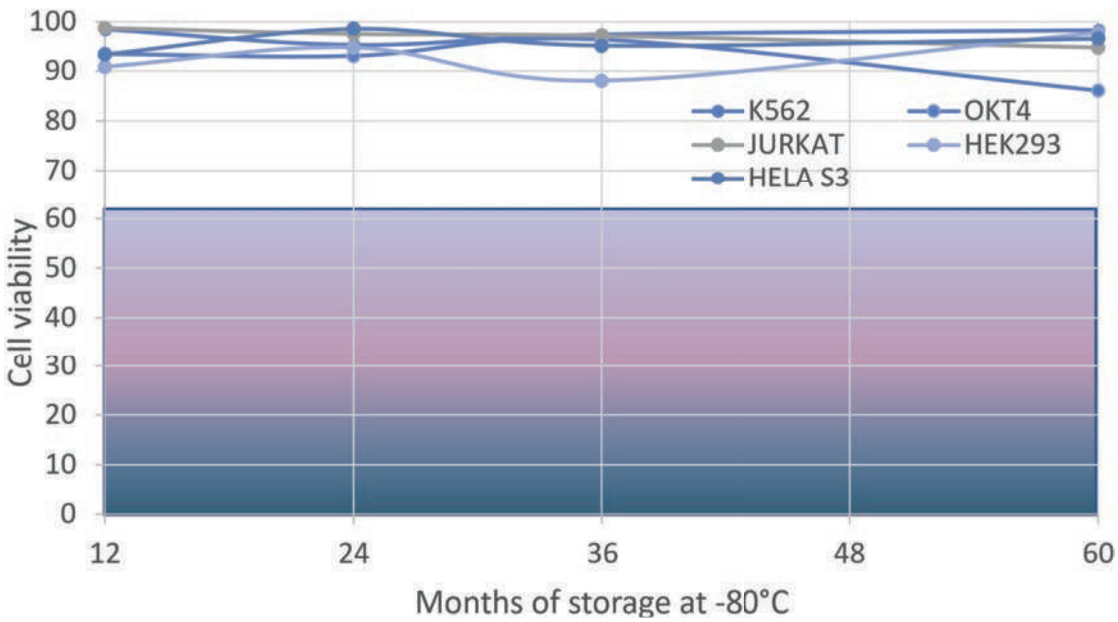
Long-term −80°C storage with Bambanker™

Viability maintained across multiple cell lines for up to 5 years at −80°C

Although liquid nitrogen (LN_2) is often considered the "gold standard" for long-term stability, mechanical −80°C storage offers practical advantages, especially when speed, access, safety and daily usability are important considerations.

With Bambanker™, cells maintained high viability after storage at −80°C for up to 5 years.

Stable viability over 5 years at −80°C



Tested cells

a) Cells cultured in suspension: K562, JURKAT

b) Cells cultured adherent: HELA S3, OKT4, HEK293

- **High viability maintained after long-term storage at -80°C (up to 5 years) across multiple cell lines, including cells grown in suspension and adherent.**
- **Supports −80°C as a practical option for routine banking, reducing reliance on LN_2 logistics for many workflows.**

Bambanker™ supports long-term −80°C storage, with viability maintained over years, making LN_2 optional for many workflows.

Rule of thumb

- −80°C for routine banking
- LN_2 for indefinite storage or highest-sensitivity materials

Bambanker™ freezing workflow

Freezing workflow with the control points that most influence recovery.

1. Confirm cells are ready to freeze
   - Healthy morphology, stable growth, appropriate confluence for your cell type.

2. Harvest cells and create a single-cell suspension (as applicable)
   - Use your standard detachment method and handle gently.
   - Pellet/centrifuge if your workflow requires it.

   Freeze cells during the logarithmic growth phase to maximize post-thaw viability.

3. Resuspend cells in Bambanker™ (serum-free)
   - Transfer the cells to a cryotube and resuspend in 1 mL Bambanker™*.

   **Avoid bubbles/foam.*
   Keep exposure time consistent across vials.

4. Freeze directly at −80°C (no step-wise freezing required)
   - Place vials at −80°C for freezing and preservation.

5. Optional: Transfer to LN_2
   - The frozen cells at -80°C can subsequently be stored in LN_2**.

   ***This step is not necessary.*

QC checkpoints

What changes outcomes most

Critical control points

- **Timing:** keep exposure times consistent across all vials;
- **Temperature exposure:** minimize and standardise room-temp time;
- **Ressuspending:** gentle, consistent ressuspending; avoid bubbles/foam;
- **Labeling + traceability:** prevent mix-ups and repeat work
- **Consistency:** same steps every time.

When control points aren't consistent

Common causes of freezing variability

- Inconsistent timing across vials;
- Variable room temperature exposure;
- Unclear labels or missing vial map;
- Different freezing loading;
- Over-vigorous ressuspension (bubbles/foam).

Consistency at freezing = consistency after thaw.

Bambanker™ thawing & recovery workflow

Thawing workflow and the early handling points that most influence recovery.

1 Prepare before thawing

- Pre-warm respective culture medium and prepare culture vessels.
- Label and plan the vial-to-vessel workflow.

2 Thaw quickly

- Thaw until just liquid; avoid extended warming.

Thawing must be carried out quickly in a constant-temperature chamber or water bath (37°C).

3 Transfer cells into medium (gentle handling)

- Transfer* 1 mL of the Bambanker™ cell suspension into fresh, pre-warmed culture medium.
- Centrifuge at 300-400 x g for 3 minutes at 20°C.
- Remove the supernatant.

**Avoid vigorous mixing or bubbles.*

4 Seed into culture

- Resuspend again in the respective pre-warmed culture medium.
- Transfer into the culture vessel.

5 First 24–72 hours: stabilize recovery

- Keep conditions stable and limit unnecessary handling.
- Monitor morphology and attachment/ growth patterns.

6 First media change

- Apply your lab's standard timing for the cell type.

Keep the timing consistent across experiments.

7 Record recovery outcome

- Document recovery vs your lab's standard control (attachment, morphology, growth)

Log key variables: vial ID, seeding density, vessel, timing, operator

QC checkpoints

Do	Avoid
✓ Have medium and vessels ready before thawing;	✗ Letting vials warm for prolonged periods;
✓ Keep thaw-to-culture timing consistent; Handle gently in the first 24–72h;	✗ Over-handling cells immediately after thaw;
✓ Compare outcomes using the same density and vessels;	✗ Changing multiple variables at once (density, vessel, timing);
✓ Record key details (vial ID, passage, date, conditions).	✗ Skipping documentation (leads to repeat work).

Broad adoption across cell types

Proved across a wide range of cell samples and workflows.

Bambanker™ has published evidence across 120+ cell and tissue types, showing broad applicability in real workflows.

What this list represents

- Includes diverse cell types and sample formats (e.g., immune/hematopoietic, epithelial, stem/progenitor, primary/patient-derived, and 3D models);
- Compiled from peer-reviewed publications where Bambanker™ was mentioned;
- One representative publication shown per cell type/samples;
- Each entry links to the original publication (DOI) for fast verification.

Scan for full list

Cell/sample type	Specie	DOI
Immune & hematopoietic		
Bone marrow mononuclear cells (MNC)	Yorkshire miniswine	https://doi.org/10.1111/j.1540-8191.2010.01086.x
CAR T cells	Human	https://doi.org/10.1038/s41586-025-09507-9
CD3+T	Human	https://doi.org/10.1007/s00262-012-1375-5
CD34+ hematopoietic stem cells	Human	https://doi.org/10.1016/j.omtm.2017.11.008
CD4 T cells	Human	https://doi.org/10.1016/j.immuni.2024.11.004
		....
Stem, progenitor & differentiated derivatives		
Adipose-derived stem cells (ASCs)	Human	https://doi.org/10.1038/nprot.2010.199
Airway basal stem cell (ABSC)	Human	https://doi.org/10.1186/s12931-025-03302-w
Bone marrow-derived endothelial progenitor cells (EPCs)	Yorkshire miniswine	https://doi.org/10.1016/j.athoracsur.2007.12.006
		....
Epithelial cells		
Bronchial epithelial cells (BECs)	Human	https://doi.org/10.1371/journal.pone.0306197
Chinese hamster ovary cells (CHO-K1)	Chinese hamster	https://doi.org/10.3389/fphar.2019.00851
Large airway epithelial (LAE) cells	Human	https://doi.org/10.1016/j.celrep.2024.114076
		....
Patient-derived samples		
Ascites-derived HGSC patient-derived xenograft	Human	https://doi.org/10.1186/s13046-022-02570-4
Breast cancer tissue biopsies	Human	https://doi.org/10.1038/s42003-022-04025-0
Gastric cancer biopsies	Human	https://doi.org/10.1038/s41598-022-12610-w
Glioma tissue cells	Human	https://doi.org/10.1038/s41467-025-58452-8
		....
Organoids & spheroids		
Neurospheres glioblastoma stem-like cells (GSCs)	Human	https://doi.org/10.62347/grsp1268
Prostate organoid	Human	https://doi.org/10.1038/s41467-021-26901-9
Intestinal tumor-derived organoids	Mouse	https://doi.org/10.1007/978-1-0716-4023-4_6

Not a guarantee of performance for every protocol. Use as a starting point and validate with your lab's control points.

PROQUINORTE

close to you | cerca de ti

For more information visit
proquinorte.com

PROQUINORTE S.A.
Parque Tecnológico de Bizkaia,
Laida Bidea, Edif. 208, 48170 Zamudio
900 900 942