

INTENDED USE

Microbank™ is a ready to use system designed for the long term storage and retrieval of bacterial and fungal isolates.

SUMMARY AND EXPLANATION

The long term storage of microorganisms is a significant challenge in microbiology. Microbank™ with unique 2D barcodes offers a platform that utilizes porous glass beads and a specially formulated cryopreservative for storage at low temperatures. The additional feature of a unique 2D barcode on each box and each vial facilitates easier documentation and retrieval of your isolates. This format coupled with the Microbank™ Cryoblock offers the least possibility of disturbance to your organism, yet, permits ready and rapid access.

DESCRIPTION

Each Microbank™ vial contains approximately 25 sterile coloured beads (single colour) and the specially formulated cryopreservative. The specially treated beads are of a porous nature allowing microorganisms to readily adhere onto the bead surface. After inoculation the Microbank™ vials are kept at -70°C for extended storage. When a fresh culture is required, a single bead is easily removed from the Microbank™ vial and used to directly inoculate a suitable culture medium.

The unique 2D barcodes on the box and vials provide you with a freezer safe, non-erasable label that can be scanned into your Laboratory Information System with ease. This feature not only removes the risk of transcription errors but has the added advantage of making retrieval from the freezer a simple task.

MATERIALS PROVIDED
• Microbank™ Vials with Cryopreservative and 2D Barcodes

Cat No.	Description	No. Vials
PL.170C/M	Microbank™ (with 2D Barcodes)-Mixed (16 vials of each colour)	80
PL.170C/R	Microbank™ (with 2D Barcodes) -Red	80
PL.170C/Y	Microbank™ (with 2D Barcodes) -Yellow	80
PL.170C/LB	Microbank™ (with 2D Barcodes) -Light Blue	80
PL.170C/G	Microbank™ (with 2D Barcodes) -Green	80
PL.170C/B	Microbank™ (with 2D Barcodes) -Blue	80

MATERIALS REQUIRED BUT NOT PROVIDED

- 2D Barcode Reader
- Insulated Cryoblock PL.155-1 (Optional)
- Inoculating Loops
- Sterile Cotton Swabs
- McFarland Standard (SD2350)
- Sterile Disposable Pasteur Pipettes

STABILITY AND STORAGE

Before use, unused Microbank™ may be stored at room temperature. Stored under these conditions Microbank™ may be used up to the date of expiration shown on the product label.

SAFETY PRECAUTIONS

1. Observe biohazard precautions when preparing new or discarding used Microbank™ vials.
2. When storing Microbank™ vials in liquid nitrogen the following precautions should be taken:
 - Always use the appropriate safety equipment.
 - Microbank™ vials should only be placed in the vapour phase of the liquid nitrogen.
 - Ensure that the threads of the Microbank™ vial and screw cap are completely dry before closing.
 - Ensure that the Microbank™ vial cap is tight. Do not overtighten.

PROCEDURE
A. INOCULATION OF THE MICROBANK™ (WITH 2D BARCODE)

1. Scan the 2D barcode on the Microbank™ box and record any relevant information in your freezer storage program.
2. Scan the 2D barcode on the side of the Microbank™ vial and record relevant information for each organism to be stored.
3. Using aseptic technique, unscrew the Microbank™ vial cap.
4. Using a sterile inoculating loop or cotton swab, pick off enough colonies from a pure culture to achieve a 3-4 McFarland standard in the specially formulated cryopreservative. In general, an overnight culture (18-24 hours) of the isolate is preferred.
5. Using aseptic technique, replace the cap on the Microbank™ vial tightly and invert it 4-5 times to emulsify the organism. **DO NOT VORTEX!**
6. Let the Microbank™ vial sit for 2 minutes to allow the isolate to bind to the beads. Remove the cap and use a sterile disposable Pasteur pipette to remove the specially formulated cryopreservative. The beads should be as free of liquid as possible.
7. Close the Microbank™ vial finger tight only. It is important that the Microbank™ vials are not over tightened.
8. Place the Microbank™ vial in the appropriate Freezer Storage Box and freeze at -70°C.

B. RECOVERY OF THE BACTERIAL AND FUNGUS ISOLATES

1. Using your freezer program find the location of the isolate you wish to work with. Scan the 2D barcode on the side of the vial to ensure that the correct isolate has been retrieved. If the barcode is obscured by freezer frost wipe gently to expose the complete barcode.
2. Place the Microbank™ vial in a cold cryoblock (PL.155-1).
3. Using aseptic technique, open the Microbank™ vial and using a sterile needle or forceps remove one coloured bead. Close the Microbank™ vial finger tight and return as soon as possible to the freezer. Excessive changes in temperature will reduce the viability of the frozen isolates.
4. The bead may then be streaked directly onto a solid medium or may be inoculated into an appropriate liquid medium

LIMITATIONS

1. Microbank™ is offered solely as a means of providing long term storage of bacterial and fungal isolates.
2. Aseptic technique should be practiced at all times to ensure continued integrity of the stored isolate.
3. Microbank™ should not be used if any of the following conditions are present before inoculation:
 - The vial shows any evidence of leakage (loss of cryopreservative).
 - There is excess turbidity in the cryopreservative suggesting contamination.
 - The expiration date on the outer label has elapsed.
4. Beads should never be returned to the Microbank™ vial for any reason.
5. Microbank™ vials are supplied in a variety of colours. These colours do not imply any change in the product's function. The different colours are provided so that the user can utilize them for their own tracking purposes.

PERFORMANCE CHARACTERISTICS

Microbank™ has been used successfully for the storage and retrieval of bacteria and fungi by many customers since its introduction. Current data is held at Pro-Lab Diagnostics and available to customers in the Microbank™ World Wide Performance Portfolio. This document contains full details for the successful long term storage and recovery of many bacterial and fungal isolates, for up to 20 years. A copy of the portfolio can be obtained by contacting Pro-Lab Diagnostics.

1. A continual performance study by Brazier and Hall at the PHLS Reference Centre (U.K.) currently demonstrates 10 years of successful storage and retrieval of 100 anaerobes in the Microbank™ system.
2. Moyes and Young, U.K. Gonococcal Reference Laboratory, achieved excellent recovery using Microbank™ (98.6%) with GC isolates after 12 months.
3. Espinal and Ingroff, Spain, demonstrated successful storage of 6,198 (97.8%) yeasts and 391 (98.6%) moulds with up to 10 years of storage.
4. Killingworth, Le Roux, Lastovica, Cape Town South Africa, demonstrated the successful storage and retrieval of fastidious isolates of *Campylobacter* and *Helicobacter* using Microbank™.
5. Donovan, U.K. PHLS, demonstrated the successful storage in Microbank™ for two years of 44 standard NCTC/ATCC isolates recommended for Quality Control and laboratory accreditation requirements.
6. The VLA Brucella Research Laboratory (U.K.), demonstrated the successful storage and retrieval after two years in Microbank™ of representative isolates of each sub-species of *Brucella* including the most fastidious type *Brucella abortus* biovar 2.
7. McLaren and Bell, VLA Salmonella Reference Laboratory (U.K.), currently holds data for the successful storage and retrieval of 312 isolates of *Salmonella* using Microbank™ since 1992.
8. Professor Valerie Edwards Jones. Manchester Metropolitan University (U.K.). Storage of NCTC strains at -20°C using Microbank™
9. Williams N.J. and others. Department of Epidemiology and Population Health, Institute for Infection and Global Health, Leahurst Campus, Neston, U.K. Long term storage of multiple large research led culture collections of zoonotic enteric pathogens and commensal bacteria.
10. D. Chandler. Horticultural Research International, Wellesbourne, Warwick, U.K. Cryopreservation of fungal spores using Microbank™.

11. Seidel KE, Gareis M. Institut für Medizinische Mikrobiologie, Infektions- und Seuchenmedizin der Tierärztlichen Fakultät, Ludwig-Maximilians-Universität, München Berl Munch Tierarztl Wochenschr. 1995 Jun;108(6):215-20. Efficiency of Microbank™ for the conservation of microorganisms relevant to veterinary medicine.
12. M. Baker and P. Jeffries. East Kent Microbiology Service, The William Harvey Hospital, Kennington Road, Ashford, Kent. Department of Biosciences, University of Kent, Canterbury, Kent (U.K.) J Clin Microbiol. 2006 Feb; 44(2): 617–618. Use of Microbank™ for long term storage of dermatophyte fungi.
13. W. Veguilla, K. K. Peak, V. A. Luna, J. C. Roberts, C. R. Davis, A. C. Cannons, P. Amuso, J. Cattani. Centre for Biological Defence, College of Public Health, University of South Florida, Tampa, Florida. Florida Department of Health, Bureau of Laboratories, Tampa, Florida (U.S.A.). J Clin Microbiol. 2008 Oct;46(10):3494-7. doi: 10.1128/JCM.00654-08. Two year study evaluating the potential loss of methicillin resistance in a MRSA culture collection.
14. Peter Taft. Microbiology. Royal Oldham Hospital. (U.K.). An internal quality assurance scheme for clinical bacteriology using Microbank™.
15. Bestbion DX. Cologne, Germany. A summary of successful storage data collected from 24 Microbiology laboratories in Germany for successful storage of microorganisms using Microbank™.

The following text books reference the Microbank™ Storage system as a recommended method:

1. Bailey & Scott's Diagnostic Microbiology, by P. Tille.
ISBN:9780323083300.
2. Laboratory Methods in Food Microbiology by W. F. Harrigan.
ISBN: 9780123260437
3. Fungal Plant Pathogens - Principles and Protocols Series by C. Lane, P. Beales, K. Hughes.
ISBN: 9781845936686
4. Probiotics in Food Safety and Human Health by I. Goktepe, V. K. Juneja, M. Ahmedna.
ISBN: 9781574445145
5. Cryopreservation and Freeze-Drying Protocols by J. G. Day, M. R. McLellan.
ISBN: 9780896032965
6. Manual of Techniques in Invertebrate Pathology by L. A. Lacey.
ISBN: 9780123868992
7. Bergey's Manual of Systematic Bacteriology by W. Whitman, A. Parte, M. Goodfellow, P. Kämpfer, H-J. Busse, M. E. Trujillo, W. Ludwig, K.I. Suzuki.
ISBN: 9780387950433
8. Manual of Clinical Microbiology by J. Versalovic.
ISBN: 9781555814632

REFERENCES

1. **White and Sand, R.L.** 1985. Medical Laboratory Sciences **42**:289-290 (U.K.)
2. **Feltham et al.** 1978. Journal of Applied Bacteriology. **44**:313-316.
3. **Nagel, J.G. & Cunz, L.J.** 1971. Applied Microbiology. **23**(4):837-838.

