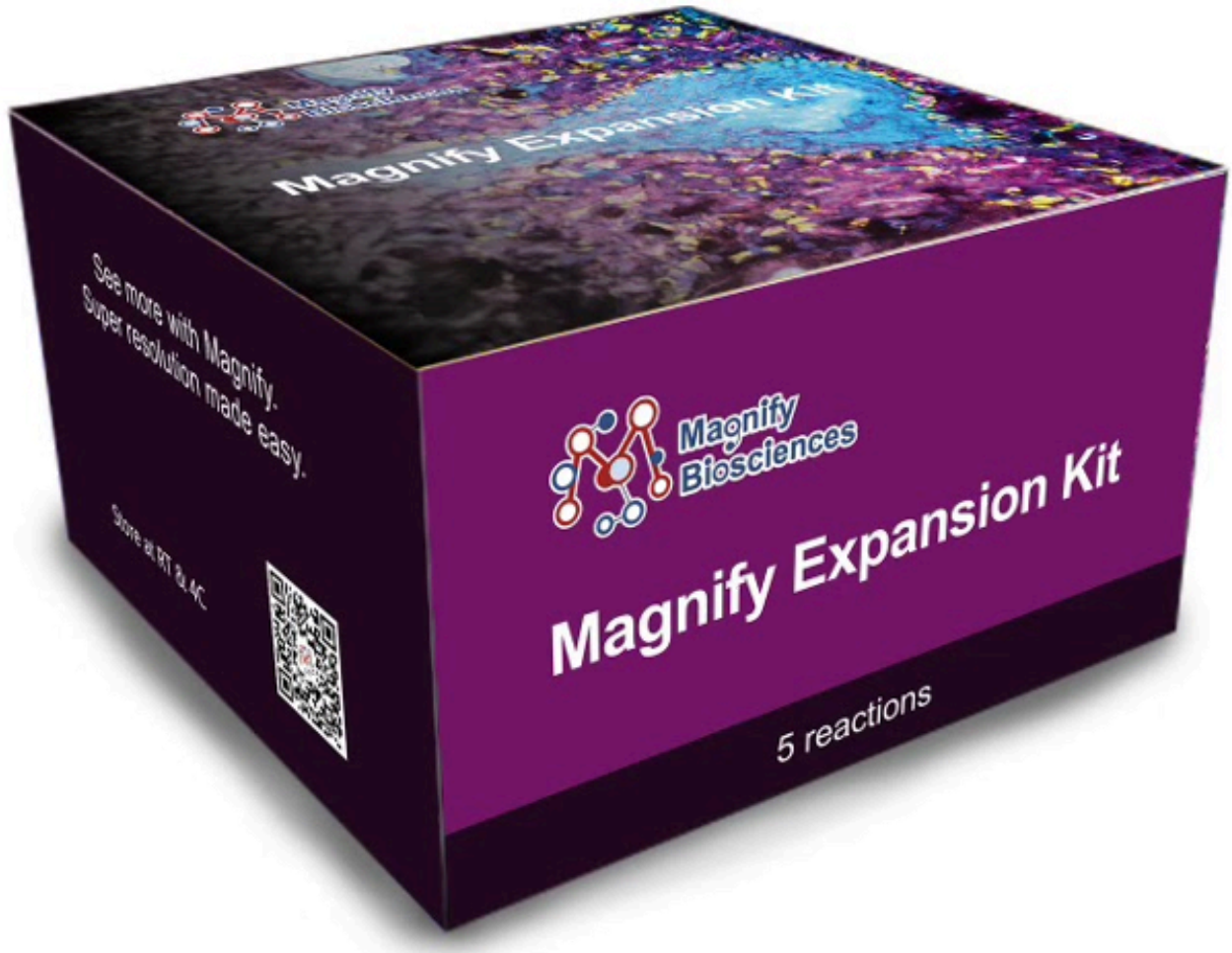
MAGNIFY EXPANSION KIT

Magnify Biosciences

PRODUCT DATA SHEET



MB-K v2.09.24

This Technical Data Sheet provides product information regarding the Magnify Expansion kit. This document applies to the Magnify kits (MB-K-001-F-T, MB-K-002-C-T, MB-K-003-O-T, MB-K-004-T-T, and their refills MB-SS-001-F-G, MB-SS-002-C-G, MB-SS-003-O-G, MB-SS-004-T-G, MB-SS-005-H, MB-SS-006-S, MB-SS-007-W). These products are designed for in-vitro applications.

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The Magnify Expansion Kit employs a hydrogel network to fix biomolecules in their original positions. This setup facilitates an isotropic expansion, effectively enhancing the resolution capabilities of the microscopy process.

Kit Contents

Name	Trial Size	Standard Size
Solution A	5 ml	20 ml
Solution G	5 ml	20 ml
Buffer H	30 ml	120 ml
Buffer S	30 ml	120 ml
10×Solution W	30 ml	120 ml
Activation Tubes	5	20
Gel catcher	1	2
Gel chamber	Various sizes	Various sizes

Note: Solutions A and G can be stored at 4°C, shielded from light, for 6 months. It can also be divided into smaller portions and stored at -20°C, shielded from light, for two years. Other solutions and activation tubes can be stored at room temperature for one year. For imaging, it is recommended to use glass-bottom dishes (suggested product: Cellvis, Cat#: D60-30-1-N) or glass-bottom plates (suggested product: Cellvis, Cat#: P01-1.5H and P06-1.5H-N).

How It Works

The Magnify Kit offers a rapid cell/tissue expansion method for obtaining tissue ultrastructural details. This method involves using gel monomers uniformly distributed in the tissue to anchor biomolecules in their original location. Upon polymerization, the sample can swell about 10 times in one dimension and about 1000 times in volume when exposed to water. This technique is often used to surpass the resolution limits of optical microscopes, effectively improving resolution. For example, when combined with Nikon CSU-W1 spinning disk confocal, it can achieve resolutions of ~25 nm (x,y) and ~70 nm (z); when combined with Zeiss Airyscan, it can achieve resolutions of 15 nm (x, y) and 40 nm (z).

Restrictions

This kit is for research use only.

Choose the right kit

Based on your sample type, choose the corresponding kit for optimal results.

Cat. No.	Optimized specimens
MB-K-001-F-T	FFPE tissue sections (< 5 μm thick)
MB-K-002-C-T	All culture cells
MB-K-003-O-T	All organoids
MB-K-004-T-T	Freshly preserved mouse brain/ other tissues and Fixed frozen tissue sections

Product Specifications

Shipping and Storage

The solutions provided in this kit are temperature sensitive, and appropriate care should be taken during shipping and storage. Magnify Expansion Kits are shipped on ice packs to ensure the integrity of the components. Upon receipt, immediately store Solutions A and G at 4°C, shielded from light. Solutions A and G have a shelf life of 6 months under these conditions. Other solutions and activation tubes can be stored at room temperature for up to one year.

Handling

Always ensure that Magnify Expansion Kit components have been thoroughly mixed before use. Buffer H may develop white precipitates depending on the environmental temperature. If precipitates are present, warm Buffer H at 45°C before use to dissolve them. Keep all kit components at the appropriate temperatures during handling and preparation to maintain their integrity and performance.

Quality Control

All kit components are subjected to stringent functional quality control, are free of detectable contaminating exo- and endonuclease activities, and meet strict requirements with respect to DNA contamination. This ensures reliable performance and reproducibility in your research applications.

Protocol

For the protocol of the specific product, please refer to the corresponding user manual and quick guide provided with the product.

For more information, please contact Technical Support at info@magnifybiosci.com.

Magnify kit refill

The refill for Magnify kit is for research use only.

Cat. No.	Optimized specimens
MB-SS-001-F-G	For FFPE tissue sections, refill, 20 reactions
MB-SS-002-C-G	For all culture cells, refill, 20 reactions
MB-SS-003-O-G	For all organoids, refill, 20 reactions
MB-SS-004-T-G	For freshly preserved mouse brain, and other tissues , refill, 20 reactions
MB-SS-005-H	For all Magnify specimens , refill, 20 reactions
MB-SS-006-S	For all Magnify specimens, refill, 20 reactions
MB-SS-007-W	For all Magnify specimens, refill, 20 reactions

Expansion Factors of Various Validated Tissue Types

Tissue Type	Sample Format/Fixation	Expansion Factor
HEK Cells	3% PFA/0.1% GA	9.2 ± 2.3 (N = 6)*
Human Brain	FFPE	8.4 ± 0.3 (N = 3)*
Human Breast	FFPE	9.0 ± 0.2 (N = 3)*
Human Colon	FFPE	9.7 ± 0.4 (N = 3)*
Human Kidney	FFPE	8.6 ± 0.2 (N = 4)*
Human Liver	FFPE	10.1 ± 0.6 (N = 3)*
Human Lung	FFPE	10.8 ± 0.6 (N = 3)*
Human Lymph Node	FFPE	8.5 ± 0.5 (N = 5)*
Human Placenta	FFPE	8.8 ± 0.4 (N = 3)*
Human Prostate	FFPE	10.4 ± 0.6 (N = 3)*
Human Skin	FFPE	9.4 ± 0.3 (N = 3)*
Human Thymus	FFPE	10.0 ± 0.4 (N = 3)*
Human Thyroid	FFPE	10.8 ± 0.4 (N = 3)*
Human Tonsil	FFPE	8.6 ± 0.3 (N = 6)*
Human Uterus	FFPE	8.0 ± 0.3 (N = 3)*
Lung Organoid	4% PFA	9.9 ± 2.1 (N = 3)
Mouse Brain	4% PFA	11.2 ± 1.9 (N = 3)*†

*Error in terms of s.e.m. over N technical replicates.

Reference

Klimas et al. *Nature Biotechnology* 41, pages858–869 (2023)

Troubles Shooting

Problem	Cause	Solution
Gelling Step		
The gel did not polymerize.	Activation buffer not added to the solution.	Be sure to activate the buffer on the new sample.
	Incubation needs to be longer.	Incubate for 1 hour longer.
	Too much liquid remained on a sample before adding the activated gelling solution	Allow tissue to dry slightly before applying the activated gelling solution.
The gel does not detach from the slide.	This may be due to the lack of humidification in the incubator	Use a razor to remove the tissue from the slide gently.
Homogenization		
Buffer H is opaque	Salt precipitates in a cold environment.	Heat at 37-60C until the solution clears.
Gel curls after washing in Buffer W after homogenizing.	The sample is under homogenized	Homogenize for at least 20% longer.
Tissue is not clear after homogenizing.	The sample is under homogenized	Homogenize for at least 20% longer.
Imaging Step		
Distortions or ruptures are present in the samples when imaging.	The sample is under homogenized.	Homogenize for at least 20% longer.
DAPI stain fails.	The sample is over homogenized	Homogenize for a 20% shorter time.
Structural preservation of target structures seems poor	The sample is over homogenized	Homogenize for a 20% shorter time.
	Poor fixation	Use better fixation protocol for tissue type.
	Poor antibody recognition of the epitope	Try different antibodies or polyclonal antibodies.

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