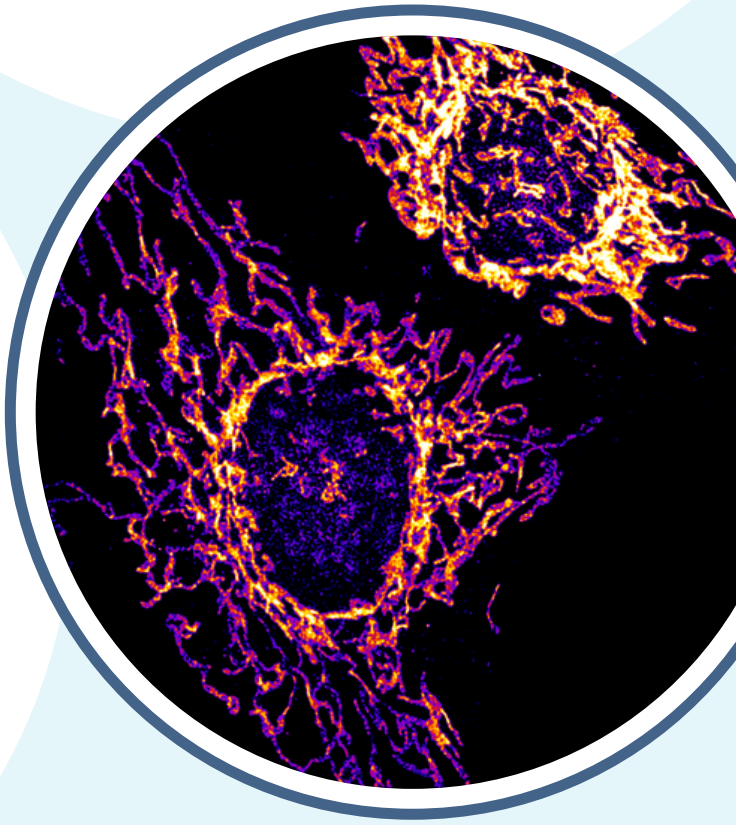
YamayBio

CELL ExM KIT

CAT.NO.	SIZE
CC6232	20 Assays

Expansion microscopy (ExM) is a novel super-resolution imaging technique. Biological samples can be isotropically expanded through expandable hydrogels, allowing for significantly improved resolution. This technique is compatible with various biological molecules and can be implemented using wide-field and confocal microscopes. For example, the resolution of wide-field microscopy can be improved from 250 nm to 60nm, and that of confocal microscopy from 120nm to 30nm. The uniform expansion preserves the spatial information of biomolecules.



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SIGNIFICANTLY HIGHER IMAGING RESOLUTION

The image resolution was improved 4.5-fold in theory after expansion.

PRESERVES THE SPATIAL INFORMATION OF BIOMOLECULES

Uniform expansion preserves the spatial information of biomolecules.

RAPID AND EFFICIENT

The cell sample expanded fully within 3 hours.

Hydrogel Expansion Fold in Three Dimension

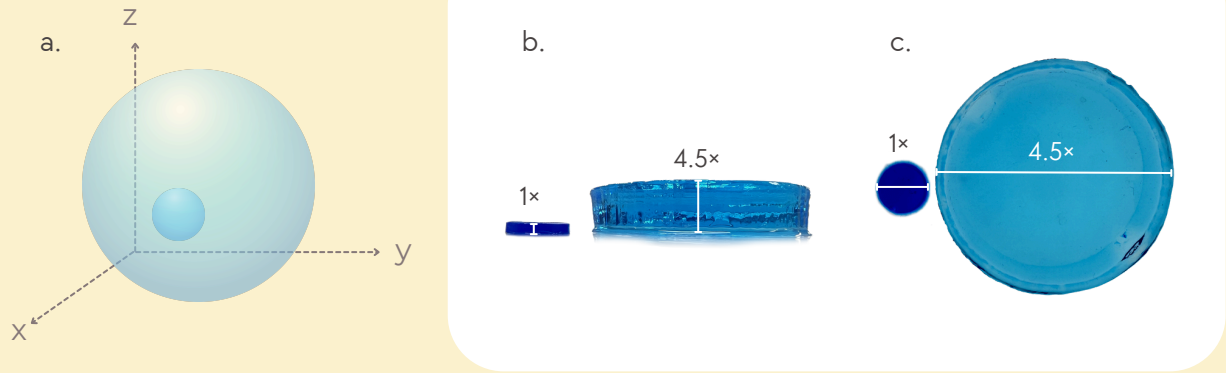

Figure 1. Analysis of gel expansion fold .Gel was prepared by adding copper phthalocyanine at a concentration of 0.05%. Expanded gels demonstrated a 4.5-fold increase in linear dimensions (X,Y,Z). Dye intensity decreased following expansion due to dilution of dye molecules in the expanded hydrogel. Schematic representation of gel expansion in three dimension(a). Comparison of gel size before (left) and after (right) expansion in yz direction (b) and xy direction (c).

Significantly Increase Imaging Resolution

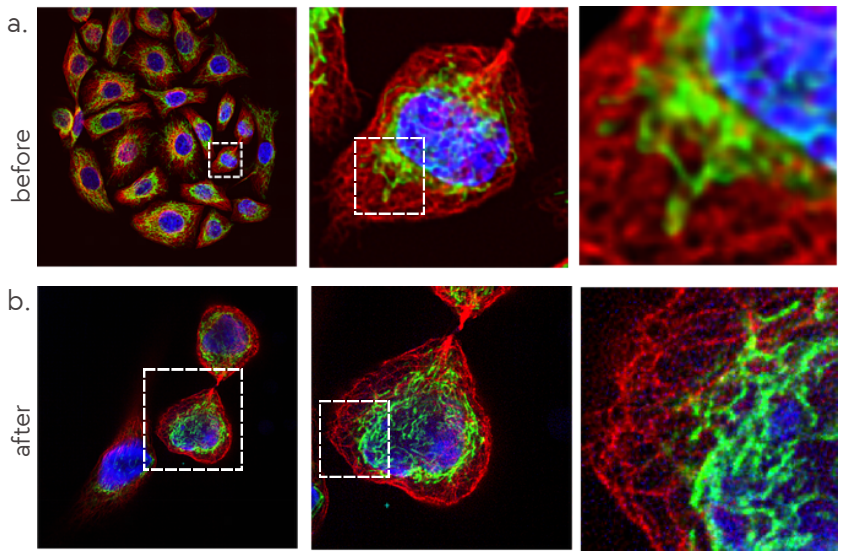

Figure 2. HeLa cells were imaged before (a) and after (b) expansion using a Nikon CSU-W1 confocal microscope followed by deconvolution with ImageJ. Hsp60 (green) labels mitochondria, tubulin (red) labels microtubules, and nuclei are stained with DAPI (blue).

The cellExM kit would dramatically improve the imaging resolution of confocol microscopy.

Preserves the Spatial Relationship

No Colocalization between Proteins

Enhanced resolution achieved through expansion microscopy revealed the original spatial relationships of proteins. Traditionally, mitochondria and microtubules were not considered to exhibit significant colocalization.

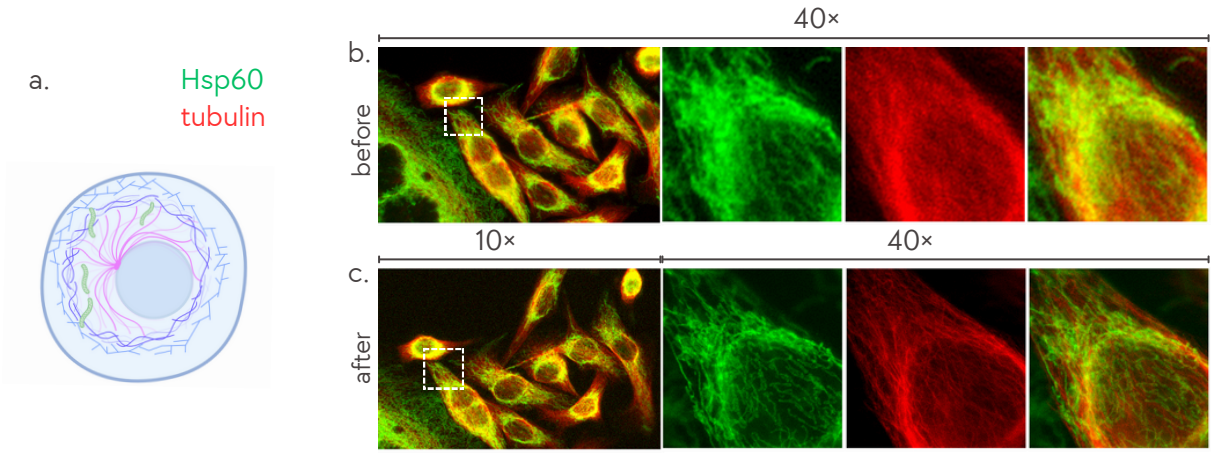

Figure 3. Schematic representation of subcellular localizaton of mitochondria and microtubles(a). HeLa cells were imaged before (b) and after (c) expansion using an OLYMPUS CKX53SF 40x microscope and subsequently deconvolved using ImageJ. Hsp60 (green) labels mitochondria, and tubulin (red) labels microtubules.

Protein-protein Colocalizatio

ZO-1 and Claudin-1 are two well-established markers of cell-cell tight junctions, commonly used for analyzing protein-protein colocalization. Following expansion microscopy, improved resolution revealed more intricate details of the signal. Notably, signal intensity decreased due to the dilution of dye molecules within the expanded hydrogel.

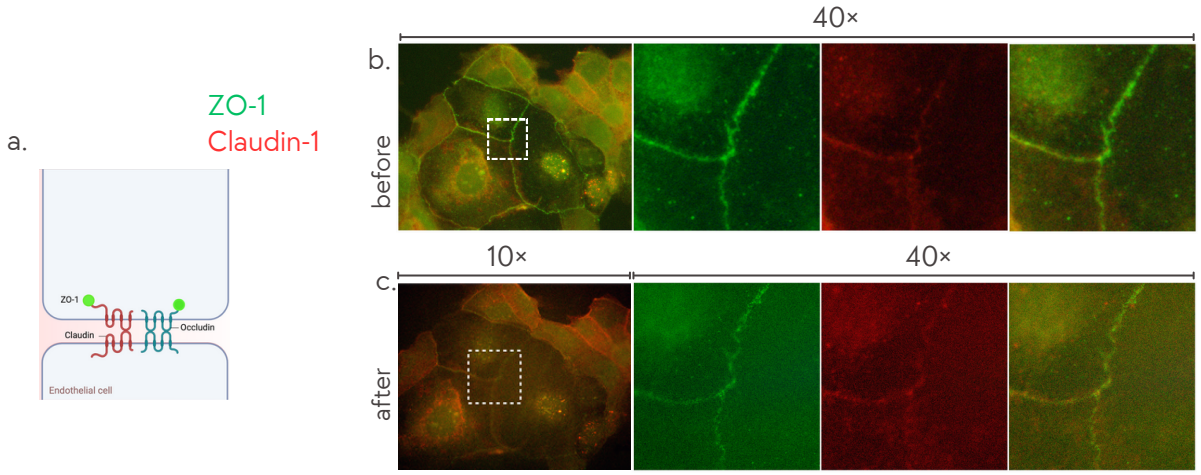

Figure 4. Schematic representation of cell-cell tight junction in Caco-2 cells (a). Caco-2 cells were imaged before (b) and after (c) expansion using an OLYMPUS CKX53SF 40x microscope and subsequently deconvolved using ImageJ. ZO-1 (green) and Claudin-1 (red) label cell-cell tight junctions.