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CryoAPEX Technique for Sub Cellular Preservation

Combines chemical fixation with high-pressure freezing to preserve live-cell membranes and organelles for electron tomography.

Researchers at Purdue University have developed a method of preparing live cells for analysis that achieves reduced morphological damage to cellular membranes and membrane bound organelles. A limitation of current cellular preservation techniques is that in order to make a sample compatible with staining, the membrane of the cell becomes damaged and the cellular architecture is lost. Researchers at Purdue University have created a method (known as cryoAPEX) of preserving cells in a way that combines chemical fixation processes with high pressure freezing of cells with peroxidase tagging for localization of membrane proteins. Unlike previously available techniques, this method can be used on cells grown in tissue cultures. This method also requires fewer steps than currently available methods of cellular preservation and is compatible with electron tomography. This technology has applications in biological sample analysis and the preservation of biological samples.

Advantages:

- Fewer steps than previously available cellular preservation methods

- Prevents damage to cell membranes

- Compatible with Electron Tomography

- Compatible with cells grown in tissue cultures

Applications:

- Biological sample preservation

- Analysis of membrane proteins

Technology Validation:

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Category
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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The cryoAPEX technologywas validated to obtain a high-resolution three dimensional contextual map of the human FIC (filamentation induced by cAMP) protein, HYPE (also known as FICD. CryoAPEX analysis shows that, under normal and/or resting conditions, HYPE localizes robustly within the subdomains of the ER and is not detected in the secretory pathway or other organelles

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