

Minute™ High Fidelity ER Isolation Kit for Liver Tissue

Cat. No. ER-035

Description

Endoplasmic reticulum (ER) is a major membranous structure that functionally connects nuclear membrane and plasma membrane. Liver is an ER-rich organ and has been used for isolation of ER for many decades. Traditional method for isolating ER is based on density gradient ultracentrifugation. The protocol requires large amount of starting material and the methods are tedious and time consuming with significant cross-contamination. Currently, all commercial kits for ER isolation are based on the methods developed in 1970s of last century. Unlike any other ER isolation kit in the market, this kit employs a patented spin-column based technology that is simple, rapid and requires only small amount of tissue. This kit can differentially precipitate native ER (mainly rough ER) frozen liver tissues without using a Dounce homogenizer and ultracentrifugation. The whole protocol can be done in about 2h.

Kit Components (20 prep)

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| Buffer A | 15 ml |
| Buffer B | 4 ml |
| Buffer C | 4 ml |
| Plastic rods | 2 |
| Filter Cartridge | 20 |
| Collection Tube | 20 |

Additional Materials Required

1 X PBS, Vortexer, Table-Top Micro centrifuge with maximum speed of 16,000 Xg. **The centrifuge should be able to reach maximum speed within 10 seconds.**

Shipping and Storage: Ship and store the kit at ambient temperature

Important Information:

1. Read the entire procedures carefully. Chill protein extraction filter cartridge with collection tube on ice prior to use.
2. **All centrifugation steps should be performed at 4°C in a cold room or in a refrigerated microfuge.**
3. To study protein phosphorylation, **phosphatase inhibitors** (such as PhosStop from Roche) should be added to buffer A prior to use. If protein degradation is a concern, add protease inhibitor cocktails to buffer A prior to use.
4. It is recommended to use BCA Protein Assay Kit for determination of protein concentration (Pierce, Cat #:23227).

Protocol

1. Place the filter cartridges in a collection tube and incubate on ice.
2. Place 30-35 mg frozen liver tissue (thaw tissue completely at room temperature, fresh tissue is not recommended due to lower final yield and purity) in a filter cartridge. Add 200 μ l buffer A to the filter and grind the tissue with a plastic rod for 2-3 min by pushing the tissue against the surface of the filter repeatedly with twisting force. After grinding, add 350 μ l buffer A to the same filter cartridge (The plastic rod is reusable. Clean it with 70% alcohol or water).
3. Cap the filter cartridge, invert a few times and centrifuge at 16,000 X g for 30 seconds.
4. Without removing the filter, centrifuge the tube at 2000 X g for 5 min (the pellet contains nuclei, large cell debris and some un-ruptured cells).
5. Remove the filter and transfer all supernatant to a fresh 1.5 ml microfuge tube (avoid the lipid on the wall of the tube as much as you can) and centrifuged at 4°C for 30 min at 16,000 X g. After centrifugation, carefully transfer 400 μ l supernatant to a fresh 1.5 ml tube. The pellet contains mainly larger cell debris, mitochondria, lysosomes and plasma membranes.
6. Add 200 μ l buffer B to the tube containing 400 μ l supernatant. Mix well by vortexing briefly (buffer B to supernatant ratio is 1:2). Incubate the tube at 4°C for 30 min.
7. Centrifuge at 16,000 X g for 10 min. Remove the supernatant completely. Resuspend the pellet in 200 μ l PBS by pipetting up and down for 40-50 times and vortex vigorously for 20 seconds. Incubate at ambient temperature for 15 min, vortex every 5 min. Centrifuge the tube at 2000 X g for 5 min. Transfer the supernatant to a fresh 1.5 ml tube. Add 200 μ l buffer C to the supernatant and mix by vortexing briefly (the supernatant to buffer C = 1:1). Incubate the tube at 4°C for 20 min.
8. Centrifuge the tube at 10,000 X g for 10 min. Remove and discard the supernatant. Spin the tube at 10,000 X g for a few second to bring down the residual reagent on the wall of the tube. Remove it completely.
9. Resuspend the pellet in 50 to 200 μ l PBS (this is isolated ER fraction that contains mainly rough ER. If the prep is not used right away, add protease inhibitor cocktails to the prep and store at -80°C). The water insoluble ER fraction can be dissolved in any buffer of your choice but following reagents are recommended depending upon downstream applications.

Following protein solubilization reagents are recommended.

| Product Name | Cat. No. | Applications |
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| Minute™ Denaturing Protein Solubilization Reagent | WA-009 | SDS-PAGE electrophoresis and Western blotting, trypsin digestion, purification of proteins with biotin labeling or histidine labeling, etc. |
| Minute™ Non-Denatured Protein Solubilization Reagent | WA-010 | ELISA, immunoprecipitation/Co-IP, enzymatic activity determination and other applications. |
| Minute™ Protein Solubilization Reagent for MS | WA-011 | Trypsin digestion and subsequent mass spectrometry analysis. |