

Allprotect® Reagent and AllPrep® DNA/RNA/Protein Kit

For sample stabilization and purification in systems biology

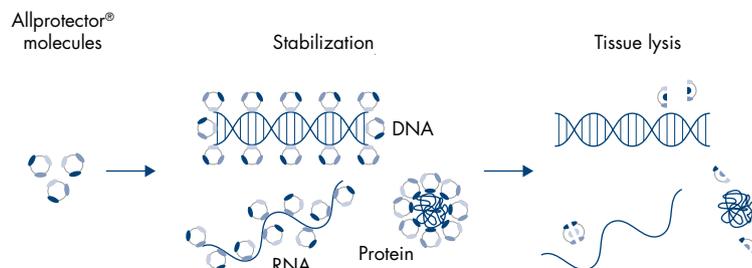
The combination of Allprotect and AllPrep technologies provides a complete solution for sample preparation in systems biology. Allprotect Tissue Reagent delivers immediate stabilization of DNA, RNA and protein in tissue samples for long-term storage without freezing, while the AllPrep DNA/RNA/Protein Mini Kit allows simultaneous purification of these 3 analytes from the same precious sample.

Benefits of Allprotect and AllPrep technologies:

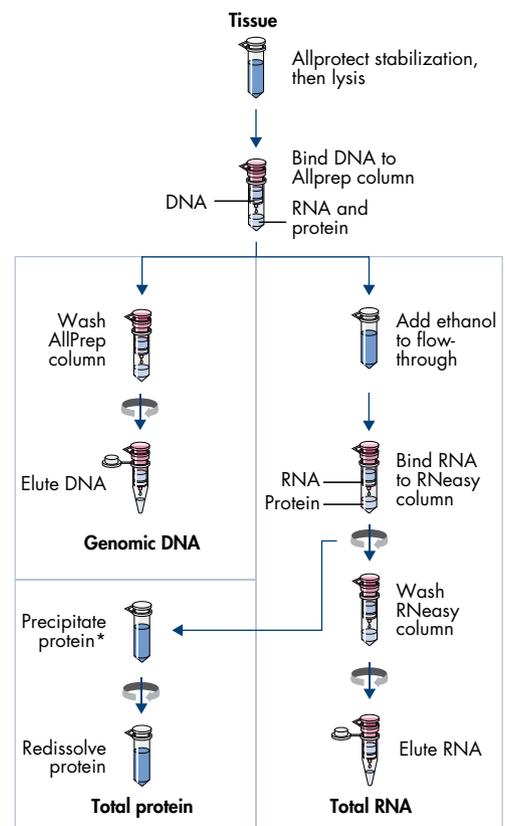
- Streamlined workflow with no liquid nitrogen or phenol
- Immediate, convenient stabilization of harvested tissues
- Long-term storage of tissues for later analysis
- Simultaneous purification of DNA, RNA and protein
- Standardized sample preparation for systems biology

Streamlined sample preparation

Allprotect and AllPrep technologies streamline sample preparation (see flowchart). Freshly harvested tissue is first submerged in Allprotect Tissue Reagent to immediately stabilize DNA, RNA and protein (Figure 1). These three analytes can then be simultaneously purified using the AllPrep DNA/RNA/Protein Mini Kit. There is no need to split the sample into 3 prior to purification, allowing maximum recovery of DNA, RNA and protein. Stabilization and purification take place at room temperature, eliminating the use of hazardous liquid nitrogen or dry ice. In addition, no organic solvents such as phenol and acetone are required.



Allprotect/AllPrep Tissue Procedure



* Using a novel protein precipitation solution.

Figure 1. Mechanism of Allprotect stabilization. Each Allprotect molecule possesses contact points that allow multiple Allprotect molecules to envelop and protect DNA, RNA and protein. Upon tissue lysis, Allprotect molecules become diluted and fall apart, releasing DNA, RNA and protein.

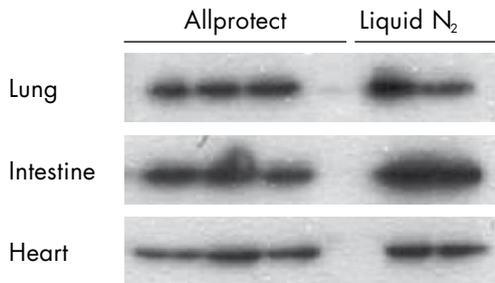


Figure 2. Intact protein for western blotting. Rat tissues were stored in Allprotect Reagent at 25°C for 5 days prior to western blot analysis of ERK2. Blot intensities were similar to those from liquid nitrogen stabilized tissues, indicating no protein degradation.

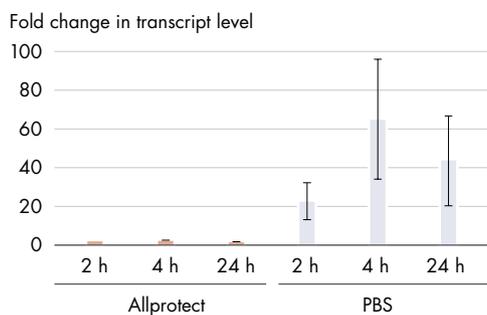


Figure 3. Prevention of gene induction. Rat lung was stored at 25°C in Allprotect Reagent or in PBS for the indicated times prior to real-time RT-PCR analysis of c-fos expression. Transcript levels relative to that in liquid nitrogen stabilized lung were calculated. The data show that Allprotect Reagent prevents c-fos induction.

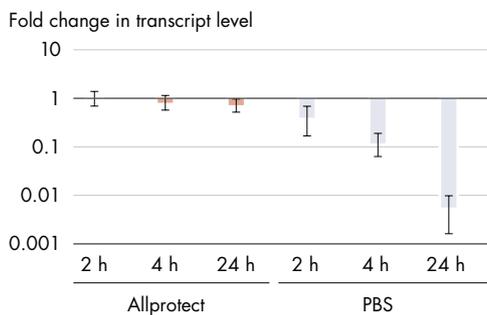


Figure 4. Prevention of RNA degradation. Rat intestine was stored at 25°C in Allprotect Reagent or in PBS for the indicated times prior to real-time RT-PCR analysis of Madh7 expression. Transcript levels relative to that in liquid nitrogen stabilized intestine were calculated. The data show that Allprotect Reagent prevents RNA degradation.

* Functional protein can be purified from Allprotect stabilized tissues using the Qproteome Mammalian Protein Prep Kit (cat. no. 37901).

Immediate, convenient tissue stabilization

Immediate stabilization of harvested tissues in Allprotect Tissue Reagent preserves the in vivo profile of DNA, RNA and proteins. This enables reliable downstream analysis (Figures 2, 5 and 7),* even with tissues stored at room temperature (15–25°C) for up to 7 days. Stabilization is especially critical for RNA, since transcript levels change rapidly after tissue harvesting (Figures 3 and 4). Agilent® 2100 bioanalyzer analysis of RNA from Allprotect stabilized tissues gives high RIN values, indicating intact RNA.

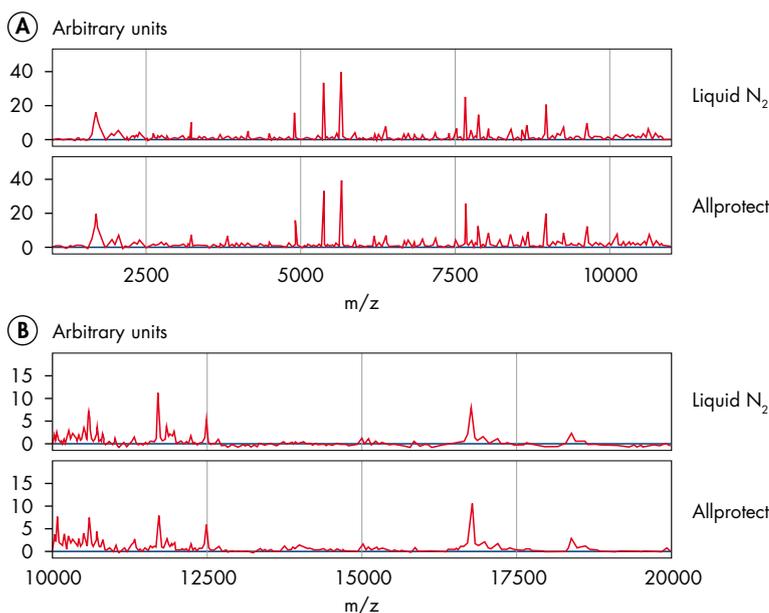


Figure 5. Prevention of protein degradation. Human intestine mucosa samples were stored for 1 day in Allprotect Reagent (4°C) or in liquid nitrogen, and analyzed by mass spectrometry. Allprotect samples gave similar peak patterns for **A** <math>< 10\text{ kDa}</math> and **B** 10–20 kDa protein as the liquid nitrogen samples, indicating stabilization of the protein content. Example analyses are shown. **Data kindly provided by Indivumed GmbH, Hamburg, Germany.**

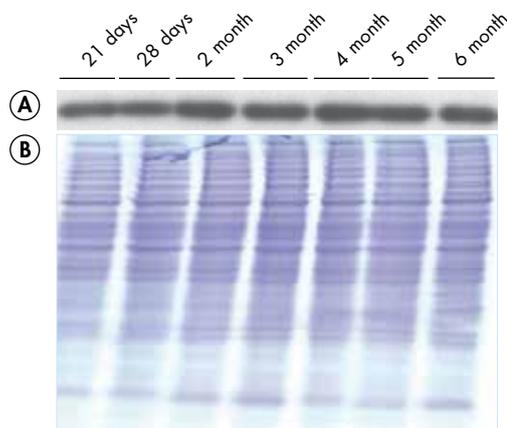


Figure 6. Long-term tissue storage. Rat liver and kidney were stored in Allprotect Reagent at 2–8°C for up to 6 months. **A** Western blotting for ERK2 (liver) and **B** SDS-PAGE analysis (kidney) showed consistent protein levels, indicating no protein degradation.

Long-term tissue storage

Tissues stabilized in Allprotect Tissue Reagent can be stored at 2–8°C for up to 6 months without showing any degradation of DNA, RNA and protein (Figures 6 and 8). For longer storage, stabilized tissues can be archived at –20°C or –80°C.

Simultaneous analyte purification for systems biology

The combination of Allprotect and AllPrep technologies standardizes sample preparation for systems biology. DNA, RNA and protein are all prepared from the same source, eliminating the variation inherent in preparing these analytes from different samples.

Genomic DNA and total RNA purified using the AllPrep DNA/RNA/Protein Mini Kit deliver optimal results in all downstream applications. These include real-time PCR and RT-PCR analyses (Figure 9). Total protein purified using the kit is suitable for SDS-PAGE and western blotting (Figure 10).

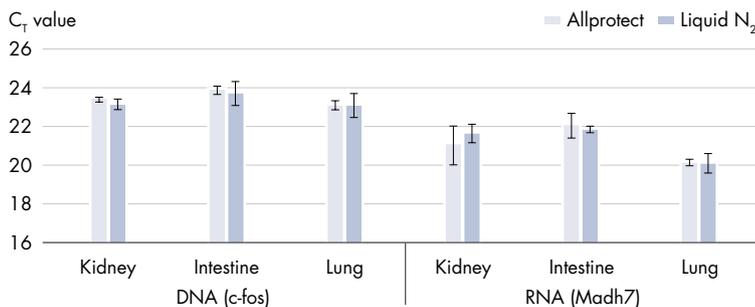


Figure 9. Reliable real-time PCR and RT-PCR analyses. Rat tissues were stabilized in Allprotect Reagent and DNA and RNA were purified using the AllPrep DNA/RNA/Protein Mini Kit. The C_T values in real-time PCR and RT-PCR analyses were similar to those achieved with tissues stabilized in liquid nitrogen.

Other QIAGEN solutions for systems biology

QIAGEN offers other products for sample preparation in systems biology. These include AllPrep Kits for simultaneous purification of DNA and RNA or of RNA and protein. DNeasy®, RNeasy® and Qproteome Kits allow individual preparation of DNA, RNA and functional protein, respectively, and are also compatible with Allprotect Tissue Reagent. * For more information, contact QIAGEN Technical Service.

* Allprotect Tissue Reagent is also compatible with QIAGEN kits for DNA purification from small human tissue samples; please inquire.

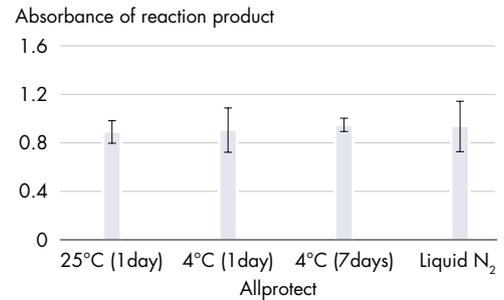


Figure 7. Preservation of protein activity. Rat liver was stored in Allprotect Reagent before total protein was purified using the Qproteome Mammalian Protein Prep Kit. Acidic phosphatase activity was similar to that for protein from control liver stored in liquid nitrogen. Each bar shows the mean from two liver pieces assayed in duplicate.

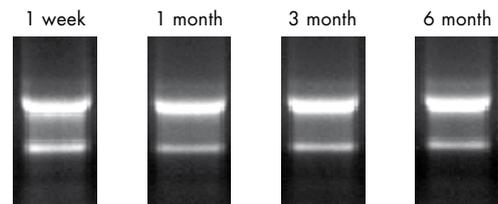


Figure 8. Long-term tissue storage without RNA degradation. Rat liver was stored in Allprotect Reagent at 4°C for up to 6 months. RNA was purified and run on an agarose gel. Band intensities remained consistent, indicating no RNA degradation.

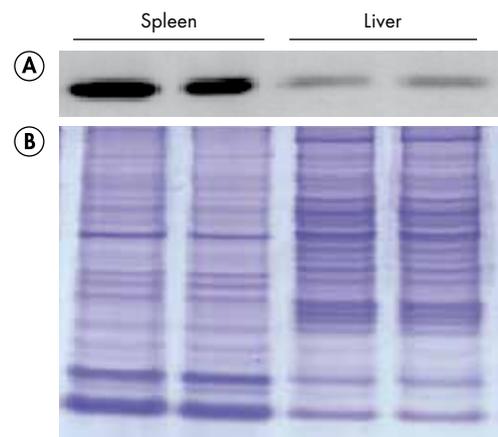


Figure 10. Reliable western blotting and SDS-PAGE. Rat tissues were stabilized in Allprotect Reagent, and protein was purified using the AllPrep DNA/RNA/Protein Mini Kit. Duplicates were run on an SDS-PAGE gel, followed by **A** western blotting for ERK2 and **B** Coomassie staining.

Ordering Information

Product	Contents	Cat. no.
Allprotect Tissue Reagent (100 ml)	100 ml Allprotect Tissue Reagent, Allprotect Reagent Pump	76405
AllPrep DNA/RNA/ Protein Mini Kit (50)	For 50 preps: AllPrep DNA Spin Columns, RNeasy Spin Columns, Collection Tubes, RNase-Free Reagents and Buffers	80004
Related products		
AllPrep DNA/RNA Mini Kit – for simultaneous purification of genomic DNA and total RNA from the same cell or tissue sample		
AllPrep DNA/RNA Mini Kit (50)	For 50 minipreps: Includes AllPrep DNA Spin Columns, RNeasy Mini Spin Columns and Buffers	80204
AllPrep RNA/Protein Kit – for simultaneous purification of total RNA and native protein from the same cultured cell sample		
AllPrep RNA/Protein Kit (50)	For 50 preps: AllPrep Spin Columns, RNeasy Spin Columns, Protein Cleanup Spin Columns, Collection Tubes, RNase-Free Reagents and Buffers	80404
DNeasy Blood & Tissue Kit – for purification of total DNA from animal blood and tissues, and from cells, yeast, bacteria or viruses		
DNeasy Blood & Tissue Kit (50)*	50 DNeasy Mini Spin Columns, Proteinase K, Buffers, Collection Tubes (2 ml)	69504
RNeasy Plus Mini Kit – for purification of total RNA from cultured cells and tissues using gDNA Eliminator columns		
RNeasy Plus Mini Kit (50)	50 RNeasy Mini Spin Columns, 50 gDNA Eliminator Mini Spin Columns, Collection Tubes, RNase-Free Reagents and Buffers	74134
Qproteome Mammalian Protein Prep Kit – for total protein preparations from mammalian cells and tissues		
Qproteome Mammalian Protein Prep Kit	For approximately 100 protein preparations from cells and tissues: Buffer, Reagents, Protease Inhibitor Solution, Benzonase®	37901

* Larger kit size available; please inquire.

Allprotect Tissue Reagent, AllPrep Kits, the DNeasy Blood & Tissue Kit, the RNeasy Plus Mini Kit and the Qproteome Mammalian Protein Prep Kit are intended for research use. No claim or representation is intended to provide information for the diagnosis, prevention or treatment of a disease.

Trademarks: QIAGEN®, Sample to Insight®, AllPrep®, Allprotect®, Allprotector®, DNeasy®, RNeasy® (QIAGEN Group); Agilent® (Agilent Technologies, Inc.); Benzonase® (Merck KGaA, Darmstadt, Germany). Benzonase® Nuclease is supplied by Merck KGaA and its Affiliates. Benzonase® is a registered trademark of Merck KGaA, Darmstadt, Germany.

© 2015 QIAGEN, all rights reserved. PROM-0118-002

Ordering www.qiagen.com/contact | Technical Support support.qiagen.com | Website www.qiagen.com