

# NEWS on diagnostics

2019 PCR Special Edition (2)



PCR is now a common and often indispensable technique used for a broad variety of applications. This Special Edition of News on Diagnostics covers products that are appropriate for the Nucleic Acid Extraction & Purification step in this valuable technique.

**Sample Collection and Stabilization**

- From various sources and FFPE samples
- Collection cards and containers
- Stabilizing reagents

**Nucleic Acid Extraction and Purification**

- Lysis method
- Organic extraction
- Column extraction and purification

**Amplification**

- PCR, qPCR, real-time PCR, RT-PCR and RT-qPCR reagents & kits
  - DNA/RNA templates and polymerases
- dNTPs/rNTPs
- PCR accessories and equipment

**Post-PCR Clean Up**

- Gel purification
- Spin columns
- High-throughput kits
- Magnetic beads



## Nucleic Acid Extraction & Purification

To extract your nucleic acids of interest, it's necessary to break open the cell membrane and release the genetic material, creating a cell lysate. There are various extraction methods to choose from, each with its own advantages and implications.

The method you select will depend on the following three factors:

- Your starting cells/tissue
- Your target genetic material
- Your downstream application

The three main extraction techniques are:

- Mechanical cell lysis
- Organic solvents
- Column-based extraction and purification

**Our resource guides and PCR product portfolio can support you to efficiently perform this pivotal molecular biology procedure. For more details on the products and procedures in this edition, please visit**

[SigmaAldrich.com/IVDPCR](http://SigmaAldrich.com/IVDPCR)

### Lysis Reagents

We can supply various lysis reagents to degrade cellular components, depending on whether your target is DNA or RNA. These include:

- Proteinase K (Cat. No. P2308)
- DNA removal with DNase I, Amplification Grade (Cat. No. AMPD1) or Deoxyribonuclease I RNase-free solution from bovine pancreas (Cat. No. D7291)
- RNA removal with Ribonuclease A (Cat. No. R6148)

Prevent cross-contamination with **RNaseZAP™** (Cat. No. R2020), a cleaning agent that removes RNase from glassware, plastic surfaces, countertops and pipettors. It also effectively eliminates RNase contamination from microcentrifuge tubes without inhibiting subsequent enzymatic reactions.

### Column-based Kits and Reagents

Choose from our column-based kits and reagents to:

- Extract and amplify crude genomic DNA from mammalian tissue and blood, plasma and serum
- Extract high-quality genomic DNA from mammalian cells, tissue, blood, serum, plasma, urine, stool, FFPE tissue, fungi or bacteria
- Isolate and purify total RNA, mRNA, microRNA or small RNA from tissue, single cell, FFPE samples, fungi, plasma and serum
- Co-purify RNA, DNA and protein from a single sample, including from tissues, cells and FFPE samples
- Perform high-throughput 96-well isolation and purification of DNA or RNA from blood and tissue and total RNA

**For more information on purification of genomic DNA from plants or mammalian tissues, please visit**

[SigmaAldrich.com/genomic-DNA](http://SigmaAldrich.com/genomic-DNA)

### Organic Solvents

Extract from a wide selection of sample types with our range of organic solvents:

- Isolate DNA, RNA and protein simultaneously
- Isolate RNA with decreased DNA contamination
- Isolate total and small RNA from human, animal, plant bacterial, and viral samples
- Process tissues, cells or cell pellets
- Process whole blood, plasma or serum
- Process fluid samples, such as cell suspensions, CSF, and amniotic fluid

**TRI Reagent®** (Cat. No. 93289) is an improved version of the single-step total RNA isolation reagent developed by Chomczynski. The RNA isolation method based on this reagent is widely used and proven for RNA applications. It is ideal for quick, economical and efficient isolation of total RNA or the simultaneous isolation of RNA, DNA and proteins from samples of human, animal, plant, yeast, bacterial and viral origin.

#### Features and Benefits

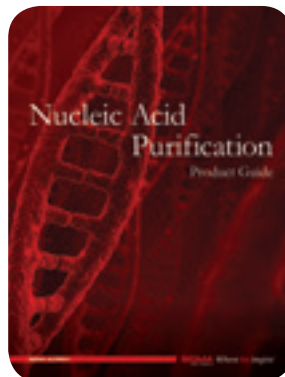
- Easily scalable RNA isolation
- Works with many sources: human, plant, yeast, bacterial or viral
- Better yields than traditional guanidine thiocyanate/caesium chloride methods
- 1 mL is sufficient for the extraction of 100 mg tissue or  $10^7$  cells

## Your Guide to Purification

GenElute™ genomic DNA purification kits provide simple and convenient methods to isolate pure, high molecular weight DNA from a variety of sources. These kits combine the benefits of silica-based bind and elute technology with a microspin format. The purified genomic DNA can be used for downstream applications, including PCR.

Find out more about our GenElute™ kits and download our Nucleic Acid Purification Product Guide at

[SigmaAldrich.com/genelute](http://SigmaAldrich.com/genelute)



## TWO-FOLD PROTECTION

### Stabilyser™ Protein & RNA Stabilizing Reagent

**Prevent degradation of proteins and nucleic acids during lysis and storage, and stabilize functionally-active proteins and RNA.**

Stabilyser™ Reagent (Cat. No. PNS1010) is the ONLY reagent that protects the integrity of nucleic acids AND functionally-active proteins in one uniform lysate mixture.

This proprietary formulation of detergents and solutes enables you to isolate functionally active proteins, while maintaining the integrity of nucleic acids. Stabilyser™ reagent protects analytes at the time of lysis and provides protection from freeze/thaw cycles during long-term storage for future detection needs. Achieve better sample-to-sample comparability as you can now stabilize complete, uniform tissue homogenates.

Stabilyser™ Reagent is compatible with Western blotting protocols, functional protein activity assays, and nucleic acid applications like qPCR.

- Maintain functionally-active protein & nucleic acids from the same tissue samples
- Gentle, non-denaturing lysis buffer does not interfere with downstream applications
- Protect samples during long-term storage and from freeze/thaw cycles for future analysis
- Convenient, ready-to-use reagent

### Additional Resources

Our molecular biology resources page provides handy hints and tips on protocols for this important step in PCR.

For more information, please visit [SigmaAldrich.com/molecular-biology-resources](http://SigmaAldrich.com/molecular-biology-resources)

**Don't just lyse your sample, stabilyse it!**

Request a sample today at [SigmaAldrich.com/stabilyser](http://SigmaAldrich.com/stabilyser)

