This Electron Micrograph Demonstrates that DNA Isolated from Agarose Gels Using GELase Pure and IMact...

Dr. Philip Serwer, Professor of Biochemistry at the University of Texas-San Antonio, wanted to find a way to isolate intact high molecular weight DNA from pulsed field agarose gels for electron microscopic (EM) observation. This had never been done before because contaminating fibers of agarose from the gel look like DNA strands using negative staining EM. Thus, the agarose had to be completely removed, yet the method had to be gentle enough—with no DNase contamination or shearing—so the DNA remained intact. Dr. Serwer's lab found that GELase digests LMP-agarose to >99% completion, permitting recovery of intact high molecular weight DNA that can be seen using negative-staining EM (see photo). Dr. Serwer's laboratory also used GELase to purify a protein-DNA complex from pulsed field gels for EM and other studies (Biochemistry, Vol. 31, pp. 8397-8405, 1992).

Here are 7 reasons that GELase is superior to any other method for purifying DNA or RNA from LMP-agarose gels.

1. GELase is easy to use. Just melt the gel slice with GELase Buffer, add GELase and incubate at 45°C to digest the agarose. To concentrate the DNA, add NH4OAc and ethanol. The gel digestion products are soluble and won't precipitate with the DNA.

2. Recovery of DNA is about 100% using GELase. Since GELase digests the gel matrix without any manipulation of the DNA, there is no opportunity for losses to occur. If the DNA is concentrated, recovery is limited only by the efficiency of ethanol precipitation of the DNA, which is usually highly efficient.

3. Any size DNA can be isolated intact using GELase. GELase will not damage your DNA, whether you work with small PCR products or high molecular weight DNA—even megabase DNA from pulsed field gels.

4. GELase is inexpensive. One unit of GELase digests 600 mg of a 1% LMP-agarose gel in 1 hour in GELase Buffer. That's about 3-4 average sized gel bands. With an overnight incubation instead of 1 hour, the 200-unit size of GELase is enough to digest more than a KILOGRAM of a 1% gel.

5. DNA purified using GELase is ready to use and biologically active. DNA recovered using GELase is ready for use in restriction mapping, cloning, labeling, sequencing, transcription or other molecular biological experiments.

6. Gels electrophoresed in all common buffers can be digested using GELase, The same simple procedures can be used for gels in TAE, TBE, MOPS or phosphate buffers.

7. GELase protocols are the same for RNA as for DNA. Glyoxal or formaldehyde gels can be digested. And GELase is certified to be RNase-free.

What is GELase?

GELase is a novel enzyme preparation that digests the carbohydrate backbone of agarose into small soluble oligosaccharides, yielding a clear liquid that will not become viscous or gel even on cooling in an ice bath. It permits simple and quantitative recovery of intact DNA or RNA from low melting point (LMP) agarose gels. GELase contains no contaminating DNase, RNase or phosphatase.

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