

Rapid and efficient purification of genomic DNA from both gram-negative and gram-positive bacteria

The ChargeSwitch® gDNA Mini Bacteria Kit provides a fast and reliable magnetic bead-based method for purifying genomic DNA (gDNA) from both gram-negative and gram-positive bacteria (Figure 1). This kit features:

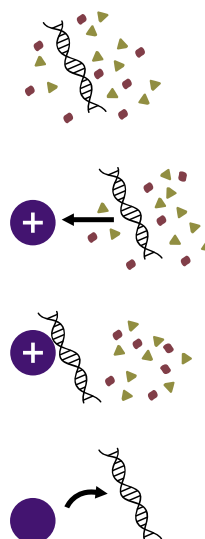
- A simple one-tube protocol that can be completed in less than 15 minutes after preparing lysates
- Efficient DNA purification from individual colonies or 0.1 to 0.5 ml of overnight cultures (Figure 2)
- Yields of up to 12 µg of genomic DNA per prep

How ChargeSwitch® Technology works

ChargeSwitch® nucleic acid purification technology (CST®) takes advantage of a unique ionizable (*switchable*) coating that can be covalently affixed to the surface of magnetic or nonmagnetic beads, membranes, or even plastic tubes and plates. At pH <6.5, the surface coating of the ChargeSwitch® Bead has a positive charge that selectively binds the negatively charged nucleic acid backbone. After proteins and other contaminants are removed with an aqueous wash buffer, the charge on the ChargeSwitch® Bead surface is neutralized by raising the pH to 8.5. The purified genomic DNA elutes instantly, ready for use in downstream protocols such as PCR, restriction enzyme digestion, and Southern blotting.

Flexible DNA purification for high-throughput applications

Unlike other bacterial DNA purification methods, the ChargeSwitch® gDNA Mini Bacteria Kit provides the flexibility to



Step 1—Cellular lysis. Pelleted cells are resuspended and lysed to release DNA.

Step 2—DNA binding. To bind DNA, the pH is dropped to <6.5. At this pH, the ChargeSwitch® Magnetic Beads become positively charged and selectively bind DNA in the presence of optimized buffers.

Step 3—Contaminant removal. Proteins and other contaminants are washed away in an aqueous wash buffer.

Step 4—DNA elution. To elute DNA, the pH is raised to >8, changing the surface charge of the ChargeSwitch® Magnetic Beads and releasing the purified DNA directly into solution.

Figure 1—ChargeSwitch® Technology. ChargeSwitch® Technology is a novel magnetic bead-based technology that provides a method for purifying DNA in a low-salt, water-based environment, eliminating the need for enzymatic inhibitors such as organic solvents, ethanol, and concentrated chaotropic salts. DNA purified with the ChargeSwitch® gDNA Mini Bacteria Kit performs better in subsequent experimental protocols than does traditionally purified DNA.

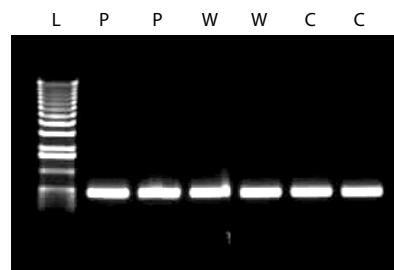


Figure 2—Efficient DNA purification from low numbers of bacteria. Genomic DNA was purified from a variety of *Salmonella typhimurium* samples using the ChargeSwitch® gDNA Mini Bacteria Kit. Following purification, the *invA* gene was amplified by PCR (456 bp product), and the PCR products were run on a 1% agarose gel and stained with ethidium bromide. Lane L: 1 Kb DNA Ladder; lane P: cells pelleted from 0.5 ml of culture; lane W: 100 µl of overnight culture; lane C: a single colony picked directly from an agar plate.



Nucleic Acid Purification

purify DNA from a wide range of both gram-positive and gram-negative bacteria (Figures 3 and 4). Furthermore, this kit's protocols are designed to be compatible with standard liquid handling robots and high-throughput applications; they contain no centrifugation or filtration steps and use reagents that will not clog lines or cause vapor pressure build-up. For added convenience, all ChargeSwitch® Kits work well with the MagnaRack™ Magnetic Rack, a two-piece magnetic separation rack that enables processing of up to 24 microcentrifuge tubes at one time (Figure 5).

For more detailed information on the ChargeSwitch® gDNA Mini Bacteria Kit and the MagnaRack™ Magnetic Rack, visit us at www.invitrogen.com/nap.

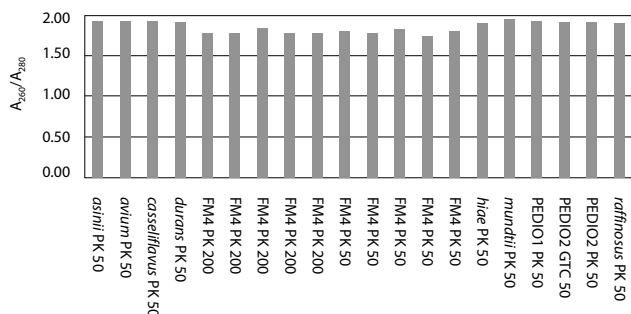


Figure 3—Purification of genomic DNA from gram-positive bacteria. Genomic DNA samples isolated from 20 species of enterococci using the ChargeSwitch® gDNA Mini Bacteria Kit show high A_{260}/A_{280} ratios indicative of DNA purity. Data kindly provided by Dr. J. Caplin, School of the Environment, University of Brighton, UK.

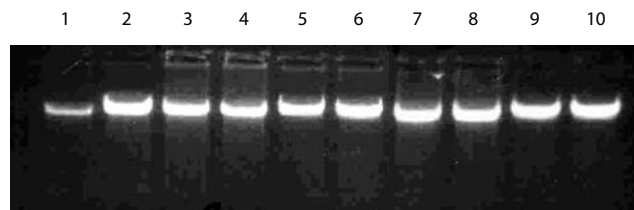


Figure 4—Purification of genomic DNA from gram-negative bacteria. Genomic DNA was purified from two species of gram-negative bacteria (*Escherichia coli* and *Pseudomonas aeruginosa*) using the ChargeSwitch® gDNA Mini Bacteria Kit in parallel with a kit from Competitor G. The purified DNA was then run on a 1% agarose gel and stained with ethidium bromide. Lane 1: 100 ng lambda DNA; lane 2: 500 ng lambda DNA; lanes 3 and 4: *E. coli* DNA purified with the CST® Kit; lanes 5 and 6: *E. coli* DNA purified with Competitor G's kit; lanes 7 and 8: *P. aeruginosa* DNA, CST® Kit; lanes 9 and 10: *P. aeruginosa* DNA, Competitor G's kit. The ChargeSwitch® gDNA Mini Bacteria Kit can also be used to purify genomic DNA from gram-positive bacteria (Figure 3); however, Competitor G's kit, which employs a salting-out/centrifugation method, is unsuitable for use with gram-positive bacteria.



Figure 5—Process 24 samples at a time using the MagnaRack™ Magnetic Rack. The ChargeSwitch® gDNA Mini Bacteria Kit works well with the MagnaRack™ Magnetic Rack, which has precisely aligned neodymium magnets that enable processing of up to 24 microcentrifuge tubes in a variety of magnetic bead-based separations.

Ordering information

To view full product details or to order ChargeSwitch® gDNA Mini Bacteria Kit, visit www.invitrogen.com/nap.

Product	Quantity	Cat. no.
ChargeSwitch® gDNA Mini Bacteria Kit, containing sufficient reagents for 50 genomic DNA preps	50 preps	CS11301
MagnaRack™ Magnetic Rack, consisting of a magnetic base station and removable tube rack	1	CS15000



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