

# DNA, Lambda Phage, Lyophilized Powder



## Introduction

Lambda phage DNA can be digested with restriction enzymes to produce discrete bands of DNA fragments when analyzed using agarose gel electrophoresis. The lyophilized powder is stable and can be stored at room temperature. Reconstituting the DNA for digestion and electrophoresis is easy—simply add sterile distilled or deionized water.

## Materials

|  |                           |
|--|---------------------------|
| Lambda phage DNA, lyophilized powder, 1 UN | Microcentrifuge tube rack |
| Water, distilled or deionized, sterile     | Microcentrifuge tubes, 66 |
| Bag, resealable                            | Micropipet                |
| Freezer access                             | Micropipet tips           |

## Safety Precautions

*Although lambda phage DNA is considered nonhazardous, wear chemical splash goggles when working with biological liquids. To prevent contamination, practice aseptic technique such as wearing clean gloves and a lab coat or apron. Wash hands thoroughly with soap and water before leaving the laboratory. Follow all laboratory safety guidelines. Please review current Material Safety Data Sheets for additional safety, handling and disposal information.*

## Preparation

1. Add 132  $\mu\text{L}$  of sterile deionized water to the stock bottle of lambda phage DNA. Cap the bottle and mix well.
2. Dispense 2  $\mu\text{L}$  of the reconstituted lambda phage DNA into a microcentrifuge tube.
3. Place the microcentrifuge tubes into a resealable bag and freeze until used.

## Disposal

Please consult your current *Flinn Scientific Catalog/Reference Manual* for general guidelines and specific procedures governing the disposal of laboratory waste. Undigested lambda phage DNA should be allowed to evaporate to dryness followed by disposal in the regular trash according to Flinn Suggested Disposal Method #26a.

## Connecting to the National Standards

This laboratory activity relates to the following National Science Education Standards (1996):

### ***Unifying Concepts and Processes: Grades K–12***

Form and function

### ***Content Standards: Grades 9–12***

Content Standard C: Life Science, molecular basis of heredity, interdependence of organisms

## Tips

- The lambda phage DNA was extracted and then lyophilized from a solution containing 1 mM Tris-HCl, pH 7.5, 1 mM NaCl, 1 mM EDTA.
- After reconstitution as described above, the concentration of lambda phage DNA should be about 50  $\mu\text{g}/\mu\text{L}$ .
- Use 2  $\mu\text{L}$  of reconstituted lambda phage DNA for each digestion with restriction enzyme.
- Each 1 UN vial of lambda phage DNA contains enough material to perform 66 digestions.
- Warm the microcentrifuge tube containing frozen, reconstituted DNA in your hand to thaw the DNA just before use.

### Discussion

Lambda phage is a bacteriophage virus with an icosahedral head and a long tail terminating in a single fiber. Lambda phage infects *Escherichia coli*. The source is *E. coli* W3110, strain  $\lambda$ c1857, Sam 7. Lambda phage DNA is isolated as a double-stranded linear molecule and it contains 48,502 bp (48 kb) or  $31.5 \times 10^3$  kDa. The complete nucleotide sequence is known and may be found online at <http://www.cf.ac.uk/biosi/staff/ehrmann/tools/dna/PhageLambda.html> (accessed September 2007).

**Materials for *DNA, Lambda Phage, Lyophilized Powder* are available from Flinn Scientific, Inc.**

| Catalog No. | Description                                 |
|-------------|---|
| FB1898      | DNA, Lambda Phage, Lyophilized Powder, 1 UN |
| AP1807      | Tips, Micropipet, 0.5–20 mL                 |
| FB0002      | Microcentrifuge Tube, Natural, Pkg of 500   |

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.