



3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sia.com
sigma-aldrich.com

Product Information

Colicin E1 from *Escherichia coli*

Product Number **C 3026**
Storage Temperature 2-8 °C

Product Description

CAS Number: 11032-88-5
Molecular Weight: 57 kDa¹
Isoelectric Point: 9.05²
 λ_{max} : 279 nm²
Extinction Coefficient: $E^{1\%} = 7.36$ (0.02 M potassium phosphate, pH 7.0)²

Unlike eukaryote evolution, molecular studies of rRNA suggest that bacterial species vary little over vast periods of time (120-160 million years). Despite this extraordinary species stability, bacteria can respond to environmental change with remarkable quickness. This may be possible in part due to different types of genetic components within the bacterial genome. In addition to bacterial chromosomes, bacterial genomes often include cytoplasmic gene clusters called plasmids that remain physically separate from the chromosome. Plasmids contain genes that increase fitness in transient environments that occur sporadically over time or space. The chromosomes provide genetic stability while plasmids provide opportunities for rapid change.^{1,3}

Plasmids encode an enormous variety of products that can provide their possessor with a competitive advantage in a select environment. Among plasmid-encoded traits is the ability of a plasmid to produce both a poison and that poison's antidote. In 1925, Andre Gratia observed that certain strains of bacteria secrete proteins that kill non-producing strains.³ These bactericidal agents are known generally as bacteriocins. When produced by coliform bacteria (*Escherichia coli* and related bacteria), they are called colicins or microcins. The term microcin is used for low molecular weight colicins which can diffuse through cellophane membranes. Microcins can diffuse through cellophane into a soft agar overlay to kill indicator bacteria whereas higher molecular weight colicins do not.^{1,3}

Most colicins are polypeptides ranging in size from about 90 kDa (colicin D) to about 1.5 kDa (microcin C7). Colicin E1 is a non-glycosylated polypeptide with a molecular weight of 57 kDa (calculated from the predicted amino acid sequence from the plasmid DNA sequence).^{1,3}

Colicins and related bacteriocins have been used in a wide variety of studies covering many different aspects of bacteriology, molecular biology, genetics, pharmacology, toxicology, membrane biology, and biochemistry. They have been used for typing bacterial isolates, as markers for microbial ecology, as models for toxin action, for studying protein secretion by bacteria, and as tools for selecting mutants with altered surface properties.^{1,3}

Colicin production and colicin sensitivity can be determined by a plate test. A plate test provides a simple semiquantitative method for detecting colicin production and for assessing colicin sensitivity. Colicin-producing bacteria are grown on agar plates such that the colicin they release into the agar prevents the growth of the indicator or test bacteria on the same plate. Test bacteria are colicin sensitive, colicin resistant (bacteria that do not have the colicin receptor), or colicin-tolerant (bacteria that have the colicin receptor, but are insensitive to the colicin or produce an inhibitor of colicin action).^{1,3}

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in water or phosphate buffer, pH 7.0 (1 mg/ml).

References

1. Plasmids: A Practical Approach, Hardy, K. G., IRL Press (Washington, DC: 1987), pp.105-161.
2. Schwartz, S. A., and Helinski, D. R., Purification and characterization of colicin E1. J. Biol. Chem., **246(20)**, 6318-6327 (1971).
3. The Biology of Plasmids, Summers, D. K., Blackwell Science (Cambridge, MA:1996), pp.3-6, pp.79-81.

CMK/RXR 10/03

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.