Creative Enzymes®

DNA ligase (ATP)

Cat. No. EXWM-5820

Lot. No. (See product label)

Introduction

Description The enzyme catalyses the ligation of DNA strands with 3'-hydroxyl and 5'-phosphate termini, forming a phosphodiester and sealing certain types of single-strand breaks in duplex DNA. Catalysis occurs by a three-step mechanism, starting with the activation of the enzyme by ATP, forming a phosphoramide bond between adenylate and a lysine residue. The adenylate group is then transferred to the 5'-phosphate terminus of the substrate, forming the capped structure 5'-(5'-diphosphoadenosine)-[DNA]. Finally, the enzyme catalyses a nucleophilic attack of the 3'-OH terminus on the capped terminus, which results in formation of the phosphodiester bond and release of the adenylate. RNA can also act as substrate, to some extent. cf. EC 6.5.1.2, DNA ligase (NAD+), EC 6.5.1.6, DNA ligase (ATP or NAD+), and EC 6.5.1.7, DNA ligase (ATP, ADP or GTP).

Synonyms polydeoxyribonucleotide synthase (ATP); polynucleotide ligase (ambiguous); sealase; DNA repair enzyme (ambiguous); DNA joinase (ambiguous); DNA ligase (ambiguous); deoxyribonucleic ligase (ambiguous); deoxyribonucleate ligase (ambiguous); DNA-joining enzyme (ambiguous); deoxyribonucleic-joining enzyme (ambiguous); deoxyribonucleic acid-joining enzyme (ambiguous); deoxyribonucleic repair enzyme (ambiguous); deoxyribonucleic joinase (ambiguous); deoxyribonucleic acid ligase (ambiguous); deoxyribonucleic acid joinase (ambiguous); deoxyribonucleic acid repair enzyme (ambiguous); poly(deoxyribonucleotide):poly(deoxyribonucleotide) ligase (AMP-forming)

Product Information

Form Liquid or lyophilized powder

EC Number EC 6.5.1.1

CAS No. 9015-85-4

Reaction ATP + (deoxyribonucleotide)n-3'-hydroxyl + 5'-phospho-(deoxyribonucleotide)m = (deoxyribonucleotide)n+m + AMP + diphosphate (overall reaction); (1a) ATP + [DNA ligase]-L-lysine = [DNA ligase]-N6-(5'-adenylyl)-L-lysine + diphosphate; (1b) [DNA ligase]-N6-(5'-adenylyl)-L-lysine + 5'-phospho-(deoxyribonucleotide)m = 5'-(5'-diphosphoadenosine)-(deoxyribonucleotide)m + [DNA ligase]-L-lysine; (1c) (deoxyribonucleotide)n-3'-hydroxyl + 5'-(5'-diphosphoadenosine)-(deoxyribonucleotide)m = (deoxyribonucleotide)n+m + AMP

Notes This item requires custom production and lead time is between 5-9 weeks. We can custom produce according to your specifications.

Storage and Shipping Information

Storage Store it at +4 ℃ for short term. For long term storage, store it at -20 ℃~-80 ℃.