D-Cycloserine, a structural analog of D-alanine, is a broad spectrum antibiotic produced by certain strains of *Streptomyces orchidaceus* or *S. garphalus*. D-cycloserine (at 100 to 200 µg/ml) inhibits the synthesis of bacterial cell walls (involving peptidoglycan synthesis) by preventing formation of D-alanine from L-alanine and hence the formation of peptide bonds involving D-alanine. D-Cycloserine has antibiotic activity *in vitro* against growth phase Gram-negative bacteria including *Escherichia coli* (working concentration of approx. 200 µg/ml), *Staphylococcus aureus*, *Nocardia* species and *Chlamydia*, and some mycobacteria including *Mycobacterium tuberculosis*. The minimum inhibitory concentrations (MIC) *in vitro* for *M. tuberculosis* range from 5-20 µg/ml. Studies *in vitro* show no suppression of growth in cultures made in media containing D-alanine which appears to block the antibacterial action of D-cycloserine. D-Cycloserine is an excitatory amino acid and partial agonist at the glycine binding site of the N-methyl-D-aspartate (NMDA) receptor. At low doses it is a cognitive enhancer that improves learning and memory in several experimental models of disease and cognitive deficit. At high doses, D-cycloserine is an anti-convulsant. Intermediate doses potentiate the anti-convulsant action of phenytoin but block its long-term memory impairment. The HPLC determination of D-Cycloserine in plasma and urine and a colorimetric method for determination of Cycloserine in biological fluids have been reported. UV, IR, NMR and mass spectra and pharmacokinetics of D-Cycloserine have been reported.

**Applications:**
This product is used for preparing diverse selective media for molecular biology and microbiology. Cycloserine is a broad-spectrum antibiotic used to treat tuberculosis. It is used rarely for treating noninfectious diseases.

**Preparation Instructions:**
D-cycloserine is soluble in deionized water up to 100 mg/ml. A solution of 50 mg/ml cycloserine in water is clear and colorless or very faintly yellow. D-cycloserine is also soluble at 1 in 50 parts of 96% ethanol but practically insoluble in chloroform and ether. It is also slightly soluble in methanol or propylene glycol. Stock solutions (e.g.10 mg/ml) of D-cycloserine may also be prepared immediately before use in 0.1 M sodium phosphate buffer, pH 8.0.
Storage/Stability:
Storage Temperature of the powder is -18°C
It is generally recommended to prepare solutions immediately before use because neutral or acidic solutions are unstable. However aqueous solutions buffered to pH 10 with sodium carbonate may be stored for up to one week if stored at 2 °C to 8 °C. In addition, aqueous solutions of D-Cycloserine have been stored in aliquots at -20 °C and thawed just prior to use.

References:
8. Watson, et al., D-Cycloserine acts as a partial agonist at the glycine modulatory site of the NMDA receptor expressed in Xenopus oocytes Brain Res. 510, 158-160 (1990)
19. Sigma-Aldrich quality control

Precautions and Disclaimer:
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.