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TECHNICAL INFORMATION

Catalog Number: 195133
DEAE-Dextran, Chloride Form

CAS # 9015-73-0
Molecular Weight: 500,00 ave
Synonym: Diethylaminoethyl-Dextran
Physical Description: White to off white powder
Form: The nitrogen content is approximately 3.2% which corresponds to one charged group per 3 glucosyl units.
Solubility: Soluble in water and dilute salt solutions. Solutions can be sterilized by autoclaving even at low pH. Autoclaving can be done at 110-115°C. For 20% (w/v) or less solutions autoclave for approximately 30 minutes; for solutions above 20%, autoclave for approximately 15 minutes. *Cool slowly*.
Description: DEAE-Dextran is a polycationic diethylaminoethyl ether of dextran. The diethylaminoethyl groups are linked to glucose residues by ether linkages.[1,10] It shows several important effects on cellular systems.:

– Stimulates uptake of proteins and polynucleotides into cells.
– Increases susceptibility of cells in culture to infection by viral RNA and DNA.
– Increases sensitivity of viral plaque assays.
– Inhibits growth of tumors in experimental animals.
– Enhances antibody response in animals.
– Stimulates interferon production induced by poly(I)-poly(C)

Enhancement of protein and nucleic acid uptake: DEAE-Dextran enhances the uptake of proteins and nucleic acids. It has been shown that the uptake of albumin by sarcoma S-180 cells is stimulated by DEAE-Dextran.[15] Increased uptake rates for ferritin and other basic proteins have also been reported.[16] The rate of incorporation of the enzyme hypoxanthine-guanine phosphoribosyltransferase into mutant chinese hamster ovary and lung cells was augmented by more than 10 times by pretreatment of the cells with DEAE-Dextran.[18]
DEAE-Dextran enhances the uptake of nucleic acids into cells by interacting with both the nucleic acid and the cell surface. The transport of DNA into cultured cells can be increased 3-10 times by the use of this product.[4,11] Cultured rat fibroblasts take up tritiated DNA in the presence of DEAE-Dextran in the G1 phase of the cell cycle.[6] As with the nucleic acids, nucleotides may form complexes with DEAE-Dextran on the basis of their charge differences, thereby facilitating their entry into the cells.[8]
The enhancement of viral infectivity in cell culture systems by DEAE-Dextran is well documented for a number of viruses.[12,14,17]
The incorporation of 150-200 ug of DEAE-Dextran per ml of the agar solution, increases the sensitivity of viral plaque assays.[3,21]
Inhibition of tumor growth: It has been shown that DEAE-Dextran is capable of inhibiting the growth of various tumors if the tumor cells are incubated in a solution of DEAE-Dextran before inoculation. This inhibitory effect was found to be reversible by subsequent incubation with heparin.[7,19] Since carcinoma cells carry a higher negative charge on the surface than normal fibroblasts, it has been postulated that the capability of polycations to inhibit the growth of tumors is due to alterations produced in the cell membrane structures.[19]
Enhancement of interferon production: Polyinosinic-polycytidylic acid (poly(I)-poly(C)) is a widely used inducer in interferon production. The resence of DEAE-Dextran in the reaction medium increases the uptake of poly(I)-poly(C) by the cells and also makes the polynucleotide less susceptible to degradation. In addition, the use of the DEAE-Dextran/poly(I)-poly(C) complex allows a lower concentration of the polynucleotide to be used while still obtaining a given yield of interferon.[5,13,20]
Use of DEAE-Dextran as an adjuvant: The use of DEAE-Dextran as an efficient adjuvant in vaccine production is well established.[22] For instance, DEAE-Dextran has been used for immunization of guinea pigs and swine with inactivated foot-and-mouth disease[2,22], and rhesus monkeys with inactivated Venezulean equine encephalomyelitis virus, IVEE.[9] The mechanism of action of DEAE-Dextran is not clear. The effect on the humoral response of rhesus monkeys to IVEE vaccine results in a typical IgM-IgG response. It has been speculated that DEAE-Dextran may cause a stimulation of the helper T-cell function in antibody synthesis.[9,22]
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