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TECHNICAL INFORMATION

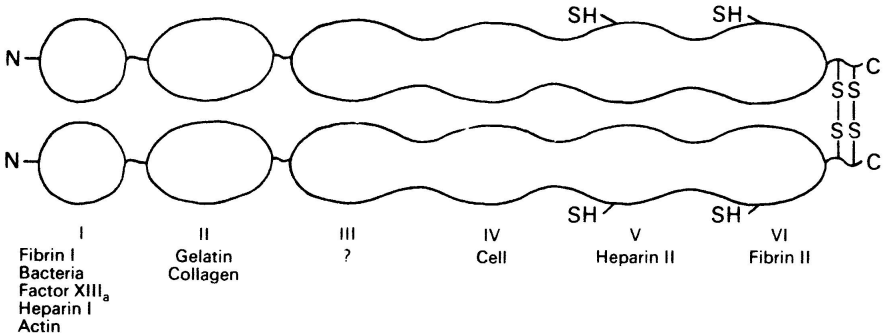
Catalog Number: 150025
Fibronectin

Molecular Weight: 220,000
Physical Description: White lyophilized powder
Source: *Bovine Plasma*
Description: Fibronectins are large glycoproteins found in cells and extracellular fluids.[1] They are involved in a wide range of biological activities including cell adhesion to extracellular matrices[2,3], blood coagulation[4,5] and wound healing.[6] In tissue culture, fibronectins promote cell adhesion and spreading on synthetic surfaces.[7, 8, 9] Certain cell types show morphological changes relating to loss of fibronectin from the cell surface[10,11,12,13] or depletion of fibronectin from the culture medium.[14] Fibronectins are of two, closely related, major types[15]: cellular fibronectin, otherwise known as Large External Transformation Sensitive (LETS) protein[16] and plasma fibronectin, also called Cold-insoluble Globulin (CLg).[17]
Fibronectin is present in plasma at a concentration of 250-300 ug/mL. When plasma is stored at +4°C, a cryoprecipitate is formed containing large amounts of fibronectin. This property gave rise to the early name of "cold-insoluble globulin".[17] Plasma Fibronectin exists in multiple molecular forms, 90% of which is a polypeptide dimer of 220,000 daltons.[18] Sodium dodecyl sulfate/polyacrylamide (SDS-PAGE) gel electrophoresis of reduced plasma fibronectin resolves the dimer as two closely spaced bands. Under non-reducing conditions, an additional band is observed corresponding to a molecular weight of 450,000 daltons.

Properties of Fibronectin[19]

pI	5.5-6.3
Carbohydrate	5-9% asparagine-linked complex oligosaccharides
Sulphydryl Groups	One or two in the C-terminal 30%
Disulphide Bonds	~20 per sub unit. Inter sub-unit bond(s) are very near C-terminal. N terminal is very rich in interchain disulphides.
Tertiary Structure	No a helix, probably some b structure
Secondary Structure	Asymmetric and elongated with globular domains

Functional Domains of Fibronectin:[19]



The regions depicted by thin lines are extremely sensitive to proteolysis. Other regions (I-VI) are compact and globular and contain specific binding sites for other molecules.

Biological Activities of Fibronectin:
The biological activities of fibronectin are largely associated with its property of being able to interact with many different substrates and molecules. Some of these properties are listed in the table below.

Activity	*Reference number*
Cell-Cell aggregation Live cells Erythrocytes	20 21
Cell-substratum adhesiveness Collagen substratum Plastic substratum Cell spreading	22 7,8 23

Reversion of Transformed Phenotype Cell alignment and overlapping Fibroblastic morphology Cell surface morphology Microfilament bundle organization	24 13,14 11,12 25
Increased Cell Motility	26
Phagocytosis	27
Embryonic Differentiation	28,29

Uses of Fibronectin:
Fibronectin has wide applications in cellular research into proliferation, differentiation, development and morphology. Precoating of glass, plastic and micro-carrier beads aids cell attachment, particularly those cell which are deficient in cell surface fibronectin. It has been reported that proteolytic digests of fibronectin are mitogenic for CH23 fibroblasts.[30]
In summary, fibronectin will:

– Bind to commonly used cell-culture surfaces.
– Increase plating efficiency of fastidious cells.
– Increase cloning efficiency.
– Reduce variation in plating efficiency found in different serum batches.

Suggested Procedure for Coating Cell Cultureware

– Determine the amount of fibronectin needed to coat culture vessels by multiplying the total surface area (cm^2) by the desired concentration (mg/mL) of fibronectin. Recommended amount is 2-10 mg/cm^2.
– Reconstitute fibronectin at 1 mg/mL and dilute to the desired concentration with physiological buffer. Wet the surface of each culture vessel to be coated with a minimum amount of sterile balanced salt solution (serum and protein free) required to cover the entire area.
– Introduce the proper CO_2 atmosphere, if required.
– Add the calculated amount of fibronectin to each culture vessel.
– Allow fibronectin to adsorb to the surface of the vessel for 5-20 minutes.
– Remove residual balanced salt solution before proceeding with standard cell culture procedures.

Solubility: Soluble in water
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