

## Product Information

### ANTI-HUMAN PROTEIN S

Developed in Rabbit  
IgG Fraction of Antiserum

Product Number **P 4555**

#### Product Description

Anti-Human Protein S is developed in rabbit using Protein S purified from human plasma as the immunogen. Whole antiserum is fractionated and then further purified by ion exchange chromatography to provide the IgG fraction of antiserum. This fraction is essentially free of other rabbit serum proteins.

Human Protein S is a vitamin K-dependent protein with a molecular weight of 69 kDa.<sup>1</sup> It is produced by the liver and has been identified in plasma (at a concentration of approximately 22  $\mu\text{g}/\text{ml}^2$ ), platelets<sup>3</sup> and endothelial cells.<sup>4</sup> Like other vitamin K dependent proteins, it contains about 10 GLA residues localized at the N-terminal site of the molecule. Unlike the other dependent proteins, Protein S is not a proenzyme to a serine protease.<sup>1</sup> The isolation and sequence of human cDNA clones that code for human Protein S has been reported<sup>5</sup> and the Protein S locus which consists of two Protein S genes has been identified on gene 3.<sup>6</sup> Protein S is present in plasma in two forms: approximately 60% is bound to C4 binding protein (C4BP) which is a regulator of the complement system and the other 40% is free.<sup>1</sup> The bound Protein S is probably important for binding the complex C4BP-Protein S to negatively charged phospholipid surfaces.<sup>1</sup> The free Protein S functions as a co-factor for activated protein C,<sup>7</sup> a key role in the regulation of blood coagulation by breaking down factors Va and VIIIa.<sup>8,9</sup>

Heterozygous Protein S deficiency is manifested by recurrent venous and arterial thrombosis<sup>10,11</sup> while the homozygous deficiency is presented by a serious thrombotic process in the newborn.<sup>12</sup> Acquired deficiencies of Protein S have also been described to predispose patients to thrombosis.<sup>13</sup>

Anti-Human Protein S may be used for immunochemical determination of Protein S levels in normal and pathogenic human plasma. Determination

of Protein S levels can be used in the study of thrombosis, regulation of blood coagulation and of the complement system.

#### Reagents

The product is supplied as a liquid in 0.01 M phosphate buffered saline, pH 7.4, containing 0.1% sodium azide as a preservative.

#### Precautions and Disclaimer

Due to the sodium azide content a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

#### Storage/Stability

For continuous use, store at 2-8 °C. For extended storage, the solution may be frozen in working aliquots. Repeated freezing and thawing is **not** recommended. Storage in "frost-free" freezers is **not** recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use.

#### Product Profile

1. Dot Blot Immunoassay: positive versus purified Protein S.
2. Immunoblot: major line at molecular weight of 69 kDa using denatured and reduced pooled human plasma.
3. Crossed Immunoelectrophoresis: characteristic pattern of two immunoprecipitates of C4BP-Protein S and free Proteins S is observed when pooled plasma is used.

In order to obtain best results, it is recommended that each individual user determine their working dilution by titration assay.

## References

1. Dahlback, B., Semin. Thrombos. Hemost., **10**, 139 (1984).
2. Dahlback, B., Biochem. J., **209**, 836 (1983).
3. Schwartz, H., et al., Blood, **66**, 1452 (1985).
4. Fair, D., et al., Blood, **67**, 1168 (1986).
5. Lundwall, A., et al., Proc. Natl. Acad. Sci. USA, **83**, 6716 (1986).
6. Ploos Van Amstel, J., et al., Thromb. Hemost., **58**, 982, (1987).
7. Walker, F., J. Biol. Chem., **255**, 5521 (1980).
8. Walker, F., et al., Biochim. Biophys. Acta, **571**, 333 (1979).
9. Fulcher, C., et al., Blood, **63**, 486 (1984).
10. Comp, P., et al., J. Clin. Invest., **74**, 2082 (1984).
11. Coller, B., et al., Arteriosclerosis, **7**, 456 (1987).
12. Mahasandana, C., et al., Lancet, **335**, 61 (1990).
13. D'Angelo, A., et al., J. Clin. Invest., **81**, 1445 (1988).

kmr 05/01

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.