

BACKGROUND

Surfactant protein A (SP-A) is an abundant, phospholipid-associated protein in pulmonary surfactant. SP-A is synthesized and secreted primarily by type II and bronchiolar cells in the respiratory epithelium. In the alveolus, SP-A forms large oligomers and is closely associated with tubular myelin, the major extracellular form of surfactant. SP-A contains a 10-kDa collagen-like amino-terminal domain and a globular carboxyl-terminal domain with structural homology to SP-D, mannose binding protein, Clq, and other members of the collectin family of mammalian lectins. Together with SP-D, SP-A plays an important role in pulmonary innate immunity by recognizing canonical patterns on microbial surfaces. These host defense proteins protect the lung from infection by recognizing the carbohydrate and/or lipid component on pathogens, including bacteria, virus and fungi, and by helping to initiate various clearance mechanisms. It was shown that SP-A activates alveolar macrophage metabolism, and enhances the uptake of bacterial pathogens by both macrophages and monocytes. In addition, SP-A has been shown to serve as a hormone in parturition through its ability to modulate proinflammatory cytokine production, as well as in several other functions which include enhancing phospholipid uptake, inhibiting surfactant secretion by isolated type II epithelial cells, contributing to tubular myelin formation, enhancing surfactant spreading, stabilizing phospholipid mixtures and conferring resistance to protein mediated inactivation of surfactant. Extensive *in vitro* evidence indicated that SP-A is involved in surfactant homeostasis and function.¹

The human SP-A gene locus includes two functional genes, SFTPA1 and SFTPA2 which are expressed independently, and a pseudo gene. Although the two human SP-A genes share a high level of sequence similarity, differences in the structure and function between SP-A1 and SP-A2 have been observed.² The largest amount of SP-A1 proteins assemble to larger molecular complexes, whereas SP-A2 forms mainly dimers and trimers. Moreover, SP-A2 gene products being more biologically active than SP-A1 in most of the *in vitro* assays investigated. SP-A polymorphisms play a role in respiratory distress syndrome, allergic bronchopulmonary aspergillosis and idiopathic pulmonary fibrosis. The levels of SP-A are decreased in the lungs of patients with cystic fibrosis, respiratory distress syndrome and further chronic lung diseases.³ The interaction of SP-A with type II cells is a receptor-mediated process. P63 (CKAP4), a 63 kDa type II transmembrane protein, is an SP-A receptor on type II pneumocytes. P63 is located on both the plasma membrane (PM) and the endoplasmic reticulum (ER). Cyclic AMP exposure resulted in enrichment of P63 on the cell surface as shown by stimulation of SP-A binding. Treatment of type II cells with LY294002, an inhibitor of the phosphatidylinositol-3-kinase (PI3-

kinase) signaling pathway, prevented the SP-A-induced PM enrichment of P63. It was further demonstrated that P63 is critical for SP-A receptor-mediated interactions with type II pneumocytes and the resultant regulation of surfactant turnover.⁴

References:

1. Floros, J. et al: Crit. Rev. Eukaryot. Gene Expr. 19: 125-137, 2009
2. Wang, G. et al: J. Biol. Chem. 285:11998-2010, 2010
3. Heinrich, S. et al: Curr. Med. Chem. 13:3239-52, 2006
4. Bates, S.R.: Cell. Physiol. Biochem. 25:41-54, 2010

TECHNICAL INFORMATION

Source:

SP-A Antibody is a rabbit antibody raised against a short peptide from human SP-A sequence.

Specificity and Sensitivity:

This antibody detects endogenous levels of SP-A proteins without cross-reactivity with other related proteins.

Storage Buffer: PBS and 30% glycerol

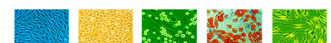
Storage:

Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

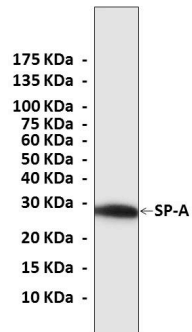
APPLICATIONS

Application:	*Dilution:
WB	1:1000
IP	n/d
IHC	1:50-200
ICC	n/d
FACS	n/d

**Optimal dilutions must be determined by end user.*



QUALITY CONTROL DATA



Western Blot detection of SP-A proteins in rat lung tissue lysate using SP-A Antibody.

