

Product Data Sheet

Cat#	SP-86612-5
Description:	SV40 NLS (AA: Pro-Lys-Lys-Lys-Arg-Lys-Val-Gly) (MW: 940.21)
Size:	5 mg
Purity:	>95%
Store:	Desiccated at -20oC.

The presence of the nuclear membrane that sequesters the cellular DNA is the defining feature of eukaryotic cells. The nuclear membrane, therefore, separates the nuclear processes of DNA replication and RNA transcription from the cytoplasmic process of protein production. Proteins required in the nucleus must be directed there by some mechanism. The presence of several million pore complexes in the oocyte nuclear membrane and the fact that they appeared to admit many different molecules (insulin, bovine serum albumin, gold nanoparticles) led to the view that the pores are open channels and nuclear proteins freely enter the nucleus through the pore and must accumulate by binding to DNA or some other nuclear component. In other words, there was thought to be no specific transport mechanism. This view was shown to be incorrect by Dingwall and Laskey in 1982. Using a protein called Nucleoplasmin, the archetypal 'molecular chaperone', they identified a domain in the protein that acts as a signal for nuclear entry. This work stimulated research in the area, and two years later the first NLS was identified

A **nuclear localization signal** or sequence (NLS) is an amino acid sequence that 'tags' a protein for import into the cell nucleus by nuclear transport. Typically, this signal consists of one or more short sequences of positively charged lysines or arginines exposed on the protein surface. Different nuclear localized proteins may share the same NLS. There are of 2 types: Classical NLSs and non classical NLSs. Classical NLSs can be further classified as either monopartite or bipartite. The bipartite NLS is now known to represent the major class of NLS found in cellular nuclear protein.

The first NLS was identified in **SV40 Large T-antigen** (or SV40). It is a hexamer protein that is a proto-oncogene derived from the polyomavirus SV40 which is capable of transforming a variety of cell types. TAg is a product of an early gene transcribed during viral infection by SV40, and is involved in viral genome replication and regulation of host cell cycle. SV40 is a double-stranded, circular DNA virus belonging to the Polyomaviridae family, Orthopolyomavirus genus. Polyomaviruses infect a wide variety of vertebrates and cause solid tumours at multiple sites. The SV40 large T-antigen has been used as a model protein to study nuclear localization signals (NLSs). It is imported into the nucleus by its interaction with importin α .

For research use only

Reference: Kalderon D (1984) Cell 39 (3 Pt 2): 499–509.; Dingwall C (1982) Cell 30 (2): 449–58.

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