

# Supporting Information

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Mutant designation	Mutated residues	Description
G376R	$\begin{array}{ccc} & 376 & 376 \\ \underline{\text{G}}\text{GA} & \rightarrow & \underline{\text{A}}\text{GA} \\ \text{G} & & \text{R} \end{array}$	Mutation of amino acid 376
K376E	$\begin{array}{ccc} & 379 & 379 \\ \underline{\text{A}}\text{AA} & \rightarrow & \underline{\text{G}}\text{AA} \\ \text{K} & & \text{E} \end{array}$	Mutation of amino acid 379
E439del	$\begin{array}{ccc} & 439 & 440 \\ \underline{\text{GAA}} & \underline{\text{GAT}} & \\ \text{E} & \text{D} & \end{array}$	Deletion of amino acid 439
KS459delN	$\begin{array}{ccc} & 459 & 460 \\ \underline{\text{AAA}} & \underline{\text{AGT}} & \\ \text{K} & \text{S} & \end{array}$	Deletion of amino acid 459, mutation of amino acid 460 to N
D560Y	$\begin{array}{ccc} & 560 & 560 \\ \underline{\text{GAC}} & \rightarrow & \underline{\text{IAC}} \\ \text{D} & & \text{Y} \end{array}$	Mutation of amino acid 560
DKRMNS560del	$\begin{array}{ccccccc} & 559 & 560 & 561 & 562 & 563 & 564 & 565 \\ \underline{\text{ATT}} & \underline{\text{GAC}} & \underline{\text{AAA}} & \underline{\text{CGT}} & \underline{\text{ATG}} & \underline{\text{AAC}} & \underline{\text{AGC}} & \\ \text{I} & \text{D} & \text{K} & \text{R} & \text{M} & \text{N} & \text{S} & \end{array}$	Deletion of amino acids 560-565
N564K	$\begin{array}{ccc} & 564 & 564 \\ \underline{\text{AAC}} & \rightarrow & \underline{\text{AAG}} \\ \text{N} & & \text{K} \end{array}$	Mutation of amino acid 564
R574fs	$\begin{array}{ccc} & 574 & 575 \\ \underline{\text{AGA}} & \text{AAG} & \\ \text{R} & \text{K} & \end{array}$	Frame shift at position 574, premature stop codon at position 600
T576 del	$\begin{array}{ccc} & 576 & 577 \\ \underline{\text{ACG}} & \underline{\text{AGA}} & \\ \text{T} & \text{R} & \end{array}$	Deletion of amino acid 576
W583 del	$\begin{array}{ccc} & 583 & 584 \\ \underline{\text{TGG}} & \underline{\text{ITG}} & \\ \text{W} & \text{L} & \end{array}$	Deletion of amino acid 583

Underlined nucleotides are deleted in the mutants.

Fig. S1. List of the mutants and their effects on the amino acid sequence of p85.

