

What is claimed is:

1. A novel natural sDSS1 protein, characterized in that includes the natural protein sDSS1 present in Anthropoidea animals including humans, wherein a human sDSS1 protein has an amino acid as set forth in SEQ ID NO: 1.
2. The novel sDSS1 protein according to Claim 1, characterized in that the Anthropoidea animals include chimpanzee, bonobo, gorilla, orangutan, white-cheeked gibbon, golden snub-nosed monkey, rhesus macaque, olive baboon, Angola colobus, sooty mangabey, drill and northern pigtail macaque; wherein a chimpanzee sDSS1 protein has an amino acid as set forth in SEQ ID NO: 5, a bonobo sDSS1 protein has an amino acid as set forth in SEQ ID NO: 6, a gorilla sDSS1 protein has an amino acid as set forth in SEQ ID NO: 7, an orangutan sDSS1 protein has an amino acid as set forth in SEQ ID NO: 8, a white-cheeked gibbon sDSS1 protein has an amino acid as set forth in SEQ ID NO: 9, a golden snub-nosed monkey sDSS1 protein has an amino acid as set forth in SEQ ID NO: 10, a rhesus macaque sDSS1 protein has an amino acid as set forth in SEQ ID NO: 11, an olive baboon sDSS1 protein has an amino acid as set forth in SEQ ID NO: 12, a Angola colobus sDSS1 protein has an amino acid as set forth in SEQ ID NO: 13, a sooty mangabey sDSS1 protein has an amino acid as set forth in SEQ ID NO: 14, a drill sDSS1 protein has an amino acid as set forth in SEQ ID NO: 15, a northern pigtail macaque sDSS1 protein has an amino acid as set forth in SEQ ID NO: 16.
3. The novel sDSS1 protein according to Claim 2, characterized in that the sDSS1 protein comprises a N-terminal amino acid sequence of 58 amino acids and a C-terminal amino acid sequence of 31 amino acids, wherein the human sDSS1 protein has a N-terminal amino acid sequence of 58 amino acids as set forth in SEQ ID NO: 3, the human sDSS1 protein has a C-terminal amino acid sequence of 31 amino acids as set forth in SEQ ID NO: 2; wherein the N-terminal amino acid sequence of the 58 amino acids comprises 3 or more amino acid sequences with consecutive acidic amino acids, each of amino acid sequences with consecutive

acidic amino acids comprises no more than 10 acidic amino acids, any two adjacent amino acid sequences of the amino acid sequences with consecutive acidic amino acids have a spacing of no more than 4 amino acids, and the spacing comprises at least one hydrophobic amino acid, a pH value is not higher than 4.5, the N-terminal amino acid sequence of the 58 amino acids comprises no less than 10 acidic amino acids; the C-terminal amino acid sequence following position 58 of the N-terminal amino acid sequence of the 58 amino acids are relatively hydrophobic overall, the C-terminal amino acid sequence of the 31 amino acids comprises no less than 10 hydrophobic amino acids;

wherein the hydrophobic amino acid is selected from the group consisting of alanine, isoleucine, leucine, valine, cysteine, phenylalanine, methionine, tryptophan, and tyrosine;

the neutral amino acid is selected from the group consisting of threonine, glycine, serine, histidine, and glutamine;

the acidic amino acid is selected from the group consisting of glutamic acid, aspartate, proline, and asparaginate; and

the basic amino acids is selected from the group consisting of arginine, and lysine.

4. The novel sDSS1 protein according to any one of Claims 1 to 3, characterized in that the C-terminal amino acid sequence included sDSS1 protein of the Anthropoidea animals is:

$X_1X_2X_3X_4X_5X_6X_7X_8X_9X_{10}X_{11}X_{12}X_{13}X_{14}X_{15}X_{16}X_{17}X_{18}X_{19}X_{20}X_{21}X_{22}X_{23}X_{24}X_{25}X_{26}X_{27}X_{28}X_{29}X_{30}X_{31}$;

X_1 is a neutral amino acid; X_2 is a hydrophobic amino acid; X_3 and X_4 are hydrophobic amino acids; X_5 is a hydrophobic amino acid; X_6 is a hydrophobic amino acid; X_7 is a hydrophobic amino acid; X_8 is a hydrophobic amino acid; X_9 is a hydrophobic amino acid; X_{10} is an acidic amino acid; X_{11} is a neutral amino acid; X_{12} is a hydrophobic amino acid; X_{13} is a hydrophobic amino acid; X_{14} is a neutral

amino acid; X₁₅ is a hydrophobic amino acid; X₁₆ is a hydrophobic amino acid; X₁₇ is a hydrophobic amino acid; X₁₈ is a hydrophobic amino acid; X₁₉ is a basic amino acid; X₂₀ is an acidic amino acid; X₂₁ is a basic amino acid; X₂₂ is a neutral amino acid; X₂₃ is a basic amino acid; X₂₄ is a hydrophobic amino acid; X₂₅ is a hydrophobic amino acid; X₂₆ is a neutral amino acid; X₂₇ is a hydrophobic amino acid; X₂₈ is a hydrophobic amino acid; X₂₉ is a hydrophobic amino acid; X₃₀ is a hydrophobic amino acid; and X₃₁ is a hydrophobic amino acid

an amino acid sequence having 40% or more homology to the C-terminal amino acid sequence of the 31 amino acids, wherein the amino acid sequence has a same or similar property and function to a C-terminal amino acid sequence of a human sDSS1 protein.

5. A polypeptide sequence, wherein the polypeptide sequence is constructed based on the N-terminal amino acid sequence of the 58 amino acids and the C-terminal amino acid sequence of the 31 amino acids of the sDSS1 protein according to Claim 1, wherein

1) the polypeptide sequence has a N-terminal having 40% or more similarity to the N-terminal amino acid sequence of the 58 amino acids, and the polypeptide sequence has a C-terminal having 40% or more similarity to the C-terminal amino acid sequence of the 31 amino acids, a protein encoded by the polypeptide sequence has a same or similar property and function to a human sDSS1 protein; or

2) a N-terminal of the polypeptide sequence is based on a N-terminal amino acid sequence of 58 amino acids of a human sDSS1 protein, or is a sequence having 40% or more similarity to the N-terminal amino acid sequence of the 58 amino acids of the human sDSS1 protein, wherein a C-terminal or the N-terminal of the polypeptide is fused with other amino acid sequence, the other amino acid sequence for fusion has an identical or similar property to a C-terminal amino acid sequence of 31 amino acids of the human sDSS1 protein and perform the same or

similar functions, a modified protein encoded by the polypeptide sequence performs an identical or similar function to the human sDSS1 protein; or

3) the peptide sequence is constructed by fusing the C-terminal amino acid sequence of the 31 amino acids in the sDSS1 protein according to Claim 4 with other polypeptide sequence.

6. A fusion protein comprising a full sequence or a partial sequence of the sDSS1 protein according to any one of Claims 1 to 4, and the polypeptide sequence according to Claim 5.

7. The fusion protein according to Claim 6, being a protein complex formed by linking with the protein sDSS1 protein, a carrier protein, an antibody or other arbitrary amino acid sequence.

8. A complex comprising a full sequence or a partial sequence of the sDSS1 protein according to any one of Claims 1 to 4, the polypeptide sequence according to Claim 5 and the full sequence or the partial sequence of the fusion protein according to any one of Claims 6 to 7.

9. The complex according to Claim 8, being a complex formed by linking the sDSS1 protein to a pharmaceutically acceptable drug carrier.

10. The complex according to Claim 9, characterized in that the pharmaceutically acceptable drug carrier comprises one or more of a microsphere/capsule, liposome, micro-emulsion, nanoparticle, magnetic particle and gel.

11. A nucleotide encoding the sDSS1 protein according to any one of claims 1-4 or the polypeptide according to Claim 5.

12. The nucleotide according to Claim 11, characterized in that the nucleotide comprises DNA and RNA.

13. A cell expressing the sDSS1 protein according to any one of claims 1-4 or the polypeptide according to Claim 5.

14. The cell according to Claim 13, characterized in that the cell is a stem cell, a precursor cell or an adult cell of a mamma.

15. The cell according to Claim 14, characterized in that the mammal is a human, an orangutan, a monkey, a horse, a cattle, a sheep, a pig, a donkey, a dog, a rabbit, a cat, a rat or a mouse.

16. The cell according to Claim 13, characterized in that the cell comprises an embryo stem cell, an induced multipotential stem cell or a stem cell derived from a primary culture, a multipotential or monopotential stem cell derived from a mother cell differentiation.

17. An expression system, wherein a nucleotide sequence coding the sDSS1 protein according to any one of Claims 1-4 or the polypeptide according to Claim 5 is introduced into an organism, and the sDSS1 protein according to any one of Claims 1-4 or the polypeptide according to Claim 5 is expressed in the organism.

18. The expression system according to Claim 17, characterized in that the expression system is selected from the group consisting of eukaryotic expression plasmid vector, adenovirus, slow virus, retrovirus, CRISPR/Cas technique and other feasible gene-editing techniques.

19. The expression system according to Claim 17, characterized in that the organism is a human, an orangutan, a monkey, a horse, a cattle, a sheep, a pig, a donkey, a dog, a rabbit, a cat, a rat, a mouse, a chicken, a duck or a goose.

20. A drug primarily targeting the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5, wherein the drug can affect an expression level of the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5 in the organism upon administration.

21. The drug according to Claim 20, characterized in that the drug is a chemical micromolecular drug, a protein/polypeptide drug, a nucleic acid drug, or a nanodrug.

22. The drug according to Claim 21, characterized in that the nucleic acid drug comprises one or more of a siRNA, a microRNA, an antisense oligonucleotide, a triple strand DNA and a ribozyme.

23. A method of producing a protein, characterized in that comprising the following steps:

S1. constructing an expression vector: inserting a nucleotide sequence coding the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5 into a plasmid and introducing the plasmid into bacteria or yeast cell, or inserting the nucleotide sequence coding the sDSS1 protein according any one of Claims 1 to 4 or the polypeptide according to Claim 5 into genome of an insect cell or a mammalian cell;

S2. expressing the sDSS1 protein: expanding a culture of the bacteria, yeast cell, insect cell or mammalian cell as modified in S1, and collecting a culture medium or cell lysate containing the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5;

S3. purifying the sDSS1 protein: coarse filtering and purifying the culture medium or cell lysate obtained in S2 to obtain the sDSS1 protein.

24. A method of producing a protein, characterized in that comprising using chemical synthesis technique to produce the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5.

25. A method of producing a protein, characterized in that comprising using *in vitro* ribosome expression system to produce the sDSS1 protein according to any one of Claims 1 to 4 or the polypeptide according to Claim 5.

26. An application of the sDSS1 protein according to any one of Claims 1 to 4, polypeptide according to Claim 5, fusion protein according to Claims 6 or 7, complex according to any one of Claims 8 to 10, nucleotide sequence according to Claims 11 or 12, cell according to any one of Claims 13 to 16, expression system

according to any one of Claims 17 to 19, and drug according to any one of Claims 20 to 22 in diagnosing, preventing or treating disease.

27. The application according to Claim 26, characterized in that the disease is a disease induced by excessive formation or accumulation of pathogenic protein/polypeptide.

28. The application according to Claim 27, characterized in that the pathogenic protein/polypeptide is an oxidation protein product, glycosylation protein product, an amyloid precursor protein and a spliceosome thereof, an islet amyloid polypeptide and a spliceosome thereof, or other pathogenic protein/polypeptides having features similar to an oxidation protein, a glycosylation protein, an amyloid protein or an islet amyloid polypeptide.

29. The application according to Claim 26, characterized in that the diagnosing of the disease comprises detecting one or more of an expression level of a full or partial sequence of the amino acid sequence, mRNA level and number of gene copies of the sDSS1 protein according to any one of Claims 1 to 4.

30. The application according to Claim 26, characterized in that the preventing comprises one or more of genetic modification, nucleic acid introduction, drug injection/administration, cellular transplantation and tissue transplantation.

31. The application according to Claim 26, characterized in that the treating comprises one or more of genetic modification, nucleic acid introduction, drug injection/administration, cellular transplantation and tissue transplantation.