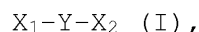


CLAIMS:

1. Fusion protein having formula (I)



wherein X_1 and X_2 comprise each four to eight allergen fragments or variants thereof fused to each other, wherein said allergen fragments are derived from at least two allergens of the genus *Dermatophagoides*, and wherein Y is a carrier protein.

2. Fusion protein according to claim 1, wherein the at least two allergens are of *Dermatophagoides pteronyssinus* and/or *Dermatophagoides farinae*.

3. Fusion protein according to claim 1 or 2, wherein the at least two allergens are of *Dermatophagoides pteronyssinus* and selected from the group consisting of Der p 1, Der p 2, Der p 5, Der p 7, Der p 21 and Der p 23.

4. Fusion protein according to any one of claims 1 to 3, wherein the allergen fragments of the at least two allergens consist of 25 to 50 amino acid residues, preferably 28 to 48 amino acid residues, more preferably 30 to 45 amino acid residues.

5. Fusion protein according to any one of claims 1 to 4, wherein at least one, preferably at least two, more preferably at least three, in particular all, of the cysteine residues of the allergen fragments are substituted with serine, threonine, glycine, alanine, or leucine.

6. Fusion protein according to any one of claims 3 to 5, wherein

a) the allergen fragment of Der p 1 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of TNACSSINGNA-PAEIDLRQMRTVTPIRMQGGCGSCWAFSGVA (SEQ ID No. 1), ATEAYLAYR-

NQSLDLAEQELVDCASQHGCHGDTIPRGIEYIQ (SEQ ID No. 2),
 HNGVVQESYYRYVAREQSCRRPNAQRFGISN (SEQ ID No. 3), VRNS-
 WDTNWGDNGYGYFAANIDLMMIEEYPYVVIL (SEQ ID No. 4), TNASSINGNA-
 PAEIDLRQMRTVTPIRMQGGSGSSWAFSGVA (SEQ ID No. 5), ATESAYLAYR-
 NQSLDLAEQELVDSASQHGSHGDTIPRGIEYIQ (SEQ ID No. 6) and
 HNGVVQESYYRYVAREQSSRRPNAQRFGISN (SEQ ID No. 7), and/or

b) the allergen fragment of Der p 2 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of CHGSEP-CIIHRGKPFQLEAVFEANQNSKTAK (SEQ ID No. 8),
 EVDVPGIDPNACHYMKCPLVKGQQYDIKYTWIVPKIAPKSEN (SEQ ID No. 9),
 HGSEPSIIHRGKPFQLEAVFEANQNSKTAK (SEQ ID No. 10) and
 EVDVPGIDPNASHYMKSPLVKGQQYDIKYTWIVPKIAPKSEN (SEQ ID No. 11),
 and/or

c) the allergen fragment of Der p 5 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of DYQNEFDLLMERI-HEQIKKGELALFYLQ (SEQ ID No. 12) and EQYNLEMAKKSG-DILERDLKKEEARVKKIEV (SEQ ID No. 13) , and/or

d) the allergen fragment of Der p 7 consists of amino acid sequence being at least 90% identical to amino acid sequence DPIHYDKITEEINKAVDEAVAAIEKSETFD (SEQ ID No. 14), and/or

e) the allergen fragment of Der p 21 consists of amino acid sequence being at least 90% identical to amino acid sequence YNYEFALESIKLLIKKLDELAKVKAVNPDEYY (SEQ ID No. 15), and/or

f) the allergen fragment of Der p 23 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of GYFADPKDPHKFY-ICSNWEAVHKDCPGNTRWNEDEETCT (SEQ ID No. 16) and GYFADPKDPHKFY-ISSNWEAVHKDSPGNTRWNEDEETST (SEQ ID No. 17), and/or

g) the allergen fragment of Der f 1 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of TSA-CRINSVNVPSSELDLRSRLRTVTPIRMQGGCGSCWAFSGVA (SEQ ID No. 38), ATESAYLAYRNTSLDLSEQELVDCASQHGCHGDTIPRGIEYIQ (SEQ ID No. 39),
 QNGVVEERSYPYVAREQQCRRPNSQHYGISN (SEQ ID No. 40) and VRNSWDTT-WGDSGYGYFQAGNNLMMIEQYPYVVIM (SEQ ID No. 41), and/or

h) the allergen fragment of Der f 2 consists of an amino acid sequence being at least 90% identical to an amino acid

sequence selected from the group consisting of HGSDP-CIIHRGKPFNLEAIFDANQNTKTAK (SEQ ID No. 42) and EVDVPGIDTNACHY-IKCPLVKGQQYDAKYTNVVPKIAPKSEN (SEQ ID No. 43), and/or

i) the allergen fragment of Der f 5 consists of an amino acid sequence being at least 90% identical to an amino acid sequence selected from the group consisting of DYQNEFDLLMQRI-HEQMRKGEEALLHLQ (SEQ ID No. 44) and ERYNVEI-ALKSNEILERDLKKEEQRVKKIEV (SEQ ID No. 45), and/or

j) the allergen fragment of Der f 7 consists of an amino acid sequence being at least 90% identical to amino acid sequence DPIHYDKITEEINKAIDDAIAAIEQSETID (SEQ ID No. 46), and/or

k) the allergen fragment of Der f 21 consists of an amino acid sequence being at least 90% identical to amino acid sequence YNFETAVSTIEILVKDLAELAKVKAVKSDD (SEQ ID No. 47), and/or

l) the allergen fragment of Der f 23 consists of an amino acid sequence being at least 90% identical to amino acid sequence GYFADPKDPCKFYICSNWEAIIHKSCPGNTRWNEKELTCT (SEQ ID No. 48).

7. Fusion protein according to any one of claims 1 to 6, wherein the fusion protein comprises at least one polypeptide having amino acid sequence selected from the group consisting of SEQ ID No. 18, SEQ ID No. 19, SEQ ID No. 20, SEQ ID No. 21, SEQ ID No. 22, SEQ ID No. 23, SEQ ID No. 24 and/or SEQ ID No. 25.

8. Fusion protein according to any one of claims 1 to 7, wherein the carrier protein is a surface polypeptide of a virus of a hepadnaviridae family or a fragment of the surface polypeptide.

9. Fusion protein according to any one of claims 1 to 8, wherein the fusion protein comprises amino acid sequence SEQ ID No. 27 or amino acid sequence SEQ ID No. 28.

10. Nucleic acid molecule encoding a fusion protein according to any one of claims 1 to 9.

11. Vector comprising a nucleic acid molecule according to claim 10.
12. Host cell comprising a nucleic acid molecule according to claim 10 or a vector according to claim 11.
13. Pharmaceutical preparation comprising at least one fusion protein according to any one of claims 1 to 9 or at least one nucleic acid molecule according to claim 10.
14. Pharmaceutical preparation according to claim 13, wherein two fusion proteins or nucleic acid molecules comprised in the preparation have a weight ratio of 1:10 to 10:1, preferably of 1:5 to 5:1, more preferably of 2:1 to 1:2, more preferably of 1:1.
15. Pharmaceutical preparation according to claim 13 or 14, wherein said preparation comprises a fusion protein comprising amino acid sequence SEQ ID No. 27 and/or a fusion protein comprising amino acid sequence SEQ ID No. 28 or a nucleic acid molecule encoding a fusion protein comprising amino acid sequence SEQ ID No. 27 and/or a fusion protein comprising amino acid sequence SEQ ID No. 28.
16. Fusion protein according to any one of claims 1 to 9, nucleic acid molecule according to claim 10 or pharmaceutical preparation according to any one of claims 13 to 15 for the use in the treatment or the prevention of an allergy caused by an allergen of a house dust mite.