least one fusion protein comprises, or preferably consists of,

a) a chimeric CMV polypeptide, wherein said chimeric CMV polypeptide comprises, or preferably consists of

(i) a CMV polypeptide, wherein said CMV polypeptide comprises, or preferably consists of, a coat protein of CMV, wherein preferably said coat protein of CMV comprises, or preferably consists of, SEQ ID NO:62; or an amino acid sequence having a sequence identity of at least 75%, preferably of at least 80%, more preferably of at least 85%, again further preferably of at least 90 %, again more preferably of at least 95%, still further preferably of at least 98% and still again further more preferably of at least 99% with SEQ ID NO:62; and

(ii) an antigenic polypeptide, wherein said antigenic polypeptide is inserted into said CMV polypeptide,

wherein said insertion of said antigenic polypeptide is between amino acid residues of said CMV polypeptide corresponding to amino acid residues of position 84 and position 85 of SEQ ID NO:62; and

(iii) a T helper cell epitope, wherein said T helper cell epitope replaces a N-terminal region of said CMV polypeptide, and wherein preferably said N-terminal region of said CMV polypeptide corresponds to amino acids 2-12 of SEQ ID NO:62.

In one aspect, the present disclosure refers to a modified mosaic virus-like particle (VLP) of cucumber mosaic virus (CMV) comprising

(a) at least one fusion protein, wherein said at least one fusion protein comprises

a) a chimeric CMV polypeptide comprising

(i) a CMV polypeptide, wherein said CMV polypeptide comprises a coat protein of CMV or an amino acid sequence having a sequence identity of at least 75% with SEQ ID NO:62; and

(ii) an antigenic polypeptide, wherein said antigenic polypeptide is inserted into said CMV polypeptide,

wherein said insertion of said antigenic polypeptide is between amino acid residues of said CMV polypeptide corresponding to amino acid residues of

position 84 and position 85 of SEQ ID NO:62; and

(iii) a T helper cell epitope, wherein said T helper cell epitope replaces a N-terminal region of said CMV polypeptide;

wherein said chimeric CMV polypeptide consists of SEQ ID NO:29; and

(b) at least one CMV protein, wherein said at least one CMV protein comprises a coat protein of CMV or an amino acid sequence having a sequence identity of at least 75% with SEQ ID NO:62, and wherein said CMV protein is optionally modified by a T helper cell epitope, and wherein preferably said coat protein of CMV comprises SEQ ID NO:62,

wherein said CMV protein consists of SEQ ID NO:5.

In a further example, the present disclosure provides a modified VLP of CMV comprising at least one fusion protein, wherein said at least one fusion protein comprises, or preferably consists of,

a) a chimeric CMV polypeptide, wherein said chimeric CMV polypeptide comprises, or preferably consists of

(i) a CMV polypeptide, wherein said CMV polypeptide comprises, or preferably consists of, a coat protein of CMV, wherein preferably said coat protein of CMV comprises, or preferably consists of, SEQ ID NO:62; or an amino acid sequence having a sequence identity of at least 75%, preferably of at least 80%, more preferably of at least 85%, again further preferably of at least 90 %, again more preferably of at least 95%, still further preferably of at least 98%

CLAIMS

1. A modified mosaic virus-like particle (VLP) of cucumber mosaic virus (CMV) comprising

(a) at least one fusion protein, wherein said at least one fusion protein comprises

a) a chimeric CMV polypeptide comprising

(i) a CMV polypeptide, wherein said CMV polypeptide comprises a coat protein of CMV or an amino acid sequence having a sequence identity of at least 75% with SEQ ID NO:62; and

(ii) an antigenic polypeptide, wherein said antigenic polypeptide is inserted into said CMV polypeptide,

wherein said insertion of said antigenic polypeptide is between amino acid residues of said CMV polypeptide corresponding to amino acid residues of position 84 and position 85 of SEQ ID NO:62; and

(iii) a T helper cell epitope, wherein said T helper cell epitope replaces a N-terminal region of said CMV polypeptide;

wherein said chimeric CMV polypeptide consists of SEQ ID NO:29; and

(b) at least one CMV protein, wherein said at least one CMV protein comprises a coat protein of CMV or an amino acid sequence having a sequence identity of at least 75% with SEQ ID NO:62, and wherein said CMV protein is optionally modified by a T helper cell epitope, and wherein preferably said coat protein of CMV comprises SEQ ID NO:62,

wherein said CMV protein consists of SEQ ID NO:5.