In one aspect, the present invention provides an *in vitro* method for the cleavage of human IgG, comprising contacting human IgG with a polypeptide comprising: (a) the amino acid sequence of SEQ ID NO: 3; (b) a variant thereof having at least 70% identity to the amino acid sequence of SEQ ID NO: 3 and having IgG cysteine protease activity; or (c) a fragment thereof of either (a) or (b), having IgG cysteine protease activity.

Disclosed is an isolated IgdE polypeptide for use in generating an immune response in a subject.

The isolated IgdE polypeptide is preferably an $IgdE_{suis}$, $IgdE_{agalactiae}$, $IgdE_{porcinus}$, $IgdE_{equi}$, or an $IgdE_{pseudoporcinus}$ polypeptide, or a variant or fragment of any thereof which retains cysteine protease activity and/or is capable of generating an immune response to a streptococcus in a subject. The variant may be an IgdE polypeptide from another bacterium. The bacterium is preferably a Streptococcus.

In one example the disclosure provides an IgdE polypeptide for use in generating an immune response in a subject comprising:

(a) the amino acid sequence of SEQ ID NO: 1;

(b) a variant of SEQ ID NO: 1 having at least 70% identity to the amino acid sequence of SEQ ID NO: 1 and having IgG degrading cysteine protease activity;

(c) a fragment of SEQ ID NO: 1, a variant of SEQ ID NO:1, or a fragment of a variant of SEQ ID NO: 1 which is capable of generating an immune response to a streptococcus, preferably a *S. suis* in a subject;

(d) the amino acid sequence of SEQ ID NO: 3;

(e) a variant of SEQ ID NO: 3 having at least 70% identity to the amino acid sequence of SEQ ID NO: 3 and having IgG degrading cysteine protease activity;

(f) a fragment of SEQ ID NO: 3, a variant of SEQ ID NO:3, or a fragment of a variant of SEQ ID NO: 3 which is capable of generating an immune response to a streptococcus, preferably a *S. agalactiae* in a subject;

(g) the amino acid sequence of SEQ ID NO: 5;

(h) a variant of SEQ ID NO: 5 having at least 70% identity to the amino acid sequence of SEQ ID NO: 5 and having IgG degrading cysteine protease activity;

(i) a fragment of SEQ ID NO: 5, a variant of SEQ ID NO:5, or a fragment of a variant of SEQ ID NO: 5 which is capable of generating an immune response to a *S. porcinus* in a subject;

(j) the amino acid sequence of SEQ ID NO: 7;

CLAIMS

1. An *in vitro* method for the cleavage of human IgG, comprising contacting human IgG with a polypeptide comprising:

(a) the amino acid sequence of SEQ ID NO: 3;

(b) a variant thereof having at least 70% identity to the amino acid sequence of SEQ ID NO: 3 and having IgG cysteine protease activity; or

(c) a fragment thereof of either (a) or (b), having IgG cysteine protease activity.

2. A method according to claim 1, wherein the amino acid sequence is SEQ ID NO: 3.

3. A method according to claim 1 or 2, wherein the method comprises incubating the polypeptide with a sample containing human IgG under conditions which permit specific cysteine protease activity to occur.

4. A method according to claim 2, wherein the human IgG is human IgG1.

5. A method according to any one of the preceding claims, which further comprises identification and/or isolation of the cleavage products.

6. A method according to claim 5, wherein said identification and/or isolation comprises analysis by gel electrophoresis or mass spectrometry.

7. A method according to any one of the preceding claims, wherein the method is used to generate Fc and Fab fragments.

8. A method according to any one of claims 1 to 7, wherein the method is used to detect human IgG.

9. A method according to claim 8, comprising:

(i) contacting a sample with a polypeptide as defined in claim 1 under conditions that permit the IgG specific cysteine protease activity of the polypeptide; and

(ii) monitoring for the presence of IgG specific cleavage fragments; wherein the presence of the specific cleavage fragments is indicative of human IgG in the sample.