CLAIMS

1. A mutated FimH polypeptide, which comprises at least one amino acid mutation relative to the amino acid sequence of the wild-type FimH polypeptide, wherein the mutation position is selected from the group consisting of: F1, P12, G14, G15, G16, A18, P26, V27, V28, Q32, N33, L34, V35, R60, S62, Y64, G65, L68, F71, T86, L107, Y108, L109, V112, S113, A115, G116, V118, A119, A127, L129, Q133, F144, V154, V155, V156, P157, T158, V163, and V185, wherein the amino acid positions are numbered according to SEQ ID NO:59.

2. The mutated FimH polypeptide according to claim 1, comprising at least one mutation selected from the group consisting of: F1I; F1L; F1V; F1M; F1Y; F1W; P12C; G14C; G15A; G15P; G16A; G16P; A18C; P26C; V27A; V27C; V28C; Q32C; N33C; L34C; L34N; L34S; L34T; L34D; L34E; L34K; L34R; V35C; R60P; S62C; Y64C; G65A; L68C; F71C; T86C; L107C; Y108C; L109C; V112C; S113C; A115V; G116C; V118C; A119C; A119N; A119S; A119T; A119D; A119E; A119K; A119R; A127C; L129C; Q133K; F144C; V154C; V156C; P157C; T158C; V163I; and V185I, or any combination thereof.

3. The mutated FimH polypeptide according to claim 2, wherein the mutated FimH polypeptide comprises mutations selected from the group consisting of:
   a) the mutations G15A and G16A;
   b) the mutations P12C and A18C;
   c) the mutations G14C and F144C;
   d) the mutations P26C and V35C;
   e) the mutations P26C and V154C;
   f) the mutations P26C and V156C;
   g) the mutations V27C and L34C;
   h) the mutations V28C and N33C;
   i) the mutations V28C and P157C;
   j) the mutations Q32C and Y108C;
   k) the mutations N33C and L109C;
   l) the mutations N33C and P157C;
   m) the mutations V35C and L107C;
   n) the mutations V35C and L109C;
   o) the mutations S62C and T86C;
   p) the mutations S62C and L129C;
   q) the mutations Y64C and L68C;
   r) the mutations Y64C and A127C;
   s) the mutations L68C and F71C;
   t) the mutations V112C and T158C;

u) the mutations S113C and G116C;
v) the mutations S113C and T158C;
w) the mutations V118C and V156C;
x) the mutations A119C and V155C;
y) the mutations L34N and V27A;
z) the mutations L34S and V27A;
aa) the mutations L34T and V27A;
ab) the mutations L34D and V27A;
ac) the mutations L34E and V27A;
ad) the mutations L34K and V27A;
ae) the mutations L34R and V27A;
af) the mutations A119N and V27A;
ag) the mutations A119S and V27A;
ah) the mutations A119T and V27A;
ai) the mutations A119D and V27A;
aj) the mutations A119E and V27A;
ak) the mutations A119K and V27A;
al) the mutations A119R and V27A;
am) the mutations G15A and V27A;
an) the mutations G16A and V27A;
ao) the mutations G15P and V27A;
ap) the mutations G16P and V27A;
aq) the mutations G15A, G16A, and V27A;
ar) the mutations G65A and V27A;
as) the mutations V27A and Q133K; and
at) the mutations G15A, G16A, V27A, and Q133K.

4. The mutated FimH polypeptide according to claim 2, comprising the sequence of any one of SEQ ID NOs: 2-58, and 60-64.

5. The mutated FimH polypeptide according to any of claims 1-4, wherein the polypeptide is isolated.

6. A pharmaceutical composition comprising (i) a mutated FimH polypeptide according to any one of claims 1-4 and (ii) a pharmaceutically acceptable carrier.

7. An immunogenic composition comprising a mutated FimH polypeptide according to any one of claims 1-4.

8. The immunogenic composition according to claim 7, further comprising at least one additional antigen.

9. The immunogenic composition according to claim 8, wherein the at least one additional antigen is a polysaccharide, or a protein.

10. The immunogenic composition according to claim 7, further comprising at least one adjuvant.

11. A nucleic acid molecule comprising a nucleotide sequence that encodes an amino acid sequence of a mutated FimH polypeptide according to any one of claims 1-4.

12. The mutated FimH polypeptide according to any of claims 1-4, wherein the polypeptide is immunogenic.

13. A recombinant mammalian cell, comprising a polynucleotide encoding a mutated FimH polypeptide according to any one of claims 1-4.

14. A culture comprising the recombinant cell of claim 13, wherein said culture is at least 5 liters in size.

15. A method for producing a mutated FimH polypeptide according to any one of claims 1-4, comprising culturing a recombinant mammalian cell according to claim 13 under suitable conditions, thereby expressing the polypeptide; and harvesting the polypeptide.

16. Use of a composition according to any one of claims 6 to 10 in the manufacture of a medicament ~~A method~~ for (i) inducing an immune response in a subject against extra-intestinal pathogenic *E. coli*, or (ii) inducing the production of opsonophagocytic and/or neutralizing antibodies in a subject that are specific to extra-intestinal pathogenic *E. coli*, wherein ~~the method comprises administering to the subject~~ an effective amount of the medicament is to be administered to the subject. ~~a composition according to any one of claims 6 to 10.~~

17. The ~~method~~ use according to claim 16, wherein the subject is at risk of developing a urinary tract infection.

18. The ~~method~~ use according to claim 16, wherein the subject is at risk of developing bacteremia.

19. The ~~method~~ use according to claim 16, wherein the subject is at risk of developing sepsis.

20. Use of a composition according to any one of claims 6 to 10 in the manufacture of a medicament~~A method of~~ for eliciting an immune response against *E. coli* in a mammal,

~~comprising administering to the mammal~~ wherein an effective amount of ~~a composition according to any one of claims 6-10~~the medicament is to be administered to the mammal.

21. The ~~method~~ use according to claim 20, wherein the immune response comprises opsonophagocytic and/or neutralizing antibodies against *E. coli*.

22. The ~~method~~ use according to claim 20, wherein the immune response protects the mammal from an *E. coli* infection.

23. Use of a composition according to any one of claims 6 to 10 in the manufacture of a medicament ~~A method of~~ for preventing, treating or ameliorating a bacterial infection, disease or condition in a subject, wherein ~~comprising administering to the subject~~ an immunologically effective amount of ~~a composition according to any one of claims 6-10~~ the medicament is to be administered to the subject.