

CLAIMS

1. A polypeptide comprising a FimH lectin domain, wherein the FimH lectin domain comprises an amino acid selected from the group consisting of valine (V), isoleucine (I),
5 leucine (L), glycine (G), methionine (M), and alanine (A) at the position that corresponds to position 144 in SEQ ID NO: 1.
2. A polypeptide according to claim 1, wherein the polypeptide comprises a mutation and wherein the mutation is a F144V substitution.
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3. A polypeptide according to claim 1 or 2, wherein the FimH lectin domain has an amino acid sequence having at least 90% sequence identity with SEQ ID NO: 1, preferably wherein the FimH lectin domain comprises SEQ ID NO: 1 wherein the phenylalanine residue at position 144 is substituted by valine.
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4. A polypeptide according to any one the preceding claims, wherein the polypeptide further comprises a FimH pilin domain.
5. A polypeptide according to any one of the preceding claims, wherein the polypeptide is
20 a full length FimH having at least 90% sequence identity with SEQ ID NO: 2, preferably wherein the FimH comprises SEQ ID NO: 2 wherein the phenylalanine residue at position 144 is substituted by valine.
6. A complex comprising a polypeptide according to claim 4 or 5 and FimC (FimCH).
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7. A polynucleotide encoding the polypeptide of any one of claims 1-5.
8. A pharmaceutical composition comprising a polypeptide according to any one of claims 1-5, a complex according to claim 6, or a polynucleotide according to claim 7.
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9. A pharmaceutical composition according to claim 8, wherein the composition further comprises an adjuvant.

10. A polypeptide according to claims 1-5, a complex according to claim 6, a polynucleotide according to claim 7 or a pharmaceutical composition according to claim 8 or 9, for use as a medicament.
- 5 11. A polypeptide according to claims 1-5, a complex according to claim 6, a polynucleotide according to claim 7 or a pharmaceutical composition according to claim 8 or 9, for use in inducing an immune response against a bacterium of the family of Enterobacteriaceae.
- 10 12. The polypeptide, polynucleotide, complex or pharmaceutical composition for a use according to claim 11, wherein the bacterium is *E.coli* or *Klebsiella*, preferably *E.coli*.
13. A polypeptide according to claims 1-5, a complex according to claim 6, a polynucleotide according to claim 7 or a pharmaceutical composition according to claim 8 or 9, for use in the prevention or treatment of a urinary tract infection caused by *E. coli* in a subject.
- 15 14. A method for treating or preventing an enterobacillus-related condition a subject in need thereof comprising administration to the subject of an effective amount of the polypeptide according to any one of claims 1-5, of a complex according to claim 6, a polynucleotide according to claim 7 or of a pharmaceutical composition according to claim 8 or 9.
- 20 15. A vector comprising a polynucleotide according to claim 7.
- 25 16. A method for producing a polypeptide comprising a FimH lectin domain, comprising expressing the polypeptide from a recombinant cell containing the polynucleotide of claim 7 and/or the vector of claim 15, optionally the method further comprising recovering and purifying the polypeptide which is optionally followed by formulation into a pharmaceutical composition of the polypeptide.