

CLAIMS

1. Polypeptide HP or a polynucleotide sequence encoding polypeptide HP or a host cell comprising an expression vector comprising said polynucleotide sequence for use in the treatment and/or prevention of a disorder in a subject; wherein said disorder is an inflammatory disorder and/or an autoimmune disorder; wherein said polypeptide has at least 75% identity to SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof; and wherein said polynucleotide sequence encodes a polypeptide which has at least 75% identity to SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof and/or wherein said polynucleotide sequence has at least 75% identity to SEQ ID NO 1, SEQ ID NO 3 or SEQ ID NO 5 or variants, homologues, fragments or derivatives thereof.
2. The polypeptide or the polynucleotide sequence or the host cell according to claim 1 for the use according to claim 1 wherein said disorder affects the alimentary canal, a section of the alimentary canal, the liver, liver cells, epithelial cells, epidermal cells, neuronal cells kidneys, spleen, lungs, heart, the pancreas, and/or pancreatic cells.
3. The polypeptide or the polynucleotide sequence or the host cell according to claim 1 for the use according to claim 1 wherein said disorder is selected from the group consisting of inflammatory bowel disorder (IBD), colitis, rheumatoid arthritis, psoriasis, multiple sclerosis, type I diabetes, coeliac disease, atopic dermatitis, rhinitis, irritable bowel syndrome (IBS), ulcerative colitis, pouchitis, Crohn's disease, functional dyspepsia, atopic diseases, necrotising enterocolitis, non alcoholic fatty liver disease, gastrointestinal infection Lupus, nephritis/glomerulonephritis, asthma, COPD, myocarditis and combinations thereof.
4. The polypeptide or the polynucleotide sequence or the host cell according to claim 1 for the use according to claim 1 wherein said disorder is an inflammatory bowel disorder (IBD).
5. The polypeptide or the polynucleotide sequence or the host cell according to any preceding claim for the use according to any preceding claim wherein said polypeptide or polynucleotide sequence is for use in reducing the inflammation of a

cell, a tissue or an organ in a subject.

6. The polypeptide or the polynucleotide sequence or the host cell according to claim 5 for the use according to claim 5 wherein said cell, tissue or organ is the alimentary canal, a section of the alimentary canal, the liver, liver cells, epithelial cells, epidermal cells, neuronal cells, kidneys, spleen, lungs, heart, the pancreas, and/or pancreatic cells.
7. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 5 to 6 for the use according to any one of claims 5 to 6 wherein said polypeptide or polynucleotide sequence is for use in reducing the inflammation by epithelial cells of the tissue or the organ.
8. The polypeptide or the polynucleotide or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in improving intestine barrier integrity in a subject.
9. The polypeptide or the polynucleotide or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in modifying the bacterial composition in a tissue or organ to provide a beneficial microbiota, preferably wherein said polypeptide or polynucleotide sequence is for use in reducing the level of one or more types of lactose fermenting bacteria in a tissue or an organ in a subject and/or reducing the level of one or more types of non-lactose fermenting bacteria in a tissue or an organ in a subject.
10. The polypeptide or the polynucleotide sequence or the host cell according to claim 9 for the use according to claim 9 wherein said tissue or organ is selected from the group consisting of mesenteric lymph nodes, liver, pancreas, spleen, kidneys, heart, lung and combinations thereof.
11. The polypeptide or the polynucleotide or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in maintaining the length of the large intestine

and/or small intestine of a subject.

12. The polypeptide or the polynucleotide sequence or the host cell according to claim 11 for the use according to claim 11 wherein said polypeptide or polynucleotide sequence is for use in preventing a reduction in the length of large intestine and/or preventing an increase in the length of the small intestine.
13. The polypeptide or the polynucleotide or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in reducing disruption to the intestine of a subject.
14. The polypeptide or the polynucleotide sequence or the host cell according to claim 13 for the use according to claim 13 wherein said polypeptide or polynucleotide sequence is for use in reducing or preventing disruption to the integrity of the mucosal epithelium and/or reducing or preventing a reduction in the number of goblet cells in the epithelium and/or reducing or preventing the infiltration of immune cells into the lamina propria.
15. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in regulating the expression of one or more pro-inflammatory genes and/or one or more barrier integrity genes in a cell or cells of a subject.
16. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in regulating the expression in a cell or cells of a subject of one or more genes selected from the group consisting of regenerating islet-derived 3 beta gene (Reg3b), resistin-like gamma resistin like beta gene (Retnlg|Retnlb) sucrase-isomaltase (alpha-glucosidase) gene (Si), defensin alpha 24 gene (Defa24), hydroxysteroid 11-beta dehydrogenase 2 gene (Hsd11b2), hydroxysteroid (17-beta) dehydrogenase 2 gene (Hsd17b2), resistin-Like Molecule-beta (RELMb), and nuclear receptor 1D1 thyroid hormone receptor alpha gene (Nr1d1|Thra).

17. The polypeptide or the polynucleotide sequence or the host cell according to claim 16 for the use according to claim 16 wherein said polypeptide or polynucleotide sequence is for use in decreasing the expression of one or more genes selected from the group consisting of regenerating islet-derived 3 beta gene (Reg3b); resistin-like gamma resistin like beta gene (Retnl γ |Retnl β); resistin-Like Molecule-beta (RELM β), sucrase-isomaltase (alpha-glucosidase) gene (Si); and defensin alpha 24 gene (Defa24).
18. The polypeptide or the polynucleotide sequence or the host cell according to claim 16 for the use according to claim 16 wherein said polypeptide or polynucleotide sequence is for use in increasing the expression of one or more genes selected from the group consisting of hydroxysteroid 11-beta dehydrogenase 2 gene (Hsd11b2); hydroxysteroid (17-beta) dehydrogenase 2 gene (Hsd17b2); and nuclear receptor 1D1 thyroid hormone receptor alpha gene (Nr1d1|Thra).
19. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in reducing the activation of pro-inflammatory pathways in a cell or cells of a subject.
20. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in reducing the activity and/or expression of NF- κ B in a cell or cells of a subject.
21. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 4 for the use according to any one of claims 1 to 4 wherein said polypeptide or polynucleotide sequence is for use in improving alimentary canal health in a subject.
22. A pharmaceutical composition comprising polypeptide HP or a polynucleotide sequence encoding polypeptide HP or a host cell comprising an expression vector comprising said polynucleotide sequence and a pharmaceutically acceptable excipient, carrier or diluent; wherein said polypeptide has at least 75% identity to

SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof; and wherein said polynucleotide sequence encodes a polypeptide which has at least 75% identity to SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof and/or wherein said polynucleotide sequence has at least 75% identity to SEQ ID NO 1, SEQ ID NO 3 or SEQ ID NO 5 or variants, homologues, fragments or derivatives thereof.

23. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 21 for the use according to any one of claims 1 to 21, or the pharmaceutical composition according to claim 22 wherein said polypeptide or polynucleotide sequence is encapsulated.
24. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 21 and 23 for the use according to any one of claims 1 to 21 and 23, or the pharmaceutical composition according to claim 22 or 23 wherein said polypeptide is a recombinant polypeptide.
25. The polypeptide or the polynucleotide sequence or the host cell according to any one of claims 1 to 21 and 23 for the use according to any one of claims 1 to 21 and 23, or the pharmaceutical composition according to claim 22 or 23 wherein an expression vector comprises said polynucleotide sequence.
26. A process for producing a pharmaceutical composition according to any one of claims 22 to 25, said process comprising admixing said polypeptide or polynucleotide sequence or host cell with a pharmaceutically acceptable excipient, carrier or diluent; optionally said polypeptide or polynucleotide sequence is encapsulated in said process; wherein said polypeptide has at least 75% identity to SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof; and wherein said polynucleotide sequence encodes a polypeptide which has at least 75% identity to SEQ ID NO 2, SEQ ID NO 4 or SEQ ID NO 6 or variants, homologues, fragments or derivatives thereof and/or wherein said polynucleotide sequence has at least 75% identity to SEQ ID NO 1, SEQ ID NO 3 or SEQ ID NO 5 or variants, homologues, fragments or derivatives thereof.