Claims

1. Use of a human β-defensin and/or α-defensin for the manufacture of a medicament for the prevention or treatment of acute graft-versus-host-disease (GVHD) in a patient that has received or is about to receive an allogeneic hematopoietic stem cell transplantation.

2. The use according to claim 1, wherein the human β-defensin and/or α-defensin is selected from SEQ ID NO: 2, SEQ ID NO: 5, SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 4, SEQ ID NO: 6, and SEQ ID NO: 7 and sequence variants differing from the SEQ ID NO by less than 5, such as less than 4, for example less than 3, such as less than 2 amino acids.

3. The use according to any one of preceding claims, wherein said human β-defensin and/or α-defensin is selected from a group consisting of hBD2 (SEQ ID NO: 2), HD5 (SEQ ID NO: 5), HD6 (SEQ ID NO: 6), hBD1 (SEQ ID NO: 1), truncated hBD2 (SEQ ID NO: 7), hBD3 (SEQ ID NO: 3) and hBD4 (SEQ ID NO: 4).

4. The use of claim 3, wherein said human β-defensin and/or α-defensin is hBD2, truncated hBD2, or HD5.

5. The use according to any one of preceding claims, wherein more than one human β-defensin and/or α-defensin, such as two human β-defensin and/or α-defensins, such as three human β-defensin and/or α-defensins, such as four human β-defensin and/or α-defensins, such as five human β-defensin and/or α-defensins are to be administered.

6. The use according to 5, wherein said two human β-defensin and/or α-defensins are hBD2 and HD5.

7. The use according to any of the preceding claims, wherein administration of said human β-defensin and/or α-defensin to the patient is to be initiated on the day of allogenic hematopoietic stem cell transplantation.

8. The use of any of the preceding claims 1-6, wherein administration of said human β-defensin and/or α-defensin to the patient is to be initiated when symptoms of GVHD appear after allogenic hematopoietic stem cell transplantation.

9. The use of claim 7 or 8, wherein administration of human β-defensin and/or α-defensin is to be continued until the patient is free of symptoms caused by the allogenic hematopoietic stem cell transplantation, such as for at least one week, for example at least two weeks, such as at least 3 weeks, for example at least 4 weeks, such as at least 2 months, for example at least 3 months, at least 4 months, at least 6 months.

10. The use according to any one of the preceding claims, wherein said human β-defensin and/or α-defensin further comprises at least one additional moiety selected from a group consisting of a cell penetrating peptide (CPP), an Albumin Binding Moiety (ABM), a detectable moiety (Z), and a half-life extending peptide.

11. The use according to claim 10, wherein the additional moiety is a half-life extending peptide.

12. The use according to claim 10, wherein the additional moiety is selected from a group consisting of a molecule capable of binding to a neonatal Fc receptor (FcRn), transferrin, human serum albumin (HSA), or polyethylene glycol (PEG), a homo-amino acid polymer (HAP), a proline-alanine-serine polymer (PAS), or an elastin-like peptide (ELP), hyaluronic acid, a negatively charged sialylated peptide such as the carboxy-terminal peptide (CTP) of chorionic gonadotropin (CG) β-chain, human IgG, and $CH_3(CH_2)_nCO$- wherein n is 8 to 22.

13. The use according to any one of the preceding claims, wherein the human β-defensin and/or α-defensin is to be administered in combination with prebiotics, probiotics, tryptophane, short chain fatty acids, glucocorticoids, cyclosporine, anti TNF-α, integrins, antibiotics, immunosuppressants, faecal transplantation, irradiation or a combination of these.

14. The use according to any one of the preceding claims, wherein the daily dosage is between 0.1 and 10 mg defensin/kg, such as between 0.5 and 5 mg defensin/kg, such as between 1 and 2 mg defensin/kg, such as 1.2 mg defensin/kg per day.

15. The use according to any of the preceding claims, wherein said human β-defensin and/or α-defensin is to be administered at least one time a day, such as at least twice a day, such as at least three times a day, such as at least four times a day, such as five times a day or continuously.

16. The use according to any of the preceding claims, wherein said administration is oral, buccal, sublingual, rectal, vaginal, intratracheal, intranasal, intracranial, subcutaneous, intravenous, transdermal, intrapulmonary or dermal.

17. The use according to claim 16, wherein said intrapulmonary, intratracheal or intranasal administration is by an inhaler, nebulizer, or vaporizer.

18. The use according to any of claims 1 to 16, wherein the administration is oral.

19. The use of any of the preceding claims, wherein the patient has one or more symptoms selected from: severe intestinal and liver inflammation (e.g. characterized by abdominal pain, nausea, vomiting and jaundice) and loss of mucosal defense, cytokine storm, weight loss, sepsis, skin rash, itching, and redness.

20. The use of any of the preceding claims, wherein the treatment.

    a. improves the symptoms as defined in claim 19;

    b. decreases mortality and increases long term survival;

    c. rebalances the immune system and prevents or treats the cytokine storm through normalization of the tissue cytokine production;

    d. treats gut permeability and sepsis through normalization of the mucosal defense or myeloperoxidase activity in the intestines;

    e. treats respiratory complications, lung capacity, lung inflammation and sepsis;

    f. reduces histological lung inflammation, peribronchial and perivascular inflammation as well as inflammatory cell migration into bronchoalveolar lavage fluid;

    g. treats or prevents inflammation and fibrosis of the lungs and skin, such as bronchiolitis obliterans and scleroderma;

    h. increases gene richness, the number of phylae, the bacterial presence, the bacterial abundance and/or the short chain fatty acid production, and/or butyrate production;

    i. decreases the acetate production from gut or lung microbiota of said patient;

j. matures, maintains or stabilizes a normal microbiota in the gut or lung or skin of said patient;

k. increases the abundance of Allobaculum, Alloprevotella, Akkermansia, Barnesiella, Bifidobacteriaceae, Faecalibacterium, Lachnospira, Rothia and Veillonella in the gut or lung of said patient; and/or

l. increases food uptake and weight gain in said patient.