

CLAIMS

1. A composition comprising a *Coprococcus* bacterium and/or a culture extract thereof exhibiting AhR agonist activity, for use in the treatment of a disease selected from the group
5 consisting of metabolic syndrome and associated disorders, and inflammatory bowel diseases.

2. The composition for use according to claim 1, wherein the bacterium is a *Coprococcus comes* bacterium.

10 3. The composition for use according to claim 2, wherein the bacterium is *Coprococcus comes* strain deposited with the Deutsche Sammlung von Mikroorganismen und Zellkulturen (DSMZ) under accession number DSM 33359, or a mutant thereof.

4. The composition for use according to any of claims 1 to 3, wherein the *Coprococcus*
15 bacterium is a living *Coprococcus* bacterium.

5. The composition for use according to any of claims 1 to 4, wherein the culture extract is a culture supernatant.

20 6. The composition for use according to claim 5, wherein said composition comprises *Coprococcus* culture supernatant, preferably *Coprococcus comes* culture supernatant.

7. The composition for use according to any of claims 5 and 6, wherein said composition comprises a living *Coprococcus* bacterium and a culture supernatant thereof,
25 preferably a living *Coprococcus comes* bacterium and a culture supernatant thereof.

8. The composition for use according to any of claims 1 to 7, wherein the composition further comprises one or several additional bacterial probiotics capable of producing an AhR agonist and preferably selected from the group consisting of bacteria belonging to the genera
30 *Allobaculum*, *Adlercreutzia*, *Anaerostipes*, *Bifidobacterium*, *Propionibacterium*, *Bacteroides*, *Eubacterium*, *Enterococcus*, *Ruminococcus* and *Faecalibacterium*, *Escherichia coli*, and lactic acid bacteria such as bacteria belonging to the genera *Lactobacillus* and *Streptococcus*.

9. The composition for use according to claim 8, wherein said one or several additional bacterial probiotics are selected from the group consisting of bacteria belonging to the genera *Allobaculum*, *Adlercreutzia*, *Propionibacterium*, *Enterococcus*, *Escherichia coli*, *Lactobacillus*
5 and *Streptococcus*.

10- The composition for use according to any of claims 1 to 8, wherein the composition further comprises one or several additional bacterial probiotics selected from the group consisting of strains available under CNCM deposit numbers CNCM I-5019, CNCM I-
10 5020, CNCM I-5021, CNCM I-5022 and CNCM I-5023, *Ruminococcus gnavus* ATCC 29149, *Lactobacillus salivarius* DSM 20555, *Lactobacillus reuteri* DSM 20016, *Lactobacillus gasseri* DSM 20243, *Faecalibacterium prausnitzii* A2-165, *Escherichia coli* MG1665, *Anaerostipes hadrus* DSM 3319, *Anaerostipes caccae* DSM 14662, *Anaerostipes butyraticus* DSM 22094 and *Allobaculum stercoricanis* DSM 13633.

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11. The composition for use according to any of claims 1 to 7, wherein the composition does not comprise any additional bacterium.

12- The composition for use according to any of claims 1 to 11, wherein said
20 composition is to be administered by oral or rectal route.

13- The composition for use according to any of claims 1 to 12, wherein the disease is selected from metabolic syndrome or associated disorders, said disorders being preferably selected from the group consisting of cardiovascular diseases, insulin resistance, glucose
25 intolerance, type 2 diabetes, non alcoholic fatty liver disease and lipodystrophy.

14- The composition for use according to any of claims 1 to 13, wherein the disease is selected from metabolic syndrome or associated disorders, said disorders being selected from the group consisting of cardiovascular diseases, insulin resistance, glucose intolerance,
30 non alcoholic fatty liver disease and lipodystrophy.

15. The composition for use according to any of claims 1 to 14, wherein the disease is metabolic syndrome.

16. The composition for use according to any of claims 1 to 13, wherein the disease is
5 a disorder associated to metabolic syndrome, said disorder being selected from the group consisting of cardiovascular diseases, insulin resistance, glucose intolerance, type 2 diabetes, non alcoholic fatty liver disease and lipodystrophy.

17. The composition for use according to any of claims 1 to 14, wherein the disease is
10 a disorder associated to metabolic syndrome, said disorder being selected from the group consisting of cardiovascular diseases, insulin resistance, glucose intolerance, non alcoholic fatty liver disease and lipodystrophy.

18- The composition for use according to any of claims 13 to 17, wherein the
15 cardiovascular diseases are coronary heart diseases, preferably heart attack or stroke.

19. The composition for use according to any of claims 1 to 12, wherein the disease is an inflammatory bowel disease, preferably selected from the group consisting of Crohn's disease, ulcerative colitis, indeterminate colitis (IC), other noninfective gastroenteritis, enteritis, enterocolitis and colitis, and pouchitis.
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20. The composition for use according to claim 19, wherein the disease is an inflammatory bowel disease selected from Crohn's disease and ulcerative colitis.

21. The composition for use according to any of claims 1 to 20, wherein the disease is
25 not antibiotic associated colitis, preferably is not *Clostridium difficile* associated diarrhea.

22. *Coprococcus comes* strain deposited with the Deutsche Sammlung von Mikroorganismen und Zellkulturen (DSMZ) under accession number DSM 33359, or a mutant
30 thereof.