

**DERMATOPONTIN AS A THERAPEUTIC FOR METABOLIC DISORDERS****CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of priority of Singapore provisional application No. 10201501053Q, filed 11 February 2015, the contents of it being hereby incorporated by reference in its entirety for all purposes.

**FIELD OF THE INVENTION**

[0002] The present invention relates generally to the field of biotechnology. In particular, the present invention relates to the field of protein biotechnology.

**BACKGROUND OF THE INVENTION**

[0003] Metabolic diseases such as cardio vascular diseases, diabetes and obesity are a worldwide pandemic with ~382 million people affected by diabetes alone. Currently, there are limited drugs that are effective in combating diabetes. One approach is to hijack biological effects of circulating factors in blood to improve whole body metabolism. Factors such as FGF-21, irisin and adiponectin, which are secreted from the liver, muscles and adipose tissue, respectively, had been previously demonstrated to improve whole body metabolism by modulating various aspects of energy homeostasis.

[0004] Therefore, there is a need to identify new therapeutic targets for the treatment of metabolic related diseases.

**SUMMARY**

[0005] In one aspect, the present invention refers to use of recombinant dermatopontin in the manufacture of a medicament for treating a metabolic disease in a subject. In one example, there is disclosed a method of treating a metabolic disease in a subject, wherein the method comprises administration of recombinant dermatopontin to a subject.

[0006] In another aspect, the present invention refers to a method of determining or making a prognosis of a subject's susceptibility to metabolic diseases and obesity, the method comprising measuring the level of circulating dermatopontin in a sample obtained from a subject; and comparing the level of circulating dermatopontin obtained with the level of dermatopontin previously determined in a control; and determining the susceptibility of the subject to metabolic disease and obesity based on the difference between the level of circulating dermatopontin and the level of dermatopontin in the control.

[0007] In yet another aspect, the present invention refers to use of recombinant dermatopontin according to any one of claims 1 to 10 in the manufacture of a medicament for treating a metabolic disease. In another example, there is disclosed a method of treating a metabolic disease comprising dermatopontin as defined herein.

**CLAIMS**

1. Use of recombinant dermatopontin in the manufacture of a medicament for treating a metabolic disease in a subject.
- 5 2. The use of claim 1, wherein the recombinant dermatopontin is of human, bovine, porcine or murine origin.
3. The use of any of the preceding claims, wherein the recombinant dermatopontin comprises a sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3  
10 or SEQ ID NO: 4.
4. The use of any of the preceding claims, wherein the recombinant dermatopontin comprises SEQ ID NO: 1.
- 15 5. The use of any of the preceding claims, wherein the recombinant dermatopontin is a homologue of any one of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3 or SEQ ID NO: 4 with a sequence identity of at least 60%.
- 20 6. The use of any of the preceding claims, wherein the recombinant dermatopontin is post-translationally modified.
7. The use of any of the preceding claims, wherein the recombinant dermatopontin is modified at its C-terminus or N-terminus; optionally  
wherein the recombinant dermatopontin comprises a detection and/or characterization tag.  
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8. The use of any of the preceding claims, wherein the recombinant dermatopontin consists of a secretory signal at its N-terminus.
9. The use of claim 8, wherein the secretory signal comprises a sequence selected from the group  
30 consisting of SEQ ID NO: 6, SEQ ID NO: 7 or SEQ ID NO: 8.
10. The use of any of the preceding claims, wherein the nucleic acid sequence of the recombinant dermatopontin consist of SEQ ID NO: 5.

11. The use of any of the preceding claims, wherein the metabolic disease is selected from a group consisting of weight gain, diet-induced weight gain, reduction in fat mass, obesity, morbid obesity, metabolic syndrome, glucose homeostasis, insulin resistance, type I diabetes, type II diabetes and cardiovascular disease.

12. The use of any of the preceding claims, wherein the recombinant dermatopontin is to be administered with at least one or two or more therapeutic agents.

13. The use of claim 12, wherein the administration is simultaneous, separately or sequentially.

14. The use of any of the preceding claims, wherein the recombinant dermatopontin is to be administered at an amount of between 0.1 mg/kg and 10 mg/kg.

15. The use of any of the preceding claims, wherein the recombinant dermatopontin is to be administered daily, weekly, twice a week, three times a week, every two weeks or monthly.

16. The use of any of the preceding claims, where the subject is human.

17. A method of determining or making a prognosis of a subject's susceptibility to metabolic diseases and obesity, the method comprising

- measuring the level of circulating dermatopontin in a sample obtained from a subject; and
- comparing the level of circulating dermatopontin obtained with the level of dermatopontin previously determined in a control; and
- determining the susceptibility of the subject to metabolic disease and obesity based on the difference between the level of circulating dermatopontin and the level of dermatopontin in the control.

18. The method of claim 17, wherein the control is a subject that is disease-free.

19. Use of recombinant dermatopontin according to any one of claims 1 to 10 in the manufacture of a medicament for treating a metabolic disease.

20. The use of claim 19, wherein the metabolic disease is selected from a group consisting of weight gain, diet-induced weight gain, reduction in fat mass, obesity, morbid obesity, metabolic syndrome, glucose homeostasis, insulin resistance, type I diabetes, type II diabetes and cardiovascular disease.