RECOMBINANT HOSTS COMPRISING FERRITIN OR HOMOLOGUES THEREOF

FIELD

[0001] The present disclosure relates to recombinant hosts comprising ferritin or homologues thereof.

BACKGROUND

[0002] Deficiencies in iron absorption or excesses in iron loss lead to non-optimal blood and/or tissue iron levels with a wide variety of symptoms. The current industry standard for iron replacement therapy is oral administration of iron sulfate supplements. However, such supplements have limited efficacy because the iron is poorly absorbed or the supplement is dependent on environmental conditions to generate a consistent level of iron. Use of iron sulfate supplements can also lead to gastrointestinal discomfort.

SUMMARY

[0003] Disclosed herein is a recombinant host comprising: at least a first set of chromosomes and a second set of chromosomes, wherein at least one of the first set of chromosomes and the second set of chromosomes comprises a recombinant gene encoding ferritin or a homologue thereof.

[0003a] In one aspect, the present disclosure refers to a recombinant host comprising: at least a first set of chromosomes and a second set of chromosomes, wherein at least one of the first set of chromosomes and the second set of chromosomes comprise a recombinant gene encoding ferritin or a homologue thereof, wherein the recombinant host is prototrophic, and wherein the recombinant host is a fungus, an alga, a protozoan, a microscopic helminth, and/or a microorganism.

[0004] Also disclosed herein is a recombinant host comprising: a prototroph comprising a recombinant gene encoding ferritin or a homologue thereof.

[0005] Also disclosed herein are compositions comprising a recombinant host of the present disclosure.

[0006] Also disclosed herein are ingestible items comprising a composition of the present disclosure.

[0007] Also disclosed herein are dietary supplements comprising a composition of the present disclosure.

[0008] Also disclosed herein are pharmaceutical compositions comprising a composition of the present disclosure.

[0009] Also disclosed herein are methods of administering to a subject a composition of the present disclosure. In another aspect the present disclosure refers to a composition of the present disclosure for use in therapy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 shows the amino acid sequence of human H-ferritin (SEQ ID NO:1).

We claim:

1. A recombinant host comprising:

at least a first set of chromosomes and a second set of chromosomes, wherein at least one of the first set of chromosomes and the second set of chromosomes comprise a recombinant gene encoding ferritin or a homologue thereof,

wherein the recombinant host is prototrophic, and

wherein the recombinant host is a fungus, an alga, a protozoan, a microscopic helminth, and/or a microorganism.

2. The recombinant host of claim 1, wherein the first set of chromosomes and the second set of chromosomes comprise a diploid, a polyploid and/or an aneuploid.

3. The recombinant host of claim 1, wherein the recombinant gene comprises a nucleic acid sequence of SEQ ID NO:2, SEQ ID NO:3 and/or SEQ ID NO:4 or homologues thereof.

4. The recombinant host of claim 1, wherein the recombinant gene encodes an amino acid sequence of SEQ ID NO: 1 or homologues thereof.

5. The recombinant host of claim 1, wherein the recombinant host is a diploid, a polyploid or aneuploid.

6. The recombinant host of claim 1, wherein the recombinant gene encoding ferritin is chromosomally integrated.

7. The recombinant host of claim 1, wherein the recombinant gene encoding ferritin or a homologue thereof is closely linked to a *URA3* gene or a homologue thereof and/or *LEU2* or a homologue thereof.

8. The recombinant host of claim 1, wherein the recombinant gene encodes an amino acid sequence for H-ferritin.

9. The recombinant host of claim 1, wherein the homologue has at least 80% sequence identity with human H-ferritin.

10. The recombinant host of claim 1, wherein the recombinant gene comprises a plant H-ferritin gene.

11. A composition comprising the recombinant host of claim 1.

12. The composition of claim 11, wherein the composition further comprises iron.

13. The composition of claim 12, wherein at least a portion of the iron is complexed with the ferritin or the homologue thereof.

14. The composition of claim 11, further comprising a second recombinant host, a probiotic, a prebiotic, or combinations thereof.

15. An ingestible item comprising the composition of claim 11.

16. A dietary supplement comprising the composition of claim 11.

17. A pharmaceutical composition comprising the composition of claim 11.

18. The composition of claim 11 for use in therapy.

19. The composition for use according to claim 18, wherein the composition comprises at least 13 mg of iron.

20. The recombinant host of claim 1, wherein the recombinant gene encoding ferritin is chromosomally integrated.