Claims

1. Use of a composition comprising a homogenous polysaccharide, or a pharmaceutically acceptable ester or salt thereof, or a pharmaceutically acceptable solvate thereof, or any combination thereof, and a pharmaceutically acceptable excipient in the manufacture of a medicament for treating or preventing bone loss and/or improving bone formation, bone mass or strength of a subject in need,

wherein the homogeneous polysaccharide consists essentially of arabinose, galactose, rhamnose, and galacturonic acid as monomer units,

preferably, the subject is a mammal.

2. The use of claim 1, wherein the subject is a human subject, and/or the bone loss is age-related bone loss.

3. The use of claim 1, wherein the composition is orally administrated.

4. The use of claim 1, wherein the homogeneous polysaccharide has a molecular weight in a range of from about 10 kDa to about 150 kDa, and/or a ratio of monomer units of arabinose, galactose, rhamnose, and galacturonic acid in a range of from 30-70: 20-60: 0.1-10: 0.1-10.

5. The use of claim 1, wherein the homogeneous polysaccharide has a ratio of monomer units of arabinose, galactose, rhamnose, and galacturonic acid being 49.9: 33.6: 8.0: 8.5.

6. The use of claim 1, wherein the composition further comprises additional polysaccharide isolated from a *Lycium barbarum* extract, and/or the homogenous polysaccharide is at least 15% of all polysaccharides in the composition.

7. The use of claim 1, wherein the composition further comprises one or more compounds selected from the group consisting of flavone, carotenoid, polyphenol, pigment, or any combination isolated from a *Lycium barbarum* extract.

8. The use of claim 1, wherein the homogeneous polysaccharide is the only polysaccharide in the composition.

9. The use of claim 1, wherein the pharmaceutically acceptable ester or salt thereof is a sulfate ester derivative of the homogeneous polysaccharide.

10. The use of claim 1, wherein the excipient is a solvent, a co-solvent, a coloring agent, a preservative, an antimicrobial agent, a filler, a binder, a disintegrate, a lubricant, a surfactant, an emulsifying agent, a suspending agent, or any combination thereof.

11. The use of claim 1, wherein the dose of the effective amount of the composition is in a range of from 10 mg/Kg to 500 mg/Kg based on a weight of the homogeneous polysaccharide or the pharmaceutically acceptable ester or salt thereof /a body weight of the subject on daily basis.

12. A composition for improving bone formation, bone mass or strength and/or treating or preventing bone loss in a subject in need thereof, comprising:

an effective amount of a homogenous polysaccharide, or a pharmaceutically acceptable ester or salt thereof, or a pharmaceutically acceptable solvate thereof, or any combination thereof, and a pharmaceutically acceptable excipient,

wherein the homogeneous polysaccharide consists essentially of arabinose, galactose, rhamnose, and galacturonic acid as monomer units.

13. The composition of claim 12, wherein the pharmaceutically acceptable ester or salt thereof is a sulfate ester derivative of the homogeneous polysaccharide,
preferably, the sulfate ester derivative of the homogeneous polysaccharide has a degree of sulfate substitution in a range of from 0.5 to 0.9.

14. The composition of claim 12, wherein the composition is a pharmaceutical composition, a functional composition, and/or a dietary supplement.

15. The composition of claim 12, wherein the composition is an oral composition and/or is in a tablet form.

16. The composition of claim 12, wherein the excipient is a solvent, a co-solvent, a coloring agent, a preservative, an antimicrobial agent, a filler, a binder, a disintegrate, a lubricant, a surfactant, an emulsifying agent, a suspending agent, or any combination thereof.

17. The composition of claim 12, wherein the homogeneous polysaccharide or its derivative thereof has a molecular weight in a range of from about 10 kDa to about 150 kDa, and a ratio of monomer units of arabinose, galactose, rhamnose, and galacturonic acid in a range of from 30-70: 20-60: 0.1-10: 0.1-10.

18. The composition of claim 12, wherein the homogeneous polysaccharide has a ratio of monomer units of arabinose, galactose, rhamnose, and galacturonic acid being 49.9: 33.6: 8.0: 8.5.

19. The composition of claim 12, wherein the homogeneous polysaccharide is the only polysaccharide in the composition.

20. The composition of claim 12, wherein the composition is a pharmaceutical composition for treating age-related bone loss in a human subject.