WHAT IS CLAIMED IS:

1. Use of a composition in the manufacture of a medicament for increasing mobility in a subject, wherein the composition comprises a therapeutically effect amount of an AKG.

2. The use of claim 1 wherein increasing mobility includes increasing exercise endurance in the subject.

3. The use of claim 1 wherein increasing mobility includes increasing exercise efficiency, metabolism, or both exercise efficiency and metabolism in the subject.

4. The use of claim 1 wherein increasing mobility includes improving gait in the subject.

5. The use of claim 1 wherein increasing mobility includes improving locomotion in the subject.

6. The use of claim 1 wherein increasing mobility includes improving balance in the subject.

7. Use of a composition in the manufacture of a medicament for altering senescence-associated secretory phenotype (SASP) of a senescent cell in a subject, wherein the composition comprises a therapeutically effect amount of an alpha-ketoglutarate (AKG) to delay SASP.

8. Use of a composition in the manufacture of a medicament for altering senescence-associated secretory phenotype (SASP) of a senescent cell in a subject, wherein the composition comprises a therapeutically effect amount of an alpha-ketoglutarate (AKG) to reduce SASP.

9. Use of a composition in the manufacture of a medicament for re-growing hair on a subject, wherein the composition comprises a therapeutically effect amount of an AKG.

10. Use of a composition in the manufacture of a medicament for treating sarcopenia in a subject, wherein the composition comprises a therapeutically effect amount of an AKG.

11. Use of a composition in the manufacture of a medicament for increasing collagen synthesis in a subject, wherein the composition comprises a therapeutically effect amount of an AKG.

12. The use of any one of claims 1 to 11 wherein the therapeutically effect amount alters secretion of at least one SASP factor.

13. The use of any one of claims 1 to 11 wherein the therapeutically effect amount reduces secretion of at least one SASP factor.

14. The use of any one of claims 12 or 13 wherein the SASP factors comprise an interleukin (IL), a chemokine, an inflammatory factor, a growth factor, a protease, an extracellular matrix component, or a combination thereof.

15. The use of any one of claims 12 or 13 wherein the SASP factors comprise IL-1β, IL-3, IL-6, IL-7, MIP-1β, TNF-α, CCL2, MMP3, or a combination thereof.

16. The use of any one of claims 12 or 13 wherein at least one senescent marker comprises $p16^{INK4a}$.

17. The use of any one of claims 12 or 13 wherein at least one senescent marker comprises $p21^{WAF1}$.

18. The method of any one of claims 1 to 17 wherein the therapeutically effect amount does not clinically affect formation of senescent cells.

19. The method of any one of claims 1 to 17 wherein the therapeutically effect amount does not clinically affect the number of senescent cells.

20. The use of any one of claims 1 to 19 wherein the medicament is configured to be administered twice daily.

21. The use of any one of claims 1 to 20 wherein the medicament is formulated into an orally administered form.

22. The use of any one of claims 1 to 21 wherein the subject has at least a 6 fold lower level of plasma AKG level compared to a control subject, where the control subject is at least 2 years younger than the subject.

23. The use of any one of claims 1 to 22 wherein the therapeutically effective amount is in the range from about 350 mg to about 2000 mg, and where the AKG is calcium alpha-ketoglutarate or calcium alpha-ketoglutarate monohydrate, or a combination thereof.

24. The use of any one of claim 1 to 23 wherein the composition further comprises vitamin A.

25. The use of any one of claim 1 to 23 wherein the composition further comprises vitamin D3.

26. The use of any one of claims 1 to 22 wherein the composition comprises 500 mg of calcium alpha-ketoglutarate monohydrate, 450 mcg of retinyl palmitate, isomalt, vegetable wax, stearic acid, magnesium stearate, and silica.

27. The use of any one of claim 1 to 22 wherein the composition comprises 500 mg of calcium alpha-ketoglutarate monohydrate, 12.5 mcg (500 IU) of cholecalciferol, isomalt, vegetable wax, stearic acid, magnesium stearate, and silica.