



Antioxidant May Help Maintain Muscle Strength in Ageing

Description

Researchers at Kyushu University in Japan are exploring ways to help us stay healthier as we age. One key focus is on a protein called hepatocyte growth factor (HGF), which helps repair muscles. As people get older, a harmful change called nitration affects HGF, hindering its role in muscle repair.

In their study, the team investigated two compounds known for their antioxidant properties. Antioxidants are molecules that protect other molecules from chemical damage. These compounds, glutathione trisulfide (GSSSG) and lipoic acid trisulfide (LASSS), are trisulfides, meaning they have three linked sulfur atoms. This structure makes them highly reactive.

The researchers discovered that while both compounds effectively reduced nitration in HGF, only LASSS improved the protein's ability to connect with cells needed for muscle repair. Increasing the amount of LASSS not only blocked nitration but also doubled HGF's effectiveness in binding with the c-met receptor, essential for muscle repair.

The team then tested LASSS using mouse models with muscle loss. Results showed that LASSS reduced nitration from muscle disuse. Although human tests are still needed, this approach shows promise in enhancing muscle repair as we age.

Future studies will investigate the impact of LASSS over longer periods and include older mice to better understand how it might combat age-related muscle loss, also known as sarcopenia.

Vocabulary List:

1. **nitration** //naɪ'treɪʃən// (noun): a chemical change where nitrogen attaches to something
2. **antioxidant** //,ænti'ɒksɪdənt// (noun): a molecule that stops chemical damage
3. **reactive** //ri'æktɪv// (adjective): likely to join or change with others
4. **receptor** //rɪ'septə// (noun): a cell part that receives signals or molecules
5. **binding** //'baɪndɪŋ// (noun): joining two things so they stay connected
6. **sarcopenia** //,sɑrkəʊ'pi:niə// (noun): loss of muscle mass with older age

Comprehension Questions



Multiple Choice

1. What is the main protein being studied by researchers at Kyushu University?
Option: Nitration
Option: HGF
Option: GSSSG
Option: LASSS
2. What type of properties do glutathione trisulfide (GSSSG) and lipoic acid trisulfide (LASSS) possess?
Option: Antioxidant properties
Option: Carcinogenic properties
Option: Inhibitory properties
Option: Protein synthesis properties
3. What is the structure of the compounds GSSSG and LASSS?
Option: Monosulfide
Option: Disulfide
Option: Trisulfide
Option: Tetrasulfide
4. Which compound improved the protein's ability to connect with cells for muscle repair?
Option: GSSSG
Option: HGF
Option: LASSS
Option: Nitration
5. What receptor is essential for muscle repair that LASSS binds with?
Option: c-met receptor
Option: HGF receptor
Option: Glutathione receptor
Option: Sarcopenia receptor
6. What condition characterized by muscle loss is mentioned in the study?
Option: Sarcopenia
Option: Hypertension
Option: Osteoporosis
Option: Obesity



True-False

7. Researchers at Kyushu University are focusing on improving muscle repair as we age.
8. Nitration enhances the role of HGF in muscle repair.
9. Both GSSSG and LASSS successfully reduced nitration in HGF.
10. LASSS was ineffective in binding with the c-met receptor.
11. Research on LASSS has been conducted solely on human subjects.
12. Future studies will also investigate the effects of LASSS on older mice.

Gap-Fill

13. Researchers are exploring ways to help us stay healthier as we age by studying a protein called hepatocyte growth factor (HGF) which helps repair muscles and is affected by _____.
14. The two compounds investigated for their antioxidant properties are glutathione trisulfide (GSSSG) and _____.
15. Antioxidants are molecules that protect other molecules from chemical _____.
16. Increasing the amount of LASSS not only blocked nitration but also doubled HGF's effectiveness in binding with the c-met _____.
17. The results showed that LASSS reduced nitration from muscle _____.
18. Future studies will explore the impact of LASSS over longer periods and include older mice to understand how it might combat age-related muscle _____.

Answer

Multiple Choice: 1. HGF 2. Antioxidant properties 3. Trisulfide 4. LASSS 5. c-met receptor 6. Sarcopenia
True-False: 7. True



8. False 9. True 10. False 11. False 12. True

Gap-Fill: 13. nitration 14. lipoic acid trisulfide 15. damage 16. receptor 17. disuse 18. loss

CATEGORY

1. Health - LEVEL3

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1. Aging Muscles
2. Antioxidant
3. B1
4. ESL learning
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Date Created

2026/08/07

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