

Letter to editor

METRNL and muscle health: The role of exercise

Hamid Alizadeh^{1*}, Seyed Ali Rasooli²

Dear Editor-in-Chief

Meteorin-like protein (METRNL) has drawn a lot of interest in the field of exercise because of its potential contribution to muscle health (Das et al., 2020). When exercising, skeletal muscle, designed for movement, goes through a variety of adaptations (Hamilton & Booth, 2000). This letter sheds light on the complex interplay between METRNL and muscle health by providing an outline of METRNL interaction with muscle tissue and the impact of exercise on this relationship.

A newly discovered adipokine called METRNL has a variety of effects on the physiology of muscles. It seems to be involved in myogenesis, muscle growth, and muscular function. According to animal research, METRNL may promote myoblast differentiation and proliferation, promoting muscle growth and repair (Lee et al., 2022). The anti-inflammatory qualities of METRNL may also lessen muscle inflammation and injury brought on by exercise.

A strong trigger for METRNL secretion is exercise. Exercise sessions, whether short-term or long-term, have been demonstrated to boost METRNL expression in circulation and muscle tissue. Numerous signaling pathways, such as those involved in metabolic adaptation, muscular contraction, and inflammation, are thought to mediate this response (Alizadeh, 2021). Research is currently being done to determine the precise processes by which exercise causes the production of METRNL.

Exercise-induced METRNL release highlights its possible importance in maintaining muscular health. Exercise-related advantages like increased muscle regeneration, less inflammation, and improved energy metabolism may be aided by METRNL (Alizadeh, 2022). Exercise-induced muscular contractions and metabolic demands may

trigger METRNL release, which in turn may promote additional muscle adaptation. This suggests that there may be a bidirectional relationship between exercise and METRNL.

There could be numerous clinical implications regarding fully grasping the effect of exercise on METRNL's effect on muscle health. To improve muscle regeneration, reduce muscle-related diseases, and reverse age-related muscle degeneration, strategies focused at modifying METRNL levels through exercise treatments could be investigated. To guide focused therapeutic methods, future research should concentrate on illuminating the precise connections between exercise, METRNL, and muscle health.

The connection between METRNL and muscle health is a fascinating topic of research, especially in response to exercise. Its potential as a modulator of exercise-induced muscle adaptations becomes more intriguing as our knowledge of METRNL's impact on muscle physiology expands. Exploring how exercise affects METRNL secretion and how METRNL affects muscle growth, regeneration, and function could offer fresh perspectives on how to construct exercise regimens that are most effective for different people and circumstances.

References

- Alizadeh, H. (2021). Myokine-mediated exercise effects: the role of myokine meteorin-like hormone (Metrl). *Growth Factors*, 39(1-6), 71-78. doi: <https://doi.org/10.1080/08977194.2022.2032689>
- Alizadeh, H. (2022). Meteorin-like protein (Metrl): A metabolic syndrome biomarker and an exercise mediator. *Cytokine*, 157, 155952. doi: <https://doi.org/10.1016/j.cyto.2022.155952>
- Das, D. K., Graham, Z. A., & Cardozo, C. P. (2020). Myokines in skeletal muscle physiology and metabolism: Recent advances and future perspectives. *Acta Physiologica*, 228(2), e13367. doi: <https://doi.org/10.1111/apha.13367>
- Hamilton, M. T., & Booth, F. W. (2000). Skeletal muscle adaptation to

1. Physical Education Department, Farhangian University, Iran. 2. Department of Educational Sciences, faculty of Physical education, Farhangian University, Shiraz, Iran.

*Author for correspondence: h.alizadeh.aw@gmail.com

exercise: a century of progress. *Journal of applied physiology*, 88(1), 327-331. doi: <https://doi.org/10.1152/jappl.2000.88.1.327>

Lee, D. E., McKay, L. K., Bareja, A., Li, Y., Khodabukus, A., Bursac, N., Taylor, G. A., Baht, G. S., & White, J. P. (2022). Meteorin-like is an injectable peptide that can enhance regeneration in aged muscle through immune-driven fibro/adipogenic progenitor signaling. *Nature Communications*, 13(1), 7613. doi: <https://doi.org/10.1038/s41467-022-35390-3>