International Journal of Sport Studies for Health

Journal Homepage

Effects of 6-Week Interval Aerobic Training (IAT) and Nano-Selenium Supplementation on Laminin α5 and Collagen IV Expression in the Extracellular Matrix of Alveolar Epithelial Cells in the Lungs of Healthy and Cigarette Smoke-Exposed Rats

Mansoureh. Ghaeni[1], Shadmehr. Mirdar[2, 3*]

[1] MSc of Exercise Physiology, Faculty of Sports Sciences, University of Mazandaran, Babolsar, Mazandaran, Iran
[2] Professor of Exercise Physiology, Faculty of Sports Sciences, University of Mazandaran, Babolsar, Iran
[3] Athletic Performance and Health Research Center, University of Mazandaran, Babolsar, Iran

*** Corresponding author email address**: shadmehr.mirdar@gmail.com

Editor	Reviewers
Luis Felipe Reynoso-Sánchez Department of Social Sciences and Humanities, Autonomous University of Occident, Los Mochis, Sinaloa, Mexico felipe.reynoso@uadeo.mx	**Reviewer 1:** Zahra Yousefi Assistant Professor, Department of Psychology, Isfahan Branch (Khorasgan), Islamic Azad University, Isfahan, Iran. Email: Z.yousefi1393@khuisf.ac.ir **Reviewer 2:** Farhad Namjoo Department of Psychology and Counseling, KMAN Research Institute, Richmond Hill, Ontario, Canada. Email: farhadnamjoo@kmanresce.ca

1. Round 1

1.1 Reviewer 1

Reviewer:

In the description of the sample size ("thirty-five male Wistar rats"), the authors should provide more justification for the number of animals used. Was a power analysis performed to determine the sample size, and if so, what were the parameters?

The method for inducing lung injury via cigarette smoke extract is detailed but lacks information about how reproducibility was ensured across batches. Please clarify the steps taken to ensure consistency in cigarette smoke concentration between different rats.

The introduction mentions the negative impacts of smoking on ECM proteins but does not explicitly mention oxidative stress as a primary mechanism. Given the relevance of oxidative stress in lung damage, this concept should be highlighted earlier to align with later sections of the article.

The figure legends are unclear about the number of replicates performed for the results shown. To ensure the robustness of the findings, indicate the number of replicates or samples used for these measurements.

Author revised the manuscript and uploaded the updated document.

1.2 Reviewer 2

Reviewer:

The authors used two-way ANOVA and Tukey's post hoc tests, but did not describe how they handled potential violations of ANOVA assumptions (e.g., normality and homogeneity of variances). Adding details about how these assumptions were tested would improve the rigor of the analysis.

The results indicate a significant difference in laminin α5 expression between the healthy and COPD control groups but no significant difference for collagen IV. Please provide a possible biological explanation for why laminin α5 but not collagen IV was affected, as this discrepancy warrants further discussion.

The statement, "six weeks of interval aerobic training may be beneficial for mitigating the negative effects of cigarette smoke" is somewhat vague. It would be helpful to quantify this benefit more specifically, perhaps by referring to the percentage change in laminin α5 levels or other metrics.

The preparation of nano-selenium particles is briefly mentioned, but the source of these particles and the characterization (e.g., size, shape, surface charge) are missing. Please include detailed information on the characterization of nano-selenium to ensure reproducibility.

The authors report a significant effect of IAT on laminin α5 but mention that the combination of IAT and nano-selenium did not enhance this effect. It would be helpful to speculate why the combined intervention did not lead to additive or synergistic effects.

The statistical analysis shows significant results for laminin α5 and collagen IV, but the effect sizes are not reported. Including effect sizes (e.g., partial eta squared) would help readers understand the practical significance of the findings beyond statistical significance.

The statement "a study showed that 9 weeks of high-intensity interval training leads to lung inflammation and structural disorders" requires more context. Was this study conducted on a comparable model (rats, COPD, etc.)? Adding this context would clarify the relevance of the comparison.

In the dissection procedure, it is stated that perfusion was performed to remove blood from the brain. However, the study focuses on lung tissue. Clarify whether lung perfusion was also performed to prevent contamination of lung samples with blood.

Author revised the manuscript and uploaded the updated document.

2. Revised

Editor’s decision after revisions: Accepted.
Editor in Chief’s decision: Accepted.