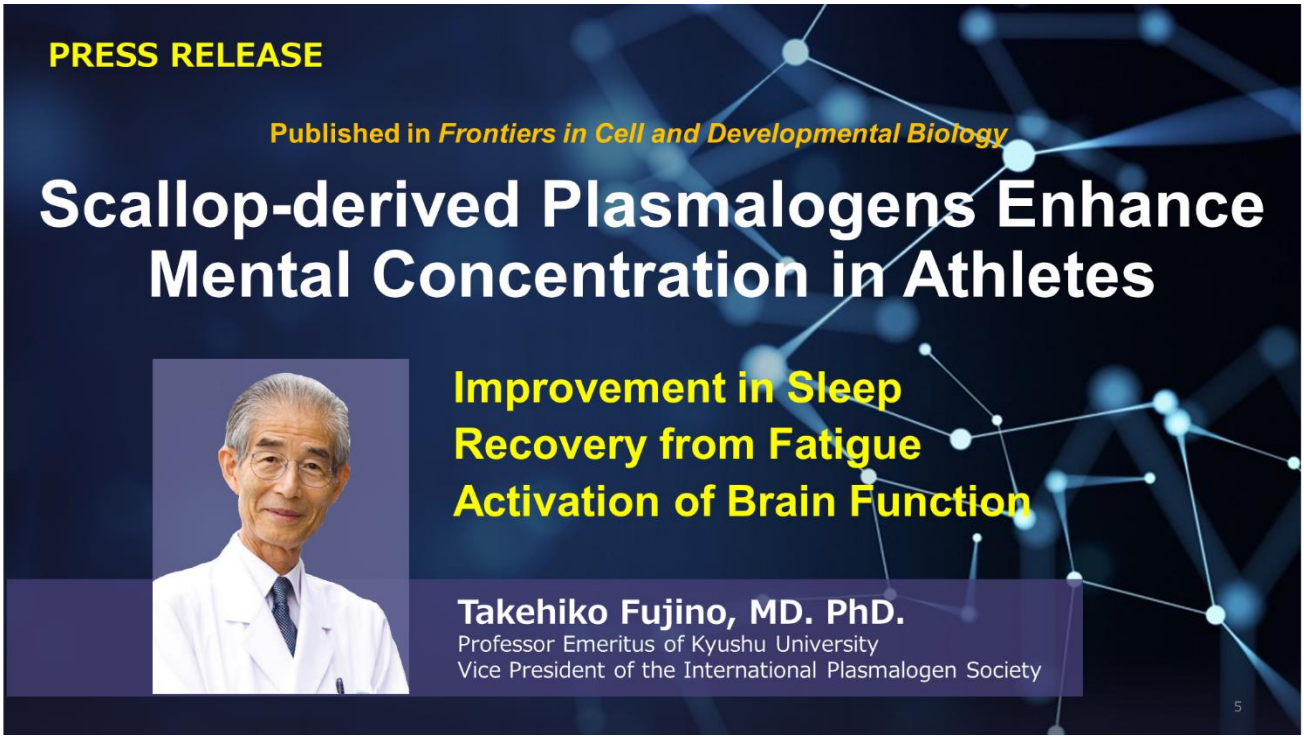
July 2022



Plasmalogens, a class of phospholipids, serve vital roles in the body, including antioxidant action, ion transport, cholesterol efflux and membrane fusion. **Plasmalogens** are abundant particularly in the brain, while they exist in the organs that require a lot of oxygen. The brain is constantly exposed to oxidative stress because it needs to process a flood of information in the modern stressful society. **Plasmalogens** were found to protect the brain against oxidative damage, and to activate brain function. Notably, scallop-derived plasmalogens, compared to sea squirt- and chicken-derived plasmalogens, abundantly contain DHA-rich plasmalogens which have been found to be more effective for cognitive function than other types of plasmalogens in our previous studies.

Highlights

- **Sleep problems were significantly improved in the scallop-derived plasmalogen group compared with the placebo group.**
- **“Anger – Hostility” and “Fatigue – Inertia” of the mood scale were significantly improved in the scallop-derived plasmalogen group compared with the placebo group. The stronger negative mood, the more marked improvement.**
- **Mental concentration was boosted in the scallop-derived plasmalogen group.**

Summary

The research group* revealed by a randomized, placebo-controlled, double-blind trial that **scallop-derived plasmalogens administered to athletes aged 18 – 22 (2mg per day) improved sleep disorders and negative mood (Anger - Hostility and Fatigue – Inertia), and enhanced mental concentration in the plasmalogen-treated group, compared with the placebo-treated group.**

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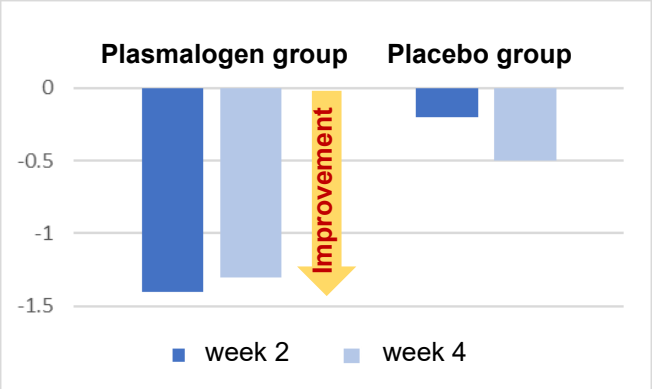
Mental concentration is a crucial factor that often determines the success or failure of study, work and sports. Poor concentration is one of the symptoms of mental illness such as depression, the number of which is dramatically increasing these days.

These findings have been published in Frontiers in Cell and Developmental Biology, a leading, open-access, peer-reviewed scientific journal (Impact Factor 6.684).

Article Title：Orally Administered Plasmalogens Alleviate Negative Mood States and Enhance Mental Concentration: A Randomized, Double-Blind, Placebo-Controlled Trial, by Fujino M, Fukuda J, Isogai H, Ogaki T, Mawatari S, Takaki A, Wakana C, Fujino T.
https://www.frontiersin.org/articles/10.3389/fcell.2022.894734/full

*The research group consists of BOOCS CLINIC Fukuoka (Fukuoka, Japan), Faculty of Human Sciences, Kyushu Sangyo University (Fukuoka, Japan), Institute of Rheological Functions of Food (Fukuoka, Japan) and Department of Integrative Physiology, Kyushu University Graduate School of Medical Sciences (Fukuoka, Japan).

1. Results of the sleep questionnaire

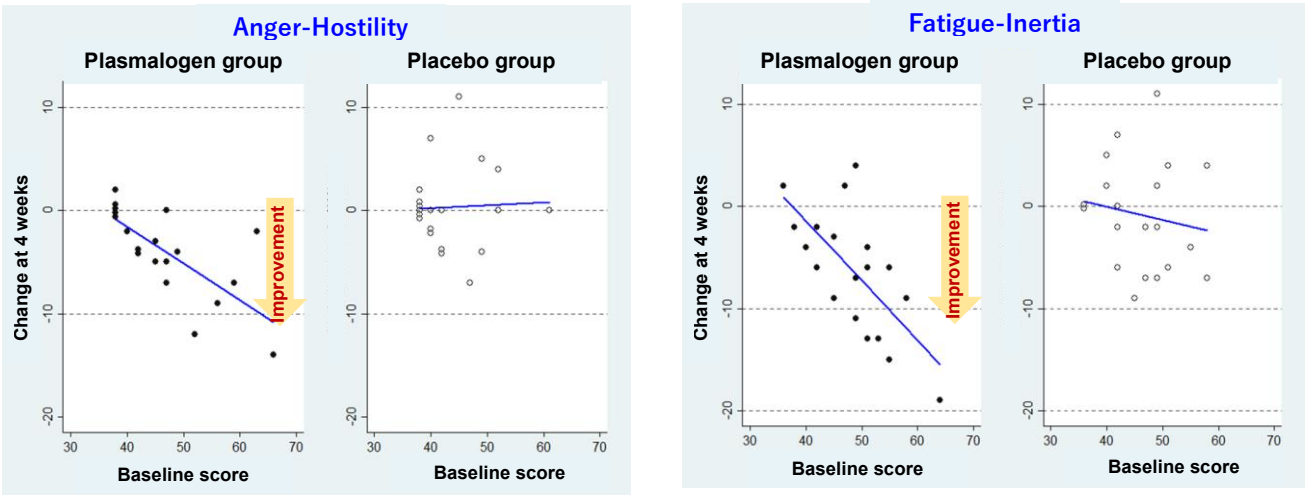


Changes in sleep assessed by the Athens Insomnia Scale**

Sleep disorders were significantly improved at 2 and 4 weeks in the plasmalogen group while no such improvement was found in the placebo group.

****The Athens Insomnia Scale is a universal method for determining insomnia developed by the World Health Organization.

2. Results of the mood scale

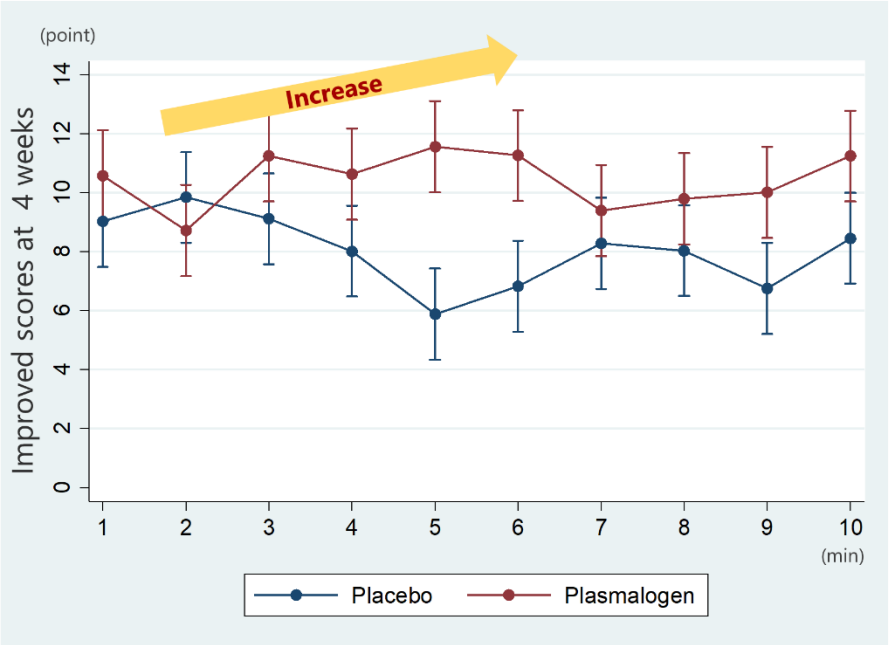


Changes in Anger-Hostility and Fatigue-Inertia of POMS2* at 4 weeks versus baseline**

Significant improvements in Anger - Hostility and Fatigue - Inertia were seen in the plasmalogen group, but not in the placebo group. Study participants with stronger negative moods showed more marked improvement.

***POMS2 (the Profile of Mood Scale 2) is globally reliable psychological scale to evaluate mood states.

3. Results of the concentration assessment



Changes in calculation amount per minute assessed by the Uchida-Kraepelin test****

The plasmalogen group showed a continuous improvement in the scores during the tests, while the placebo group showed the slowing down in the scores at min 5.

******The Uchida-Kraepelin test is a psychological test of simple addition within the time limit to analyze the personality and processing capability.

Future Prospects

These results have shown that orally administered scallop-derived plasmalogens markedly improve a stronger negative mood and then enhance mental concentration in athletes. Every year, the number of patients suffering from mental illness including depression is increasing, and the rate of increase is accelerating due to Covid-19. The study suggests that scallop-derived plasmalogens would be useful for anyone who hopes to be free from a negative mood and to be lively.

References

1 Fujino T et al. Therapeutic efficacy of plasmalogens for Alzheimer's disease, Mild Cognitive Impairment and Parkinson's disease in conjunction with a new hypothesis for the etiology of Alzheimer's disease. Adv Exp Med Biol. 2020;1299:195-212.

2 Fujino T et al. Effects of Plasmalogen on Patients with Moderate-to-Severe Alzheimer's Disease and Blood Plasmalogen Changes: A Multi-Center, Open-Label Study. J Alzheimers Dis Parkinsonism 2019; 9:474.

3 Fujino T et al. Effects of Plasmalogen on Patients with Mild Cognitive Impairment: A Randomized, Placebo-Controlled Trial in Japan. J Alzheimers Dis Parkinsonism 2018; 8:419.
4 Fujino T et al. Efficacy and Blood Plasmalogen Changes by Oral Administration of Plasmalogen in Patients with Mild Alzheimer's Disease and Mild Cognitive Impairment: A Multicenter, Randomized, Double-blind, Placebo-controlled Trial. EBioMedicine 2017; 17:199-205.
5 Hossain S et al. Biological Functions of Plasmalogens. Adv Exp Med Biol. 2020;1299:171-193.

Links

Faculty of Human Sciences, Kyushu Sangyo University
https://www.kyusan-u.ac.jp/E/faculty/human/
Institute of Rheological Functions of Food
https://www.reoken.com/english/
Kyushu University Graduate School of Medical Sciences
https://www.med.kyushu-u.ac.jp/english/
The Japanese Plasmalogen Society
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The International Plasmalogen Society
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