

Omega-3 and flavonoids - perspective in CFS symptoms alleviation

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Statement of the Problem: The accelerated pace of life and social competition in modern society are the cause of fatigue and fatigue-related disorders from which millions of people suffer. Prolonged accumulated fatigue threatens people's physical and mental health, while causing a variety of illnesses, including chronic fatigue syndrome (CFS). It is estimated that almost 40% of the total population, of which 70% are women, have significant pathological fatigue. **Methodology & Theoretical Orientation:** Three major search engines (GoogleScholar, PubMed, and ScienceDirect) and combinations of keywords 'omega-3, CFS, fatigue, inflammation, polyphenols' were used to identify per reviewed scientific publications related to the subject. Collected information were critically assessed. **Findings:** The concept of "diet to reduce fatigue" includes whole grains, vegetables, fruits, and omega-3 fatty acids, and the Mediterranean diet is thought to improve disease-related fatigue by reducing inflammatory load and balancing the intestinal microbiota. Omega-3 supplementation appears promising considering the reduction of inflammation. Recently, data have emerged demonstrating a positive influence of omega-3 fatty acid intake on skeletal muscle. Increase intake of unsaturated fatty acids and omega-3 fatty acids through diet and supplementation is included in recommendations for a non-pharmacological approach to the relief of CFS symptoms. Antioxidant phytochemicals from some natural plants were found to possess a remarkable anti-fatigue effect. Flavonoids are a class of typical anti-fatigue compounds with a potent antioxidant effect. **Conclusion & Significance:** The use of omega-3 fatty acids in CFS management is promising in terms of anti-inflammatory action. However, the best results in relieving fatigue are likely to be achieved by synergy with flavonoids of antioxidant and anti-inflammatory effect. Therefore, anti-fatigue nutraceuticals including omega-3 and selected flavonoids could have the potential in therapeutic strategies for fatigue-sub-health.



Figure 1. Anti-fatigue nutraceuticals including omega-3 and flavonoids

Recent Publications

1. Mimica-Dukic N., Beara I., Vojnović T., Cvejic J.H. (2021) Bioactives for Neuronal and Immune Functions. In: Galanakis C.M. (eds) Food Bioactives and Health. Springer, Cham. https://doi.org/10.1007/978-3-030-57469-7_8
2. Cvejić Hogervorst Jelena, Russo Giorgio, Godos Justyna, Mimica-Dukic Neda, Simin Natasa, Bjelica Artur, Grosso Giuseppe. (2018) Beneficial effects of polyphenols on chronic diseases and ageing In: Polyphenols: Properties, Recovery and Applications. Editor: Charis M. Galanakis, Elsevier, Academic press, pp. 69-102. ISBN: 978-0-12-813572-3 (print); ISBN: 978-0-12-813573-0 (online).
3. Hoppenbrouwers T, Cvejić Hogervorst JH, Garssen J, Wichers HJ, Willemsen LE (2019) Long Chain Polyunsaturated Fatty Acids (LCPUFAs) in the prevention of Food Allergy. Frontiers in Immunology, Frontiers in Immunology, section Nutritional Immunology, 10:1118. doi: 10.3389/fimmu.2019.01118

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4. Cvejić Hogervorst J, Atanacković Krstonošić M., Bursać M., Miljić U. Polyphenols. In: Nutraceutical and Functional Food Components: Effects of Innovative Processing Techniques, Editor: Charis M. Galanakis Elsevier, Academic press, 2017, ISBN 9780128052570. DOI: 10.1016/B978-0-12-805257-0.00007-7

5. Cvejić Hogervorst J, Verardo V, Bernard O, Bonfond H, Langelotti L. Microalgae as a source of edible oils In: Lipids and Edible Oils: Properties, Processing and Applications. Editor: Charis M. Galanakis, Elsevier, Academic press, 2019. ISBN-13: 978-0128171059, ISBN-10: 0128171057

Biography

Prof. Jelena Helene Cvejić is a Professor at the University of Novi Sad, Serbia. Her recent research interest emphasizes effects of

nutrients on immune system, inflammation and gut microbiome, as well as related health conditions. Professor Cvejić obtained a PhD in Chemistry from ULP, Strasbourg I, France. She spent her sabbatical leave at Universities of Wageningen and Utrecht, the Netherlands. She is a co-author of more than 50 peer-review scientific publications (articles and book chapters) and reviewer for more than 20 indexed scientific journals, also participating in different international collaborations, research projects (eg. H2020-ERA; H2020-MSCA-RISE) and conferences. Her teaching involves the training of pharmacy students in Master, Specialization and PhD programs.

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