|  |
| --- |
| Elucidating the interplay between high anxiety and caloric restriction: a multiomics approach  **Elissavet Anousi** 1,2#, **Markus Nussbaumer** 1,2, **Maria P. Papageorgiou** 1,2, **Frederik Dethloff** 3, **Martina Samiotaki** 4, **Afroditi Divane** 1,2, **Anastasia Mitka** 1,2, **Eirini Panteli** 1,2 and **Michaela D. Filiou** 1,2\*  1 Biomedical Research Institute, Foundation for Research and Technology-Hellas (BRI-FORTH), Ioannina, Greece  2 Laboratory of Biochemistry, Department of Biological Applications and Technology, School of Health Sciences, University of Ioannina, Ioannina, Greece  3 Metabolomics Core Facility, Max Planck Institute for Biology of Ageing, Cologne, Germany  4 Biomedical Sciences Research Center "Alexander Fleming", Institute for Bioinnovation, Vari, Greece  # Presenting author: Elissavet Anousi, email: <elissavetanousi@gmail.com>  \* Corresponding author: Michaela D. Filiou, email: <mfiliou@uoi.gr> |

abstract

Anxiety and eating disorders are highly prevalent in modern societies affecting more women than men, and a high comorbidity of anxiety and eating disorders has been reported. To explore the interplay of these disorders, we used the high anxiety-related behavior (HAB) mouse model of trait anxiety. Female HAB mice were subjected to a caloric restriction (CR) protocol, according to which food intake was reduced by 30%, daily for 5 weeks. The effects of CR in HAB female mice were assessed by a battery of behavioral tests and mass spectrometry-based proteomics and metabolomics. CR exerted an anxiolytic effect in HAB mice in the dark-light box. Multiomics analysis indicated that CR increased protein expression of the proteasome core complex, altered mitochondrial processes such as oxidative phosphorylation and mitochondrial dynamics and modulated glycolysis. Taken together, our data show that CR alleviates anxiety-related behavior in high anxiety in a proteasome- and mitochondria- dependent manner.

**REFERENCES**

[1] Filiou, M. D., & Sandi, C. (2019). Anxiety and Brain Mitochondria: A Bidirectional Crosstalk. Trends in neurosciences, 42(9), 573–588. https://doi.org/10.1016/j.tins.2019.07.0028;4:1283550. doi: 10.3389/fpain.2023.1283550. PMID: 38259981; PMCID: PMC10800923.

[2] Papageorgiou, M. P., & Filiou, M. D. (2024). Mitochondrial dynamics and psychiatric disorders: The missing link. Neuroscience and biobehavioral reviews, 165, 105837. Advance online publication. https://doi.org/10.1016/j.neubiorev.2024.105837.

[3] Natsi, A., Valkanou, M., Anousi, E., & Labrakakis, C. (2024). Differential behavioral response to predator odor in neuropathic pain in mice. Frontiers in pain research (Lausanne, Switzerland), 4, 1283550. https://doi.org/10.3389/fpain.2023.1283550.