

## Plan Overview

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*A Data Management Plan created using DMPTool*

**DMP ID:** <https://doi.org/10.48321/D1PM3H>

**Title:** THE NUTRITIONAL IMPACT OF ELONGASES AND DESATURASES MEDIATED BY PHYSICAL EXERCISE: A MULTIORGANIC APPROACH

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### **Project abstract:**

Omega-3 fatty acids ( $\omega$ 3) are essential for mammals, necessitating their acquisition through diet. Alpha-linolenic acid (ALA) is found in flaxseed and can be bioconverted, in both animals and humans, to eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), crucial for health. However, this process has low efficiency, making the intake of EPA and DHA from their sources (fish oil) essential. On the other hand, physical exercise positively interferes with the action of GPR120,  $\omega$ 3 receptor. Preliminary data from our group show that exercise also interferes with the utilization and synthesis of  $\omega$ 3. Therefore, this project aims to assess whether physical exercise (chronic or acute) influences the modulation of desaturation and elongation enzymes of these fatty acids, as well as  $\omega$ 3 uptake, reducing its requirement for the organism. For this purpose, C57 mice will be distributed into four groups: sedentary group; sedentary group + 100  $\mu$ L of flaxseed oil; exercised group; and exercised group + 100  $\mu$ L of flaxseed oil. Exercised animals will undergo acute and chronic aerobic exercise protocols, and the study will last for 8 weeks. At the end of the experimental period, the incorporation of  $\omega$ 3 (ALA) and its bioconversion to EPA and DHA will be measured by mass spectrometry. The expression of genes for delta-5/6 desaturases and elongases 2/5/8 will be assessed through RT-qPCR. The activity of enzymes and the GPR120 receptor will be evaluated through immunoprecipitation via Western blot. Analyses will be conducted on tissues such as liver, muscle, adipose tissue, hypothalamus, hippocampus, cerebellum, prefrontal cortex, testicles, and blood from experimental animals. Finally, histomorphological analyses of mentioned tissues will be conducted to detect intracellular lipid transporters, such as perilipins. If the hypothesis that exercise increases essential fatty acid production is confirmed, this description could be a new strategic tool for improving the physiological condition of essential fatty acid action and production, with a potential outcome

of modifying dietary intake recommendations for these nutrients.

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# THE NUTRITIONAL IMPACT OF ELONGASES AND DESATURASES MEDIATED BY PHYSICAL EXERCISE: A MULTIORGANIC APPROACH

Gene expression; Protein content; Blood biochemical parameters; Anthropometrics; Fatty acids profile; Physiological mice parameters

The data will be generated from experimental tests on cells, animals, and human data banks. The variables obtained in specific equipment will be plotted in software such as Excel (Microsoft).

There will be samples (blood and tissues [hypothalamus, hippocampus, cerebellum, muscle, liver, white adipose tissue, ]), animal body measurements, graphs, and spreadsheets.

Experiments with rodents - all procedures will be approved by the local ethical committee. The generated data from these experiments will be available, at least not protected by industrial secrets.

If an intellectual product is generated, the authors involved in the creation will be invited to join the authorship.

The data will be stored in real-time, in the cloud (Google Drive - System provided and recommended by our Institution). At the end of the collection, the data will also be stored on 3 hard drives, kept in different locations and far from each other.

After being processed, analyzed, and plotted in graphs, the data already used will be available in the repository created

exclusively for this project, located at: [www.nutrigen-lab.com/repositorio](http://www.nutrigen-lab.com/repositorio) The address will be accessed only with a password or after registering the interested parties on the site itself. To obtain access to individual data, the interested researcher will contact the LabGeN coordinator directly by email at [dennys@unicamp.br](mailto:dennys@unicamp.br). By signing this Term, the researcher undertakes to use the data exclusively for the research described there, protect the information and ensure that the data will not be publicly disclosed or disclosed to third parties. Initially, individual-level information will be stored for 10 years on three physically separate servers to maintain redundancy.

The data generated from rodents: The data will be stored for, at least, 10 years in our servers. It also will be available in the scientific journals repository. After publication, data from experimental animals or cells will be freely accessed, or under journal laws.

All generated data will be stored for, at least, 10 years on our servers.

Grouped information (i.e., not representing individual-level data) collected and generated by this project will be immediately shared in Scientific meetings, Thesis, published articles, and repository banks when required by journals

To obtain access to individual data, the interested researcher will contact the LabGeN coordinator directly at [dennys@unicamp.br](mailto:dennys@unicamp.br). By signing this Term, the researcher undertakes to use the data exclusively for the research described there, protect the information, and ensure that the data will not be publicly disclosed or disclosed to third parties.

All students and researchers involved in this project are responsible for inputting and maintaining the correct and

organized data in the system. The backup system occurs automatically and does not requires human action. The researcher responsible for the analytical part of the project, Dennys Esper Cintra, will conduct periodic audits to confirm the proper implementation of data entry. The implementation of this plan will require periodic acquisition of hard drives for expansion of storage and backup systems.

We will only require hardwares and repository data bank maintenance.

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