

## Supplementary Material:

### Actimetry

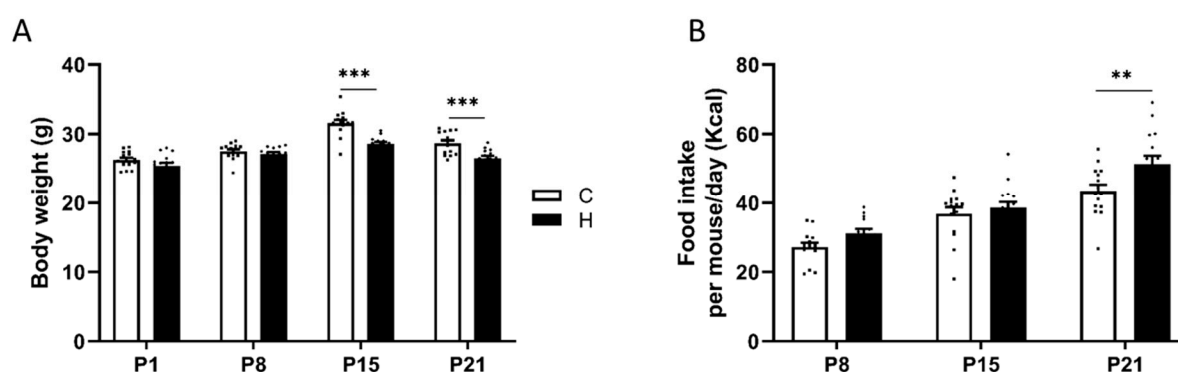
Mice were placed in the center of an infrared actimeter (45x45x35 cm; Bioseb), composed by a 2-dimensional square frame, and left for 10 min. Spontaneous behavior of mice was tracked with distance moved and velocity recorded by Actitrack software (Bioseb).

### Elevated Plus Maze

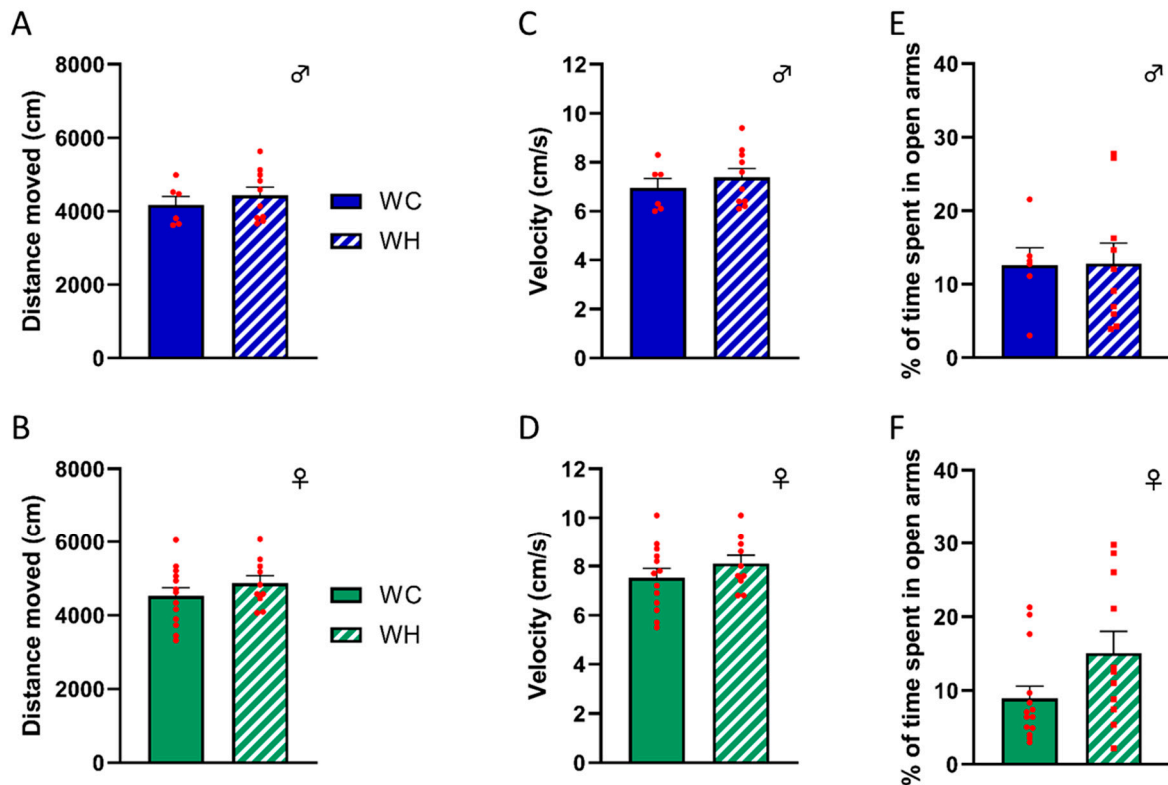
The elevated plus maze (EPM) was used to investigate anxiety-like behavior. The apparatus consists of a plus-shaped maze with two closed and two open arms (30 cm long x 6.5 cm wide). Mice were placed at the center of the maze with their face in the direction of a closed arm and were allowed to explore freely for 5 min. Time spent in open arms was recorded using Ethovision XT tracking system (Noldus).

**Table S1.** Diet composition. Percentages of protein, fat and carbohydrates in each diet, and associated total amount of kilocalories per kilogram of body weight

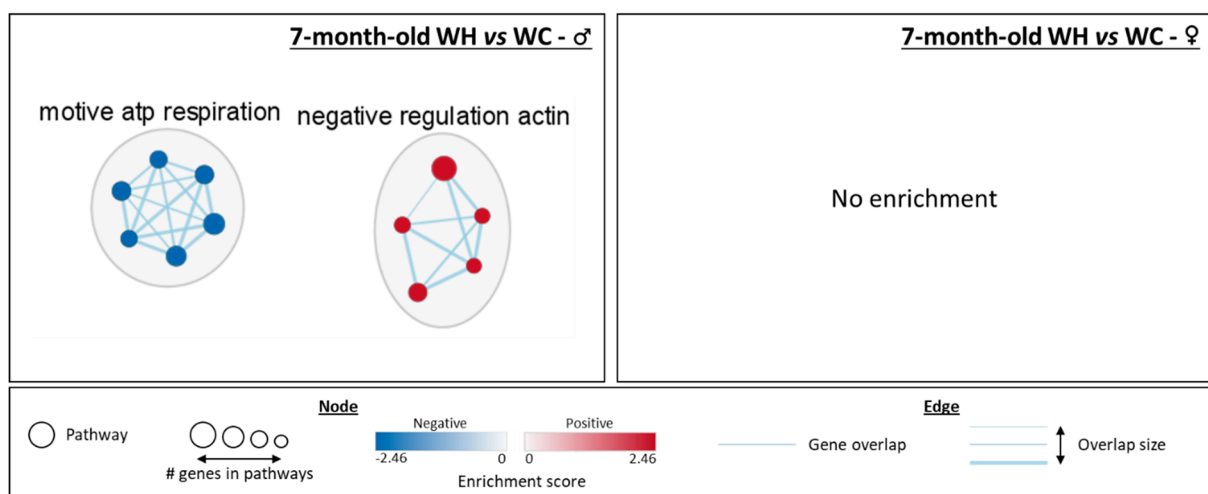
	Control diet	High-fat diet	Standard diet
Period	P0 until P1		P21 until sacrifice
Reference	SAFE A03	Research diets D12331	SAFE A04
% protein	25.2	16.5	19.3
% lipid	13.5	58.0	8.4
% carbohydrates	61.3	25.5	72.4
Kcal/Kg	3395	5558.5	3339



**Supplementary Data S1.** Body weight and food intake of dams during lactation. (A) Body weight of dams that fed a chow (C) or high-fat (H) diet during lactation at different post-natal day (P1, P8, P15 and P21). (B) Food intake of dams that fed a C or H diet during lactation at different post-natal day (P8, P15 and P21). Values are represented as mean  $\pm$  SEM. \*\* $p < 0.01$ , \*\*\* $p < 0.001$  vs C mice using two-way ANOVA followed by Tukey's *post hoc* test.



**Supplementary Data S2.** Effect of maternal high-fat diet during lactation on locomotion (A-D) and anxiety-like behavior (E-F) in 6-month-old male and female offspring, using respectively, actimetry and elevated plus maze. (A-B) Distance moved during the actimetry, respectively in male and female offspring. (C-D) Velocity during the actimetry, respectively in male and female offspring. (E-F) Percentage of time spent in the open arms, respectively in male and female offspring representing. n=13 WC females; n=11 WH females; n=6 WC males; n=10 WH males.



**Supplementary Data S3.** Network analysis of gene set enrichment analysis (GSEA) results from the hippocampal proteomic of 7-month-old male and female offspring. The network, built using Cytoscape, shows gene ontology (GO) terms significantly enriched (false discovery rate < 0.25) in terms of cellular components, biological pathways and molecular functions in GSEA (males on the left and females on the right). Groups with fewer than 5 gene sets were deleted.