Muscle-to-brain crosstalk mediated by exerkines in a context of obesity

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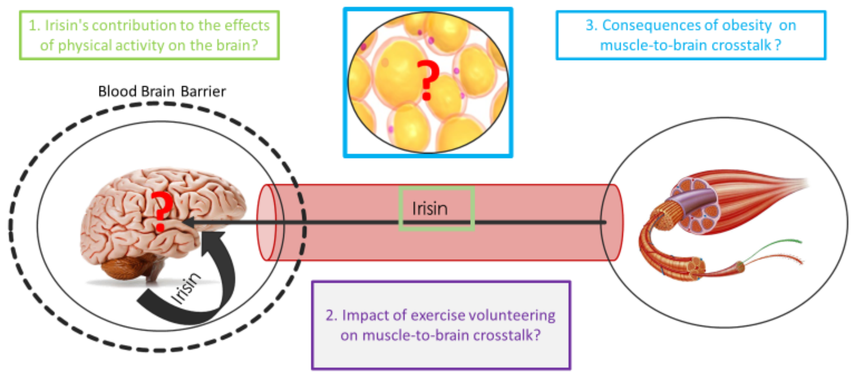
Aims

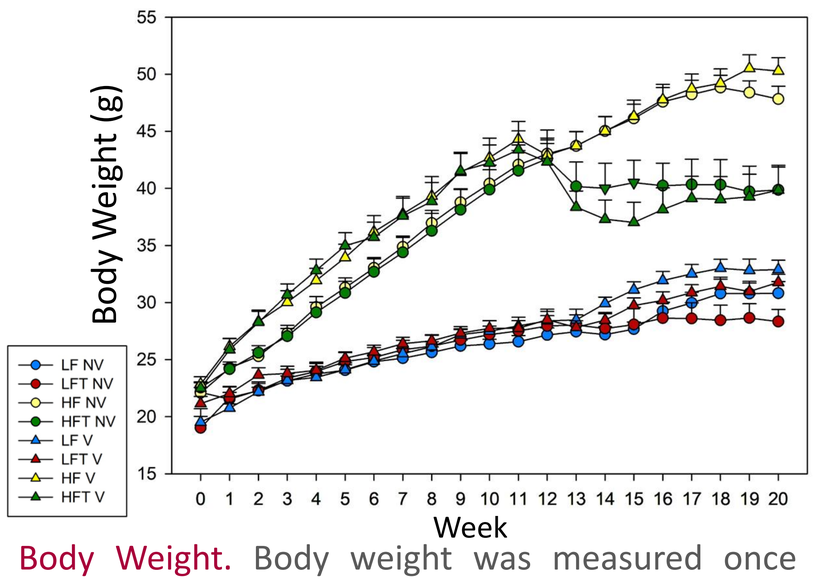


Exercise training (ET) has been shown to be beneficial in managing **obesity**-related disorders. ET was reported to have positive effects on the **brain** but molecular mechanisms of its benefice is poorly known. Our project aims to define the role of **irisin** in this context. **Irisin** is an exercise-induced myokine also expressed in the hippocampus, an essential brain area for learning and memory.

Methods

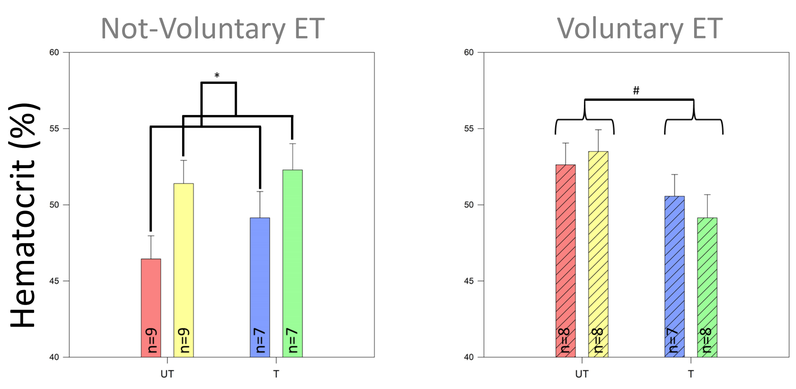
Results

Body Weight



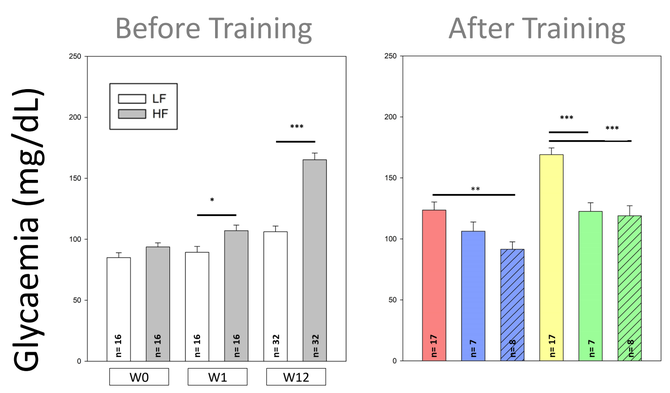
Body Weight. Body weight was measured once a week. Slope comparison before ET : One Way ANOVA and after ET : Two Way ANOVA

Haematocrit



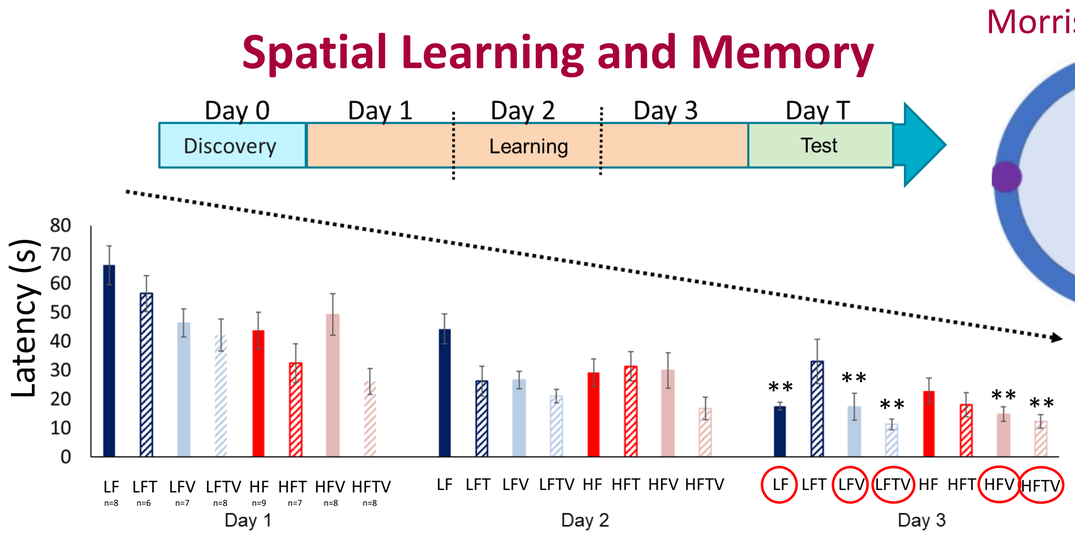
Haematocrit. At the end of the protocol, haematocrit was measured on blood samples. Two Way ANOVA, * $p < 0,05$ LF Vs HF ; # $p < 0,05$ UT Vs T

Fasting Glycaemia

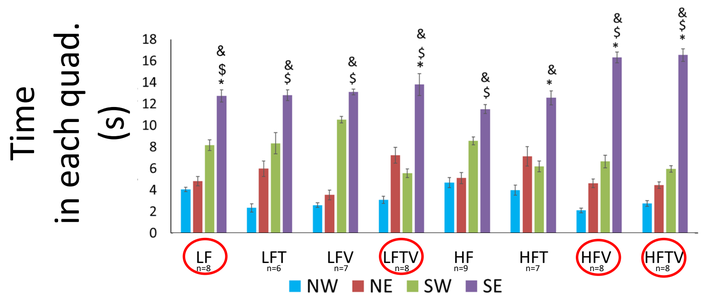


Fasting Glycaemia. Glycaemia was measured after 16h fasting. One Way ANOVA, *** : $p < 0,001$; ** : $p < 0,01$; * : $p < 0,05$

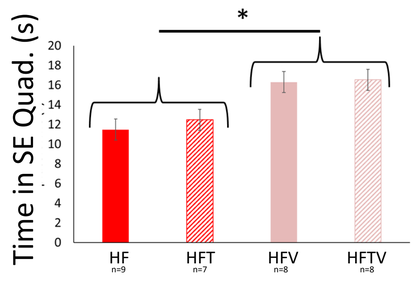
Spatial Learning and Memory



Latency. During learning period, time taken by mouse to reach the platform was measured and is called latency. One Way ANOVA on Repeated Measures, ** $p < 0,05$ Day 1 Vs Day 3

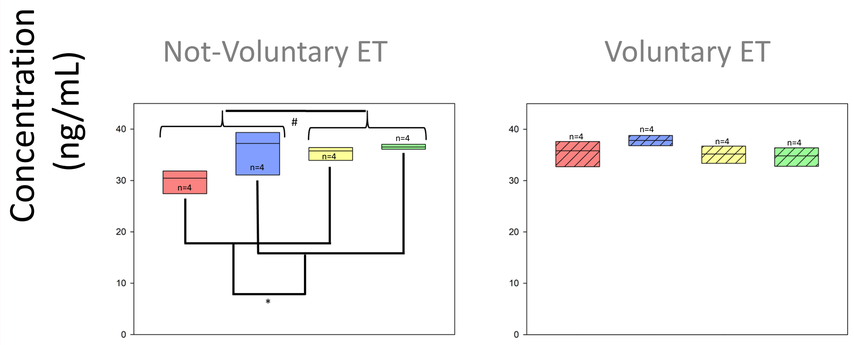


Time in each quad. During Test Day, time spent by mouse in each quadrant was measured. One Way ANOVA on Repeated Measures, $p < 0,05$: * Vs SW, $ Vs NE, & Vs NW



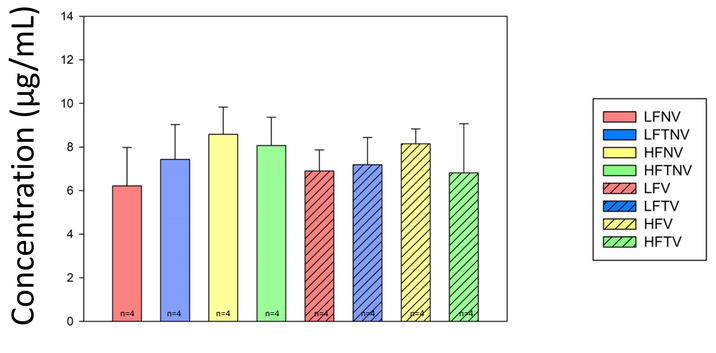
Time in SE. During Test Day, time spent in the platform quad. was measured. Two Way ANOVA, * $p < 0,05$ NV Vs V

Irisin plasmatic level



Irisin plasmatic level. After 20 Weeks. Irisin concentration was measured by competitive ELISA. Two Way ANOVA, * : $p < 0,05$ UT Vs T ; # : $p = 0,05$ LF Vs HF

Adiponectin plasmatic level



Adiponectin plasmatic level. After 20 Weeks. Irisin concentration was measured by indirect ELISA. Three Way ANOVA, NS.

Conclusion

Exercice training (ET) reduces weight gain and fasting glycaemia in obese mice. Enrichment, in mice submitted to voluntary ET, improves spatial learning and memory particularly in obese animals. Irisin plasmatic level is enhanced by high-fat diet and endurance ET. Further studies are now necessary to better understand the contribution of Irisin in ET benefits on brain function.

Aknowlegements

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