

## ENDOCRINE SYSTEM AND METABOLIC DISORDERS

### High fat diet induces obesity in rat

The World Health Organization defines overweight and obesity as the condition where excess or abnormal fat accumulation increases risks to health. The prevalence of obesity is increasing worldwide and is around 20% in ICU patients. Adipose tissue is highly metabolically active, and especially visceral adipose tissue has a deleterious adipocyte secretory profile resulting in insulin resistance and a chronic low-grade inflammatory and procoagulant state. Obesity is strongly linked with chronic diseases such as type 2 diabetes, hypertension, cardiovascular diseases, dyslipidemia, non-alcoholic fatty liver disease, chronic kidney disease, obstructive sleep apnea and hypoventilation syndrome, mood disorders and physical disabilities<sup>1</sup>.

**Species:** *Rattus norvegicus* (Sprague Dawley)

**Number of animals/group:** 10 animals

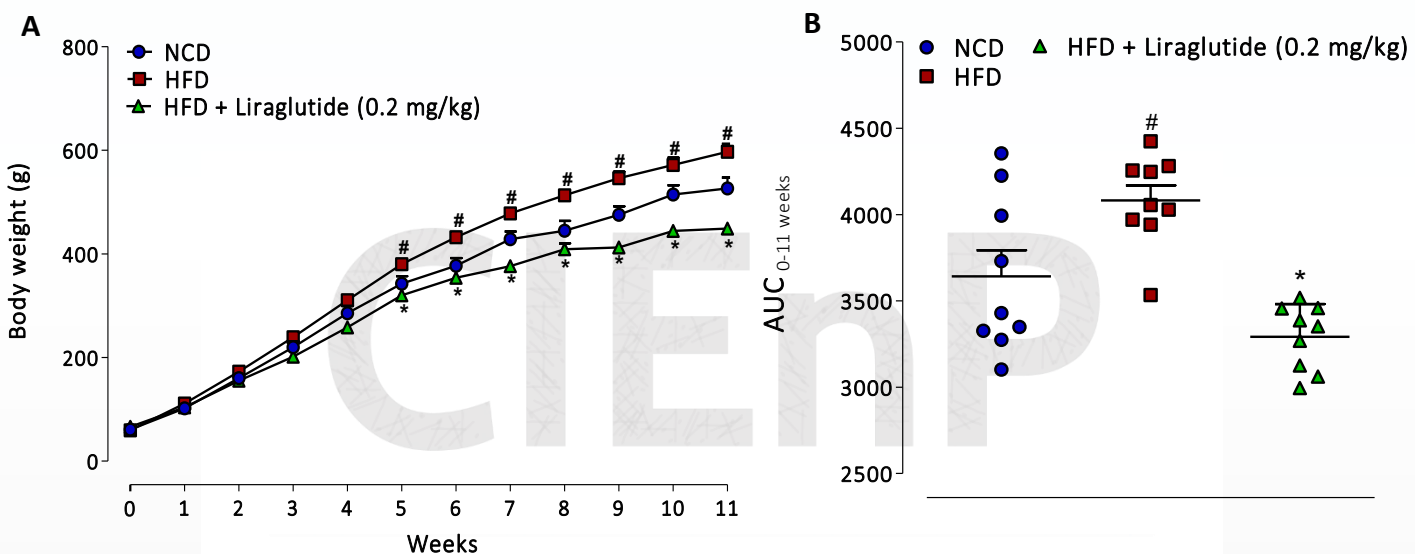
**Route of administration:** upon request

**Treatment mode:** upon request

**Main Read-outs:** Body weight.

**Facultative read-outs:** Clinical chemistry analysis, histopathology, immunohistochemistry, RT-PCR analysis of biomarker messenger RNA, hematology and others.

### Validation Data



**Figure:** Effect of liraglutide on body weight gain induced by high-fat diet in rats. (A) Body weight gain from week 1 to week 11; (B) representative area under the curve (AUC) of body weight gain. Animals were fed with normal chow diet (NCD) or high-fat diet (HFD, 45% Kcal from fat) during 11 weeks and were treated daily with vehicle (10 mL/Kg, p.o.) or with liraglutide (0.2 mg/Kg, s.c.). Body weight was measured once a week. Data are presented as mean  $\pm$  standard error of mean. Statistical analysis was performed by two-way ANOVA followed by *Bonferroni post hoc* test (A) and one-way ANOVA followed by *Dunnett post hoc* test (B). # indicates significant statistical difference ( $p < 0.05$ ) when compared to NCD group. \* indicates significant statistical difference ( $p < 0.05$ ) when compared to vehicle HFD. NCD: Normal Chow Diet; HFD: High-fat Diet. 9-10 animals per group.

To avoid bias and to allow reproducibility all in vivo experiments follow the ARRIVE guidances<sup>2</sup>. Rat colony from Charles River Laboratories is breed and maintained in SPF conditions. The project includes study plan and final report. Raw data are inspected by quality assurance unity. The experimental procedures was previously approved by the CIEnP Committee on the Ethical Use of Animals.

### References:

<sup>1</sup>Schetz, M. et al. Obesity in critically ill: a narrative review. *Intensive Care Medicine*. Vol.45, 2019.

<sup>2</sup>Kilkenny C, Browne WJ, Cuthill IC, Emerson M, Altman DG. Animal research: reporting in vivo experiments: The ARRIVE guidelines. *PLoS Biol*. 8 (6): e1000412, 2010.