

Supplementary Data.

Figure Legends.

Suppl. Figure 1) Oleic acid causes a membrane depolarization associated with an increase in membrane resistance.

a1 and a2) Whole-cell recording from a POMC neuron. Under control conditions in the presence of CNQX, DL-APV, picrotoxin, strychnine and tetrodotoxin (μM ; 10, 50, 100, 1 and 1, respectively), V_m was -61mV . Hyperpolarizing current steps (100pA , 100ms) were applied at 0.2 Hz to monitor changes in membrane resistance (R_m) before, during and after treatment with oleic acid ($50\mu\text{M}$). Membrane hyperpolarization after access in whole-cell mode was associated with a fall in R_m . Treatment with oleic acid induced a membrane depolarization with a robust increase in R_m . Scale bar: 200mV , 5min . **a2.** Responses to hyperpolarizing current steps on an expanded time scale with and without oleic acid. Scale bar: 20mV , 50ms .

b) Summary of the membrane resistance data obtained from 8 separate experiments (control: $466\pm 72\text{M}\Omega$; oleic acid: $617\pm 81\text{M}\Omega$; $n=8$; $p=0.005$).