Neural correlates of sleeve gastrectomy-induced food preference changes in mice and investigation of gut taste receptors as an underlying mechanism.

Dr Rosalind Walmsley

University of Melbourne

St Vincent's Hospital Melbourne

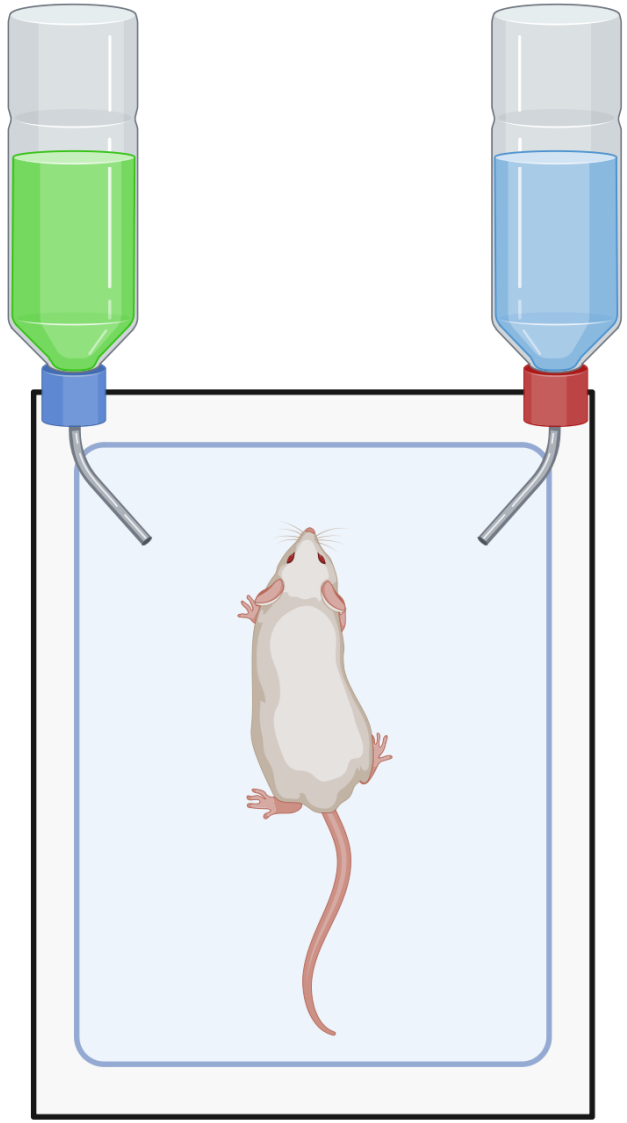
Two-bottle taste test after sleeve gastrectomy

Sleeve Gastrectomy

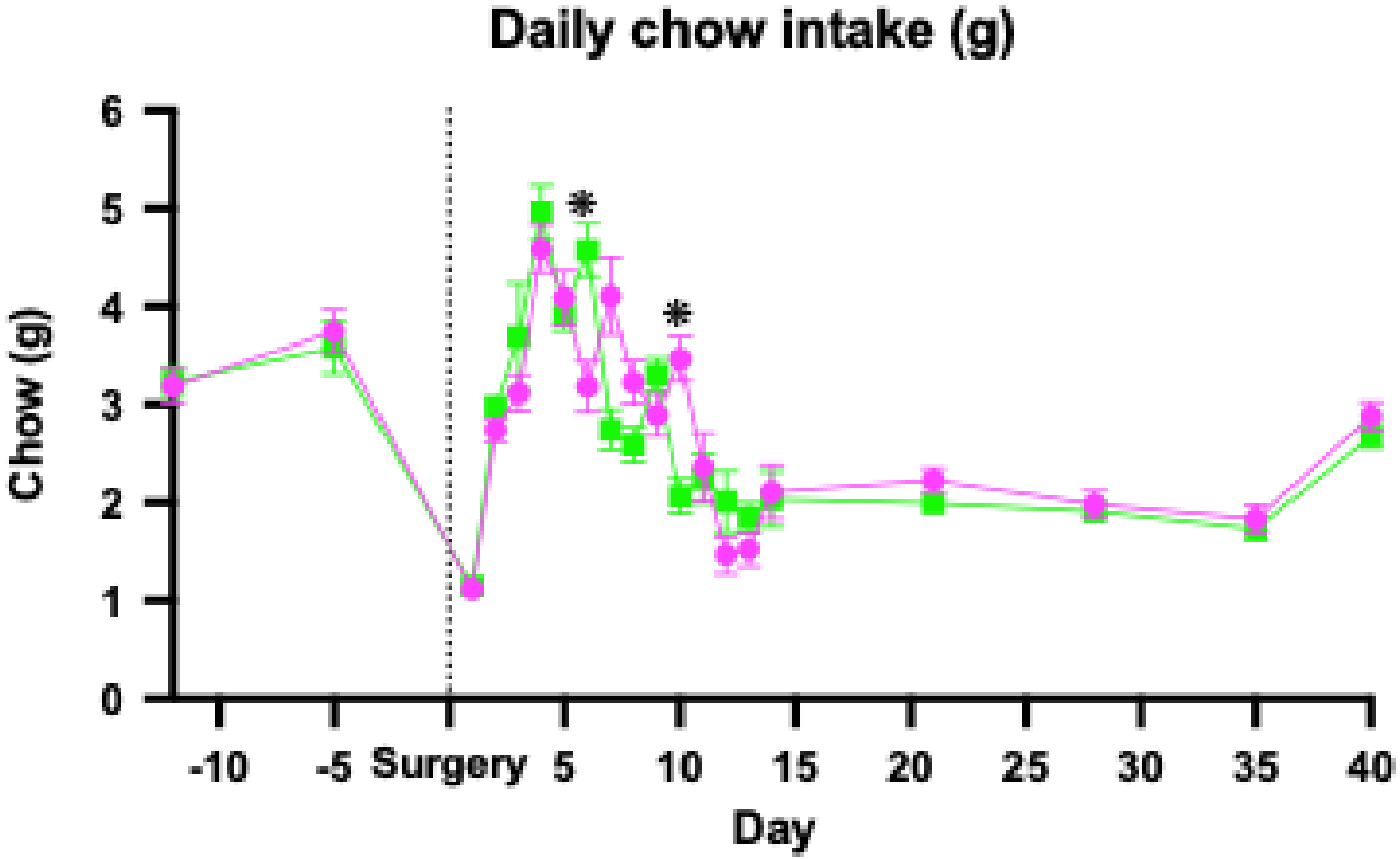
Sham Surgery

Glucose or Intralipid

Water



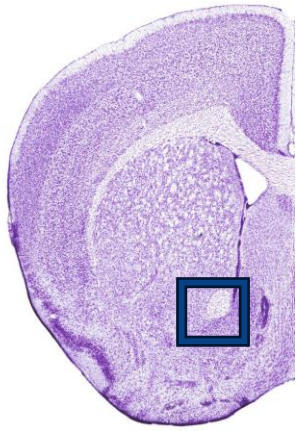
Sleeve gastrectomy reduces intake of sugars and fats but not regular diet

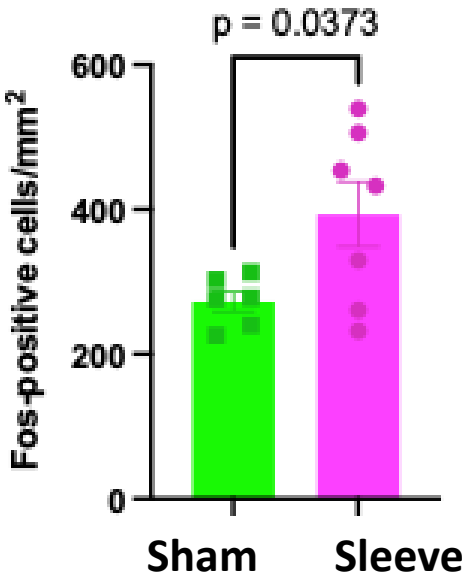


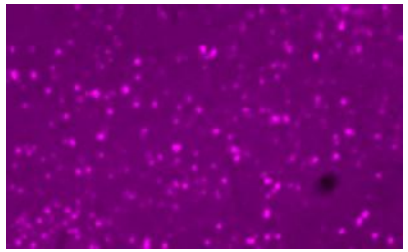
Analysed using unpaired student's T test. Presented as mean ± SEM

Sleeve gastrectomy increases reward response to food (but not taste)

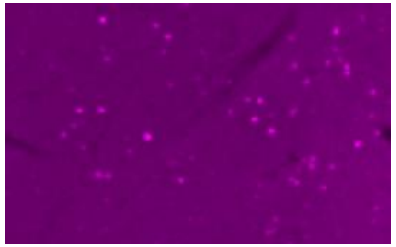
Nucleus accumbens (reward)





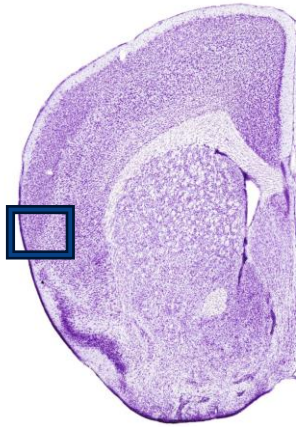


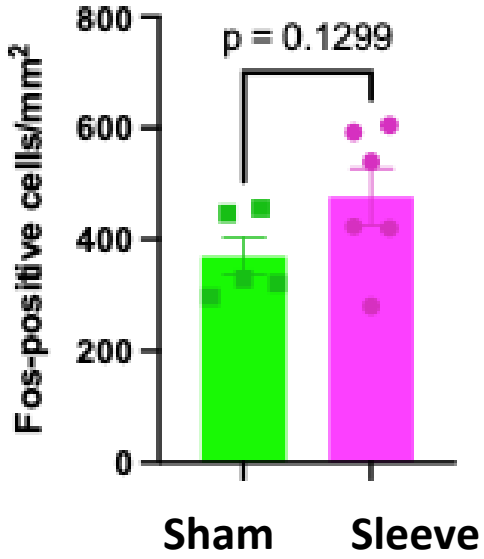
Sleeve gastrectomy

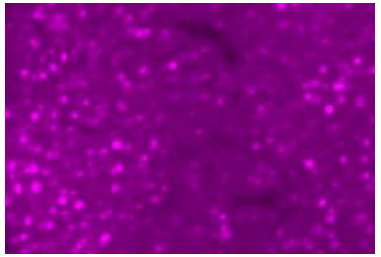


Sham surgery

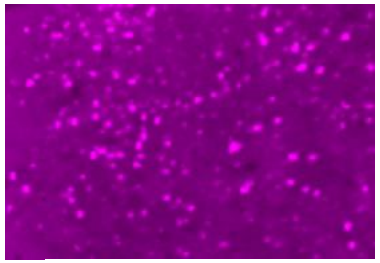
Primary gustatory cortex (taste)







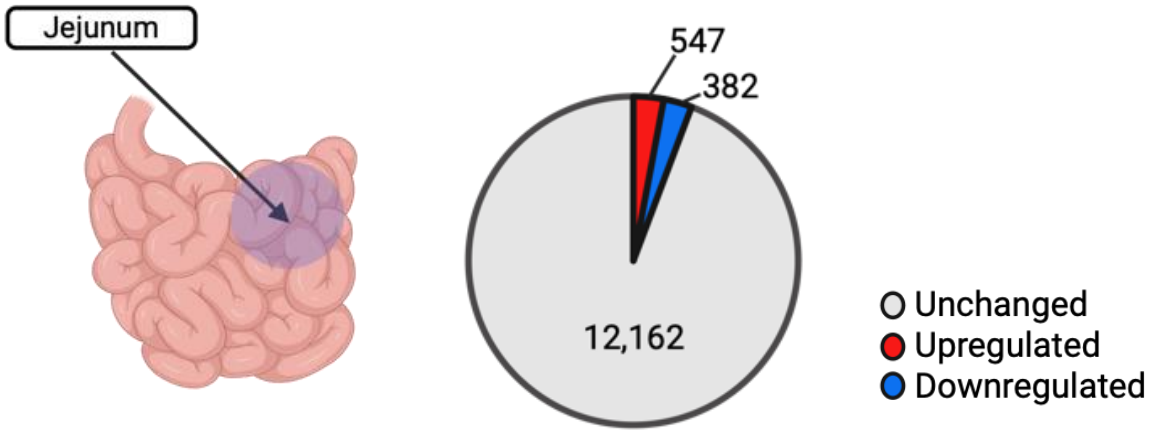
Sleeve gastrectomy

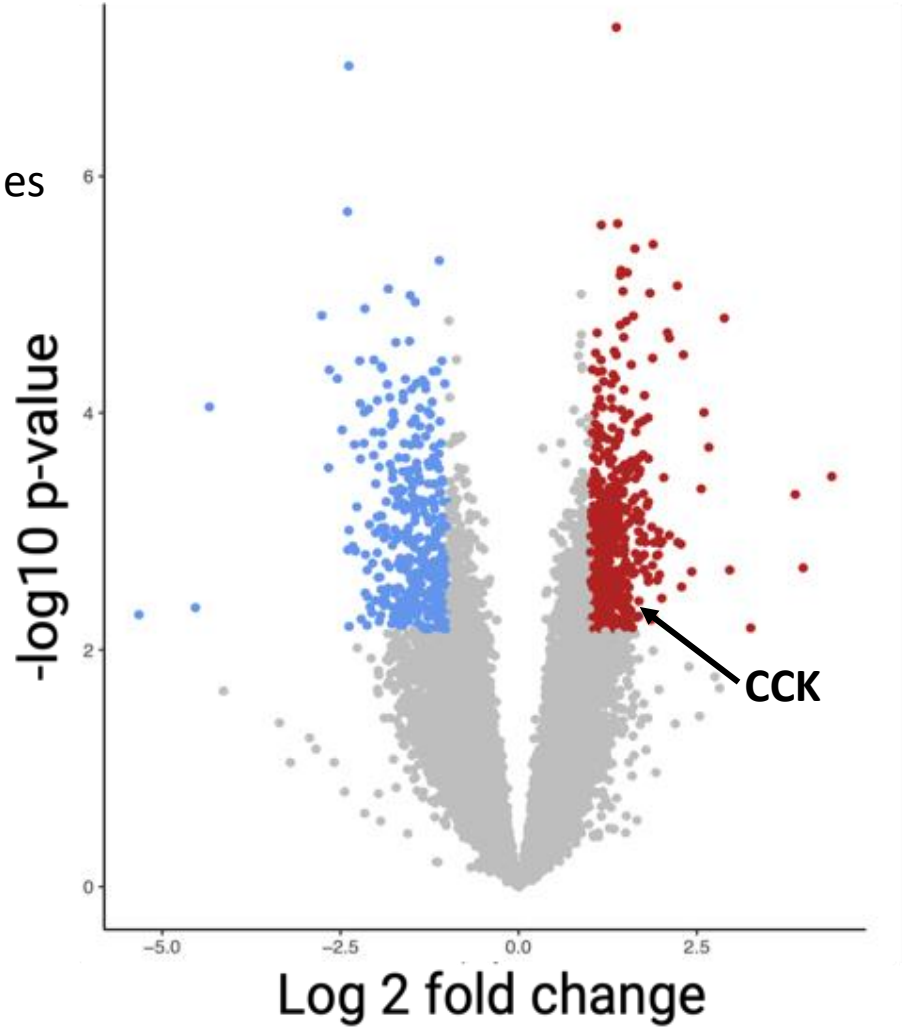


Sham surgery

CCK is upregulated in the jejunum of mice after sleeve gastrectomy

- RNA sequencing identified ~1000 differentially expressed genes
- Cholecystokinin (CCK) ↑ 2.5x in jejunum (p =0.026)
- CCK signals to the brain about the presence of sugars and fats in the gut.





Food preference changes after sleeve gastrectomy are likely gut-derived

- Food preference changes after sleeve gastrectomy occur independently of weight change or prior exposure to high-fat high-sugar diets.

- Sleeve gastrectomy increases sensitivity to the rewarding value of highly palatable foods.

- Upregulation of CCK in the jejunum may play a role in post-oral food preference via gut-brain axis signalling.

- The role of nutrient sensing via gut taste receptors in food preference is still to be determined