



# Acute cystitis induced by cyclophosphamide in mice

## A MODEL FOR INTERSTITIAL CYSTITIS / BLADDER PAINFUL SYNDROME (IC/BPS)

### Model

Interstitial cystitis / bladder painful syndrome (IC/BPS) is a chronic inflammatory disease characterized by visceral pain and urinary symptoms such as urinary frequency. IC/BPS is induced by a single injection of cyclophosphamide (CYP). This acute model is a rapid, reliable and widely used model to test therapeutic approaches on visceral pain and bladder inflammation.

### Interest

- This model recapitulates 2 hallmark symptoms of IC/BPS (visceral pain and bladder inflammation).
- Visceral pain can be evaluated by non invasive technique using von Frey filaments allowing repeated monitoring on the same animal.
- This model is validated by clinically relevant compounds: non-steroidal anti-inflammatory drug (ibuprofen) and opioid receptor agonist (morphine).
- Rat models of CYP-induced cystitis (acute and chronic) are also available (for additional information, please see our IC/BPS models).

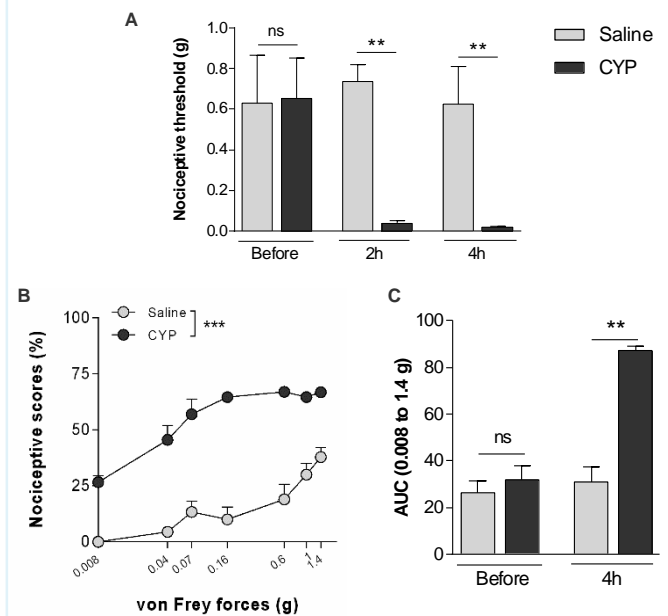
### Model Description

- The lower abdomen sensitivity to mechanical stimuli is assessed using 7 von Frey filaments that are applied to the pelvic area.
- Bladder inflammation is characterized by structural changes of the bladder (weight, edema, ...).
- Tested compounds can be administered via various routes (i.v., i.p., s.c., p.o.).

### Parameters evaluated

- Pain: nociceptive threshold, scores and area under the curve (AUC) by plotting nociceptive scores against von Frey forces
- Inflammation: macroscopic evaluation (weight, edema / hemorrhage scores)
- Bladder can be collected for histological, molecular or biomarkers analysis (ELISA, multiplex assays)
- Urines can be collected using metabolic cage rack with refrigerated sample collection

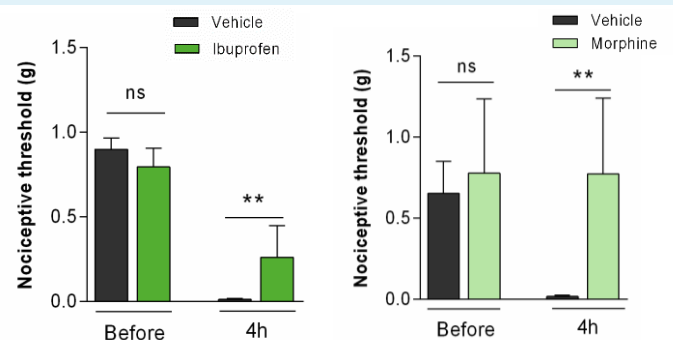
#### CYP induces acute visceral pain



(A) Nociceptive threshold, (B) scores and (C) corresponding AUC (0.008–1.4 g).

ns  $p > 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$  (n=6/group)

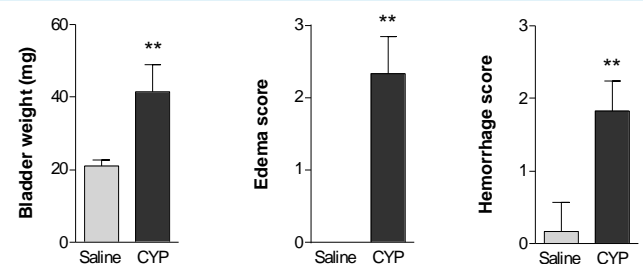
#### Ibuprofen (100 mg/kg, p.o.) and morphine (3 mg/kg, s.c.) decrease CYP-induced visceral pain



(A) Effect on ibuprofen and (B) morphine on CYP-induced nociceptive threshold decrease (allodynia)

ns  $p > 0.05$ , \*\*  $p < 0.01$  (n=5-6/group)

#### CYP induces acute bladder inflammation



Urinary bladder inflammatory macroscopic evaluation at 4h.

\*\*  $p < 0.01$  (n=6/group)