

Supporting information

Table 1 Respiratory parameter values before and after opioid antagonist administration

Drug	Pre drug-treatment baseline		Post drug-treatment baseline		n
	Respiratory rate (bpm)	Tidal volume (ml.min ⁻¹)	Respiratory rate (bpm)	Tidal volume (ml.min ⁻¹)	
Naltrindole 10 mg.kg ⁻¹	430.5 ± 14.7	0.37 ± 0.03	434.8 ± 8.2	0.38 ± 0.03	6
Nor BNI 20 mg.kg ⁻¹	370.3 ± 22.5	0.36 ± 0.03	397.0 ± 24.1	0.35 ± 0.03	6

All values are mean ± SEM of 5-min averages; bpm, breaths per minute. Pre-treatment baseline was taken as the final 5-min of respiration before administration of Naltrindole (30-min pre-treatment) or Nor BNI (24-hr pre-treatment). Post-treatment baseline was taken as the final 5-min of respiration before administration of fentanyl. Naltrindole and Nor BNI did not significantly alter respiratory parameters alone. Values were compared using a paired two-way Student's t-test.

Table 2. Baseline respiratory parameters in μ -opioid receptor knock-out and wild type mice.

Wild type mouse baseline		μ Knock-out mouse baseline		n
Respiratory Rate (bpm)	Tidal volume (ml.min ⁻¹)	Respiratory Rate (bpm)	Tidal Volume (ml.min ⁻¹)	
454 ± 10.9	0.33 ± 0.01	438 ± 13.6	0.33 ± 0.03	6

All values are mean ± SEM of 5-min averages; bpm, breaths per minute. Baseline measurements were taken from the 15-20 min baseline period prior to fentanyl administration. There was no significant difference in respiratory parameters between wild type and μ knock-out mice. Values were compared using an unpaired two-way Student's t-test.