

Supplementary Information

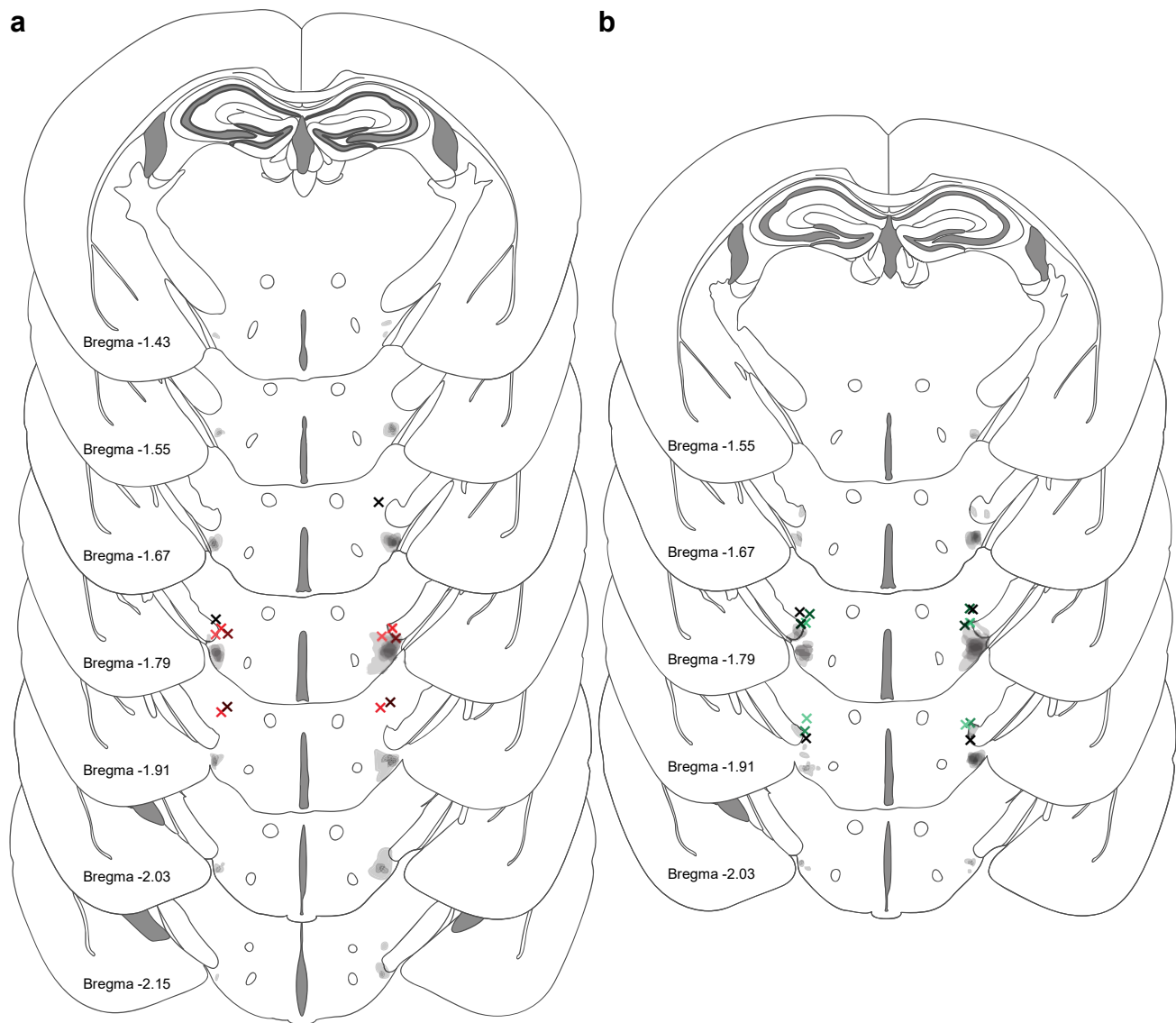
Lateral hypothalamic fast-spiking parvalbumin neurons modulate nociception through connections in the periaqueductal gray area

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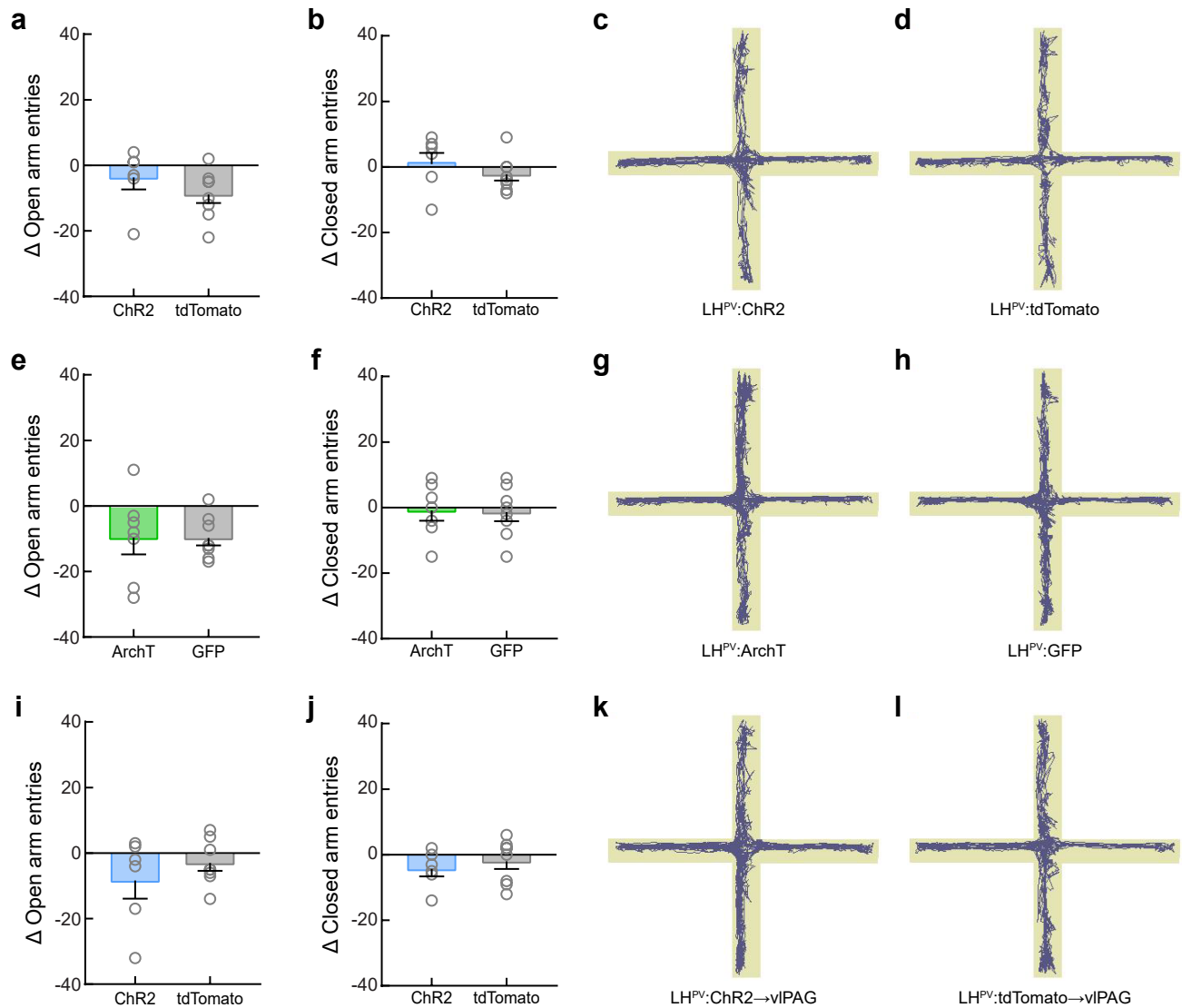
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Supplementary Figure S1



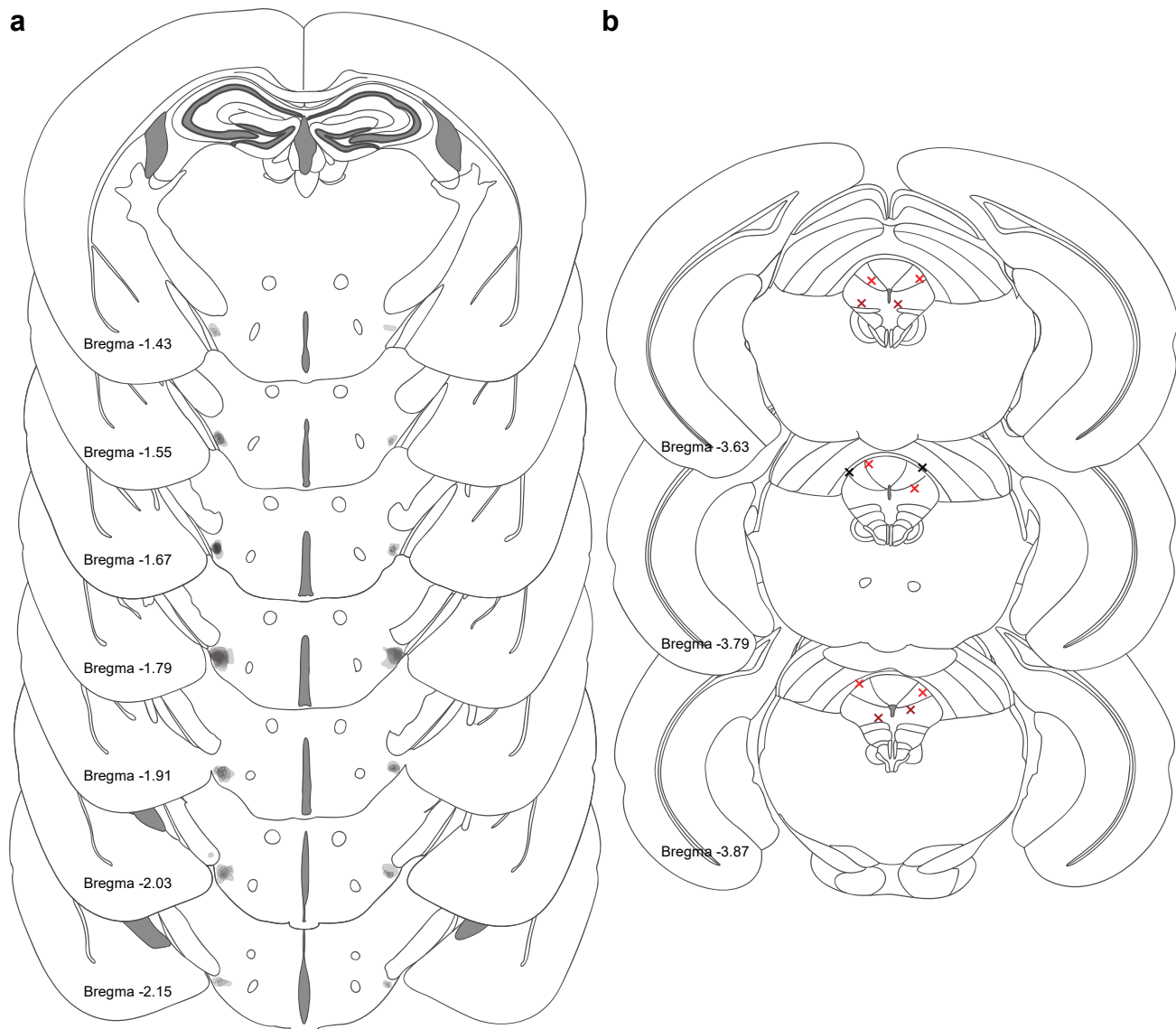
(a-b) Schematic representations of (a) AAV-FLEX-ChR2:tdTomato and (b) AAV-FLEX-ArchT:GFP viral expression in the LH of *Pvalb^{Cre}* transgenic mice. Optical fibers (x) were implanted in the LH above viral targets. Schematic images adapted from Franklin and Paxinos (Fourth edition, 2013).

Supplementary Figure S2



Optogenetic LH^{PV} neuronal manipulations do not affect elevated plus maze open or closed arm entries. (a) Photostimulation of LH^{PV}:ChR2 mice and LH^{PV}:tdTomato control mice did not alter open arm entries (unpaired Student's *t* test, $t(12) = 1.18$, $p = 0.26$) or (b) closed arm entries ($t(12) = 1.07$, $p = 0.30$). (c-d) Representative EPM traces for LH^{PV}:ChR2 and LH^{PV}:tdTomato mice. (e) Photoinhibition of LH^{PV}:ArchT mice and LH^{PV}:GFP control mice did not alter open arm entries ($t(13) = 0.007$, $p = 0.99$) or (f) closed arm entries ($t(13) = 0.12$, $p = 0.90$). (g-h) Representative EPM traces for LH^{PV}:ArchT and LH^{PV}:GFP mice. (i) Photostimulation of LH^{PV}:ChR2→vIPAG mice and LH^{PV}:tdTomato→vIPAG control mice did not alter open arm entries ($t(12) = 0.96$, $p = 0.35$) or (j) closed arm entries ($t(12) = 0.69$, $p = 0.50$). (k-l) Representative EPM traces for LH^{PV}:ChR2→vIPAG mice and LH^{PV}:tdTomato→vIPAG mice.

Supplementary Figure S3



(a-b) Schematic representations of **(a)** AAV-FLEX-ChR2:tdTomato viral expression in the LH of *Pvalb^{Cre}* transgenic mice and **(b)** optical fiber (x) placement above the vIPAG. Schematic images adapted from Franklin and Paxinos (Fourth edition, 2013).