



Figure S5. Optogenetic activation of SCN GABA neurons drives inhibitory responses in downstream neurons. (a) Left shows a schematic of the recording configuration for experiments using SCN electrical and optogenetic stimulation in $GAD2^{+/cre}; Ai32^{+/-}$ slices, with local recording and optogenetic stimulation of one SCN hemisphere via a 32-site optrode. Right plot illustrates proportions of responding cells and their overlap following optical and electrical stimulation (bubble size proportional to population sizes). Lower pie chart shows proportion of isolated SC neurons with excitatory response to optogenetic stimulation (n.r. indicates no response). (b) peri-stimulus spike rasters for representative SCN neuron showing direct excitatory response to optogenetic stimulation (upper) and extra-SCN neuron with synaptically mediated inhibitory responses (GABAⁿ; lower panel), under baseline conditions and following GABA_A receptor blockade (BIC; 20 μ m (+)-bicuculline) in the absence and presence of ionotropic glutamate receptor antagonists (iGlu-X; 50 μ m D-AP5 and 20 μ m CNQX). (c) Mean \pm SEM responses of SCN GABA neurons (upper; $n=18$) and extra-SCN GABAⁿ cells (lower; $n=5$) before and after antagonist treatment. Data analysed by mixed-effects linear model (upper: $F_{2, 31.3}=0.3$, $P=0.76$; lower: $F_{2, 5.5}=9.9$, $P=0.02$) with Sidak's post-tests. $*=P<0.05$.