

Table S1. ANCOVA results assessing effects of sex, stimulus and locomotion on mean *egr-1* levels in each forebrain region analyzed

Brain region	Sex	Stimulus	Sex × stimulus	Movement	Stimulus × movement	Sex × movement	Sex × stimulus × movement
MP	$F_{1,46}=0.67$ $P=0.420$	$F_{2,46}=2.19$ $P=0.123$	$F_{2,46}=0.96$ $P=0.392$	$F_{1,46}=53.3$ $P<0.001$	$F_{2,46}=4.86$ $P=0.012$		
DP	$F_{1,44}=1.56$ $P=0.219$	$F_{2,44}=0.28$ $P=0.754$	$F_{2,44}=0.18$ $P=0.833$	$F_{1,44}=13.3$ $P=0.001$	$F_{2,44}=1.15$ $P=0.326$	$F_{1,44}=1.32$ $P=0.257$	
LP	$F_{1,45}=14.3$ $P<0.001$	$F_{2,45}=1.22$ $P=0.305$	$F_{2,45}=0.12$ $P=0.890$	$F_{1,45}=23.2$ $P<0.001$	$F_{2,45}=2.00$ $P=0.147$	$F_{1,45}=8.00$ $P=0.007$	
rST	$F_{1,40}=0.55$ $P=0.461$	$F_{2,40}=0.86$ $P=0.429$	$F_{2,40}=2.04$ $P=0.143$	$F_{1,40}=9.65$ $P=0.003$	$F_{2,40}=2.18$ $P=0.127$	$F_{1,40}=3.08$ $P=0.087$	$F_{1,40}=4.03$ $P=0.025$
cST	$F_{1,45}=6.04$ $P=0.018$	$F_{2,45}=2.28$ $P=0.114$	$F_{2,45}=0.92$ $P=0.407$	$F_{1,45}=17.7$ $P<0.001$	$F_{2,45}=1.95$ $P=0.154$	$F_{1,45}=0.15$ $P=0.095$	
LS	$F_{1,45}=0.80$ $P=0.375$	$F_{2,45}=2.17$ $P=0.126$	$F_{2,45}=3.81$ $P=0.030$	$F_{1,45}=82.9$ $P<0.001$	$F_{2,45}=2.09$ $P=0.136$		
MS	$F_{1,46}=6.28$ $P=0.016$	$F_{2,46}=0.07$ $P=0.930$	$F_{2,46}=2.97$ $P=0.061$	$F_{1,46}=18.7$ $P<0.001$	$F_{2,46}=4.07$ $P=0.024$		
DS	$F_{1,46}=1.82$ $P=0.184$	$F_{2,46}=1.25$ $P=0.298$	$F_{2,46}=1.33$ $P=0.275$	$F_{1,46}=46.3$ $P<0.001$	$F_{2,46}=4.15$ $P=0.022$		
CS	$F_{1,42}=3.94$ $P=0.054$	$F_{2,42}=2.03$ $P=0.145$	$F_{2,42}=3.62$ $P=0.035$	$F_{1,42}=0.06$ $P=0.813$	$F_{2,42}=1.43$ $P=0.250$	$F_{1,42}=4.28$ $P=0.045$	$F_{2,42}=2.54$ $P=0.091$
NA	$F_{1,47}=8.56$ $P=0.005$	$F_{2,47}=2.99$ $P=0.060$	$F_{2,47}=0.07$ $P=0.933$	$F_{1,47}=33.2$ $P<0.001$			
MA	$F_{1,43}=9.02$ $P=0.004$	$F_{2,43}=5.26$ $P=0.009$	$F_{2,43}=6.47$ $P=0.004$	$F_{1,43}=28.4$ $P<0.001$	$F_{2,43}=10.5$ $P<0.001$	$F_{1,43}=18.2$ $P<0.001$	$F_{2,43}=9.39$ $P<0.001$
LA	$F_{1,46}=0.19$ $P=0.667$	$F_{2,46}=0.97$ $P=0.385$	$F_{2,46}=1.36$ $P=0.265$	$F_{1,46}=6.69$ $P=0.013$			
AA	$F_{1,46}=0.49$ $P=0.488$	$F_{2,46}=0.36$ $P=0.699$	$F_{2,46}=0.71$ $P=0.499$	$F_{1,46}=7.42$ $P=0.009$	$F_{2,46}=2.00$ $P=0.147$		
aPOA	$F_{1,45}=8.12$ $P=0.007$	$F_{2,45}=4.68$ $P=0.014$	$F_{2,45}=2.69$ $P=0.079$	$F_{1,45}=30.3$ $P<0.001$	$F_{2,45}=8.04$ $P=0.001$	$F_{1,45}=7.24$ $P=0.010$	
pPOA	$F_{1,47}=1.87$ $P=0.179$	$F_{2,47}=7.11$ $P=0.002$	$F_{2,47}=2.31$ $P=0.110$	$F_{1,47}=6.30$ $P=0.016$		$F_{1,47}=2.59$ $P=0.114$	
SC	$F_{1,47}=9.58$ $P=0.003$	$F_{2,47}=1.39$ $P=0.259$	$F_{2,47}=0.39$ $P=0.681$	$F_{1,47}=9.57$ $P=0.003$			
VH	$F_{1,46}=2.25$ $P=0.141$	$F_{2,46}=0.13$ $P=0.879$	$F_{2,46}=3.02$ $P=0.059$	$F_{1,46}=18.6$ $P<0.001$			
NP	$F_{1,43}=0.53$ $P=0.471$	$F_{2,43}=0.80$ $P=0.454$	$F_{2,43}=0.53$ $P=0.595$	$F_{1,43}=36.1$ $P<0.001$	$F_{2,43}=4.16$ $P=0.022$		
DH	$F_{1,42}=0.64$ $P=0.427$	$F_{2,42}=0.99$ $P=0.379$	$F_{2,42}=3.15$ $P=0.053$	$F_{1,42}=18.5$ $P<0.001$		$F_{1,42}=3.40$ $P=0.072$	
PT	$F_{1,45}=0.65$ $P=0.424$	$F_{2,45}=2.15$ $P=0.128$	$F_{2,45}=0.24$ $P=0.787$	$F_{1,45}=21.3$ $P<0.001$			
Athal	$F_{1,41}=0.08$ $P=0.785$	$F_{2,41}=0.21$ $P=0.814$	$F_{2,41}=0.16$ $P=0.851$	$F_{1,41}=15.9$ $P<0.001$	$F_{2,41}=1.57$ $P=0.221$	$F_{1,41}=1.49$ $P=0.229$	$F_{2,41}=2.24$ $P=0.119$
Cthal	$F_{1,42}=0.15$ $P=0.705$	$F_{2,42}=7.44$ $P=0.002$	$F_{2,42}=1.75$ $P=0.187$	$F_{1,42}=21.1$ $P<0.001$			
Pthal	$F_{1,44}=0.04$ $P=0.838$	$F_{2,44}=1.96$ $P=0.153$	$F_{2,44}=1.54$ $P=0.226$	$F_{1,44}=6.87$ $P=0.012$			
VMthal	$F_{1,43}=3.26$ $P=0.078$	$F_{2,43}=5.30$ $P=0.009$	$F_{2,43}=0.10$ $P=0.902$	$F_{1,43}=30.7$ $P<0.001$	$F_{2,43}=2.80$ $P=0.072$	$F_{1,43}=2.49$ $P=0.122$	

The ANCOVA for dorsal pallium includes both sex × movement and stimulus × movement interaction terms. Removing either interaction term causes the remaining term to be at or near significance, hence we removed neither.

The covariate representing global activity throughout the brain is included in all ANCOVA analyses and is a significant ($P<0.001$) covariate for every brain region (results not shown).

MP, medial pallium; DP, dorsal pallium; LP, lateral pallium; rST, rostral striatum; cST, caudal striatum; LS, lateral septum; MS, medial septum; DS, dorsal septum; CS, central septum; NA, nucleus accumbens; MA, medial amygdala; LA, lateral amygdala; AA, anterior amygdala; aPOA, anterior preoptic area; pPOA, posterior preoptic area; SC, suprachiasmatic nucleus; VH, ventral hypothalamus; NP, periventricular nucleus; DH, dorsal hypothalamus; PT, posterior tuberculum; Athal, anterior thalamus; Cthal, central thalamus; Pthal, posterior thalamus; VMthal, ventromedial thalamus.