SUPPLEMENTAL INFORMATION

(Figures, Tables)

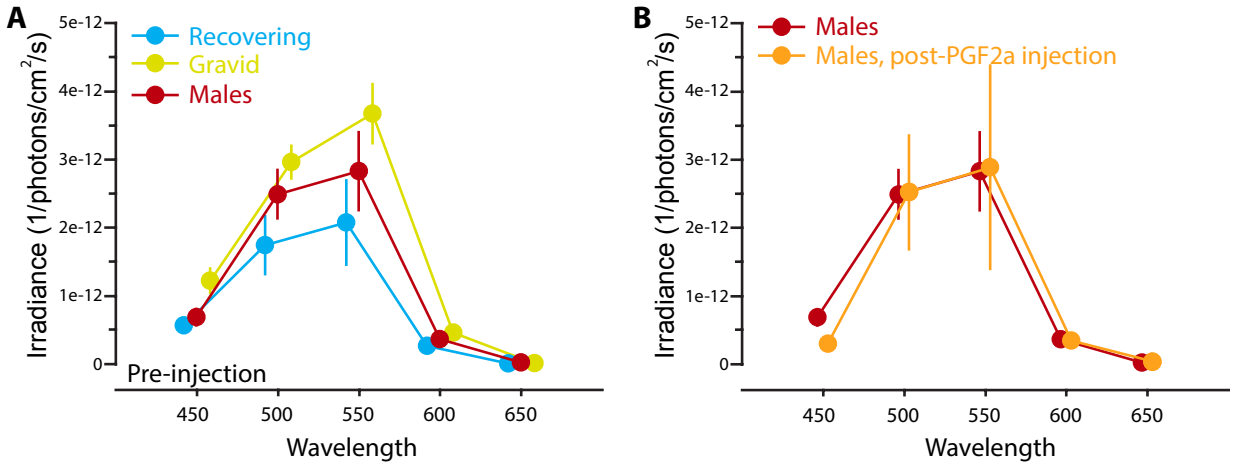

Figure S1. Male spectral sensitivity is similar to females. A. Males (N=5) have similar spectral sensitivity to both gravid (N=8) and recovering (N=7) females, and their sensitivity was not affected by PGF2α injections (**B**; N=3). Plots are mean ± s.e.m.

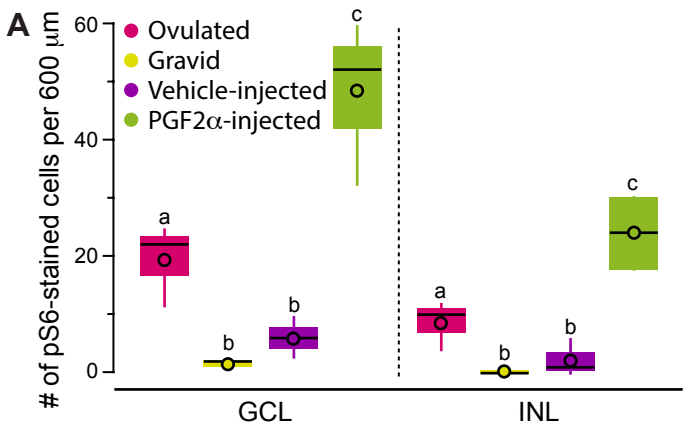

Figure S2. Neural activation in the retina of females visually exposed to courting males varies with ovulation status. (**A**) Ovulated females (natural: red; PGF2α: green) have more pS6 staining in the ganglion cell layer (GCL) and inner nuclear layer (INL) of the retina compared to gravid (natural: yellow; vehicle-injected: purple) females. N=4 for all groups. See Fig. 1 for box plot descriptions. Different letters represent statistical significance at $P<0.05$.

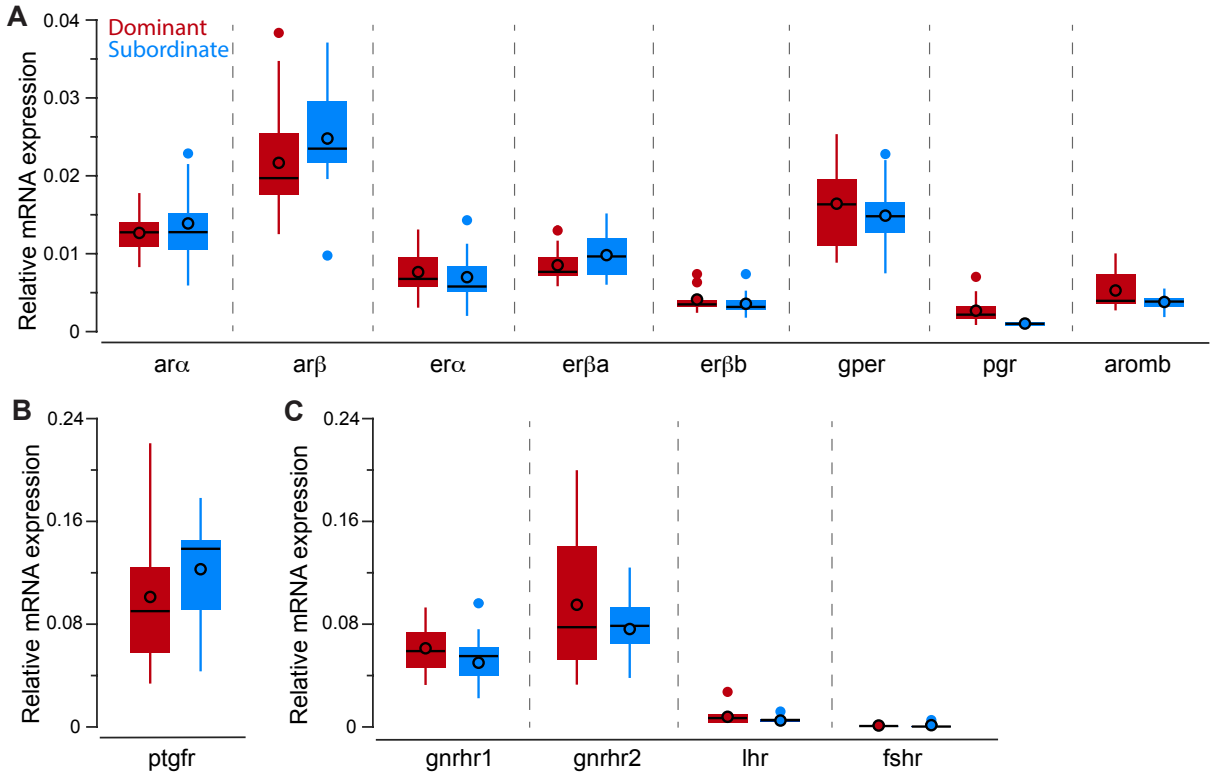

Figure S2. Dominant and subordinate males have similar levels of neuromodulatory receptors in the eye. There was no difference in levels of sex steroid receptors (**A**), prostaglandin F2α receptor (**B**), or gonadotropin system receptors (**C**) between dominant (red, N=14) and subordinate (blue, N=14) males. See Figure 1 legend for box plot descriptions.

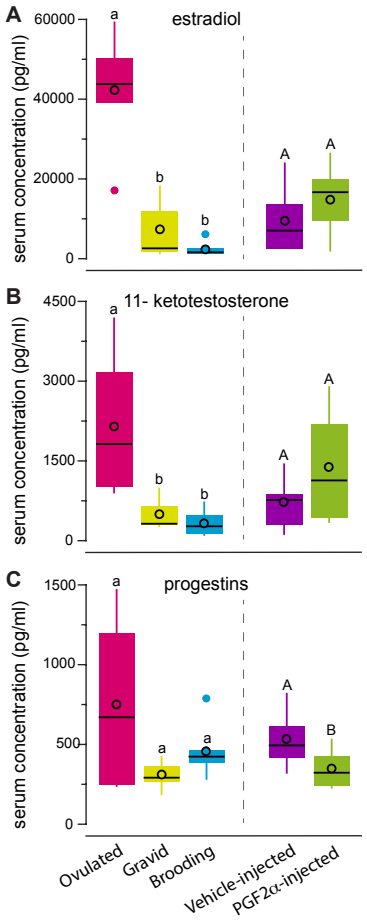

Figure S3. Circulating levels of estradiol and 11-ketotestosterone vary with female ovulation status. Ovulated females (pink) have higher circulating levels of estradiol (**A**) and 11-ketotestosterone (**B**) but not progestins (**C**) when compared to gravid (yellow) and brooding females (blue). PGF2α-injected females (green) and vehicle-injected females (purple) have similar levels of circulating estradiol and 11-ketotestosterone, but vehicle-injected females have higher circulating progestins than PGF2α-injected females (**C**). N=6-7 for all groups. See Figure 1 legend for box plot descriptions. Different lowercase letters indicate statistical significance within steady-state animals (ovulated, gravid, brooding) while different uppercase letter indicated a statistically significant difference between vehicle- and PGF2α - injected females.

Table S1. Primer sequences used for quantitative PCR. Primers are identical to those used previously (Au et al., 2006; Burmeister et al., 2007; Maruska and Fernald, 2010, 2011) or were designed from Genbank sequences (see methods for details).

Gene	Forward Primer (5' → 3')	Reverse Primer (5' → 3')	Amplicon Size (bp)
erα	CCGGTTCCCAGAGACGACCAG	CTCGCCCAAGCCGTAT	57
erβa	ACAAGAAGGTTTGCCGTGTC	GCCCGTCTCCTAGTATTCA	49
erβb	AATCTGAAGGAGCGGAAGG	CTAGCGCAGATGAGCACGAT	51
gper	CAGCCTCTGGGAACTAAAC	CAGCCAACAGAGGAAGAAG	100
arα	CGCTGTATCTGGTACGGTAG	TGAGGAATCGCACTTGG	104
arβ	TTCGGCGACAAGTACAACTC	ACTGTTCACGGCGCATTA	124
pgr	GCCTTGACTCCCATGTCTTAC	CCACCTCTGGTTCGATGTTT	94
aromb	TGCTTACTTCCAGCCCTTTG	AGTGTACCGAGACAGGAGAG	106
ptgfr	GCCCATTACTGATCCATGTC	CTTCCTCAGCAGGATGTAGA	134
lhr	CAATGGGACAAAGCTCAACACGCT	AGTTGGACCTGTGGCTCCTTCAAA	94
fshr	CAGCAGCTATGGCAAAGTGAGCAT	AAGGCTTGCGAAAGGTGAGGTAGA	155
gnrhr1	TCAGTACAGCGGCGAAAG	GCATCTACGGGCATCACGAT	187
gnrhr2	GGCTGCTCAGTTCCGAGTT	CGCATCACCACCATACCACT	220
gapdh	CACACAAGCCCAACCCATAGTCAT	AAACACACTGCTGCTGCCTACATA	78
eef1a	TTCCACTGAGCCCAACTA	GAGGCGCTTCCATCTTTAC	204

Table S2. Pearson correlation values of neuromodulatory receptor expression in the eye with mate choice-like behaviors in females. Body size-corrected gene expression values from ANCOVAs were used. Bold indicates significance at P<0.05. * indicates p-value was not significant after corrections for false discovery rate at 5%.

	Response to male behaviors		# of entries to spawning territory		Time spent in spawning territory	
	R	P	R	P	R	P
arα	0.482	0.081	0.194	0.507	0.247	0.395
arβ	0.427	0.128	0.077	0.795	0.156	0.595
erα	0.508	0.064	0.229	0.430	0.280	0.333
erβa	0.291	0.313	-0.134	0.648	-0.226	0.436
erβb	0.445	0.111	0.084	0.774	0.082	0.782
gper	0.296	0.326	-0.126	0.681	-0.213	0.484
pgr	0.469	0.090	0.202	0.488	0.306	0.288
aromB	0.465	0.094	0.160	0.585	0.239	0.411
ptgfr	-0.143	0.625	-0.178	0.544	0.263	0.363
gnrhr1	0.259	0.442	0.112	0.744	0.129	0.705
gnrhr2	0.616	**0.025***	0.546	0.053	0.716	**0.006**
lhr	0.705	**0.007**	0.745	**0.003**	0.685	**0.010**
fshr	0.281	0.500	0.672	0.068	0.344	0.403

Supplemental References

Au, T.M., Greenwood, A.K., Fernald, R.D., 2006. Differential social regulation of two pituitary gonadotropin-releasing hormone receptors. Behavioural brain research 170, 342-346.

Burmeister, S.S., Kailasanath, V., Fernald, R.D., 2007. Social dominance regulates androgen and estrogen receptor gene expression. Hormones and behavior 51, 164-170.

Maruska, K.P., Fernald, R.D., 2010. Steroid receptor expression in the fish inner ear varies with sex, social status, and reproductive state. BMC Neurosci. 11, 1.

Maruska, K.P., Fernald, R.D., 2011. Plasticity of the reproductive axis caused by social status change in an African cichlid fish: II. testicular gene expression and spermatogenesis. Endocrinology 152, 291-302.