**Supplemental Figure 1.** Preadsorption controls. Anti-glycine (anti-Gly) and anti-GABA antibodies were tested for specificity to their respective antigens by pre-incubating the antibodies with glycine-BSA (Gly-BSA) or GABA-BSA glutaraldehyde conjugates prior to application to brain tissue. A-B, tissue incubated with anti-Gly antibody (A) or anti-Gly pre-incubated with 100-fold molar excess of Gly-BSA (B). C-D, glycine-like immunoreactivity in sections labeled with anti-Gly alone (C) or anti-Gly pre-incubated with GABA-BSA. E-F, tissue incubated with anti-GABA alone (E) or anti-GABA + 100-fold molar excess of GABA-BSA (F). G-H, GABA-like immunoreactivity in sections labeled with anti-GABA alone (G) or anti-GABA + Gly-BSA (H). A-D, nucleus laminaris. E-H, nucleus magnocellularis. Sections shown in each set of comparison images were acquired from the same animal and processed identically with the exception of the preadsorption step. Comparison images were acquired with identical laser settings during the same imaging session and identical brightness and contrast settings were applied uniformly to each image pair. Scale bar in F applies to all images.