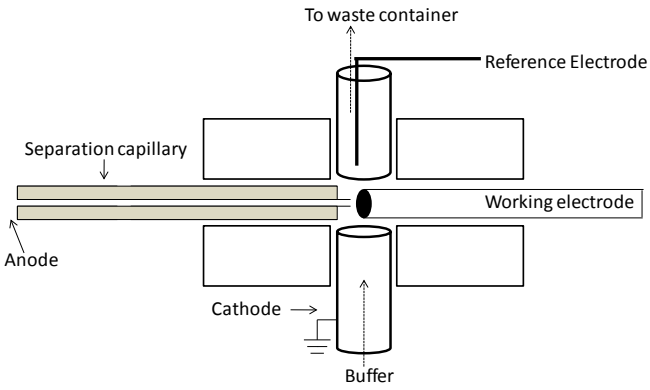
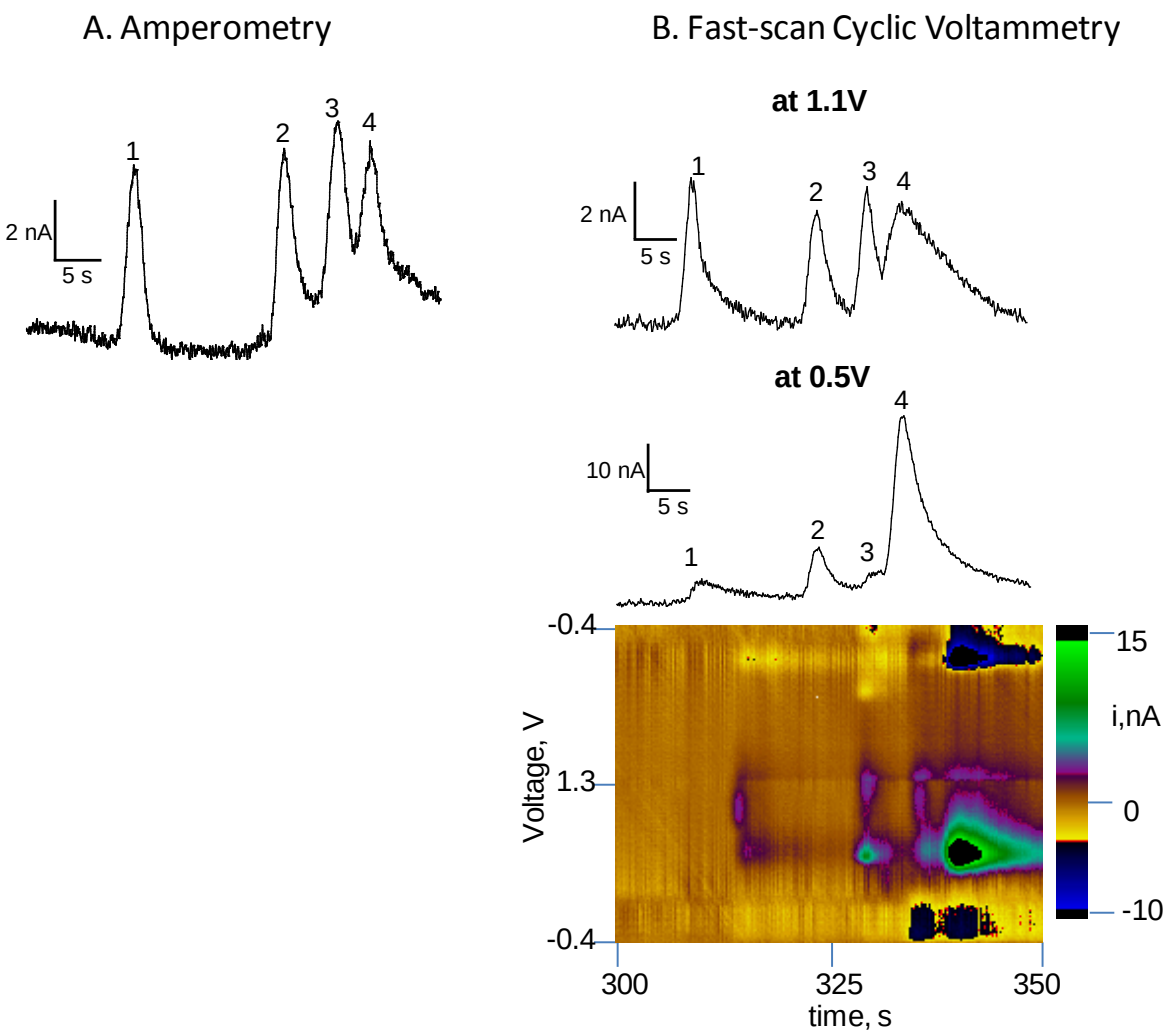
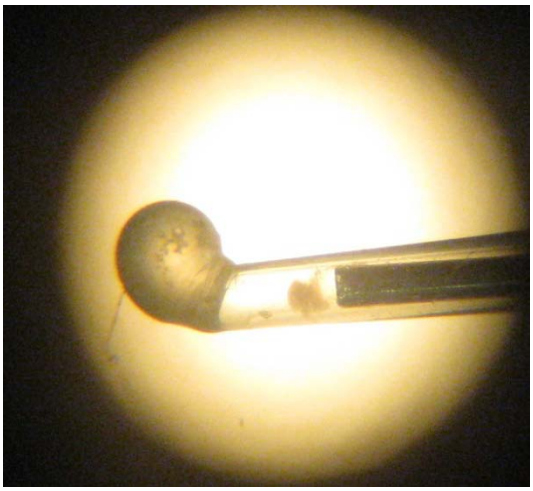


Supplemental Figure 1. Top view of the electrochemical detection cell. The cell is a Lucite block, typically used for flow gated injections, with tapped holes to that allow connectors to be screwed in place. The separation capillary and working electrode are positioned in the middle of the cross, 15 µm apart. A cross flow buffer flows at 0.5 mL/min. The reference electrode is inserted about 50 µm away from the working electrode and stainless steel tubing is used to ground the electrophoresis.



Supplemental Figure 2. Comparison of amperometry and FSCV with standard samples. A.) Amperometry results collected with an electrode potential of +1.0 V and rate of 100 Hz. The buffer was 100 mM phosphate, pH 4.5 (no tetraborate). For amperometry, the standard samples were 1 µM. The analytes are 1. tyramine, 2. serotonin, 3. octopamine and 4. dopamine. Serotonin, octopamine and dopamine are not baseline separated. Detection limits were not as good for amperometry, likely because our instrumentation and gain settings are not optimized for amperometry, but for FSCV. A higher gain amplifier should lead to lower noise and better detection limits. B.) FSCV data for the same separation capillary and conditions (pH 4.5 phosphate buffer), but for 50 nM standards. The labeled peaks are the same as for the amperometry experiment. On top the color plot, two traces are shown, for 0.5 V (the peak oxidation potential for dopamine and serotonin and a side peak oxidation potential for tyramine and octopamine) and 1.1 V (main oxidation peak for octopamine and tyramine, some peak still present for dopamine and serotonin). The color plot provides more information than do the electropherogram traces and the separation is easier to distinguish. For example, while octopamine and dopamine are difficult to differentiate at 0.5 V, the main peak for octopamine at 1.1 V is separated from the main peak of dopamine, at 0.5 V. This illustrates one advantage of seeing all the data in a color plot for FSCV.



Supplemental Figure 3. Image of sample vial with a larval CNS inside. The vial is made from a gel loading pipette tip that was sealed in a flame. The metal wire (o.d. 325 µm) is used as a pestle and serves as a scale reference. The CNS is approximately 250 µm by 100 µm. The i.d. of the sample vial is 0.4 mm, smaller than a glass homogenizer (1.2 mm) designed by the Ewing group.[27]