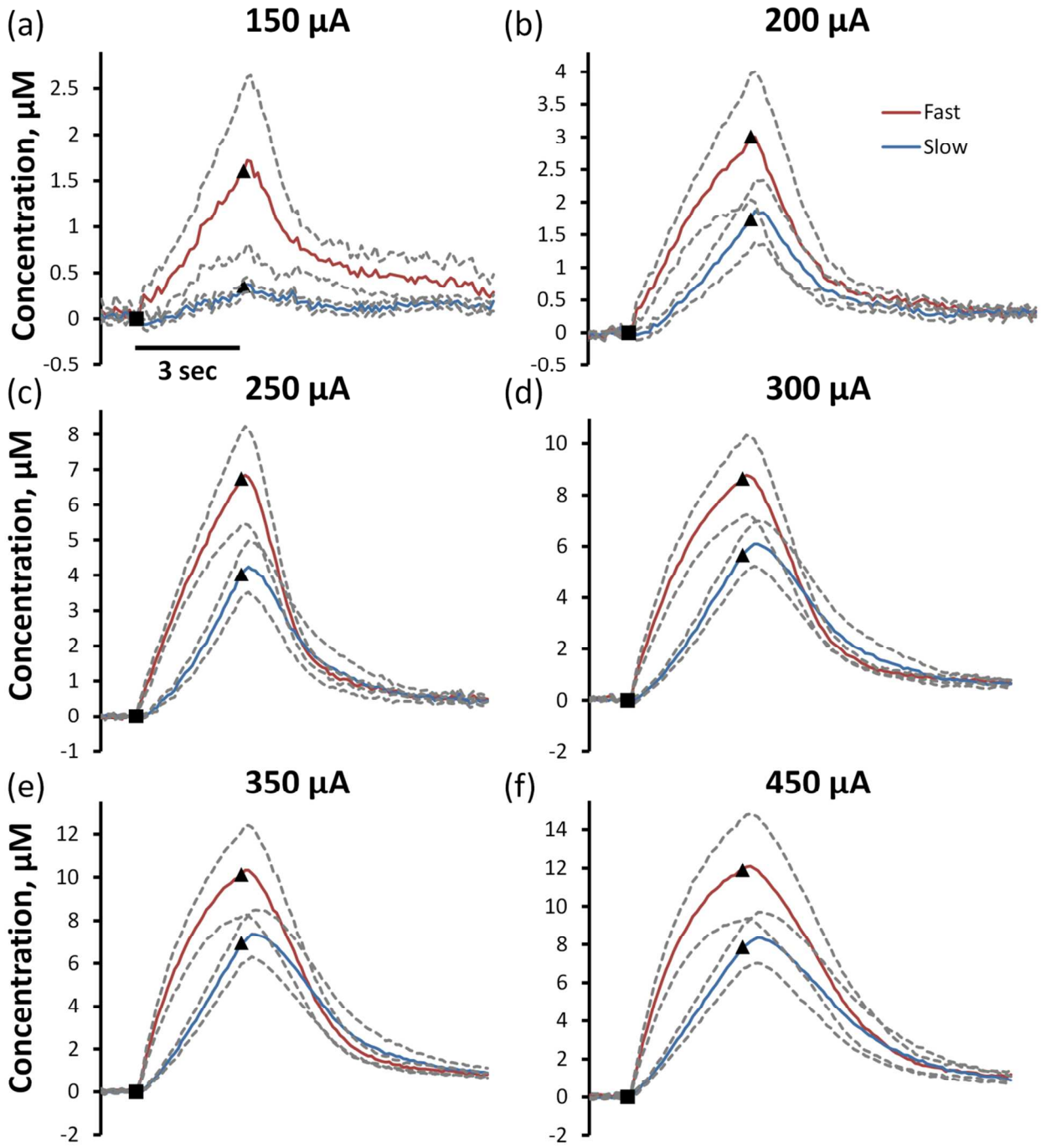
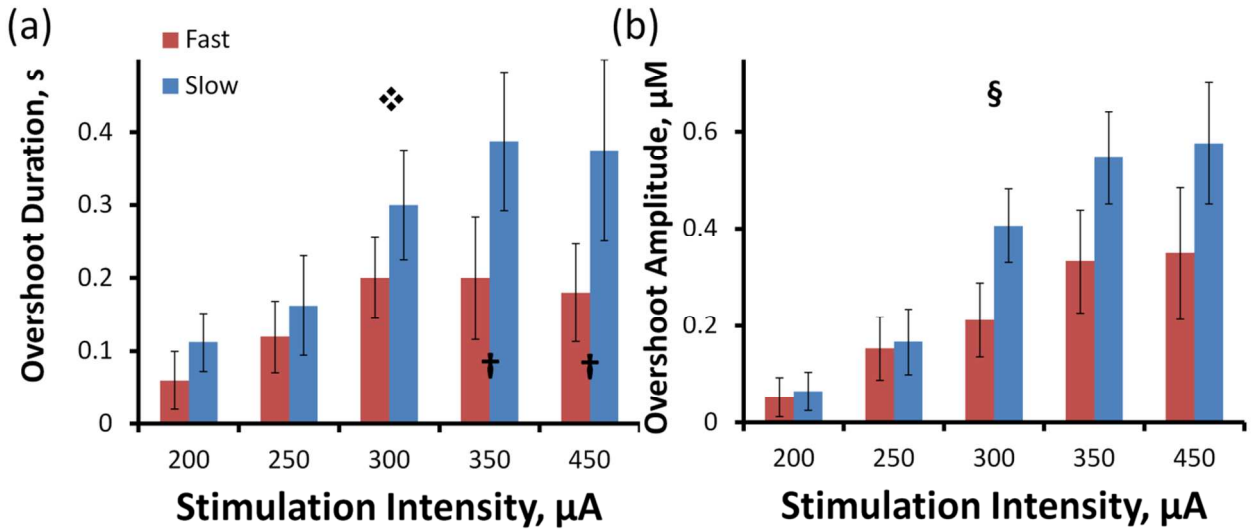
Supplementary Information



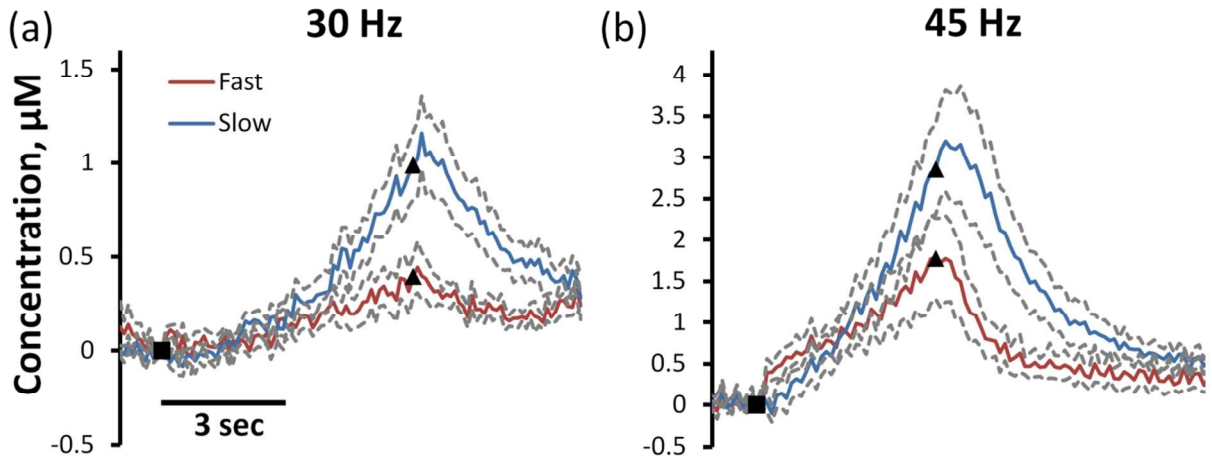
Supplementary Fig. 1 Supplementary Fig 1 contains the same data as Fig 1 of the main text presented in a different format to aide comparison of the domain-dependent evoked responses at each current intensity (150-450 µA, 60 Hz, 3 s). The solid lines are the average of multiple responses recorded in

multiple rats in objectively identified fast (red, n=5) and slow (blue, n=8) domains: the dashed lines are confidence intervals based on standard errors: the solid symbols mark the beginning (square) and ending (triangle) each stimulus. The previously-identified [20, 22, 23] hallmark features of responses recorded in fast domains include (i) immediate DA release when the stimulus begins, (ii) short-term depression with the rate of evoked response decreasing as the stimulus proceeds (except at the lowest stimulus intensity, 150 µA), and (iii) rapid DA clearance compared to the slow domains (based on the apparent V_{max}, see main text). Responses in slow domains exhibit (i) an initial delay in the onset of DA release when the stimulus begins, (ii) short term facilitation with the rate of evoked response increasing as the stimulus proceeds, and (iii) slow DA clearance compared to the fast domains.



Supplementary Fig. 2. This figure summarizes the duration (a) and amplitude (b) (mean ± SEM) of the overshoots observed at the end of 3-s stimuli over a range of stimulus intensities (the responses themselves are contained in Fig 1 of the main text and Supplementary Fig. 1). Both the duration and amplitude of the response overshoots increase significantly with stimulation intensity (2-way ANOVA with repeated measures: ❖ stimulation intensity $F(1,4) = 6.640$, $p < 0.0005$; **§** stimulation intensity $F(1,4) = 5.842$, $p < 0.0002$). At the higher stimulation intensities of 350 and 450 µA, the overshoot duration is

significantly larger in the slow domains compared to the fast domains († post hoc tukey test comparison, $p < 0.05$). Responses reported in our previous studies of fast and slow domains contain relatively little evidence of overshoot, except after uptake inhibition. However, those studies mainly involved shorter stimulus durations at a stimulus intensity of 240 or 270 µA: such stimulus conditions keep DA overflow at a relatively low magnitude, which explains why overshoot was less apparent.



Supplementary Fig. 3. Supplementary Fig 3 contains the same data as Fig 3 of the main text but in a different format designed to aid comparison of the responses recorded in fast and slow domains at 30 (a) and 45 Hz (b). The response in slow domains at 30 Hz is highly asymmetric, exhibiting an initial delay of 2-3 s but a much shorter delay with the stimulus ends. The conventional model of evoked responses does not predict these asymmetric delays when the stimulus begins and ends [(23)]. Likewise, the conventional model does not predict that the delays should be affected by the stimulus conditions.