

The neural correlates underlying conflict resolution performance using a rodent analogue of the Stroop task

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Introduction

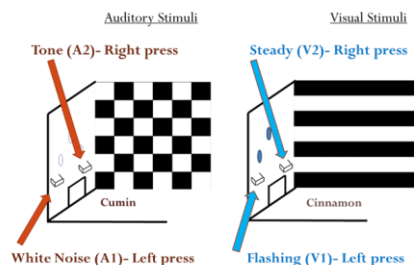
The Stroop task is a widely used task measuring attention and conflict resolution, which shows sensitivity across a range of diseases, including Huntington's disease (HD). A rodent analogue of the Stroop task, the 'Response-Conflict task', allows for systematic investigation of the neural systems underlying performance in this test.

The aim of this study was to determine whether neural regions relevant to HD are utilised during conflict resolution. 'Control' cortical regions were also included to validate the success of the procedure.

Methods

Listerhooded rats were trained on the operant Response-Conflict task for 23d to >80% accuracy. The set-up is depicted in Figure 1.

Tests of 'congruent' stimuli and 'incongruent' stimuli were undertaken and rats were perfused 90 mins post-test session. Brain tissue was analysed for nuclear zif268 expression to determine the patterns of neural activation elicited by the cognitive tests. LP=lever, A=auditory, V=visual



	Context			
	Check + cumin		Stripe + cinnamon	
	LP1	LP2	LP1	LP2
Pre-training	A1	A2	V1	V2
rRCT Control	A1V1	A2V2	A1V1	A2V2
rRCT Incongruent	A1V2	A2V1	V1A2	V2A1

Figure 1. Experimental design

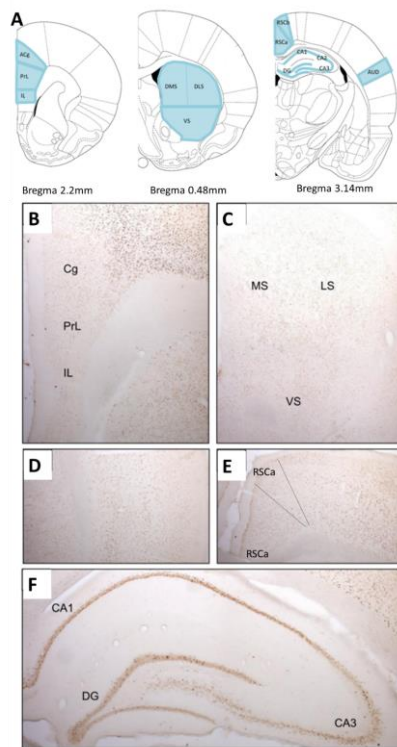


Figure 2. (A) Regions of interest. (B-F) Zif268 immunohistochemistry

Results

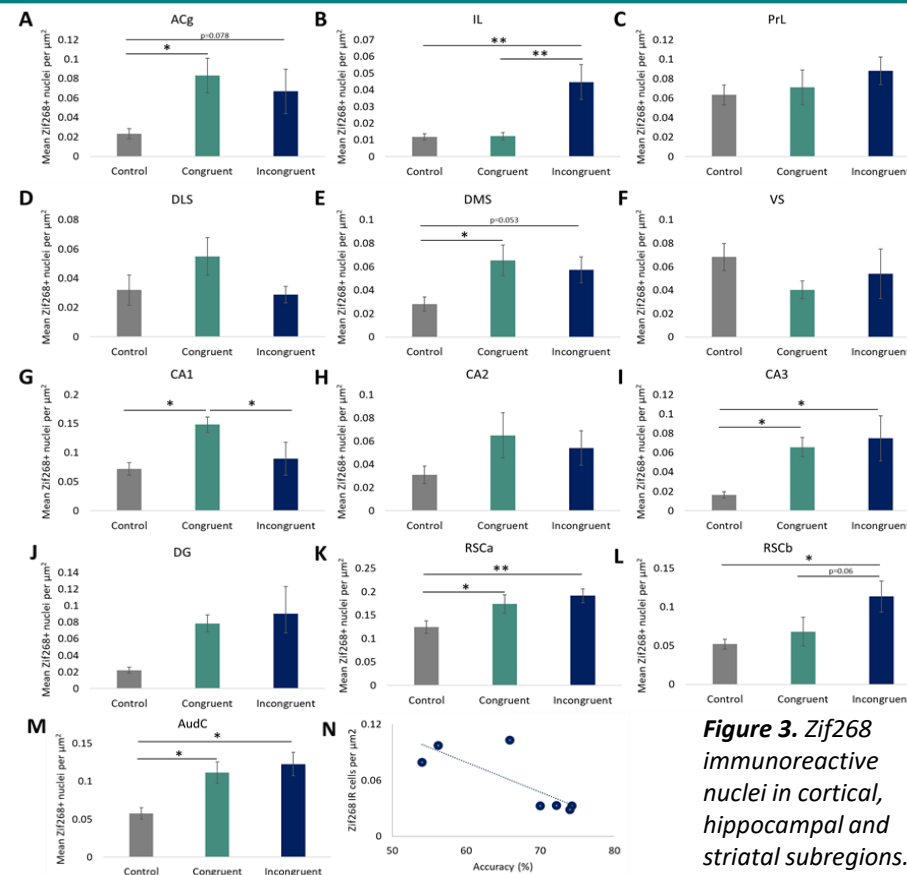


Figure 3. Zif268 immunoreactive nuclei in cortical, hippocampal and striatal subregions.

Conclusions

Our data are consistent with previous reports of IL and ACg cortical involvement. We reveal novel findings in recruitment of the DMS subregion of the striatum, and in both regions of the RSCa/b cortex in performance on this task. Specific conflict resolution performance (incongruent stimuli) was associated with infralimbic and retrosplenial cortex b involvement.