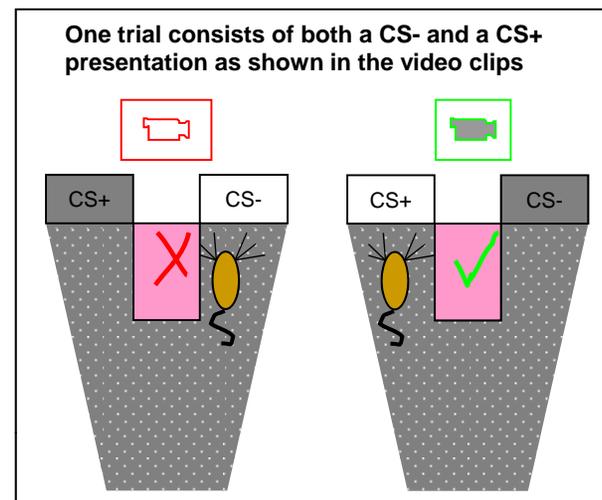
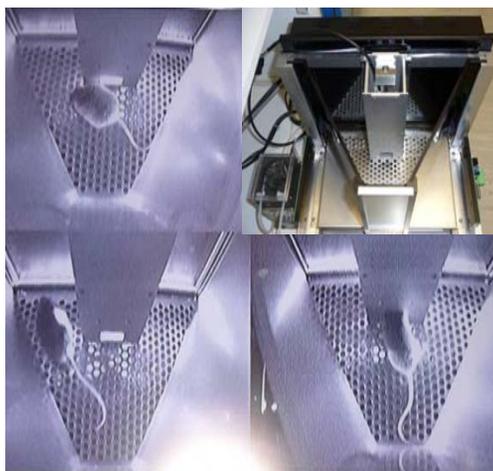
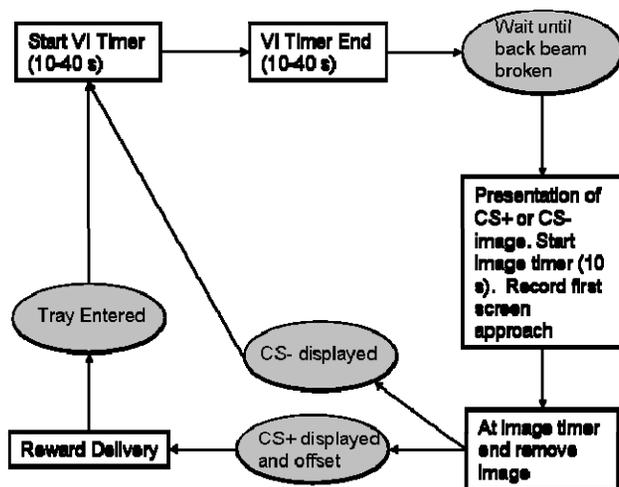


Autoshaping and VDR in  
Campden Instruments  
Touchscreen Chambers for Mice



# Autoshaping: Protocol

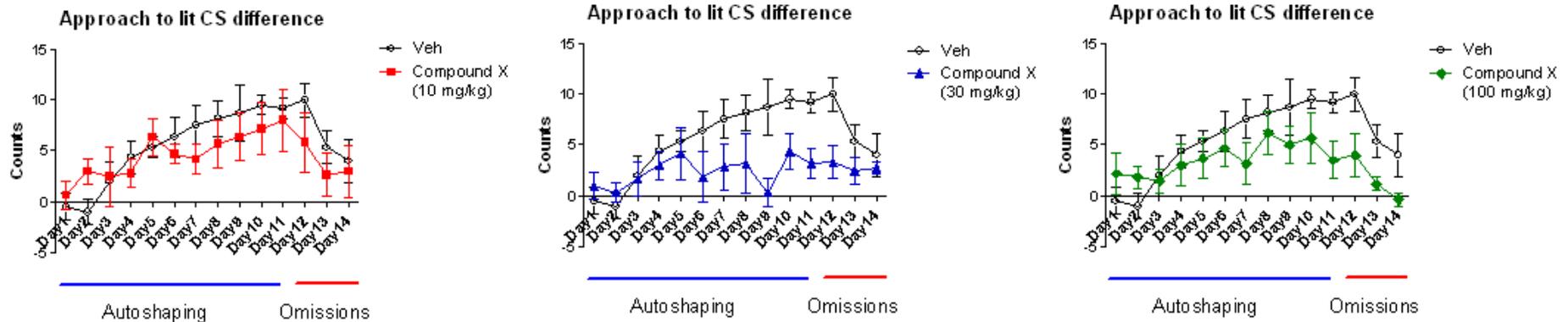


The Autoshaping task measures a Pavlovian response to the screen. This is a very rapidly administered test of simple classical conditioning, dependent on a reward system centered on the ventral striatum, that can be used for both phenotypic characterisation or compound screening.

For this task the reward tray is placed directly in front of the screen. White vertical rectangles are presented on the screen (10s), on a variable interval schedule (10-40s), to the left or the right of the reward tray. One side will always be followed by delivery of food to the reward tray (CS+); the other is never followed by a reward (CS-). Food reward does not depend on the mouse approaching the screen. Approaches to the screen are measured via an IR beam detector either side of the food tray. Mice receive one session of 40 trials per day until criterion is reached.

Over a period of sessions, mice should develop a conditioned discriminative response to approaching the CS+

# Autoshaping: Compound X



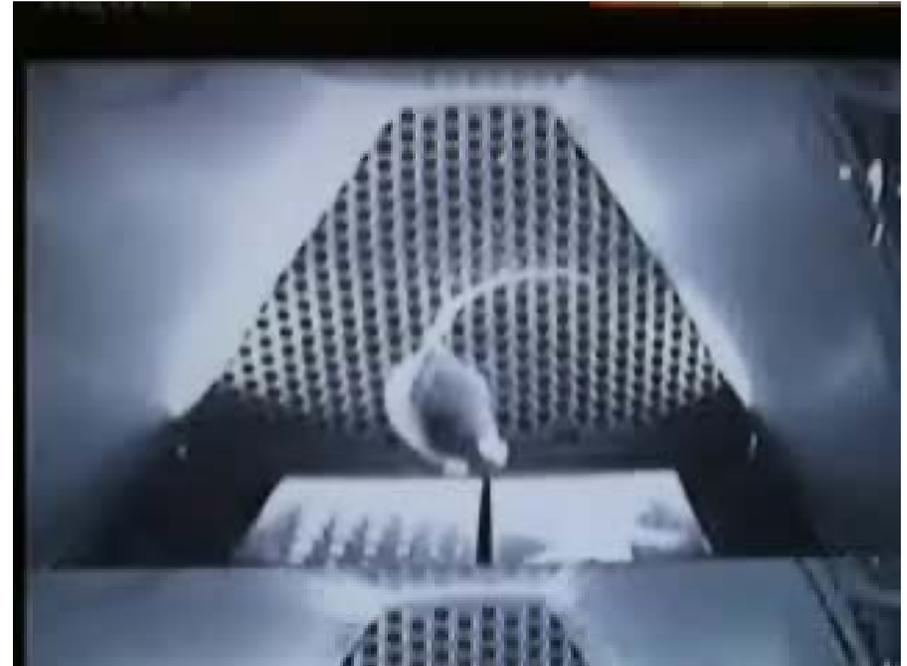
Across sessions, vehicle treated C57Bl/6 mice develop a conditioned discriminative response to approaching the CS+ (significantly above chance), suggesting that the mice have learned the association between the CS+ and the reward.

Compound X dosed at 10, 30 and 100 mg/kg (i.p. 1hr prt) reduced the difference between lit CS- & CS+ approaches across the 11 days of autoshaping. The maximal effects were seen with the 30 mg/kg dose, with both 10 and 100 mg/kg appearing to be less potent. Additionally, the omissions data for the vehicle group show a Pavlovian response on day 12 with performance dropping off at days 13 & 14. The 30 mg/kg group however appear to show no change in behaviour during the omissions phase. These data point towards a cognitive reducing effect of Compound X with the greatest effect at the intermediate dose

# Visual Discrimination & Reversal: Protocol

The VDR task involves learning that one of two shapes displayed simultaneously on the screen is correct. Touching the correct stimuli (S+) will be rewarded by delivery of food to the reward tray. Touching the incorrect stimuli (S-) will start a timeout period before the next trial can be initiated. The position of S+ can be in the right or the left window of the mask and will change randomly through out the task. Once the task has been learnt the stimuli are reversed, so that the S+ stimuli now becomes the S- stimuli and vice versa.

This reversal learning requires inhibition of prepotent responses and is known to be dependant on the prefrontal cortex.

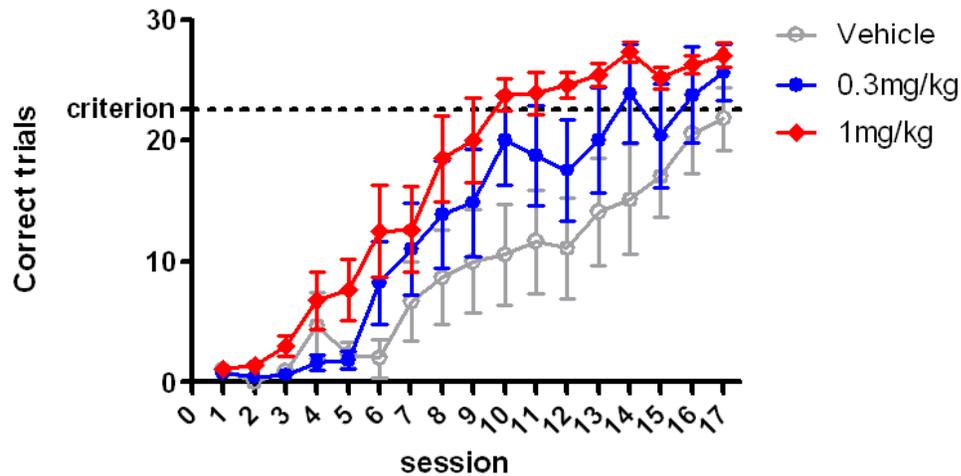


## Protocol:

1. *Habituation*
2. *Pretraining*
  - (learning to touch screen for reward & Punished for mistakes)
  - Once training criteria is reached (~2 wks), each mouse is moved onto the following:
3. *Visual Discrimination*
  - Two novel stimuli are displayed, one is programmed as being correct, and one as incorrect (In the video clip above 'marbles' is the CS+, 'fan' CS-).
  - The mouse must nose poke the correct stimuli to elicit the reward.
  - If the incorrect stimulus is poked this evokes a punishment (house light turned on, no reward).
  - Reversal learning

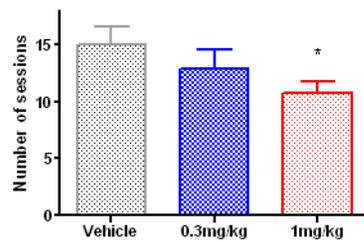
# Visual Discrimination & Reversal: Compound Y

No. Correct Trials / Session



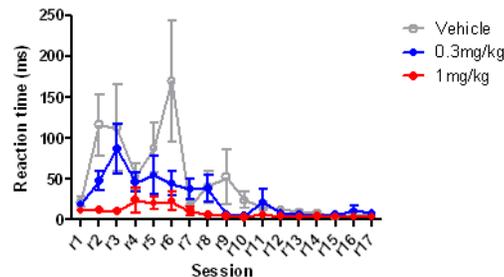
Main effect of treatment (Veh vs. 1mg/kg)  $p < 0.05$

Number of sessions to 75% correct criterion



\* Vehicle vs. 1mg/kg  $p < 0.05$

Stimulus Reaction Time



Marginal main effect of treatment (Veh vs. 1mg/kg)  $p = 0.076$

After acquisition training, 129SvEv mice were dosed i.p. with Compound Y at 1 mg/kg or 0.3 mg/kg or with saline, 1 hour prior to each reversal session

Mice receiving 1 mg/kg dose showed significantly improved performance over saline group

- No performance differences present at beginning of reversal phase
- Rate of learning in 1mg/kg group enhanced relative to vehicle group
- Good dose response pattern – intermediate dose yields an intermediate effect on performance for all parameters shown.

Data indicates Compound Y is a potential cognitive enhancer.