Abstract: 151P

Establishing a platform mediated avoidance paradigm in male rats

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Fear and anxiety are experienced in response to threats to well-being and they promote behaviours that benefit survival. However, fear and anxiety can become maladaptive when they occur in response to non-threatening stimuli or occur in response to threatening events in a way that interferes with normal function. Avoidance allows an animal to avoid or disengage with areas or stimuli associated with danger or threat, it is fundamental to survival in most animals and is a key feature of human fear and anxiety in which excessive avoidance is a hallmark and diagnostic feature of several mental illnesses. This study took advantage of a novel behavioural paradigm; platform mediated avoidance (PMA) to explore this important behavioural consequence of fear and anxiety. After 2 days of habituation (10 minutes per day) to a behavioural box, male Sprague Dawley rats were conditioned to associate a 30 second tone with a negative event, a co-terminating 2 second foot shock. However, unlike standard fear-conditioning protocols, in PMA the rat could avoid the foot shock by stepping onto a Perspex platform. To encourage rats to leave the safety of the platform, palatable food was placed at the furthest distance from the platform. Each rat was trained for a total of 10 days, experiencing a total of 9 tone-shock pairings each day. Testing occurred on the 13th day and involved presentation of the tone in the absence of shock. Avoidance was measured at three different time points: during a 300 second pre-tone period, during the 30 second tone and finally whether the animal avoids shock by having all 4 paws on the platform in the final 2 seconds. Compared to control rats (same training but without shock), the shock-group spent more time on the platform during a 300 second pre-tone period (n =12, shock =155.7s ± 16.03; n = 8, control = 34.39s ± 9.5; t=5.706; p=0.0001) and spent more time on the platform during the 30 second tone (n=12, shock; 21.55s ± 2.96 n = 8, control; 4.17s ± 2.16 t=4.293 p=0.0004). In addition, 8 out of 12 animals avoided the shock delivered in the final 2 seconds of the tone. Two hours after tone presentation on test day, all rats were deeply anaesthetised (isoflurane followed by pentobarbitone, i.p.) and transcardially perfused with 4% formaldehyde. Fixed brains were then sectioned and immunolabeled for Fos protein (a marker for neuronal activation) to explore brain regions involved in expression of PMA. Ultimately, we plan to use PMA to determine the role that vasopressin may play in the expression of learned avoidance behaviour.