British Association of Psychopharmacology In-Vivo Research Project

Mood disorders cost the EU €113.4 billion per year (Gustavsson et al. 2011), however improvement of antidepressant treatments is hindered by the lack of translational rodent models of depression. Studies in depressed patients suggest they exhibit negative affective biases, which influence reward learning and memory. The affective bias test (ABT) and conditioned place preference (CPP) test aim to replicate these biases in animals and may provide a translational model for future research into depression.

Throughout my 8-week in-vivo research project funded by the BAP, I investigated the role of affective biases in learning and memory and the effects antidepressants have on this. With supervision from Dr Emma Robinson, Dr Sarah Stuart and Dr Marcus Munafò, this was tested using 12 CD1 mice in the conditioned placed preference assay. The aims of my investigations were to determine whether associative reward-based learning differs as a result of affective state in rodents, and if the serotonin and noradrenaline-reuptake inhibitor venlafaxine affects this learning and memory.

Experiments were completed using three odour-paired substrates, in a three-compartment testing arena. Firstly, 2vs1 CPP tests were completed with one odour-substrate being paired with 10 sucrose pellets, one with 5 sucrose pellets, and one blank, to cause affective biases in learning and memory. Following 4 pairing sessions, a preference test was completed on day 5 in which the time spent in each side of the testing arena, and the entries into each side were measured. This method was then repeated using a restraint stress-paired substrate as a mouse model of depression, with both baited substrates containing 5 sucrose pellets. The final CPP test involved the use of venlafaxine (5mg/kg) administered via 0.1ml strawberry milkshake, to determine whether antidepressant therapy can cause an affective bias.

The 2vs1 CPP tests gave promising results suggesting mice can be used in antidepressant research as they showed mice develop affective biases, and data support previous ABT completed in rats (Stuart et al. 2013).

Restraint stress, and venlafaxine CPP however did not prove to be effective therefore suggesting CPP is not a suitable alternative to ABT.

This project gave me the chance to complete in-vivo research and contribute to on-going translational work. From this I gained research skills and animal handling and data handling skills, which will be valuable to my career in research. I would like to thank the BAP and my supervisors for this experience.

References:

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