5-HT$_{1A}$ receptor-mediated effects on feeding and on periprandial behaviour

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Contribution statement

I conducted, either alone or with technical support, the experiments described in this thesis.

Abstract

This thesis aimed to study the effects of the $5HT_{1A}$ receptor agonist, 8-OH-DPAT and related $5HT_{1A}$ receptor ligands on prandial and periprandial behaviours. Time sampling analysis of prandial behaviours was used to study the effects of partial satiation (pre-feeding) in the rat, mouse and guinea pig. These data established that a behavioural satiety sequence (BSS) could be successfully demonstrated for the rat and mouse.

Studies of the effects of 8-OH-DPAT on food intake and BSS in rats and mice identified that in the mouse unexpectedly large doses of 8-OH-DPAT were required to increase food intake, doses that also disrupted behaviour. However, in the rat 8-OH-DPAT increased feeding and decreased grooming but did not give a clear delay in the onset of resting. Thus, although there was no gross disruption of the satiety sequence of behaviours these data argue against inhibition of a pre-feed-induced satiety signal.

A procedure was developed, an extension of the BSS, where grooming was enhanced by water spray applied to the rat. Using this paradigm low doses of 8-OH-DPAT and other $5HT_{1A}$ receptor ligands were shown to reduce spray-induced grooming, inhibition of which was dissociated from post-prandial grooming.

WAY-100135, a $5\text{-}HT_{1A}$ receptor antagonist attenuated 8-OH-DPAT-induced hyperphagia but not inhibition of grooming. However, the selective $5\text{-}HT_{1A}$ receptor antagonist, WAY 100635, blocked the effects of 8-OH-DPAT and increased grooming per se. Neither antagonist decreased feeding when given alone under conditions of either high or low basal intake.

From these studies a method for examining $5\text{-}HT_{1A}$ inhibition of grooming was developed allowing the underlying mechanisms mediating 8-OH-DPAT effects on feeding and grooming to be dissociated. $5\text{-}HT_{1A}$ mediated feeding appears to be an integration of complex processes whereas grooming may be under more straightforward control with $5\text{-}HT_{1A}$ antagonists increasing and $5\text{-}HT_{1A}$ agonists inhibiting grooming. Support was not found for the proposal that 8-OH-DPAT blocks a satiety signal.

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