ABSENCE IN MICE OF A DIURNAL VARIATION IN $5HT_{1A}$ RECEPTOR FUNCTION

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It is well established that 5-hydroxytryptamine (5HT) metabolism varies throughout the day. In addition, Bruiniuk et al (1983) have demonstrated that $5HT_2$ receptor binding exhibits a diurnal variation, as does receptor function (Marsden et al 1985). Here, we present data demonstrating that the decrease in mouse rectal temperature induced by the $5HT_{1A}$ receptor agonist 8-hydroxy-2(di-n-propylamino)tetraline (8-OH-DPAT) does not vary throughout the day.

Male BK.TO mice (30-40 g) were housed under a 12:12 h light-dark cycle and allowed free access to food and water. Groups of 5 animals were taken 3 and 8 hours after the onset of the light period (L3 & L8) and 2, 5 and 10 hours after the onset of darkness (D2, D5 & D10) when a rectal temperature probe was inserted to a distance of 1 cm into the rectum. Animals were then injected with 0.9% saline (4 mls/kg s.c.) or 8-OH-DPAT (1 mg/kg s.c.). The rectal temperature was noted just prior to injection and every 10 minutes following injection for one hour.

A significant diurnal variation in rectal temperature was observed (ANOVA, $P<0.001$), with the maximum temperature observed at D5 ($35.88\pm0.05^{o}C$, n=5) and the minimum at L8 ($34.81\pm0.03^{o}C$, n=5). Injection of 0.9% saline did not affect the temperature at any time, whereas the rectal temperature fell significantly ($P<0.01$) following injection of 8-OH-DPAT. The decrease was greatest 30 min after the injection and of the same order at each time tested (usually $\sim2^{o}C$) and with identical time courses. The rectal temperatures observed 30 min after injection of either 0.9% saline or 8-OH-DPAT are shown in Table 1.

TABLE 1.

TIME OF DAY	L3	L8	D2	D5	D8
TREATMENT					
Saline (4 mls/kg)	35.50±0.10	34.79±0.10	35.33±0.05	35.93±0.04	35.74±0.05
8-OH-DPAT (1 mg/kg)	33.32±0.05	32.71±0.06	33.34±0.09	33.95±0.05	33.74±0.06

Data are expressed as mean±s.e.m. of 5 observations. Two-way analysis of variance on the above data revealed that there were significant ($P<0.001$) diurnal variations in rectal temperature after both treatments. However, there was no significant relationship between the responses to 8-OH-DPAT and the time of day. In other words there was no diurnal variation in the magnitude of the response to 8-OH-DPAT.

In conclusion, the data presented here demonstrate that the functional response to $5HT_{1A}$ receptor stimulation does not vary throughout the day. This is in marked contrast to the data that we have previously reported concerning the behavioural response to the $5HT_1$ receptor agonist RU 24969 which exhibited a clear diurnal variation (Marsden et al 1985). It seems unlikely then, that these two compounds are acting on the same 5HT receptor, which in the case of RU 24969 is probably a pre-junctional autoreceptor (Marsden & Martin 1985).

We thank the Wellcome Trust and the M.R.C. for financial support.

Bruiniuk, A. et al (1983) Life Sci. 33: 31-38.
Marsden, C.A. et al (1985) Br.J.Pharmac. in press.
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