tion, of the females is important during copulation behavior[13-20]. Only in the wolf spider *Trochosa singoriensis* there is evidence in favour of olfactory stimuli guiding the males towards the females[21]. There is no reaction of tarsal organs to odor of prey. Olfactory recognition of the prey is therefore unlikely as also shown in behavioral experiments[22]. In these experiments blinded *Cupiennius salei* did not react to motionless prey *(Calliphora),* even when walking past it with a tarsus as close as 1 cm.

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Effects of brain monoamine depletion on thermoregulation, active avoidance, and food and water intake in rats[1]

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Summary. Intraventricular administration of 6-OHDA or 5,6-DHT suppressed food intake, whereas their effect on active avoidance produced a suppression with the former and an enhancement with the latter. The increased water intake was specifically associated with 5,6-DHT treatment in rats.

The use of neurotoxins including 6-hydroxydopamine (6-OHDA) and 5,6- or 5,7-dihydroxytryptamine (5,6- or 5,7-DHT), to destroy either catecholamine (CA) or 5-hydroxytryptamine (5-HT) nerve terminals and axons more or less specifically, provides a unique opportunity for examining the role of the brain monoaminergic systems played in physiology and behavior[2-4]. However, the observations made by various authors were not always consistent. For example, Myers[5] and Waller et al.[6] claimed that monkeys and rats treated with intrahypothalamic injections of 5,6-DHT showed acute increases in body temperature when exposed to warm or cold environment. In contrast, Lin and Stitt[7] and Lin[4] demonstrated that rabbits treated with intraventricular injections of 5,7-DHT were capable of maintaining their body temperature within normal limits. Similarly, the role of brain 5-HT in mediating avoidance behavior remains to be ascertained. Intracisternal injections of 5,6-DHT was found to facilitate learning an active avoidance task in rats[8], yet intrabrain stem injections of 5,7-DHT had no effect[9].

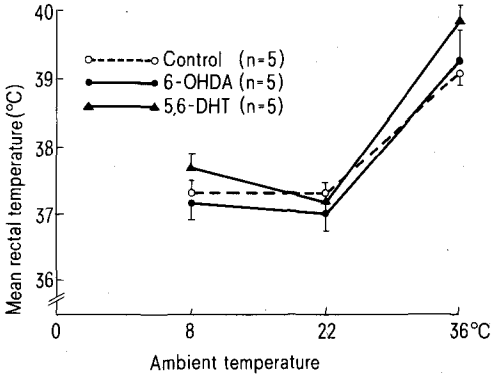

Fig. 1. The maximal changes in rectal temperature of groups of control, 6-OHDA treated and 5,6-DHT treated rats, 5 for each group, after 1 h of heat (36 °C) or cold (8 °C) exposure. Both amine-depleted rats maintained their rectal temperatures within normal limits.

This study was a concerted effort to detect any changes in thermoregulation, shock avoidance and food and water intake in rats following destruction of the CA or 5-HT pathways within the CNS with 6-OHDA or 5,6-DHT respectively.

43 male rats of Sprague-Dawley strain ranging between 250 and 350 g at the time of surgery, served as subjects. The rats being housed individually in wire-mesh cages in a room at 25±1 °C with natural light-dark cycles were given free access to tap water and granular young chicken feed. Food and water intake and b.wt were measured daily at 10.00 h.

3 separate experiments were carried out using 3 groups of rats for each experiment. The 3-groups consisted of a) sham-treated control rats, b) rats with intraventricular administration of an aliquot of 100 µl containing 100 µg of 5,6-DHT, resulting in lasting depletion of 5-HT in the CNS, and c) rats with intraventricular administration of an aliquot of 100 µl containing 200 µg of 6-OHDA, resulting in lasting depletion of CA in the CNS. Each of the rats had been implanted with an intraventricular cannula under general anesthesia according to the methods described previously[10]. Instead of the drugs, the sham-treated controls were injected with 100 µl of saline vehicle.

The 3 separate experiments for the 3 groups of rats were: a) food and water intake, b) temperature responses to thermal stress, and c) active shock avoidance.

The table summarizes the results of the 1st experiments, in which food and water intake before and after injection of saline vehicle, 6-OHDA or 5,6-DHT for the 3 groups of animals, consisting of 5 each, was measured. The sham-treated control animals had a temporary decrease of food intake during the first 6 days following the injection of saline vehicle, but it returned to the pre-injection level during the subsequent 6-day period. Their water/food ratio and weight gain were unaffected. The 6-OHDA treated

group showed a greater decrease both in food intake and in weight gain as compared to the control group. The 5,6-DHT-treated animals also had a decrease in food intake and weight gain, while a persistent increase of water/food ratio following the injection was evident.

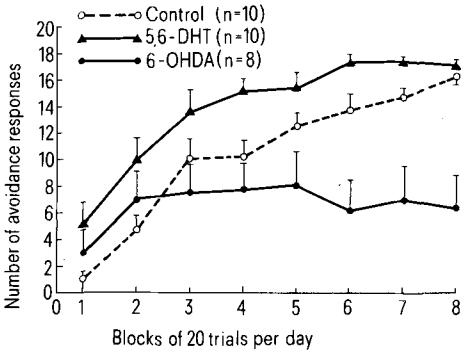

Fig. 2. The active avoidance responses of groups of control, 6-OHDA treated and 5,6-DHT treated rats at an ambient temperature of 22 °C. The 5,6-DHT treated rats were found to perform better than the controls in active task. In contrast, the 6-OHDA treated rats failed to acquire the avoidance.

Effects of intraventricular injection of normal saline, 6-hydroxydopamine (6-OHDA; 200 µg) and 5,6-dihydroxytryptamine (5,6-DHT; 100 µg) on daily food and water intake and daily weight gain in rats. Values are means ± SE

Animals	Pre-injection (6 days) Food (g)	Water (ml)	Water/food (ml/g)	Wt gain (g)
Sham-control (n = 5)	17.8 ± 0.9	21.2 ± 1.1	1.2 ± 0.08	2.8 ± 0.1
6-OHDA (n = 5)	17.6 ± 0.9	22.2 ± 0.5	1.3 ± 0.1	3.0 ± 0.1
5,6-DHT (n = 5)	17.0 ± 0.8	24.1 ± 0.7	1.4 ± 0.1	2.8 ± 0.1

Animals	Post-injection (1st 6 days) Food (g)	Water (ml)	Water/food (ml/g)	Wt gain (g)
Sham-control (n = 5)	14.2 ± 0.7*	21.3 ± 1.1	1.5 ± 0.1	2.7 ± 0.1
6-OHDA (n = 5)	11.2 ± 1.8*	14.0 ± 2.5	1.3 ± 0.8	2.0 ± 0.1*
5,6-DHT (n = 5)	8.9 ± 1.1*	22.8 ± 2.2	2.6 ± 0.9*	−(2.0 ± 0.1)*

Animals	Post-injection (2nd 6 days) Food (g)	Water (ml)	Water/food (ml/g)	Wt gain (g)
Sham-control (n = 5)	17.4 ± 1.3	23.4 ± 0.8	1.5 ± 0.1	2.7 ± 0.1
6-OHDA (n = 5)	14.3 ± 1.6*	17.0 ± 0.8	1.4 ± 0.2	2.2 ± 0.1*
5,6-DHT (n = 5)	14.4 ± 1.1*	26.9 ± 1.0	1.9 ± 0.2*	2.3 ± 0.1*

*Significantly different from the corresponding control value, $p < 0.05$ (Student's t-test).

Figure 1 depicts the results of the 2nd experiment, i.e. the maximal changes in rectal temperature of the 3 groups of rats, 5 for each, after 1 h of heat (36 °C) or cold (8 °C) exposure 6 days after injection. Both amine-depleted rats maintained rectal temperatures within normal limits, as also displayed by the sham-treated control group over a wide range of ambient temperatures.

The 3rd experiment used animals of 10 sham-injected, 10 treated with 5,6-DHT and 8 treated with 6-OHDA. All were tested with shock avoidance. In brief: They were individually put in a 2-way shuttle box (LeHigh Valley). A buzz signaled the coming of electric shock through the grid in 3 sec. An avoidance response was scored when the rat crossed the midline to the other half of the cage and thus terminated the buzz and the impending shock. They were given 20 trials per day for 8 consecutive days. As shown by figure 2, the 5,6-DHT-treated rats were found to perform better than the controls from the beginning, only to be caught up by the latter the 8th day. In contrast, the 6-OHDA-treated rats failed to acquire the avoidance. Results of this study indicate that 6-OHDA or 5,6-DHT by intraventricular administration suppressed food intake, whereas their effect on active avoidance dissociated with a suppression with the former and an enhancement with the latter. The findings are generally in agreement with earlier reports[8,11,12]. In this connection, a previous report that ventromedial hypothalamic (VMH) lesions enhanced and lateral hypothalamic (LH) lesions suppressed shock avoidance is of particular interest[13]. Since similar results were obtained by the 2 different approaches, it is tempting to speculate that 2 antagonistic systems exist in the CNS controlling avoidance behavior, and that either system subserving active avoidance may be selectively destroyed by 2 different methods. It is well known that destruction of VMH or LH induces hyperphagia or aphagia respectively[14]. Since only a hypophagia resulted from either 6-OHDA or 5,6-DHT treatment, mechanisms that subserve feeding and avoidance behavior are probably different but overlap in the hypothalamus. The increased water intake in terms of water/food ratio appeared to be specifically associated with 5,6-DHT treatment. The findings that the monoamine depleted rats showed no disruption of temperature regulation upon cold or heat exposure further strengthened the previous observations on rats[15] and rabbits[4,7].

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