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L. DI BELLA, G.C. MINUSCOLI & G. GUALANO

(Private Laboratory of Physiology, Via Marianini, 45, 41100 Modena, Italy).

D/L water intake by tumorous rats.

Tumour growth rate and water proton relaxation times correlate in human breast cancer (Weisman J.D. et al., *Science*, 1972, **178**, 1288; Saryan L.A., *J. Natl. Cancer Inst.*, 1974, **62**, 599; Beall P.T. et al., *Cancer Res.*, 1982, **82**, 4124). Tumours could, moreover, be detected by means of nuclear magnetic resonance (NMR) (Damadian R., *Science*, 1971, **171**, 1151; Bovée W. et al., *J. Natl. Cancer Inst.*, 1974, **52**, 595; Higer H.P. & G. Bielke Eds. *Tissue Characterisation in MR Imaging*, Berlin, Springer, 1990).

NMR lattice spin relaxation time is however lengthened not only in tumor tissue water, but also in apparently normal tissues of tumor-bearing animals (TBA), independently of the tumor seat. Since four in a group of 9 laboratory rats showed a rapidly growing cutaneous tumor, the L/D (L at 6 a.m., D at 6 p.m.) water intake was measured to verify eventual differences between the two groups. The daily water intake was not found significantly reduced in TBA versus normal rats; but the L/D rhythm of water intake was mostly irregular.

Since the tumor mass formed over 30% of the b.w., the water turnover is the result of body and tumor metabolism. Since all the rats had lived for over two years in identical conditions, the non-TBA behaviour probably adapts to a precancer, although no tumor trace was apparent.

L. DI BELLA, G.C. MINUSCOLI & G. CUALANO

(Private Laboratory of Physiology, Via Marianini, 45, 41100 Modena, Italy).

Effect of melatonin on circadian water intake by normal and tumor-bearing rats.

The Dark-Light (DL) water intake rhythm by rats can be reversed by parenteral Melatonin (MLT), according to administration time. We have investigated the effect of i.p. MLT injection in normal (n=5) and cutaneous tumor-bearing rats (CTBR) (n=4).

All the rats had been kept for two years in identical dietetic and surrounding physical conditions. Their weight was $470,5 \pm 92,94$ g. in CTBR, and $387,8 \pm 45,2$ g. in normal rats.

All rates ate the same ad libitum balanced diet. MLT, dissolved with adenosine in distilled water, was injected in late afternoon i.p. at dosage 0,0519 mg./100 g b.w. in CTBR and 0,063 mg/100 g. b.w. in normal rats.

Water was drunk from 4 water glasses fastened along one side of the cage, which were weighed at 6 a.m. and p.m. The following results were obtained. (1) D/L water intake difference is higher in normal than in CTBR. (2) There seems to be some gradual habituation to successive MLT treatment. (3) L-water intake is less influenced by MLT injection than D-water intake.

The results seem to indicate that water of normal tissues is in a different lattice from water of CTBR tissues, and is moderately influenced by MLT. The lengthening of the NMR lattice spin relaxation time would support this suggestion. An at least partial role in this phenomenon of tumor pathogenesis is probably exerted by vasopressin, which is synthesized by tumor tissue (W.G. North et al., *Ann. N.Y. Acad. Sci.*, 1994, **689**, 107-121).