catecholamines are not detectable in the arterial blood, as is demonstrated by the electrophoretogram of a corresponding blood sample taken during the same time interval from the aorta abdominalis (Figure 1d).

Figure 2 demonstrates the content of H^3-dopamine and of H^3-norepinephrine in different samples of the venous blood from the adrenals as a function of time after H^3-tyrosine injection. Between 0 and 30 min the concentration of H^3-dopamine and of H^3-norepinephrine increases continuously, and is nearly constant between 30 and 45 min. H^3-norepinephrine concentration reaches values up to $3^0/_{00}$, H^3-dopamine up to $1.8^0/_{00}$ of the total radioactivity. However, in the first sample there is more H^3-dopamine than H^3-norepinephrine, a fact which is easily understood in view of the precursor nature of dopamine.

Besides its occurrence in the venous blood, H^3-dopamine could also be demonstrated in the adrenal gland itself. It represented about 50% of the newly synthesized H^3-catecholamines. Contrary to AXELROD et al.[13], we failed to detect 3-O-methylated catecholamine derivatives in the gland.

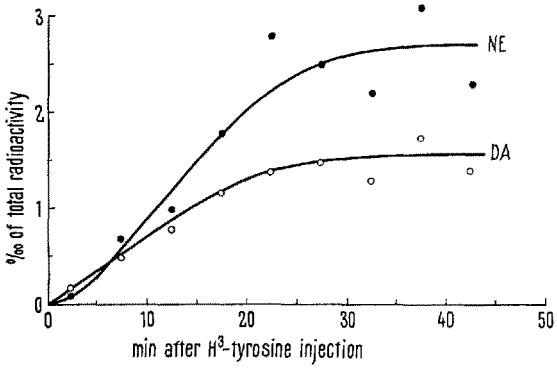

Fig. 2. Concentration of H^3-dopamine (DA) and H^3-norepinephrine (NE) in the venous blood from the adrenals as a function of time after i.v. H^3-tyrosine injection. The total radioactivity of the electrophoretograms was taken as 100%.

Radioactive dopamine was also present in the other organs investigated. The amount of dopamine, expressed as percentage of the total radioactivity of the acid soluble fraction, represents 0.80% in the heart, 0.20% in the spleen, liver and cortex cerebri, 0.17% in the brain stem, and 0.04% in the cerebellum and in the lungs.

The experiments reported here show that dopamine is not only an intermediate in epinephrine biosynthesis in the adrenal gland but also a regular constituent of catecholamines secreted by the adrenal medulla. The biological role of the dopamine secretion cannot be elucidated at this stage. Though dopamine has only little and short lasting pharmacological effect after i.v. administration[14], it must be considered that the fate of secreted dopamine could be influenced by a specific protein binding as suggested recently for catecholamines[15,16].

Zusammenfassung. In Kurzzeitversuchen mit Katzen wurde nach i.v. Injektion von H^3-Tyrosin radioaktives Dopamin im venösen Blut der Nebenniere sowie im Organ selbst nachgewiesen.

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Tumour Glucose-6-Phosphate Dehydrogenase Inhibition by Actinomycin

The pentose cycle, an alternative pathway to the Krebs tricarboxylic acid cycle for aerobic breakdown of glucose-6-phosphate, has been considered by some authors to be more important in neoplastic than in normal tissue[1-5]. The first enzyme participating in this shunt is glucose-6-phosphate dehydrogenase (G-6-PD)[6,7], the activity of which has also been shown by some to be higher in cancer tissues than in their normal counterparts[3,8-10]. Indeed, as suggested by SAHASRABUDHE[5], the high rate of synthesis of nucleic acids in tumours could result in the acceleration of this route for pentose phosphate production. Conversely, inhibition of this cycle or one of its steps might conceivably also inhibit tumour proliferation.

Previous studies using a heterotransplanted human adenocarcinoma (H.Ad.) of probable colonic origin growing in the cheek pouch of unconditioned golden hamsters (*Mesocricetus auratus*), H.Ad. No. 1, showed that tumour-inhibitory doses of actinomycin C resulted in a significant inhibition of tumour G-6-PD activity; corresponding liver G-6-PD activity remained, however, unaffected[11]. In view of the similar chemosensitivity of another heterotransplantable human colonic tumour (GW-39) to H.Ad. No. 1[12,13], it was of interest to determine whether this

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G-6-PD inhibition could be demonstrated for this second bowel tumour system.

The methods for transplantation and chemotherapy of GW-39, as well as for spectrophotometric assay of G-6-PD activity, have been described elsewhere[11–13]. Table I presents the results of 2 experiments using well tolerated doses of actinomycin C (Sanamycin®, Bayer). Tumour inhibition has been calculated by comparing mean increase in tumour size, based on the first measurement of tumour volume 6–7 days after transplantation, between treated and control groups of tumours on the day of enzyme extraction. All enzyme determinations were performed between 24 and 36 h after the last i.p. injection of actinomycin. Enzyme activity is expressed in IU/mg total nitrogen. As can be seen, tumour inhibitory doses of actinomycin once more significantly inhibit G-6-PD activity. Liver enzyme levels of the same animals, however, again showed no significant change due to actinomycin therapy (Table II), thus reconfirming the tumour-specificity of this effect.

Table I. G-6-PD activity of GW-39 tumours after actinomycin C therapy

Daily dose mg/kg	Days treated	No. of tumours assayed	Tumour G-6-PD activity (± S.D.)	Significance[a] (P) treated vs. controls	Tumour growth inhibition (%)
0.06	7	6	37.9 ± 4.6	< 0.001	47
controls		5	86.7 ± 12.2		
0.08	7	5	55.9 ± 13.1	< 0.005	59
controls		5	89.6 ± 14.4		

[a] P according to Student's t test.

Table II. Hamster liver G-6-PD activity after actinomycin C therapy

Daily dose mg/kg	No. of livers assayed	Liver G-6-PD activity (± S.D.)	Significance (P) treated vs. controls
0.06	3	27.5 ± 8.8	0.1
controls	3	39.8 ± 3.1	
0.08	4	57.2 ± 16.4	0.9
controls	4	55.6 ± 7.7	

These results present additional evidence for the correlation between the high anti-tumour activity of actinomycin in such human colonic cancers and tumour G-6-PD inhibition. No cause-and-effect relationship, however, can be postulated at this time. Indeed, a primary effect of actinomycin on DNA-directed synthesis of RNA[14,15] might secondarily affect this enzyme, a point which should be clarified by testing other template-inhibiting active and inactive anti-tumour compounds[16].

Zusammenfassung. Die Aktivität der Glukose-6-phosphat-Dehydrogenase (G-6-PD) wurde in Extrakten des heterotransplantierten Humantumors GW-39 nach cytostatischer Therapie mit Actinomycin C untersucht. Es kam zu einer signifikanten Hemmung der G-6-PD-Aktivität in den Tumoren, während die Enzymaktivität in der Leber der tumortragenden Wirtstiere (Hamster) unbeeinflusst blieb. Diese Ergebnisse entsprechen unseren, an einem histopathologisch ähnlichen Humantumorsystem (H.Ad. No. 1) früher erhobenen Befunden und bestätigen damit den tumorspezifischen Enzymeffekt der Behandlung mit Actinomycin C.

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Micturition Behaviour of Neonatally Testosterone Treated Female Dogs

It is generally accepted that the pattern of activity of the hypothalamus-hypophysis axis can be changed or shifted to the so-called male type – lessened luteinizing hormone secretion and absence of cycles – when testosterone is injected during the first days of life. Female rats so treated are anovulatory and vaginal estrus is maintained[1].

This paper deals with another type of masculinization, through hetero-sexual change of the nervous centres controlling behaviour: the wellknown adult postural pattern of the dog at micturition. We have already shown (Martins and Valle[2–6]) that male dogs when early castrated (28–64 days of age) maintained through life their peculiar infantile attitude at micturition (IP)[7]. However, they shifted to the adult normal type of lifting one of the hind legs if treated with testosterone propionate (TP). We have also observed that infantile dogs treated with this hormone shifted to the adult male posture (AMP) earlier than the normal male controls. It is interest-

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