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Letter to the Editor

Pilot Studies on the Effects of a Phosphomolybdic Tungstic Acid Compound (PTMC) on Spontaneous Malignant Tumours in Dogs

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PTMC is a chemical compound containing phosphorus, tungsten and molybdenum. The preparation has been described by Mukerjee [1]. Chemical analysis gives the possible structure of the compound as $(C_8H_{11}N_4O_2)_6$ $(P_2MO_{12}W_6O_{62})$ (M.L. Tobe, personal communication).

In 1959 and the early 1960s, Van't Hoog and Schuler (personal clinical cases 1959–62) in Holland obtained tumour regression in a small number of human clinical cancer cases using PTMC.

In the present observations 27 dogs with advanced spontaneous malignant tumours have been treated with PTMC: tumours treated included fibrosarcoma, osteosarcoma, malignant melanoma, squamous cell carcinoma and adenocarcinoma. In 23 cases lung metastases were visible radiographically and were measured at intervals during therapy. PTMC doses were given i.m. or i.v., usually three times weekly, and varied from 35 to 400 mg per dose according to the size of the dog. In five dogs treated there was objective tumour regression and in one dog abnormally slow progression. A summary of the main observations made in these six cases is given in Table 1.

In general the lack of toxicity following PTMC administration is remarkable; clinical signs of allergy occurred in one dog and vague illness and inappetence in a second dog; the other 25 dogs showed no adverse effects. Plasma values for alanine aminotransferase (ALT), glucose, creatinine and urea have shown no appreciable change and haematological values have also remained within the normal range in over 15 dogs tested. After several injections there is often distinct blue coloration of skin and mucous membranes which may persist for long periods, but gradually fades.

Spontaneous regression of metastatic tumours in the dog is very rare and the present results of objective tumour response or delayed growth in 6 out of 27 dogs indicate that further research into the anticancer effects of molybdenum and tungsten and their combinations would be fully justified. Research on the exact chemical structure of the compound is essential. It appears that salts of heteropolyanions are being made. HPA 23, a cryptate mineral condensed polyanion of constitution ammonium 21-tungsto-9-antimoniate and molecular weight 6800, is a competitive inhibitor of the reverse transcrip-transcriptase of murine oncornaviruses and has been used in patients with AIDS [2].

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Supplies of PTMC—Supplies of PTMC can be obtained from Dr L.N. Owen, Oncology Unit, Animal Health Trust, Kennett, Newmarket CB8 7PN, U.K.

Table 1. *Tumour responses to PTMC in six dogs—five with objective responses and one very slow progressive disease*

Dog	*Site TNM classification and histology	Dose	Response†	Duration of response	Toxicity
1. Miniature poodle	Lung and bone metastases undifferentiated squamous cell carcinoma mouth T1 No M1	35 mg i.m. daily 2 months	Thirteen lung metastases 5–10 mm—diameter. Regression complete on X-ray. Fracture of tibia due to metastasis not obviously showing objective response	2 months	Some pain on injection
2. Springer spaniel	Lung metastases of tubular adenocarcinoma of mammary gland To (excised) No M1	300 mg i.v. 3 × weekly 5 weeks	Complete regression on X-ray of lung metastasis measuring 2.4 cm diameter	20 months	None
3. Labrador X	Fibrosarcoma upper lip T4 N1 Mo	50 mg i.v. 3 × weekly 12 weeks	Partial response decrease more than 50%	2 months	None
4. Cocker spaniel	Lung metastases of tubular adenocarcinoma mammary gland To (excised) No M1	150 mg i.v. 3 × weekly reducing to once weekly	Partial response (approx 60%)	4 weeks	Listless. Resents injection
5. Standard poodle	Lung metastases of osteosarcoma limb bone T2 M1	200 mg i.v. 3 × weekly 4 weeks, 5 months no drug	Partial slow response—(more than 50%)	6 months	None—dog more active after PTMC
6. Bloodhound	Lung metastases of kidney adenocarcinoma primary tumour excised, but evidence of local muscle invasion at time of operation T4 No M1	200/300 mg i.v. twice weekly reducing to once weekly for 6 months. Then infrequently	Very slow progressive disease. Development of skin and mandible metastases after 2 years	Lung metastases radiographically visible 2·5 years and showing very slow progression	None

*TNM: *Classification of Tumours in Domestic Animals*. Owen L.N. ed. Geneva. WHO, 1980.
†*WHO Handbook for Reporting Results of Cancer Treatment*. (WHO Offset Publ. No. 48) Geneva, 1979.

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