bromide) was performed by analogy with the (1,6-di-(2-chloroethylamino)-1,6-dideoxy-D-mannitol dihydrochloride from the 1,6-diethylenimino-1,6-dideoxy-3,4-*iso*propylidene-D-mannitol with concentrated aqueous hydrobromic acid. The former compound crystallizes from *iso*propanol, or aqueous dioxan in colourless needles which are easily soluble in water: m.p. 204–205° C. while decomposing; $[\alpha]_D^{20}$ = + 10·6°, water, c = 1·0. (Found: C 21·4, H 4·6, Br 57·4. $C_{10}H_{24}O_4N_2Br_4$ requires C 21·6, H 4·4, Br 57·5.)

As animal experiments presented in the next communication prove, 1,6-di-(2-bromoethylamino)-1,6-dideoxy-D-mannitol dihydrobromide is active as expected in much smaller dose than the chlorine derivative and its therapeutic effectiveness is more favourable.

L. Vargha
T. Horváth

Research Institute of Pharmaceutical Industry,
Budapest VII, Hungary.

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Effect of 1,6-Di-(2-Bromoethylamino)-1,6-Dideoxy-D-Mannitol Dihydrobromide on Tumours of Laboratory Animals

The chemotherapeutic effect of the new compound 1,6-di-(2-bromoethylamino)-1,6-dideoxy-D-mannitol dihydrobromide (see preceding communication) has been tested on different tumours of laboratory animals (Table 1). The compound was administered once daily in succession intraperitoneally after the appearance of palpable inoculated tumours. In comparison we tested the effect of the chlorine derivative ('Degranol', 'Mannomustine')[1] in the treatment of the same tumours.

From the results it is obvious that the 1,6-di-(2-bromoethylamino)-1,6-dideoxy-D-mannitol dihydrobromide inhibits the growth of rat and mouse tumours to a greater extent than 'Degranol' (Fig. 1).

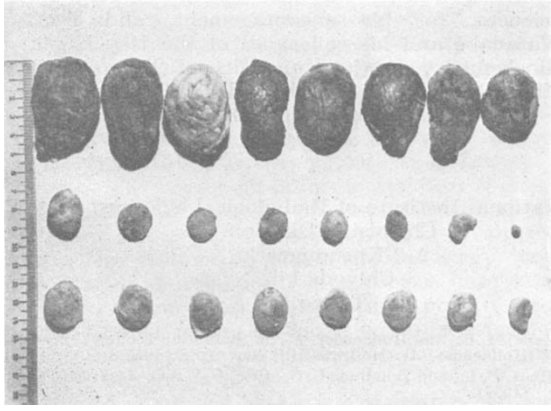

Fig. 1. Inhibition of the growth of the subcutaneous form of Yoshida sarcoma by 1,6-di-(2-bromoethylamino)-1,6-dideoxy-D-mannitol dihydrobromide (DBM) (*R*/13) and the chloride derivative (BCM)

Top, control; middle, DBM; bottom, BCM

Table 1. Degree of Inhibition of the Growth of Rat and Mouse Tumours by 1,6-Di-(2-bromoethylamino)-1,6-dideoxy-D-mannitol Dihydrobromide (DBM) (*R* 13) and the Chloride Derivative (BCM) ('Degranol')

Tumours tested	Degree of inhibition (per cent) DBM (*R* 13)	BCM ('Degranol')
Guérin rat carcinoma	89	
Guérin rat carcinoma	64	54
Yoshida rat sarcoma subcutaneous form	93	84
Ehrlich mouse carcinoma	39	21
S_{37} mouse sarcoma	53	29
Amytal mouse ascites (ref. 2) sarcoma	44	19

For the treatment of mice with tumours, 3–5 mgm./kgm. daily dose is necessary, and for the treatment of tumour-bearing rats 2–3 mgm./kgm. is sufficient. In contrast, the daily therapeutic dose of 'Degranol' corresponds to 20 mgm./kgm. for mice and 15 mgm./kgm. for rats.

When given 34 times in daily succession, the therapeutic dose to rats, in the bone marrow a slight decrease of leucopoietic elements is to be observed. Study of the blood reveals moderate leucopænia with more marked lymphopænia. Microscopically, in the spleen and lymph nodes atrophy of the follicles can be found.

J. Baló
G. Kendrey
J. Juhász
I. Besznyák

I. Department of Pathological Anatomy and
Experimental Cancer Research,
Medical University,
Budapest VIII,
Hungary.

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Biochemical Heterogeneity of the Ribonucleic Acid synthesized by *Escherichia coli B* after Irradiation with Ultra-violet Light

It is well known that the effects of radiation on the biosynthesis of ribonucleic acid and protein are reduced slightly under conditions in which the synthesis of deoxyribonucleic acid is inhibited almost completely[1]. There have been few investigations of the ribonucleic acid synthesized after irradiation.

It has recently been suggested by Haas and Doudney[2,3], however, that mutation of *Escherichia coli* is induced by ultra-violet light through the incorporation of modified nucleic acid precursors into the ribonucleic acid, resulting in modifications of the latter. It is thus of interest to investigate whether any chemical or biochemical modifications occur in ribonucleic acid synthesized after irradiation.

An overnight culture of *E. coli B(H)* was inoculated in *tris*–glucose medium and harvested by centrifugation when growth was in the logarithmic phase. The cells collected were washed once with physiological saline and resuspended in the same saline. Half the suspension was irradiated with ultra-violet light. Irradiation was carried out by germicidal lamp ('Toshiba' *GL*-1502, 15 W.) for 60 sec. at a distance of 30 cm. The other half was used, unirradiated, as control. Both irradiated and control cells were collected and resuspended in *tris*–glucose medium