and hexagonal crystals of silicon carbide could be grown side-by-side from the vapour phase at 2,600° C.

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Syntheses of Poly-DL-Serine Derivatives containing Cytotoxic Groups

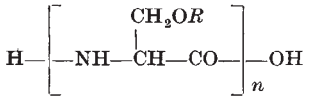
Nature has often used the trick of having a functional group carried by a larger structure of polypeptide character. This idea prompted me to use a polypeptide, namely polyserine, as carrier of groups with cytotoxicity and latent cytotoxicity.

Several serine derivatives have served as anti-tumour agents[1,2], but so far as I know polyserine has not yet been tried as a carrier moiety.

Poly-DL-serine was prepared from the *O*-benzyl-DL-serine-*N*-carboxylic acid anhydride by polymerization in boiling chloroform using triethylamine as initiator[3]. The benzyl groups were removed by suspending the polymer in dioxane saturated with hydrogen bromide and allowing the mixture to stand in the cold[4].

Poly-DL-serine, purified by dialysation followed by freeze-drying, was coupled with methanesulphonyl chloride, in pyridine. According to analytical data (required, S 17·5, N 7·7; found, S 16·4, N 7·7) and infra-red spectroscopic investigations nearly all OH-groups could be blocked with the well-known cytoactive methanesulphonyl-group (I).

I succeeded in coupling polyserine in the same manner with chloromethanesulphonyl chloride[5] (required, S 14·7, Cl 16·3, N 6·4; found, S 13·8, Cl 15·5, N 6·7) (II).



I $R = SO_2CH_3$

II $R = SO_2CH_2Cl$

I then examined the possibility of attaching latent mustard groups to polyserine. For this purpose polyserine was coupled with di-(2-chloroethyl)-phosphoramidic dichloride[6] in pyridine-dioxane. The resulting polypeptide derivative is insoluble in water, in alcohol and in most organic solvents. According to analytical data (required, C 33·2, H 4·5, N 11·6, P 8·6, Cl 19·6; found, C 33·1, H 4·4, N 11·3, P 8·2, Cl 19·1) and infra-red spectroscopic investigations, phosphoric acid esters are formed with the participation of two OH-groups. The two OH-groups may belong to two neighbouring serine units, forming cyclic esters, as formulated in III, but there is also a possibility of the formation of phosphoric acid ester linkages between two polyserine chains (IV).

It cannot be overlooked, naturally, that on each NH_2-terminated chain end there is a possibility for the formation of cyclic phosphamide esters with the participation of the OH- and NH_2-groups of the same, terminal standing serine-unit.

Further investigation and proof of the proposed structures are in progress.

The biological tests were carried out by Dr. B. Szende and Dr. K. Németh in the I. Institute of Pathological Anatomy and Experimental Cancer Research, Medical University of Budapest. Their results will be submitted for publication elsewhere.

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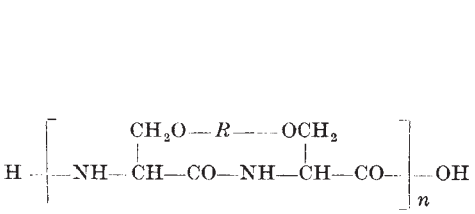
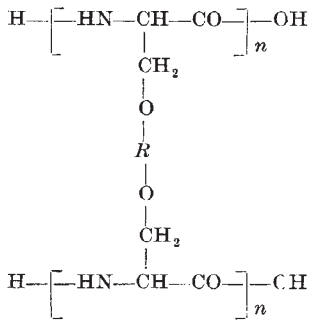
Use of Alkyltrimethylammonium Bromides for the Isolation of Ribo- and Deoxyribo-nucleic Acids

The use of cetyltrimethyl ammonium bromide for the isolation of nucleic acids and for the separation of RNA from DNA was first reported in 1951[1–3] and since has been used successfully for the isolation of DNA from bacteria[4]. The cetyltrimethylammonium bromide originally used was 'Cetavlon' (Imperial Chemical Industries Pharmaceuticals, Ltd.). A change in the nature of this material and modifications to the procedure used for the isolation of nucleic acids have necessitated a re-examination of the method.

Before May 1953 'Cetavlon' contained 85 per cent alkyltrimethylammonium bromides including a large proportion of the cetyl compound and some longer chain compounds. Since then a product of higher solubility, which contains a considerable proportion of the tetradecyl compound, has been issued. This change, which is advantageous from the pharmaceutical point of view, makes 'Cetavlon' less satisfactory for the separation of RNA from DNA, although it can still be used to separate nucleic acids from neutral compounds. In order to find a satisfactory alternative, a comparison has been made between 'Cetavlon', commercial cetyltrimethylammonium bromide (CTAB, British Drug Houses, Ltd.; found: C, 62·7, H, 11·9; N, 3·6; calc. for



III



IV

III, IV $R = PON(CH_2CH_2Cl)_2$