Communications to the editor

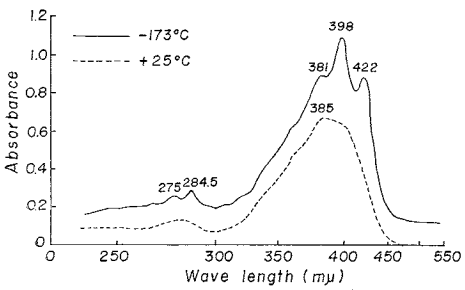
DERMOSTATIN: A REVISED HEXAENE STRUCTURE

Sir:

In a previous communication[1] we reported that dermostatin was a pentaene, which did not exhibit the typical polyene fine structure spectrum. The pentaene structure was postulated on the basis of hydrogenation studies and on the UV absorption data of dermostatin treated with either mild alkali or acid. It was also shown that in dermostatin molecule the lactone carbonyl was in conjugation with the polyene system. Two other pentaenes flavofungin[2] and flavomycoin[3] showed similar spectral properties. Of these flavomycoin was shown to exhibit the typical polyene fine structure spectrum at low temperatures. At ordinary temperature (+25°C) this compound showed maxima at 262 and 363 mμ and at low temperature (−185°C) the maxima were at 351, 369 and 390 mμ. On the basis of the spectral properties SCHLEGEL and THRUM[3] classified this as a pentaene where the C=O of the lactone was in conjugation with the pentaene system.

Through the kind courtesy of Dr. R. H. THRUM and Mr. R. SCHLEGEL we obtained a low temperature spectrum of dermostatin in ethanol. The spectra at room temperature and at −173°C are shown in Fig. 1. The maxima at −173°C are displaced by +30 mμ compared to flavomycoin. This would suggest a hexaene structure for dermostatin and a shift to higher wave length (422 mμ) is because of the conjugation of the hexaene system with the carbonyl (C=O) of the lactone.

Fig. 1. UV spectrum of dermostatin in ethyl alcohol at +25°C and −173°C, c=1.15 mg/10 ml, d=0.8 mm on Beckman Model DK 2 A Spectrometer.



The revised hexaene structure required a reexamination of the analytical data reported earlier. In macrolides the molecular weight determination by osmometric method is not very reliable. When a purified sample of dermostatin acetate was used for mass spectrometry, a good spectrum was obtained which showed a molecular ion at m/e 1052. The major fragmentation of the acetate (m/e, 1052, 992, 932, 872, 812, 752, 692, 632, and 572) is by successive loss of 60 mass units (CH_3COOH) and this shows the presence of 8 hydroxyl groups in dermostatin. The acetyl value reported in our earlier paper is in agreement with the theoretical value obtained by the revised molecular weight of the acetate. Thus dermostatin constitutes the first example of a hexaene with a masked UV spectrum similar to the pentaenes flavomycoin and flavofungin and also a hexaene where the polyene system is conjugated to the lactone carbonyl.

Acknowledgement

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References

1) NARASIMHACHARI, N. & M. B. SWAMI: Chemistry of dermostatin. II. A new pentaene structure. Chemotherapy (Basel) 13: 181~187, 1968
2) BOGNAR, R.; I. FARKASH, S.H. MAKLEIT, M. RAKOSI, J. SOLTESZ, L. SOMOGY & K. ZUPAN: Khimiia flavofungina. (Chemistry of flavofungin) Antibiotiki 10: 1059~1066, 1965
3) SCHLEGEL, R. & H. THRUM: Flavomycoin, ein neues antifungales Polyenantibiotikum. Experientia 24: 11~12, 1968