FractIon no.

Fig. 1. Fractionation of PMU on DEAE cellulose. One ml of PMU was run into a 0.7 x 13 cm column of DEAE cellulose previously equilibrated with 0.02 M sodium phosphate, pH 7.0. The column was eluted with 40 ml of the same buffer containing a linear gradient of NaCl (- - -).

CSA (- - . - . - . - .) was measured in mouse bone marrow cultures containing 1 x 10^{-7} M dithiothreitol; vitamin B_{12} (- - -) was measured by the Euglena assay; protein (- - - - -) was measured by the method of Lowry et al.

has been rarely found in localized ocean areas. This prehistoric fish usually lives at great depths and infrequently surfaces to be noticed. Hematology as a private practice specialty does not have to be localized or hidden if it will only surface more often and adapt to changes so it can survive as a viable and useful medical specialty and not become a coelacanth. Such survival can be assured by hematology and medical oncology fellowships offering dual training programs. Hematology has a lot to offer to medical oncology and vice versa, for it seems to me that the medical oncologist of today is the same physician who I remember as the hematologist of yesterday.

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To the Editor:

Colony-stimulating factor (CSF) is a glycoprotein required for granulopoiesis in vitro. There is circumstantial evidence that the factor may be a vitamin B_{12}-carrying protein. Gibson et al. have reported a partial correlation between the colony-stimulating activity (CSA) and the vitamin B_{12}-binding capacity of human urines and have speculated that the two factors may be identical.

I also have observed high concentrations of the two factors coinciding in certain biological materials: pregnant mouse uterus extracts (PMU) prepared by the method of Bradley et al. and having 10,000 units of CSA per ml contain 3000-5000 pg of vitamin B_{12} per ml; ascitic fluids from mice bearing ascitic tumors (L1210, MOPC 21a, MOPC 315, or LPC-1) have considerable CSA (up to 2000 units per ml) and contain 10,000 to 20,000 pg of vitamin B_{12} per ml.

In order to test the hypothesis that the two factors are identical, I have compared the distribution of the two activities during fractionation.

Fig. 1. Fractionation of PMU on DEAE cellulose. One ml of PMU was run into a 0.7 x 13 cm column of DEAE cellulose previously equilibrated with 0.02 M sodium phosphate, pH 7.0. The column was eluted with 40 ml of the same buffer containing a linear gradient of NaCl (- - -). CSA (- - - - -) was measured in mouse bone marrow cultures containing 1 x 10^{-7} M dithiothreitol; vitamin B_{12} (- - -) was measured by the Euglena assay; protein (- - - - - - -) was measured by the method of Lowry et al.
tion procedures. PMU was fractionated on DEAE cellulose by a modification of the method of Hall and Finkler for separating vitamin B₁₂-binding proteins⁴ (Fig. 1). The vitamin B₁₂ activity and the CSA were distinctly separated. Vitamin B₁₂ eluted at 0.05 M salt, corresponding to the known elution properties of transcobalamin II⁴; CSA eluted in a broad band centered at 0.17 M salt. These results indicate that the endogenous vitamin B₁₂ of PMU is not related to CSA but do not exclude the possibility that the CSA peak may contain an unsaturated vitamin B₁₂-binding protein. In order to test this possibility, the fractionation procedure was repeated after adding 0.1 μC of ⁵⁷Co–vitamin B₁₂. All of the radioactivity eluted in fractions 1 to 4 and there was no radiolabel associated with the CSA peak. These results indicate that the CSA peak does not contain an unsaturated vitamin B₁₂-binding protein.

As a further test of the hypothesis, vitamin B₁₂-binding protein was partially purified by affinity chromatography from ascitic fluid of BALB/c mice bearing the ascitic plasmacytoma MOPC 21a using vitamin B₁₂-sepharose (a gift from R. H. Allen) according to the method of Allen and Majerus.⁸ The partially purified material had a vitamin B₁₂-binding capacity of 20,000 pg/ml. This material had no demonstrable CSA in mouse bone marrow cultures.

It is concluded that CSF is not a vitamin B₁₂-binding protein.

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Letter: Colony-stimulating factor and vitamin B 12 carrier protein

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