

PRINCIPLES OF CHEMOTHERAPEUTIC SCREENING

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1. Introduction

Progress in the field of cancer chemotherapy has been characterized recently by the development of broad screening programs for the assay of candidate therapeutic agents. A landmark in this field was the Gellhorn and Hirschberg [1] report on "Investigation of Diverse Systems for Cancer Chemotherapy Screening" which was devoted to an examination of a variety of biological systems potentially useful in the selection of antitumor compounds. This report covers the results obtained employing 27 compounds in 74 biological systems and provides much worthwhile information for the formulation of a satisfactory screening program.

Two points from the Gellhorn-Hirschberg report may be worth noting at this time. For one thing, no single tumor system employed appeared capable of selecting all the useful agents tested and it was recommended that a spectrum of tumors could provide a "greatly improved screening system." For another, the results seemed to indicate the general unsuitableness of nontumor systems as screening tools for carcinostatic agents.

While results such as those given in the above mentioned report are essential in the planning of screening programs, equally important is the following of certain guidelines and principles which are appropriate to any screening program. The use of proper guidelines will tend to minimize the cost in time and effort required to attain the objectives of a screening program. In the discussion below a number of these principles will be considered. It should be remarked that, in general, in the use of screening programs the principles which will be discussed below, while not specifically stated, are implicitly followed. The discussion below will also deal with the relationships between screening programs and laboratory development procedures. Implications with respect to a suitable cancer chemotherapy screen will also be covered.

2. Objectives of a screening program

Essentially, the purpose of a screening program is to select for further use or study the more promising materials being processed. A program may be designed

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