February

In our guest editorial, Rowley (The University of Chicago and The Pritzker School of Medicine, Chicago, Illinois) hypothesizes that a specific relationship may exist between chromosomes and the etiologic agents of various human cancers. The newer staining methods for detecting alterations in chromosomes need to be exploited in this regard. Several hypotheses are considered: (a) The chromosome pattern within the affected cells may be consistent for a disease produced by a single etiologic agent (or possibly several closely related agents). (b) The chromosome pattern may be highly variable for a given disease that can be produced by different etiologic agents. (c) Within a disease category, it may be possible to distinguish individuals whose affected cells have the same chromosome abnormality and thus to identify those whose disease may be due to the same etiologic agent. (d) The converse of (c)—that a single etiologic agent may cause the same chromosome abnormality in cells from each individual—is probably less valid for a genetically heterogeneous population.

Diseases with a consistent chromosome pattern are chronic myelogenous leukemia, meningioma and Burkitt’s lymphoma. The variable chromosome patterns in such diseases as acute myelogenous leukemia, polycythemia vera, or myelodysplasia suggest multiple etiologic agents.

From the data collected about humans, Dr. Rowley concludes: (1) The relative importance of genetic and environmental factors in tumor production has not been determined, but families as well as ethnic groups differ in the type and frequency of various tumors. (2) Cells from some types of tumors have a consistent chromosome pattern. (3) Cells from other diseases, including tumors, have a variable chromosome pattern; no specific etiologic agent has yet been identified with any of these diseases.

If the hypothesis proposed is correct, one would expect to find that chronic myelogenous leukemia with the Ph1 chromosome, meningioma lacking one G-group chromosome, and Burkitt’s lymphoma with the 14q+ chromosome have a specific etiologic agent different from the agent producing the chromosomally normal variant of each disease.

Byar and associates (National Cancer Institute, Bethesda, Maryland) present a multivariate exponential survival model by which they were able to determine the relative severity of presenting symptoms in patients with advanced carcinoma of the prostate gland. With this model, survival for any given patient can be estimated. The authors discuss the possibility of extending the interpretation of their results to determine the most appropriate treatment for patients presenting with different symptoms.
In an epidemiologic study of cervical cancer in Yugoslavia, Kessler et al. (The Johns Hopkins University School of Hygiene and Public Health, Baltimore, Maryland) found that antibodies to genital herpesvirus (HSV-2) were more prevalent in patients than in controls. The study included 350 women under age 65 with histologically confirmed squamous carcinoma of the uterine cervix and an equal number of other currently hospitalized women. They were studied particularly for measurement of neutralizing antibodies to oral herpesvirus (HSV-1) and HSV-2. For both Moslems and non-Moslems in each age group studied, as well as in all combined, HSV-2 titers were higher among cases than controls. The ratio of HSV-2 to HSV-1 mean log titers was also significantly higher in each group of cases than in the corresponding controls. The consistent direction of these findings is regarded as important and the results lend further credence to the hypothesis that HSV-2 is etiologically related to cervical cancer.

According to the report by Federman and co-workers (Wills Eye Hospital, Philadelphia, Pennsylvania) tumor-associated humoral antibodies from patients with primary ocular melanomas reacted with the cytoplasmic contents of malignant melanoma cells derived from the following melanomas: (1) autologous primary ocular, (2) allogeneic primary ocular, (3) allogeneic metastatic ocular, and (4) allogeneic primary cutaneous. The tumor-associated antibodies in the sera of patients with ocular or cutaneous melanomas did not react with allogeneic normal choroidal melanocytes. The four eye melanomas, which formed the basis for this study, all showed positive autologous reactions and a high percentage of positive allogeneic reactions. The study suggests that the positive autologous and allogeneic reactions in ocular melanomas are similar to those reported in cutaneous melanomas.

Sulitzeanu and associates (Hebrew University-Hadassah Medical School, Jerusalem, Israel) showed that pleural and ascites effusions of patients with malignant diseases contained occasional clusters of a central malignant cell surrounded by various types of lymphoreticular cells. These clusters may be a manifestation of the immune reactivity of the patient against the tumor.
March

In our editorial, Stanton (National Cancer Institute, Bethesda, Maryland) presents evidence of a structural relationship between asbestos fibers and their carcinogenicity; he postulates that durable fibers of many types in our environment may cause human cancers.

Newell and associates (National Cancer Institute, Bethesda, Maryland) examined the incidence, by race, sex and site, of subsequent malignant tumors in patients with primary Hodgkin’s disease, leukemia, and multiple myeloma. Whites with both Hodgkin’s disease and leukemia had an increased risk for subsequent skin cancer. Blacks with leukemia had a significantly increased risk for developing lung cancer. White males with myeloma had a 6.6-fold increased risk for later malignancy.

In a companion paper, Newell et al. compared multiple primary neoplasms in Negroes and whites in relation to subsequent malignancies in patients with cancer of the buccal cavity and pharynx. The overall risk of males was increased for both whites and blacks. Among females, the overall risk was greater for whites but not for blacks.

Studying the in vitro effects of steptovaricin and rifamycin SV on colony-forming cells from the peripheral blood of 19 normal individuals and two patients with chronic myelogenous leukemia, Horoszewicz and co-workers (Roswell Park Institute, Buffalo, New York) reported that the ansamycins had antiproliferative activity against colony-forming cells in leukemic patients; no selective toxicity was observed.

Fraumeni and Mason (National Cancer Institute, Bethesda, Maryland) contrasted the cancer mortality patterns of Chinese with those of whites and blacks in the United States from 1950-69. The total mortality rate among Chinese males was significantly higher than that of white males in the United States, but comparable to that of black males; the corresponding rate among Chinese females was significantly lower than that of both white and black females. Compared to whites and blacks, mortality from nasopharyngeal cancer was elevated 26-fold in Chinese males and 22-fold in Chinese females. Deaths from primary liver cancer and lung cancer were significantly high among the Chinese. Thyroid
cancer mortality was excessive in Chinese of both sexes, but low mortality was reported among Chinese males for prostate and bladder cancers and among Chinese women for breast and cervical cancers. Deaths from tumors of the large intestine and rectum were excessive in Chinese males. The mortality patterns by cancer site among Chinese are generally in line with cancer incidence statistics in Hawaii and California and suggest shifts away from the cancer risks among Chinese in Asia and toward those prevailing in the general United States population.

Using an electronic cell sorter capable of multiparameter analysis, Horan and associates (Los Alamos Scientific Laboratory of the University of California, Los Alamos, New Mexico) detected, by DNA content, heteroploid tumor cells in mice. This technology could be applied to detection of tumors with elevated DNA content in humans. Tumor cells from suspect specimens could be enriched and stained for further pathologic examination, and only suspect specimens would then need to be enriched for further analysis.

Human mammary epithelial cells were grown in culture by Furmanski et al. (Michigan Cancer Foundation, Detroit, Michigan). These cells incorporated \(^{3}H\)-uridine at a density gradient of 1.16-1.19 g/cc and contained 70S RNA and reverse transcriptase activity as determined by the simultaneous detection test.

Vernon and co-workers (Microbiological Associates, Bethesda, Maryland) observed type-C particles in 12 or 15 human placentas. The regular occurrence of these particles supports the concept of a vertically transmitted genome and is a readily available source of material for study of these endogenous particles and their significance, if any, for humans.