Reporting on

Cancer Research

Commentary on the
March and April, 1977
(Volume 37, Numbers
3 and 4) issues

Michael B. Shimkin, M.D.
Associate Editor

March
Biochemical Diagnostic Forays
The March issue of Cancer Research is noteworthy for some eight articles on various biochemical determinations on human material that would have been grouped as possible diagnostic procedures or leads a couple of decades ago. The implications are still there, but stated more cautiously.

Leon and co-workers (Albert Einstein Medical Center, Philadelphia, Pennsylvania) developed a radiimmunoassay for ng. quantities of DNA in the serum, and applied it to 173 patients with cancer and 55 healthy individuals. Of the cancer patients, 50 percent had normal DNA levels, and the hope is expressed that it may be useful in the evaluation of therapy.

Parsons et al. (Scripps Clinic and Research Foundation, La Jolla, California) report on a human serum DNA-binding protein (C₃DP) derived from complement component C₃. Serum from 31 normal individuals had levels of 40 to 146 μg./ml., whereas 47 cancer patients had values of 146 to 500. However, five of 12 patients with a variety of non-malignant diseases had levels in the range for cancer sera.

Chawla and associates (Emory University School of Medicine, Atlanta, Georgia) isolated and characterized a glycoprotein in the urine of a patient with carcinoma of the colon (JBB5), produced antibodies to it in a rabbit, and studied reactions with urines by means of double immunodiffusion. The authors report positive reactions with 58 of 177 urines from cancer patients, and with 10 of 242 urines from patients with non-neoplastic conditions. The potential clinical uses seem moot.

Cohen (State University of New York at Stoney Brook, New York) summarizes a conference on Polyamines in Cancer, held in March, 1976. Here, too, the conclusion was, "The prospectus for polyamines as a cancer-screening procedure seems limited at this time . . . the most likely utility seems to be as a predictor for monitoring the effectiveness of therapy."

Tissue Biochemistry
Studies on actual neoplastic tissue, by specific types, may be more revealing than urine or serum specimens. Manzoli et al. (University of Chieti, Italy) compared normal and chronic lymphocytic leukemia lymphocytes, finding reduction of sphingomyelin in leukemic lymphocytes. This phospholipid affects both DNA stability and transcription.

Bratlai et al. (University of Alabama, Birmingham, Alabama) demonstrated that human colonic carcinomas contained a higher proportion of β-hexosaminidase B than A, while normal
human colonic mucosa contained more of the A than the B.

April

Hydrocarbon Enzymes

McLemore et al. (Baylor College of Medicine, Houston, Texas) measured aryl hydrocarbon hydroxylase (AHH) activity in pulmonary alveolar macrophages (PAM) and peripheral blood lymphocytes from 47 patients with primary lung cancer and 56 patients bronchoscoped for other conditions. AHH activity was consistently higher in PAMs from smokers than non-smokers, whether or not cancer was present. In addition, lymphocytes from smokers were more responsive to AHH induction than from non-smokers. In patients without lung cancer, a positive correlation existed between enzyme values in both cell types. In patients with lung cancer, there was a dissociation of this correlation, suggesting the development of abnormal cellular function. These studies may be more useful as a means of illuminating the tobacco-host-cancer relationships than as a methodology for earlier diagnosis.

Prolactin and Breast Cancer

In mice and rats, prolactin is unequivocally an important hormone in mammary carcinogenesis. Welsch and Naga-sawa (Michigan State University, Michigan and the Japanese National Cancer Center Research Institute, Japan) collaborate in a review of the subject, citing 266 references. The evidence on rodents has been extrapolated to man but, as the authors conclude, "whether or not prolactin is significantly influential in human breast tumorigenesis remains to be determined." It is an important, active area of research. Investigators pursuing it clinically would be well advised to study this thorough review.

Where Stands Immunotherapy?

An international conference on Immunotherapy of Cancer was held in October, 1976, at the National Institutes of Health, and is summarized by Sydney E. Salmon. Immunotherapy has been used as adjuvant therapy and in patients with metastatic disease. Immunotherapeutic agents include bacterial stimulators such as BCG or C. parvum, tumor cell antigens, levamisole, bovine thymosin and "immune RNA."

The single intrapleural injection of BCG, in a randomized adjuvant trial, continues to show a positive effect in patients resected for Stage I lung cancer. Similar encouraging results were reported with a soluble lung cancer antigen preparation in complete Freund's adjuvant, and with BCG oil-attached cell wall skeleton. In a double-blind, placebo-controlled trial from Europe, levamisole as an adjunct to surgery in resectable cases also showed positive effects.

Results of clinical studies of immunotherapy in acute leukemia do not appear encouraging. BCG has thus far failed to show beneficial effects in patients with Hodgkin's disease. However, the overall remission rate for those with non-Hodgkin's lymphoma, Stages III and IV, is significantly higher in those treated by chemotherapy plus BCG than in those treated by chemotherapy alone.

BCG, C. parvum and levamisole have undergone initial testing in patients with advanced breast cancer, with promising results. No benefits have been observed in patients with advanced metastatic colon cancer. Immunotherapy as an adjuvant for those with malignant melanoma shows a favorable trend that has not reached statistical significance. BCG, levamisole, C. parvum or serotherapy have failed to be effective in patients with advanced metastatic melanoma.

There are no reports of using immunostimulators in the prevention of cancer, which is a worthy topic.