Ninth International Cancer Congress Held in Tokyo

The Ninth International Cancer Congress, under the auspices of the International Union Against Cancer, was held in Tokyo, October 23-29, 1966. The aim of the Congress was to promote the diffusion of international scientific thought to aid progress in the study of cancer. The professional men of medicine and allied sciences had an opportunity to pool their knowledge by the conferences, meetings, discussions, and social gatherings provided by the Congress.

Attending the meeting were representatives of medical and other sciences from many of the countries of the world. Numerous scientific and medical papers and 23 panel discussions were presented by the delegates on many aspects of cancer, research, diagnosis, and treatment. Information was presented in approximately 45 areas of scientific interest.

Leading lectures at the International Congress were on the subjects of molecular basis of translation of the genetic message, viruses in carcinogenesis, cancer immunology, and cytogenetical aspects of cancer. The Harold Dorn Memorial Lecture was delivered by Harold L. Stewart of the U.S.A. on the topic “Site Variation of Alimentary Tract Cancer in Man and Experimental Animals as Indicator of Diverse Etiology.”

Also presented at the International Congress was information from scientific and technical committees of the International Union Against Cancer. These committees perform a significant function in the worldwide fight against cancer.

Dr. R. Lee Clark, Director, Surgeon-in-Chief, and Prof. of Surgery at MDAH, has been a member of the International Union Against Cancer Committee on Patient Care for the past four years; and Dr. Murray M. Copeland, assoc. director (education), gen. surgeon, and prof. of surgery at MDAH, has been an official delegate from the U.S.A. and member of the International Union Against Cancer Committee on Clinical Stage Classification and Applied Statistics for the four years since the last international congress. Japan, Canada, the U.S.S.R., the Philippines, and several western European and Latin American countries are represented on these committees.

Dr. Alexander Haddow of England, outgoing president of the International Union Against Cancer, presided. Dr. Haddow was the 1966 recipient of the Bertner Foundation Award, given annually at the MDAH Symposium on Fundamental Cancer Research.

Other officers of the International Union Against Cancer included: President-elect, Dr. N. N. Blokhin, U.S.S.R.; past president, Dr. V. R. Khanolkar, India; general secretary, Dr. M. J. Shear, U.S.A.; treasurer, Dr. P. Loustalot, Switzerland; vice-president, Dr. M. Kuru, Japan; vice-president, Dr. R. Patterson, England; vice-president, Dr. P. Denoix, France; and vice-president, Dr. H. L. Stewart, U.S.A.

Previous meetings of the International Union Against Cancer were held in Madrid, 1933; Brussels, 1936; Atlantic City, 1939; St. Louis, 1947; Paris, 1950; Sao Paulo, 1954; London, 1958; and Moscow, 1962.

This issue of the News Letter is devoted to abstracts of the presentations of 18 MDAH staff members who were selected to attend the Ninth International Cancer Congress. In all, 21 presentations were made by MDAH representatives.

Houston Selected for 1970 Congress

The council of the International Union Against Cancer (UICC) has chosen Houston as the meeting place for the Tenth International Cancer Congress to be held in 1970.

Dr. R. Lee Clark, Director, Surgeon-in-Chief, and Professor of Surgery at MDAH, issued the invitation to the organization last spring.

At the Ninth International Cancer Congress meeting in Tokyo, the UICC council voted on proposed sites in four countries. Houston, earlier selected as the United States’ choice, was selected to host the international event.

The UICC is made up of scientists and physicians from 65 nations and maintains a permanent international office in Geneva. The organization is headed by a council and executive committee. Local meetings are held, and every four years, the international congress is held.

Dr. Murray M. Copeland, MDAH associate director (education) and chairman of the U.S.A. Committee of the Union, was one of two Americans elected to the UICC council. The council, composed of delegates appointed by its national members, is the supreme governing body of the Union. It meets regularly at the time of each International Cancer Congress.
Surgical Management of Pharyngeal Cancer

“Principles of Surgical Management of Cancer of the Pharyngeal Walls” was presented at the International Cancer Congress by Dr. A. J. Ballantyne, assoc. head and neck surgeon, dept. of surgery, and assoc. prof. of surgery at MDAH. Dr. Ballantyne presented his conclusions, based on an analysis of clinical data, concerning reasons for and treatment of recurrence of cancer of the pharyngeal wall after surgical treatment.

Such recurrence Dr. Ballantyne found to be caused primarily by: (1) failure to remove unrecognized local extension of the tumor along muscle planes, fascial planes, or nerves, (2) failure to remove lymphatic structures in the vicinity of the primary tumor, (3) failure to remove areas of in situ or early invasive cancer, or (4) implantation of cancer cells in the operative wounds.

The emphasis in this surgical approach has been shifted from concern for metastatic nodes in the lateral neck to wider resection of structures between the carotid arteries, including retropharyngeal node dissection. This variation in procedure has resulted in a significant decrease in the incidence of local recurrence and an apparent increase in survival rate.

In addition to presentation of this paper, Dr. Ballantyne participated in a panel discussion regarding cancer of the nasopharynx.

Replication and Inhibition of Polyoma Virus

“Studies on Replication of Polyoma Virus in Vitro and its Inhibition by Antagonists of Protein and Nucleic Acid Synthesis” by James M. Bowen, asst. virologist, dept. of virology, R. G. Hughes, res. assistant, dept. of virology, and Leon Dmochowski, virologist, head of the dept. of virology, and prof. of virology, was presented at the International Cancer Congress by Dr. Bowen.

The study was designed to clarify some of the biosynthetic events in the formation of new virus components in infected cells by using metabolic inhibitors. Specifically, the study investigated the effect of several inhibitory compounds, i.e. actinomycin D, mitomycin C, and p-fluorophenylalanine (FPA), on polyoma virus replication in mouse embryo cells.

The results of studies with actinomycin D and mitomycin C indicated that polyoma virus-specific messenger RNA is synthesized very early in infection and has a relatively long half-life. Effects of actinomycin D varied according to concentration of the inhibitor.

The results of the study suggested that a functional host cell genome is required for polyoma virus replication. Studies with FPA indicate that early protein synthesis is necessary for initiation of viral DNA synthesis. FPA stops DNA synthesis but does not prevent its return after the FPA is removed.

Studies on a 3’-MeDAB-Induced Transplantable Hepatoma

“Establishment, Histochemistry, Cytology, and Fine Structure of a 3’-MeDAB-Induced Hepatoma” was presented at the International Cancer Congress by Dr. Jeffrey P. Chang, biologist, sec. of exper. pathology, dept. of pathology, and prof. of biology. Other researchers involved in his study were: C. W. Gibley, asst. biologist in exper. pathology, and asst. prof. of biology; M. M. Romsdahl, postdoctoral fellow in biology; and K. Ichinoe, project investigator, sec. of exper. pathology, dept. of pathology.

Seven strains of rat hepatoma, each showing different biological behavior, were induced by 3’-MeDAB. These strains were successfully and repeatedly transplanted. Observations were then made of chemical, structural, and biological changes in the total cell, cell nu: 

(Studies, continued on Page 3)
Studies, continued from Page 2

cel, and fine structure produced by the transplantation.

This study indicated that transplantable hepatoma can be established at will, thus providing new material for research. It is possible, with this technique, to study, from any approach, the chemical, structural, or biological changes in the early passages of hepatoma transplantation simply by repeating establishment from another primary tumor.

New Technique for Recovery of Malignant Cells from Blood

"An Improved, Clinically Applicable Technique for Recovery of Malignant Cells from Circulating Blood" was presented at the International Cancer Congress by Suk Chul Chang, assoc. pathologist in the sec. of anatomical pathology, dept. of pathology, and assoc. prof. of pathology at MDAH.

A new millipore concentration technique for identification of malignant cells in circulating blood has been developed. It has the following advantages: (1) The filter is fully dissolved. (2) Cellular details are clearer. (3) Immature lymphocytes, myeloid cells, and megakaryocytes are more easily distinguished from malignant cells. (4) The clearly stained cells provided by this technique allow maximum interpretation of detail. (5) The technique also prevents fading of the stained cells. With these advantages, both evaluation of malignant characteristics and subsequent diagnosis are facilitated. Dr. Chang presented the method and a summary of the results of its use in 100 cases.

Calcium Dynamics in Metastatic Breast Cancer

"Calcium Dynamics in Metastatic Breast Cancer" by V. William Cole, assoc. internist, endocrine-isotope sec., dept. of medicine, and assoc. prof. of medicine; B. S. Min, fellow in medicine; and C. D. Howe, internist, chief of gen. med. service, head of the dept. of medicine, and prof. of medicine, was presented at the International Cancer Congress by Dr. Cole.

Calcium-47 kinetics were used to test for the presence, extent, and type of metastatic bone disease resulting from breast cancer. Calculation of the exchangeable calcium pool, bone accretion, and bone resorption rates yielded distinct variations in breast cancer patients. These variations correlated with the absence of skeletal metastasis, and the presence of minimal and advanced skeletal metastasis.

Calcium studies of this type can provide direct information as to the extent and type of skeletal metastasis in breast cancer patients. This information will help in effecting control of hypercalcemia, nephrocalcinosis, and other complications which occur in patients with this disease.

Rehabilitation of the Cancer Patient

"Rehabilitation of the Cancer Patient" was presented at the International Cancer Congress by R. Lee Clark, Director, Surgeon-in-Chief, and Prof. of Surgery at MDAH. Co-authors of the paper were R. D. Moreton, asst. director, vice-president, University Cancer Foundation, and prof. of radiology; J. E. Healey, assoc. exper. surgeon, chief of the sec. of exper. surgery, and prof. of anatomy; and Miss Eleanor J. MacDonald, epidemiologist, head of the dept. of epidemiology, and prof. of epidemiology.

The positive potential for cancer patient rehabilitation was emphasized in this paper. It was proposed that a government sponsored expansion of rehabilitation efforts would ameliorate the present space, monetary, and personnel limitations in the area of rehabilitation. In the past, these limitations have hindered both the practical application of rehabilitation methods and a positive attitude toward their worth. It is hoped that, as a result of expanded efforts in rehabilitation, the present "cure" rate among cancer patients, meaning the ability of patients to return to useful activities following therapy, may be doubled.

Through routine physical therapy, subjective and objective benefits to medically treated patients have been demonstrated at MDAH. An eight-year study on this topic showed physical therapy to be helpful in treatment of patients and indicated the potential of the physical therapist as a prime contributor in re-

(Rehabilitation, continued on page 4)
Direct Isolation of Mycoplasma

“Direct Isolation of Mycoplasma from Patients with Leukemia and Lymphoma,” was also presented at the International Cancer Congress by Dr. Dmochowski. Co-authors included D. A. Dreyer, former asst. virologist in the MDAH dept. of virology, and now at Rutgers University; J. A. Shively, pathologist, chief, sec. of clin. pathology, dept. of pathology, and prof. of pathology; Grant Taylor, pediatrician, chief, sec. of pediatrics, dept. of developmental therapeutics, prof. of pediatrics, and chairman, Southwest Cancer Chemotherapy Study Group Headquarters; and Emil J. Freireich, internist, chief, sec. of res. hematology, asst. head, dept. of developmental therapeutics, and prof. of medicine.

Mycoplasma were isolated by direct inoculation of a modified Eaton agent agar from 15 of 27 specimens collected from seven patients with leukemia and lymphoma. Isolated mycoplasma appeared as “fried egg” colonies, with a wider periphery than those of Myco-

Leon Dmochowski

Detection, Diagnosis and Treatment of Cancer at MDAH

“The Detection, Diagnosis and Treatment of Cancer, with Emphasis on Manpower and Facilities as Employed at The University of Texas M. D. Anderson Hospital and Tumor Institute” by Dr. M. M. Copeland, assoc. director (education), gen. surgeon, and prof. of surgery, and Dr. R. Lee Clark, Director, Surgeon-in-Chief, and Prof. of Surgery, was presented at the Ninth International Cancer Congress by Dr. Copeland. His address outlined the development of the facilities and manpower of MDAH, and the growing role of the institution in the control of cancer.

From a staff of four research scientists and 13 clinical specialists in 1943, housed in temporary quarters, MDAH has come to be a leading categorical hospital and institute in the United States. The present facilities of the hospital and tumor institute occupy 645,000 square feet of space. There is a total complement of 1,820 personnel in all categories, with 136 full-time and 46 part-time professional staff members and 102 consultants and volunteers. Education, research, and patient care receive equal emphasis in the program of cancer control. Training programs are being conducted at the graduate level in basic research, clinical research, and clinical medicine. Specific research projects in progress now number 278. Annual registration of new patients has reached 14,000 per year, with an average of 140,000 outpatient visits each year.

Murray M. Copeland
Chemotherapy and Radiotherapy

“Chemotherapy as an Adjuvant to Radiotherapy” was presented at the International Cancer Congress by Gilbert H. Fletcher, radiotherapist, head, dept. of radiotherapy, and prof. of radiology. Other researchers involved in this study were H. D. Suit, assoc. radiotherapist, chief, sec. of experimental radiotherapy, and assoc. prof. of radiology; R. D. Lindberg, asst. radiotherapist, dept. of radiotherapy, and asst. prof. of radiology; C. D. Howe, internist, chief, gen. med. service, head, dept. of medicine, and prof. of medicine; M. L. Samuels, assoc. internist, dept. of medicine and assoc. prof. of medicine; R. H. Jesse, Jr., assoc. head and neck surgeon, dept. of surgery, and assoc. prof. of surgery; and J. P. Smith, volunteer clin. asst. surgeon (otolaryngology) to the tumor institute.

A pilot study was initiated in which patients were given a total of 60 mg/kg body weight of 5-FU in five injections before radiation therapy was begun. Radiation therapy was started on the day after the last injection. Because of the apparently encouraging results, a systematic study was initiated for management of oropharyngeal lesions in this fashion.

Twenty-eight patients with pharyngeal wall lesions were entered in a double blind study. To the patients randomly selected to receive 5-FU, 1,000 rads per week were given to a total dose of 6,000 rads in six weeks. The patients receiving radiation alone were given 1,000 extra rads through reduced portals, making a total of 7,000 rads in seven weeks.

Anterior oropharyngeal lesions regressed rapidly with the radiotherapy. For some patients who did not receive 5-FU, the total dose was no more than 6,000 rads because regression was complete at the end of six weeks.

Patients with pharyngeal wall lesions had best treatment results with 5-FU; in this group of patients no tumor was palpable at the end of six weeks. In most patients treated without 5-FU, clinically residual tumors were present.

The rationale for using 5-FU either before or concomitantly with radiation therapy is that it produces shrinkage of tumor and is also a radiation sensitizer. However, despite faster and more complete initial tumor regression with systemic administration of 5-FU given in addition to radiation, no increase in permanency of control of advanced squamous cell carcinoma was obtained, and there was an increase in number of complications.

Also at the congress, Dr. Fletcher served as chairman of a panel on “Chemotherapy as Adjuvant to Surgery and Radiotherapy.”

Comparative Therapeutic Trial in Cancer Patients

“The Comparative Therapeutic Trial in Patients with Cancer” was presented at the International Cancer Congress by Emil Frei, III, assoc. director (clinical research), internist, prof. of medicine, and head of the dept. of developmental therapeutics at MDAH. Dr. Frei emphasized that the comparative clinical trial is a powerful tool for defining optimal treatment for and the natural history of a disease. He presented some aspects of structuring and implementing a comparative clinical trial program. These were discussed from the viewpoint of both the clinician and the statistician or data analyst. Improvement of patient survival rate and condition during such a study was emphasized throughout.

A comparative study is inappropriate, Dr. Frei stated, in some circumstances including those in which the natural history of the untreated or control group is known with precision, or when there is reason to believe that optimal procedure for using the experimental agent has not been determined.

Dr. Frei also presented suggestions concerning methodology of data collection and analysis for a comparative therapeutic trial study. He emphasized the inclusion of all variables and the separate analysis of varying functions as methods for gaining maximum information from the studies.

Comparative trial is the best known means to determine the relative efficacy of treatments.
Radionuclide Imaging Techniques

"Radionuclide Imaging Techniques in the Detection and Management of Cancer" was presented at the International Cancer Congress by Thomas P. Haynie, assoc. internist, sec. of nuclear medicine, and assoc. prof. of medicine.

Dr. Haynie discussed the use of radionuclide imaging as a diagnostic technique in the treatment of patients with malignant disease. Procedures are available, stated Dr. Haynie, for imaging tumors of the brain, thyroid, lung, liver, kidney, pancreas, spleen, bone, and parathyroid, as well as in certain cases for metastatic carcinoma and lymphoma.

Methods for the collection of data consist of moving detectors (scanners) and stationary devices (cameras). The largest experience has been obtained with scanners, which offer good resolution, but which require some time to cover large areas.

Cameras require less time, but at present are somewhat limited in sensitivity and resolution. The use of short-lived radioactive materials such as technetium-99m has resulted in some advantages in performing diagnostic procedures.

The value of radionuclide scans for use in the diagnosis and management of cancer was emphasized. This technique provides significant physiological and anatomical information concerning the patient by making possible study of organs and lesions not usually visible on roentgenograms.

Anatomy and Therapy for Liver Tumors

The results of this study, which indicate a poor vascular supply to liver tumors, may explain the poor results of systemic or local chemotherapeutic attack upon these lesions. These results also suggest the need for a more basic investigation of nutrition of cancer cells.

Solid Carcinoma of Thyroid Gland: Analysis of 50 Cases

"Solid Carcinoma of the Thyroid Gland: Analysis of 50 Cases" was presented at the International Cancer Congress by Dr. Michael L. Ibanez, assoc. pathologist, dept. of pathology, and prof. of pathology. Working with Dr. Ibanez in preparing the paper were V. William Cole, assoc. internist, sec. of exper. med., dept. of medicine, and assoc. prof. of medicine; William O. Russell, pathologist, chief of the sec. of anatomical pathology, dept. of pathology, head of the dept. of pathology, and prof. of pathology; and R. Lee Clark, Director, Surgeon-in-Chief, and Prof. of Surgery.

Among a total of 550 patients with thyroid carcinoma seen at MDAH, 50 had tumors of the solid type. Identification and diagnosis of this type of carcinoma of the thyroid gland were emphasized by Dr. Ibanez in his presentation. Solid carcinoma of the thyroid differs (Thyroid, continued on Page 8)
U.S. Regional Mortality Patterns in Cancer

An exhibit entitled “Regional Patterns in Mortality from Cancer in the U.S.” was presented at the International Cancer Congress by Eleanor J. Macdonald, epidemiologist, head of the dept. of epidemiology, and prof. of epidemiology. Assisting Miss Macdonald in preparing the exhibit were Dorothy G. Wellington, volunteer assoc. epidemiologist, and Patricia Wolf, asst. epidemiologist.

A statistical analysis of the results of a nationwide study of cancer mortality was presented. The study indicated age-adjusted cancer death rates for all sites during the 20-year period 1940-1959.

Miss Macdonald, Mrs. Wellington and Mrs. Wolf organized basic data gathered by the U. S. Public Health Service and analyzed it for significant trends within the total category of cancer mortality in the U. S. Taken into account were such contributing factors as: (1) differing patterns of age distribution, (2) racial and regional differences, and (3) interrelationship between cancer types.

The analysis indicated regional patterns of variation in cancer mortality. Marked differences were found between male and female, and between white and nonwhite. These differences existed not only in changing death rates for each site, but also in age patterns for these rates.

New Detection Technique

“A New Concentration Technique for Detecting Malignant Cells in Sputum: Evaluated in 200 Patients with Primary Lung Cancer” was presented at the International Cancer Congress by William O. Russell, pathologist, head of the dept. of pathology, chief of the sec. of anatomical pathology, and prof. of pathology at MDAH.

Studies in exfoliative cytology done in the pathology dept. at MDAH have proved the most effective method for early detection of pulmonary cancer available to be exfoliative cytology. Dr. Russell now reports the results of use of a new technique which increases the effectiveness of exfoliative cytologic methods. In this technique, cells are concentrated up to 100 times their original frequency by millipore filtration. The filter is then bisected and the filtering surface pressed on a 3 x 1 inch slide, where the filter is dissolved, leaving only the cells.

Analysis of results showed that this millipore concentration technique was 13 per cent more effective in recovering malignant cells. This new method enhances an effective means for early detection of lung cancer, which, with wider application, could be comparable to the smear technique for the diagnosis of cervical and endometrial cancer.

The even distribution of cells on the slides achieved using this method could permit automatic scanning for malignancy by electronic devices. The use of these devices could facilitate mass screening for lung cancer in susceptible populations. It could also contribute to earlier detection of lung cancer in physicians’ offices and in outpatient clinics.

Tumor Localization

“Intracranial Tumor Localization: A Comparative Study with ¹¹¹-Labeled Antibody to Human Fibrinogen and Neohydrin-Hg₂⁰³” was presented at the International Cancer Congress by Dr. David Marrack, assoc. pathologist, chief of the sec. of biochemistry, res. clin. pathology, dept. of pathology, and assoc. prof. of clin. pathology at MDAH. Co-authoring the paper with Dr. Marrack were M. Kubala, P. Corry, M. Leavens, I. Spar, J. Howze, and W. Dewey of the MDAH sec. of neurosurgery, and depts. of physics and pathology; and the depts. of radiation biology at the University of Rochester School of Medicine, and at Colorado State University.

Dr. Marrack presented a comparison of two radioactive agents which may be used for the localization of intracranial tumors. Those agents were Neohydrin-Hg₂⁰³ and ¹¹¹ antibody. Results were obtained from a study of the effects of these agents upon 52 patients. Patients for the study were selected on the basis of suspected brain tumors, which were later confirmed histologically or by air encephalogram and arteriogram.

The two agents were similar in accuracy of detection (approximately 85 per cent), Dr. Marrack reported. A comparison of their properties showed Neohydrin-Hg₂⁰³ to be more readily available and clinically more convenient to use. However, it proved of little use in localization of tumors elsewhere in the body than the brain. ¹¹¹-labeled antibody had 80 per cent success in localization of all tumor sites.
from other types of thyroid carcinoma in several respects. The distinguishing characteristics of solid carcinoma of the thyroid are: (1) similar incidence in males and females; (2) a distinct cellular morphology; (3) it contains amyloid; and (4) there is a tendency to metastasize to the cervical lymph nodes and the mediastinum.

Physiological corollaries of the disease varied widely within the group studied by Dr. Ibanez. The prognosis associated with solid thyroid carcinoma also is highly variable and cannot be predicted accurately from histologic studies of the tumor.

**Irradiation Damage and Cure Probability**

“Normal Tissue Damage and Tumor Cure Probability for Irradiation Given under Different Conditions of Tissue Oxygenation” was presented at the International Cancer Congress by Herman D. Suit, assoc. radiotherapist, chief of the sec. of exper. radiotherapy, dept. of radiotherapy, and assoc. prof. of radiology at MDAH. Work toward elucidation of a radiation dosage producing maximal tumor control with minimal tissue damage was reported by Dr. Suit.

Prior studies by Dr. Suit have established the probability of tumor cure as a function of radiation dose for C3H mouse mammary carcinoma. From these earlier studies, six complete dose response curves were obtained (i.e. for irradiation given as single doses or as 10 equal doses given at 24-hour intervals under the conditions of: local “anoxia”; “air,” with normal blood flow to the tumor area; and HPO, with the animal exposed to 100 per cent O₂ at 30 pounds per square inch for 15 minutes prior to and then during irradiation).

The present experiment was designed to assess which treatment produced the least damage to normal tissue at the tumor control probabilities of TCD₁₀, TCD₅₀ and TCD₉₀.

Results of the study were described in terms of (1) degree and area of acute reaction against time, and (2) late reaction as measured by the extent of contracture of the skin in the treated area. The results were then discussed in terms of apparent oxygen tension of normal tissue as compared with that of tumor tissue. Implications of the results of the study for the clinical use of HPO in radiotherapy were also mentioned.

**Leukemogenic Effect**

“Attempts to Enhance in Mice the Leukemogenic Effect of Human Leukemic Materials by Combination with Inactivated Mouse Leukemia” was presented at the International Cancer Congress by J. G. Sinkovics, assoc. internist, dept. of medicine, and assoc. prof. of medicine. Participants in the research for the paper were: C. C. Shullenger, internist, chief of the sec. of hematology, dept. of medicine; C. D. Howe, internist, chief of the gen. med. service, head of the dept. of medicine, and prof. of medicine; and B. A. Bertin, laboratory technician.

In this study, human leukemic bone marrow cells or fluids from cultures of such cells were mixed with heat-inactivated Rauscher mouse leukemia virus. The mixture was then inoculated into newborn or suckling mice of a low leukemic line. Control mice were inoculated with (1) the human material mixed with heat-inactivated normal mouse spleen extract, or (2) the heat-inactivated Rauscher virus mixed with fluids from normal human cell cultures.

Materials from 16 leukemic patients were tested. Results were equivocal for all materials except one. This material consisted of tissue culture fluids from lymph node and bone marrow cells taken from a patient with acute leukemia. This material, mixed with heat-inactivated Rauscher virus, repeatedly caused leukemia with significantly higher incidence than did the corresponding control materials.

Theoretically, Dr. Sinkovics explained, an increased leukemogenic potency of human leukemic materials and inactivated murine leukemia virus can be explained by recombination of human and murine leukemia viruses. Other mechanisms, however, such as multiplicity reactivation of the murine leukemia viruses or increased activity of virus-decoating enzymes, are also possible, and are being investigated. Also, means other than heat are being tested for inactivation of murine leukemia virus.

**Studies of Mammary Tumors in Mice**

“Electron Microscope Studies of Mammary Tumors in Mice with a High Incidence of Spontaneous or Induced Leukemia” was also presented at the International Cancer Congress by Leon Dmochowski. This paper was prepared by Dr. Dmochowski, with P. L. Langford, research technician in virology; E. L. Young, res. associate in virology; and J. A. Sykes, formerly assoc. virologist in the dept. of virology.

In this paper, Dr. Dmochowski discussed the relationship of murine leukemia virus to mammary tumors in mice with a high incidence of spontaneous or induced leukemia. Mammary adenocarcinomas were observed to develop in three AKR high-leukemia strain mice during the past 10 years. In these mammary adenocarcinomas and in an induced mammary tumor in a BALB/c mouse, the electron microscope revealed typical murine leukemia virus particles. Leukemia virus particles were also found in the mammary glands, spleen, and thymus glands of tumor-free and non-leukemic AKR mice.