

TEXAS SOCIETY FOR ELECTRON MICROSCOPY
NEWSLETTER

Number 13

Supplement 1

5 March 1970

Report From

DR. LEON DMOCHOWSKI
Professor and Chairman
Department of Virology
M. D. Anderson Hospital
Texas Medical Center
Houston, Texas

Due to an unintentional oversight on our part, news items from Dr. Leon Dmochowski's laboratory have not appeared in the last three issues of the TSEM newsletter. Therefore, Dr. Dmochowski has submitted to us a summarization of events and topics incident to his important laboratory which we are happy to publish as a separate supplement. In addition, he has provided us with a history of his laboratory which complements the many news items.

For Period July - December 1969

The University of Texas M. D. Anderson Hospital and Tumor Institute -
Department of Virology - Meetings

Dr. Koshi Maruyama attended a workshop on "Cross Reactions of Oncogenic Viruses", at the Immunology-Epidemiology Segment's Special Virus-Cancer Program. August 28-29, 1969. Bethesda, Maryland.

Dr. L. Dmochowski attended the IVth International Symposium on Comparative Leukemia Research at Cherry Hill, New Jersey, September 21-25, where he presented the paper, "Ultrastructural Comparison of Leukemogenic and Sarcomagenic Viruses in Animals and Different Species.

Dr. Dmochowski attended the meeting of the National Board of Trustees and of the National Medical Advisory Committee of the Leukemia Society, September 26-27, 1969 in Cherry Hill, New Jersey.

Dr. L. Dmochowski and Dr. K. Maruyama attended and participated in the 4th Joint Working Conference, Special Virus Cancer Program of the National Cancer Institute at the Airlie House, Warrenton, Va., October 13-15, 1969. Also, Dr. Dmochowski presented a talk on "Type C Virus Particles in Human Leukemia".

Dr. Dmochowski participated in the 14th Clinical Conference, held November 5-6, 1969. Dr. Dmochowski presented a paper entitled "Current Status of the Relationships of Viruses to Leukemia, Lymphoma and Solid Tumors".

Dr. Dmochowski presented a lecture to the Department of Pediatrics Club, reviewing papers given at the International Symposium on Immunity and Tolerance in Oncogenesis, held in Perugia, Italy, June 25-July 1, 1969.

Dr. Gabriel Seman participated in the Integrated Cancer Congresses, Sao Paulo, Brazil, September 7-13, 1969, where he presented a paper entitled "The Relationship of Viruses to Human Breast Cancer", on the invitation of the President and the Secretary of the Congresses.

Dr. Dmochowski participated in the Executive Committee Meeting of the Leukemia Society of America, Houston Chapter on November 25, 1969.

Dr. Dmochowski attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Oklahoma, October 31-November 1, 1969 and Chaired the Session on Virology on November 1, 1969.

Dr. Gabriel Seman attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented 2 papers entitled "Electron Microscope Studies of Marek's Disease of Chickens" and "Ultrastructural Studies on Human Breast Cancer".

Mrs. W. Clydell Williams attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented a paper entitled "Immunological Studies on Mammary Tumors and Leukemia of Mice.

Dr. Koshi Maruyama attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented two papers entitled "Studies on Transspecies Infection of Murine Leukemia Virus" and "A Case of Canine Reticulum Cell Sarcoma with Type C Particles".

Miss Patricia McGehee attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented a paper entitled "Immunological Studies of Friend Virus-induced Tumors of Mice and Rats".

Dr. Elizabeth Priori attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented a paper entitled "Enhancement of Virus Production in Animal and Human Tumor Cells Grown in vitro".

Dr. J. M. Bowen attended the 1969 Annual Meeting of the Southwest Section of the American Association for Cancer Research at Lake Murray Lodge, Ardmore, Oklahoma, October 31-November 1, 1969 and presented a paper entitled "Studies on the Role of Cellular RNA in the Replication of Polyoma Virus in Mouse Embryo Cells".

Dr. J. M. Bowen participated as an invited speaker together with Dr. Thomas Matney and Dr. Robert Vick of Baylor University College of Medicine in a program entitled "Science, Ethics, and Religion" to a group of young people and adults at St. Luke's Methodist Church on August 19, 1969.

Papers Published:

"Comparative Studies of Type C Virus Particle-containing Cultures of Different Animal Species by Mixed Hemadsorption Reaction" by Koshi Maruyama and Leon Dmochowski, Texas Reports on Biology and Medicine 27: (2) 437-456, Summer, 1969.

"Induction of Bone Tumors in Rats and Hamsters with Murine Sarcoma Virus and their Cell-free Transmission" by R. L. Soehner and L. Dmochowski, Nature 224: 191-192, October 11, 1969.

"Viruses as possible Etiological Factors in Human Breast Cancer" by L. Dmochowski, G. Seman and H. S. Gallager, Cancer 24: #6, 1241-1249, December, 1969.

Abstracts Published:

"Morphological and Immunological Studies on Cat Embryo Cells in vitro Treated with Cell-Free Filtrate of Spontaneous Feline Lymphoma", K. Maruyama, L. Dmochowski, G. R. Swearingen, and M. Lewis. Proceedings of the 27th Annual Meeting of Electron Microscope Society of America, St. Paul, Minn., August 26-29, 1969.

"Comparative Studies of Feline and Human Leukemia by Mixed Hemadsorption Reaction", K. Maruyama, L. Dmochowski and Charles G. Rickard. IVth International Symposium on Comparative Leukemia Research, Cherry Hill, New Jersey, September 22-25, 1969, pp. 22, Abstract #D-3.

"Comparison of Leukemogenic and Sarcomagenic Viruses at the Ultrastructural Level", L. Dmochowski. IVth International Symposium on Comparative Leukemia Research, Cherry Hill, New Jersey, September 22-25, 1969, pp. 10-11, Abstract #A-5.

"Neoplastic Bone Lesions Induced in Rats and Hamsters by Moloney and Harvey Murine Sarcoma Viruses", R. L. Soehner, S. Fujinaga and L. Dmochowski. IVth International Symposium on Comparative Leukemia Research, Cherry Hill, New Jersey, September 22-25, 1969, pp. 38-39, Abstract #G-4.

Visitors:

Dr. Wilold Brozosko, Associate Professor of Pathology, Department of Immunopathology, Vtate Institute of Hygiene, Warsaw, Poland, was a visitor in the Department in September, 1969.

Dr. Larry Leonard, a Research Virologist from the California State Department of Public Health, Berkeley, California, visited the Department on October 7, 1969 and presented a lecture entitled "An Immunological Investigation of a Recurrent, Latent Viral Infection".

Dr. Pasquale Alis of Palermo, Italy was here for a month as an observer with Dr. Denton Cooley at St. Luke's Hospital and visited in the Department.

Dr. M. D. Daniel, Virologist from New England Regional Primate Research Center, Harvard Medical School, Southborough, Mass. visited in the Department on the afternoon of October 20, 1969.

Dr. Donald J. Read, Professor of Pharmacology, Oregon State University, Visiting Scientist, National Institutes of Health, Corvallis, Oregon was a visitor in the Department and presented a talk on "The Interaction of Microsomes with Procarbazine and Related Drugs", November 4, 1969.

Dr. M. A. Guidry, Coordinator Life Science Research, West Texas State University, Killgore Research Center, Canyon, Texas, was a visitor in the Department on November 7, 1969.

Dr. Chester Stock, Vice President, Sloan-Kettering Institute for Cancer Research, New York, New York was a visitor in the Department on November 17, 1969.

Dr. Gordon H. Theilen, Member of the Department of Clinical Sciences (Division of Surgery) University of California School of Veterinary Medicine, Davis, California, visited November 17 and 18 and consulted with members of the departmental staff and presented a lecture entitled "The Current Status of the Leukemia-Sarcoma Complex in Animals and Man".

Dr. W. Ray Bryan, Scientific Coordinator, National Cancer Institute, Bethesda, Maryland, was a visitor in the Department on November 18, 1969.

Miss Ann Rainey, a student at Wharton High School consulted with Dr. Dmochowski on November 28, 1969 concerning a science project.

Dr. Richard Jamison, Assistant Professor, Department of Pathology, School of Medicine, University of Colorado Medical Center, Denver, Colorado, visited the Department and presented a seminar entitled "Studies on Echovirus 22", December 5, 1969.

Dr. Ingegerd Hellstrom, Research Associate Professor, Department of Microbiology, Washington University, Seattle, Washington, was a visitor in the Department and presented a seminar entitled "Cellular Immunity to Tumor Antigens" on December 9, 1969.

Messrs. Terenc G. Jackson and Wesley Tennant of Stanford Research Institute, Menlo Park, California and Messrs. J. L. Taylor, Jr. and Robert H. Brewer of the Houston Chamber of Commerce were visitors in the Department on December 19, 1969.

Dr. Guy Juillard, Radiotherapist of Nice, France was a visitor in the Department on December 31, 1969.

Special Items:

Dr. Takeo Fujimoto joined the Department of Virology and Pediatrics as a Project Investigator from June 1, 1969-July 30, 1970. Dr. Fujimoto is Assistant in the Department of Pediatrics of Kyushu University, Japan.

Dr. Takao Kodama joined our Department as a Postdoctoral Fellow in Virology for the period of August 1, 1969 through July 31, 1970. Dr. Kodama is from the Hokkaido University School of Medicine, Sapporo, Japan. Dr. Kodama is paid from the China National Medical Board.

Dr. E. Bereczky Priori returned to full time duty on July 8, 1969. Her son is now weighing 14 pounds after 2 months.

Dr. R. L. Soehner, formerly with the Department has joined the Molecular Biology Research Laboratory, Miles Laboratories, Inc., 1127 Myrtle Street, Elkhart, Indiana 46514.

Dr. Tokichi Yumoto, visiting Associate Professor in Virology returned to the Department of Pathology, Kyushu University, Faculty of Medicine, 1276 Katakasu, Fukuoka, Japan.

Eight college students and 1 high school student finished summer training in the Department of Virology during the month of August.

Dr. Y. Hosobuchi, Assistant Professor, Division of Neurological Surgery, University of California School of Medicine, San Francisco Medical Center, San Francisco, California, consulted with members of the departmental staff on November 21, 1969.

Dr. Ingegerd Hellstrom, Research Associate Professor, Department of Microbiology, Washington University, Seattle, Washington, while a visitor in the Department of Virology, participated in a round table discussion at the Immunology Study Section Meeting on December 9, 1969.

SUMMARY OF ACCOMPLISHMENTS IN THE SECTION OF ELECTRON MICROSCOPY
OF THE DEPARTMENT OF VIROLOGY, M. D. ANDERSON HOSPITAL, HOUSTON, TEXAS

1956 JUNE 1968

The electron microscope installed in 1956 in the Section of Virology and Electron Microscopy, which has since expanded into Department of Virology in 1965, has been used in various research projects chiefly centered on studies on the relationship of viruses to the origin of cancer in animals and man. These projects have been and are being carried out by members of the staff of the Department either alone or in collaboration with the staff of almost every clinical department of the M. D. Anderson Hospital and Tumor Institute. Very soon after the installation of the electron microscope collaborative research was developed and established with scientists of a number of institutions in the Texas Medical Center and with scientists of many other institutions in the country. Successful research projects have been carried out with members of the University of Texas Dental School, the Institute for Dental Science, Baylor University College of Medicine, and the Department of Botany of the University of Texas in Austin. Among the institutions outside the State of Texas which have in the past or are now collaborating in electron microscope research and in other projects with members of the Department of Virology, the following may be mentioned: National Cancer Institute of the National Institutes of Health, Bethesda, Maryland; Institute of Microbiology of Rutgers University, New Brunswick, N. J.; Regional Poultry Research Laboratory, U. S. Agricultural Research Service, East Lansing, Mich.; Cancer Research Unit, Veterans Administration Hospital, Bronx, N. Y.; Department of Pathology, New York State Veterinary College, Cornell University, Ithaca, N. Y.; Department of Veterinary and Animal Sciences, University of Massachusetts, Amherst, Mass.; Department of Animal Diseases, University of Connecticut, Storrs, Conn.; Department of Virology, Virginia Institute for Scientific Research, Richmond, Va.; Institute of Cancerology and Immunogenetics, Paris, France; and Institute of Virology of the Karolinska Institute, Stockholm, Sweden.

Studies carried out with the help of the electron microscope have led to a number of first and original observations on the relationship of viruses to cancer. Almost every observation has since been confirmed by a number of investigators in this country and in various parts of the world. Among these observations, the following may be briefly mentioned:

The observation of virus particles in leukemia of mice and rats and demonstration that these virus particles are the causative agent of various types of leukemia in mice, rats and hamsters. They also have been found to cause autoimmune disease in mice and bone tumors in mice, rats and hamsters. These bone cancers have been found to be amazingly similar to neoplastic bone lesions of man. These virus particles also have been found to play an essential part in the induction of leukemia in mice by x-irradiation.

In leukemia of chickens, which in its various forms produces heavy losses in the poultry industry in this country, characteristic virus particles have been found and pinpointed as the causative agent of all the forms of chicken leukemia and various types of so-called solid tumors including cancer of the kidneys, which is strikingly similar to the kidney cancer, or Wilm's tumor, of children.

Studies on tumors in mice, rats and hamsters induced by a viral agent called "polyoma" have led to the first original demonstration of this agent in these tumors of various types.

Studies of cancer of the eye in cattle, combined with other approaches, have led to the visualization of the virus which causes "pink-eye", or keratoconjunctivitis, in cattle. These studies have led to the isolation of the virus and provided a basis for attempts at vaccination against "pink-eye", which is economically a disease of great importance. Preliminary carefully controlled studies have shown that vaccination against this disease is indeed successful. The relationship of this virus to eye cancer in cattle is being further studied.

Parallel with the described studies on animal cancer, a study on various types of leukemia in patients, initiated in 1956, has been vigorously pursued. This study has led to the original demonstration of characteristic virus particles in tissues and blood of leukemic patients. It has led to present attempts at growing these virus particles, which are very similar to those found in animal leukemia, outside the body of the patients. These studies, if successful, may lead to first attempts at vaccination against leukemia.

In a cooperative study with members of the Department of Surgery and the Head and Neck Section of this department, the presence of virus particles in laryngeal papillomas has been demonstrated. These virus particles are very similar to those found in human warts. Attempts are being made to grow this virus in tissue culture outside the patient's body in order to obtain quantities of the virus sufficient for preliminary studies on the effect of vaccination against this type of tumor.

Recently initiated studies of breast cancer in women have led to the discovery of characteristic virus particles in some types of breast cancer. These studies, combined with other approaches, urgently require extension.

Whenever the occasion required, electron microscopy was carried out as a service function in examination of non-cancerous and other lesions of unknown origin in patients at the Hospital.

Studies carried out with the help of the electron microscope have led to the organization of two symposia on fundamental cancer research with the main subject comprising studies on viruses and cancer. They were held in 1957 and in 1963. Many scientists from the United States and from a number of foreign countries attended these symposia. In addition, invitations were received to participate in the organization of a number of international symposia in Europe and in Japan,

Interest in the studies carried out in the Department has resulted in numerous invitations to participate in national and international symposia in various parts of the world. It has further led to invitation to serve as consultant to the National Cancer Institute and to serve on various committees of the Special Virus-Leukemia Program of the National Cancer Institute and committees of the Leukemia Society of America.

Electron microscopy has been found very helpful in the educational activities of the Department and of the Institution. It has greatly helped in the educational program of the Department in the following aspects: (1) Special Summer Training Program for College and Medical Students -- Since 1956, 28 students have participated in this program; (2) Predoctoral Training Program in which 3 persons have so far participated; (3) Postdoctoral Training Program -- there have so far been 11 postdoctoral fellows; (4) Project Investigators in clinical research -- 3 investigators have taken part in this program; (5) Training Programs at the Research Technician Level -- A total of 15 individuals have completed this program, 3 of which have obtained an M. D. degree, 1 a Ph.D. degree, and 6 are Ph.D. candidates. In the interdepartmental teaching program, 4 clinical fellows have completed their training. Within the extradepartmental teaching activities, series of lectures should be mentioned which were presented to nurses, dieticians, TV audiences and medical schools in the United States and abroad in which results obtained by electron microscopy were presented.

There are now investigators in Italy (1), France (1), England (1), and Japan (3) who have undergone a period of training in electron microscopy and virology and have reached high academic rank in their respective countries.

Several prominent scientists (3) have spent some time in the Department as Visiting Professors or Visiting Scientists because of the interest in the work of the Department.

Finally, it should be mentioned that the results of electron microscope studies have formed the basis of 67 original scientific articles, 9 reviews in various scientific journals published in this country and abroad, and 4 chapters in different textbooks. A number of additional articles are now in press.