Meetings

Mouse Mammary Tumor Virus

On 23 and 24 March a working conference on the mouse mammary tumor virus was held at the University of California in Berkeley, under the auspices of the Cancer Research Genetics Laboratory of the department of zoology. The meeting was made possible by Cancer Research Funds of the University of California. Attendance at the informal conference was limited to invited workers in the field of mouse mammary tumorigenesis, who are actively concerned with the role of the virus (the mammary tumor agent of Bittner) in this neoplastic process. The conference was dedicated to the memory of the late John J. Bittner of the University of Minnesota, discoverer of the mammary tumor virus and a vigorous and pioneering experimenter in the field.

Present at the conference were the staff (K. B. DeOme, H. A. Bern, D. R. Pitelka, S. Nandi, and P. B. Blair), postdoctoral fellows (N. Takasugi and M. Banerjee), and graduate students (L. J. Faulkin, Jr., E. Rivera, R. Moretti, C. Daniel, and K. K. Sekhri) of the Cancer Research Genetics Laboratory at Berkeley; R. Huseby of the American Medical Center at Denver; D. Moore and G. Miroff of the Rockefeller Institute for Medical Research, New York; E. Lasfargues of the Columbia University College of Physicians and Surgeons, New York; and L. Dmochowski and J. A. Sykes of the M. D. Anderson Hospital and Tumor Institute, Houston, Texas.

The discussion was based on informal reports on current research from the several laboratories represented. DeOme introduced the sessions with the statement that the mammary tumor virus represents one of the few instances of a naturally occurring tumor virus in its natural host, which is available for investigation. It is noteworthy that so few workers in the area of tumor biology are at present working on the important and difficult problem of the role of this virus. DeOme proposed a model schema describing the possible intervention of the virus in mouse mammary tumorigenesis; this was focused on the Cancer Research Genetics Laboratory's current conclusion that the virus modifies normal tissue and thus contributes to the formation of hyperplastic alveolar nodules (the precancerous state) with high tumorigenic potential. The data of the Cancer Research Genetics Laboratory indicate an apparent lack of identity between the biologically active mammary tumor virus (MTV) and the viruslike particles visible with the electron microscope (EMV).

Pitelka reviewed efforts to infect mice with EMV without simultaneously introducing MTV; the means used were various reciprocal hybrid matings, foster nursings, and the hormonal induction of nodules. To date, no structures (nodules or tumors) have been found that might contain experimentally transmitted EMV in the absence of MTV. Blair commented that her work involving transplantation of nodules and determination of their tumor potential indicates that nodules formed in the absence of MTV are less tumorigenic than those formed in its presence, and that adding MTV to a nodule formed in its absence does not appear to alter the tumor potential of the nodule. She further reported evidence of some antigenic similiarity between EMV and MTV, as indicated by the ability of EMV-containing tissues to cause the production in the rabbit of antibodies which will neutralize MTV. Nandi discussed attempts to develop a new bioassay method for MTV which might permit more rapid determination of the presence of the virus than is now possible. A method, based upon the differential sensitivity of C3H mammary tissues, in the presence and absence of the virus, to growth-hormone-containing hormone combinations, proved unsatisfactory owing to the apparent occurrence in mammary tissues of factors other than MTV which are capable of modifying the mammary responsiveness to hormones. A second method, involving the hormonal induction of nodules, is proving more promising.

Lasfargues discussed his organ-culture results and reported hormonal induction of alveolar hyperplasia in mammary fragments of normal, early pregnant strain RIII mice which are not reproducible in agent-free C57 mammary tissues. This corresponds in the RIII mice to an active production of B particles. Addition of a lactogenic hormone combination in vitro to RIII mammary tissues taken in lactation results in the maintenance of secretion and a new peak in the production of B particles.

Moore opened his presentation with a discussion of the observations of D. G. Feldman on the occurrence of particles in normal mammary tissues of MTV-infected mice (strains DBA and RIII). Moore then considered biophysical evidence as to the size of the MTV and its relation to the particles. His data suggest the existence of biologically active large particles (B particles), of small particles (nucleoids), and possibly of an active nucleic acid, and also of an inhibitor intermediate in size between the B particle and the nucleoid, and of a second small dialyzable inhibitor. New information on the ultrastructure of the B particles and the possible origin of small particles from them was presented. The small particles appear to contain an infective ribonucleic acid (RNA) protein, and the MTV is apparently an RNA virus. Moore considers the MTV to be different from other viruses hitherto investigated. Miroff presented his in vivo and in vitro experiments illustrating the metabolic alterations produced by the mammary tumor agent upon ribonucleic acid, deoxyribonucleic acid, and phospholipid syntheses in normal tissues and ascites cells lacking the mammary tumor agent.

Huseby considered the possible mediation of the MTV effect in tumorigenesis through influence on the endocrine system. If the MTV caused a decrease in the level of circulating androgen, increased secretion of prolactin (mammotropin) could be postulated, with a possible resultant stimulation of tumor formation. However, Huseby made it clear that he does not consider that the MTV exerts its primary influence through such a path.

Sykes demonstrated the occurrence of cytoplasmic inclusions in mammary tumor cell cultures, both virus-bearing

and supposedly virus-free, which appear to be RNA-containing aggregates. In addition, by a method of serial cultivation of mammary tumor cells on the chick yolk sac and subsequent inoculation of virus-free mouse embryo cultures, Sykes was able to detect considerable proliferation of the MTV in culture. Sykes and Dmochowski have found considerable numbers of particles in the milk of various nominally MTV-negative mouse strains. In addition, they reported the occurrence of mammary tumors in mice injected with extracts of C3Hf tumors or with high-speed centrifugal pellets obtained from defatted and decaseinated milk from Af strain mice. Dmochowski then discussed his findings regarding physical and chemical properties of MTV and presented new ultrastructural information on particles in milk from both MTV-positive and MTV-negative mice, based on the negative staining technique with potassium phosphotungstate. In addition, he presented data based on electron-microscope studies of virus-containing milk preparations treated with proteases and nucleases, which indicate that MTV is an RNA-carrying virus.

In conclusion, it appears that progress is being made in associating the physical and biological characteristics of the mammary tumor virus. The biological effects of the virus suggest that its supposed tumor-inducing properties may actually derive from early influences on normal mammary tissues. This virus has been one of the most intensively studied of the so-called tumor viruses; nevertheless, it remains one of the most elusive. It is reasonable to expect that additional investigators will interest themselves in the challenge presented by this potent agent and that the next conference of this kind will not be so limited in the number of participating laboratories.

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Forthcoming Events

September

9–14. American Chemical Soc., natl. meeting, Atlantic City, N.J. (A. T. Windstead, Natl. Meetings Dept., ACS, 1155 Sixteenth St., NW, Washington 6)

9–14. American Congr. on Surveying and Mapping—American Soc. of Photogrammetry, St. Louis, Mo. (Convention Headquarters, ACSM, Box 2731, Soulard Station, St. Louis 4)

9–14. Homeopathic Medicine, intern. congr., Bad Godesberg, Germany. (W. Schwarzhaupt, Sachsenring 73, Cologne, Germany)

9–14. Illuminating Engineering Soc., Dallas, Tex. (C. L. Amick, Day Brite Lighting, Inc., P.O. Box 141, St. Louis 66, Mo.)

9–14. International College of Surgeons, biennial, New York, N.Y. (H. E. Turner, 1516 Lake Shore Dr., Chicago 11, Ill.)

9–15. Dermatology, intern. congr., Washington, D.C. (E. D. Osborne, 71 North St., Buffalo, N.Y.)

9–15. International Soc. of Hematology, congr., Mexico, D.F., Mexico (L. Sánchez-Yllades, c/o Instituto de Estudios Médicos y Biológicos, Apartado postal 25228, México 20, D.F.)

9–15. Paediatrics, intern. congr., Lisbon, Portugal. (M. Cordeiro, Clinica Pediatrica Universitoria, Hospital Santa Maria, Avenue 28 de Maio, Lisbon 4, Portugal)

9–23. Technical Science in the Service of Progress and Peace, intern. trade fair, Brno, Czechoslovakia. (Embassy of the Czechoslovak Socialist Republic, 2349 Massachusetts Ave., NW, Washington 8)

10–12. Geochemical Soc., organic geochemistry group, Milan, Italy. (U. Colombo, G. Donegani Research Inst., Montecatini Co., Via del Lavoro 4, Novara, Italy)

10–12. Technical Assoc. for Waste Water, annual, Wiesbaden, Germany. (Abwassertechnische Vereinigung, Bertha-von-Suttner-Platz 8, Bonn, Germany)

10–14. Applied Meteorology, natl. conf., Hampton, Va. (D. A. Lea, Navy Weather Research Facility, Naval Air Station, Norfolk 11, Va.)

10–14. Inelastic Scattering of Neutrons in Solids and Liquids, symp., Chalk River, Canada. (Intern. Atomic Energy Agency, 11 Kärntner Ring, Vienna 1, Austria)

10–15. Analog Computation Applied to Aeronautics, seminar, London, England. (S. C. Redshaw, Civil Engineering Dept., Univ. of Birmingham, Edgbaston 15, Birmingham, England)

10–15. International Assoc. of Game, Fish, and Conservation Commissioners, Moran, Wyo. (IAGFCC, 16413 Canterbury Dr., Hopkins, Minn.)

10–15. International Gravimetric Bureau, general assembly, Paris, France. (J. J. Levallois, Intern. Assoc. of Geodesy, 19 rue Auber, Paris 8e)

10–15. Molecular Structure and Spectroscopy, intern. symp., Tokyo, Japan. (Secretary, Organizing Committee, Science Council of Japan, Ueno Park, Tokyo)

10–15. Research in Mammary Tumours, World Health Organization scientific group, London, England. (WHO, Palais des Nations, Geneva, Switzerland)

10–16. Protection Against Corrosion, symp., Bratislava, Czechoslovakia. (Mr. Jelinek, Dôm Technicky, Kocel'ova 17, Bratislava)

10–16. Relationship between Soil Fauna and Soil Microflora, symp., Oosterbeek, Netherlands. (J. van der Drift, Inst. for Biological Field Research, Kemperbergerweg 11, Arnhem, Netherlands)

10–18. Variations of Existing Glaciers, symp., Obergurgl, Austria. (L. J. Tison, Intern. Assoc. of Scientific Hydrology, 61 rue des Ronces, Gentbrugge, Belgium)

10–21. Experimental Stress Analysis, inst., Detroit, Mich. (J. Der Hovanesian, Engineering Mechanics Dept., Wayne State Univ., Detroit 2)

11–17. Ornithology, all-union conf., L'vov, U.S.S.R. (Ministry of Higher and Secondary Special Education, Moscow, U.S.S.R.)

11–17. Physiology, intern. congr., Leiden, Netherlands. (W. O. Fenn, Dept. of Physiology, Medical Center, Univ. of Rochester, Rochester 20, N.Y.)

12–14. Condensation and Evaporation of Solids, intern. symp., Dayton, Ohio. (Office of Aerospace Research, U.S. Air Force, Washington 25)

12–14. Plutonium as a Power-Reactor Fuel, natl. meeting, Richland, Wash. (American Nuclear Soc., 86 E. Randolph St., Chicago 1, Ill.)

12–18. International Inst. de Sociologie, Córdoba, Argentina. (C. C. Zimmerman, 200 Emerson Hall, Harvard Univ., Cambridge 38, Mass.)

13–14. Advanced Gas-Cooled Reactors, symp., London, England. (Secretary, British Nuclear Energy Conf., 1–7 Great George St., London, S.W.1)

13–14. Engineering Management, annual conf., New Orleans, La. (Inst. of Radio Engineers, 1 E. 79 St., New York 21)

13–14. Engineering Writing and Speech, natl. symp., Washington, D.C. (Inst. of Radio Engineers, 1 E. 79th St., New York 21)

13–15. Polymer Research, annual symp., Łodz, Poland. (A. Boryniec, Technical Univ. of Łodz, Zwirki 36, Łodz)

14–16. Society of Exploration Geophysicists, annual intern. meeting, Calgary, Alberta, Canada. (N. J. Christie, 209A Sixth Ave., SW, Calgary)

15–17. Psychology and Pedagogy, intern. symp., Turin, Italy. (Servizio di Assistenza Psico-Medico Sociale della Provincia di Torino, Via Giovannida Verazzano 4, Turin)

16–19. American Inst. of Chemical Engineers, natl. meeting, Denver, Colo. (Secretary, AICE, 25 W. 45 St., New York 36)

16–22. Latin American Chemistry Congr., annual, Buenos Aires, Argentina. (Secretary, Congreso Latinoamericano de Quimica, Casilla de Correo 2153, Buenos Aires)

16–22. Low-Temperature Physics, intern. conf., London, England. (LT8, Queen Mary College, University of London, Mile End Rd., London, E.1)

16–24. Military Medicine and Pharmacy, intern. congr., Caracas, Venezuela. (E. P. Vivas, c/o Ministerio de la Defensa, Caracas)

17–18. Hydrofoils and Air Cushion Vehicles, natl. meeting, Washington, D.C. (W. H. Arata, Jr., Manager-Market Planning, Fairchild Stratos, Hagerstown, Md.)

17–18. Water Protection, symp., Schaffhausen, Switzerland. (Ligue Suisse pour la Protection des Eaux, Kurbergstrasse 19, Zurich 49, Switzerland)

17–19. Pharmaceutical Products, intern. symp., Florence, Italy. (A. Soldi, Società Italiana di Scienze Pharmaceutiche, Via Giorgio Jan 18, Milan, Italy)