A REPORT TO THE PHYSICIANS OF TEXAS

newsletter

THE UNIVERSITY OF TEXAS SYSTEM CANCER CENTER

January-February 1982 M. D. Anderson Hospital and Tumor Institute at Houston Volume 27, Number 1

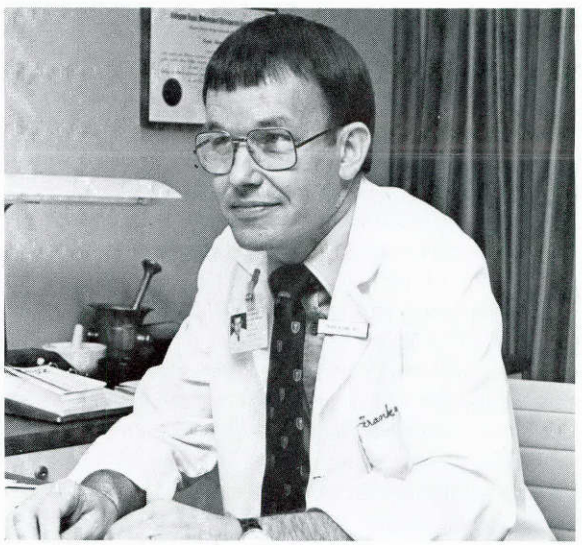
Psychiatric Treatment Addresses Chronic Pain and Depressive Illness

Treatment at UT MDAH focuses on the patient with cancer, not just the cancer itself. Therefore, when a cancer patient develops chronic pain or depressive illness, both central nervous system disorders, Frank Adams, MD, chief of psychiatry in the Department of Internal Medicine, is prepared to diagnose and treat these disorders.

The physiological or emotional changes that result from a central nervous system disorder can ravage almost every aspect of a patient's life. According to Dr Adams, "A cancer patient's rate of recovery, rate of response to treatment, and rehabilitation is obviously going to be affected by the existence of any other illness. Therefore, while treatment of chronic pain or depressive illness may not affect the ultimate outlook for recovery, it will contribute significantly to the patient's quality of life."

Chronic pain is a heterogeneous entity that accompanies a variety of conditions. Therefore, Dr Adams works with specialists from nursing, neurosurgery, anesthesiology, physical therapy, occupational therapy, chaplaincy, and pharmacy in applying a multidisciplinary approach to the treatment of chronic pain. "Because of the peculiar nature of chronic pain in patients with malignant disease, there are many ways of attacking the pain. No one modality will always work," Dr Adams explained.

Chronic pain rarely exhibits only physiological characteristics. For this reason, Dr Adams believes that psychiatry has an essential role in pain management. "Chronic pain is expressed as behavior—it is not like any other tangible disease. Therefore, psychiatrists are uniquely equipped to treat it," he said.



***Frank Adams, MD,** applies a neuropsychiatric approach to the treatment of chronic pain and depressive illness in UT MDAH patients.*

Dr Adams considers many factors that may affect a patient's response to treatment before he designs a treatment plan. During the psychiatric examination, he assesses the patient's description and history of the pain, as well as his or her personal and family histories of past pain conditions and emotional disorders.

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Murgola Represents UT MDAH at Workshop on Genetic Translational Accuracy

Emanuel J. Murgola, PhD, Department of Molecular Biology, recently represented UT MDAH at an international molecular biology meeting. Dr Murgola was one of 63 invited participants in the European Molecular Biology Organization's Workshop on Accuracy held September 1-6, 1981, in Grignon, France.

The workshop topics addressed the mechanisms by which genetic information is accurately processed and passed on to succeeding cell generations. Explaining the importance of this accuracy and, thus, of the workshop, Dr Murgola said, "The health of an organism depends upon the faithful storage and retrieval of genetic information within each cell and the precise transmission of that information from one cell generation to the next. Specifically, the information contained in each gene or segment of DNA must be accurately duplicated in DNA copies or transcribed into an RNA copy. The genetic information, or nucleotide sequence, of the RNA transcript must then be accurately translated into the specific amino acid sequence of a particular protein."

Dr Murgola's presentation was entitled "Anticodon Shift in the Generation of Novel Missense and Nonsense Suppressor tRNAs." He and his co-workers have devoted several years to elucidating the structural features of transfer RNA (tRNA) that permit it to interpret and accurately translate the genetic information contained in messenger RNA into the amino acid sequences of proteins. He reported the discovery of a new mechanism by which a particular tRNA can be altered by mutation to recognize a codon (three-nucleotide "word" in the genetic code) different from

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Conference to Focus on Psychological Implications of Chronic Illness in Children

UT MDAH Department of Pediatric's Seventh Mental Health Conference, "The Mind of the Child Who is Said to be Sick," will be held March 11-12, 1982, at the First Presbyterian Church in Houston. The conference, one of a series of conferences aimed at educating health professionals to help ill children achieve normal lifestyles, focuses on the psychological implications of chronic illness and how health professionals can assist the child and family in adjusting to the illness.

Four half-day sessions will be held, each consisting of formal presentations, followed by a panel presentation and a group discussion. Each session will focus on one aspect of chronic illness in children.

The first session will examine the child's perception of illness in terms of how others treat the child and how the child feels. The second session will address the impact of the illness on the child's family, focusing on stress and the altered family structure. Cognition of the child will be the subject of the third session, which will deal with how treatment may affect the child, the kind of information the child may need or want, and the use of hypnosis to treat chronic illness in children. The fourth session will examine social, ethical, and religious concerns, including the right of the child to make treatment decisions, how to explain the possibility of death, and the impact of a child's illness on the attending health professionals.

According to Conference Cochairperson Donna Copeland, PhD, Department of Pediatrics, "The conference is designed to provide information to people who take care of chronically ill children—psychologists, psychiatrists, social workers, chaplains, nurses, pediatricians, and parents—all of whom are very concerned about helping the chronically ill child achieve as normal a lifestyle as possible."

Chairing the conference with Dr Copeland are Jan van Eys, MD, PhD, Department of Pediatrics, Allison Stovall, MSW, Departments of Pediatrics and Social Work, and Betty Pfefferbaum, MD, Department of Pediatrics and The University of Texas Medical School at Houston.

For additional information, please write to Donna Copeland, PhD, conference cochairperson, Room C6.036, The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, 6723 Bertner Avenue, Houston, Texas 77030.

newsletter

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35th Annual Symposium on Fundamental Cancer Research

Perspectives on Genes and the Molecular Biology of Cancer

March 2–5, 1982
Shamrock Hilton Hotel
Houston, Texas

Sponsored by
The University of Texas
M. D. Anderson Hospital and Tumor Institute at Houston

Cosponsored by

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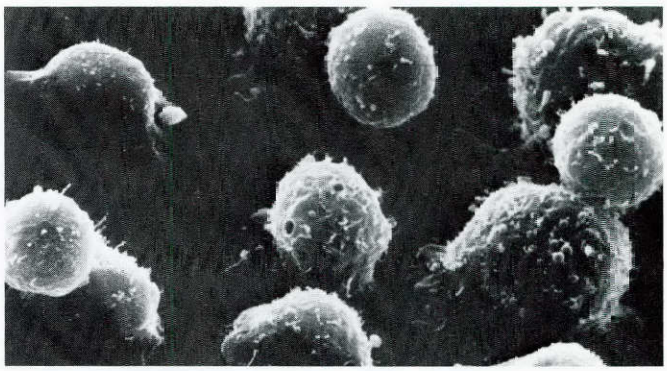
and the American Cancer Society,
Texas Division, Inc.

With the cooperation of The University of Texas
Health Science Center Graduate School
of Biomedical Sciences

Cochairpersons: Donald L. Robberson, PhD, Department of Molecular Biology, and Grady F. Saunders, PhD, Department of Molecular Biochemistry

As an organization accredited for continuing medical education, The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston certifies that this medical education offering meets the criteria for 17 credit hours in Category I of the Physician's Recognition Award of the American Medical Association. For further information, contact Donald L. Robberson, PhD, Department of Molecular Biology, The University of Texas M. D. Anderson Hospital and Tumor Institute at Houston, 6723 Bertner Avenue, Houston, Texas 77030.



This hybridoma, designated 124-40, *secretes an antibody specific for a cell-surface protein found exclusively in experimental x-ray-induced murine leukemias. The antibody has been shown to be useful in the detection and separation of tumor cells from normal cells and has been found to have therapeutic potential in this experimental system. (The scanning electron micrograph of the hybridoma cell, which was constructed in the laboratory of James P. Allison, PhD, The University of Texas Science Park, was taken by Stephen Meier, PhD, Department of Zoology, The University of Texas at Austin.)*

Hybridoma Conference Aimed at Diverse Audience of Biological Scientists

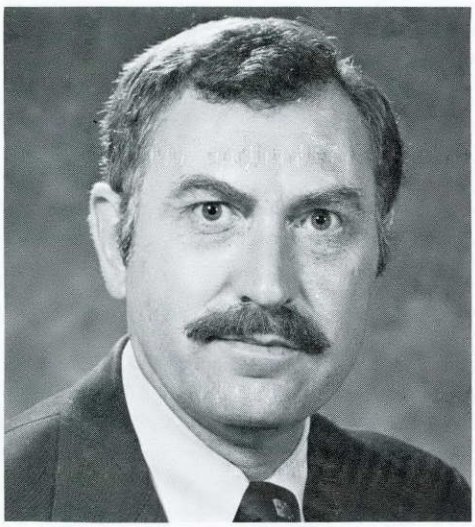
The "Hybridomas and Cellular Immortality" symposium, sponsored by The University of Texas Medical School at Houston, Office of Continuing Education; Ortho Pharmaceutical Corporation, Ortho Diagnostic Systems, Inc.; and the American Cancer Society, Texas Division, Inc., was held November 5-6, 1981, at the Stouffer's Greenway Plaza Hotel in Houston. The symposium was held in cooperation with UT Medical School—Houston's Division of Immunology and Organ Transplantation and the Departments of Surgery and Pharmacology and The University of Texas Science Park. More than 500 people attended the symposium, which was the second in a series of symposia on developments in active biological research.

The goal of the hybridoma symposium was to provide access to information on hybridoma technology for people in diverse areas of biomedicine. According to the hybridoma symposium chairperson, Baldwin H. Tom, PhD, Department of Surgery and the Department of Biochemistry and Molecular Biology at UT Medical School—Houston, "Hybridoma technology is likely to find many applications outside the domain of immunology and cell biology; it may greatly expedite the solution of research problems in protein chemistry, virology, pharmacology, and clinical investigations. Thus, it is important to disseminate current information on hybridoma approaches to a broad audience of biological scientists."

The symposium sessions were entitled *Antibody Diversity and B-Cell Differentiation; Somatic Cell Hybrids in Studies of T-Cell Function, Differentiation, and Immortalization; Monoclonal Antibodies in Cellular and Molecular Immunology, Monoclonal Antibodies to Tumor Cell Surfaces—Potential Reagents* and *Hybridomas: Cellular Immortality Now and Beyond.*

Addressing the question of the future of hybridoma technology, the hybridoma symposium program director, James P. Allison, PhD, UT Science Park, stated that "hybridoma technology has taken tumor immunology beyond a purely descriptive phase into a phase in which we'll be able to gain some understanding of what specific changes occur, and further, how these changes affect the behavior of the tumor cell."

He added "In the future, I foresee the development of in vitro techniques for the construction of antibodies with the specificity and biological activity that we desire. Such carefully engineered antibodies are going to prove valuable in all areas of biomedicine."



Guy R. Newell

Noteworthy

Guy R. Newell, MC, director of the Department of Cancer Prevention, will receive an award from Eta Sigma Gamma, the academic honorary society for men and women in health education, during the annual meeting of the Association for the Advancement of Health Education on April 24, 1982, at the Albert Thomas Convention Center in Houston. The Eta Sigma Gamma Honor Award, which will be presented to Dr Newell by the society's national president, Warren E. Schaller, HSD, chairman of the Department of Physiology and Health Science at Ball State University, is given in recognition of outstanding contributions to the health science field. "Dr Newell is being recognized because of the responsibility he has to work with health educators on their role in cancer prevention," said Dr Schaller. During the meeting, Dr Newell will speak on the role of the health educator in cancer prevention.

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Lester J. Peters

Peters Joins Staff as Head of Radiotherapy

Lester J. Peters, MD, has been appointed head of the Division of Radiotherapy and the Department of Clinical Radiotherapy. He assumed the post on November 9, 1981, succeeding Gilbert H. Fletcher, MD, who recently retired after serving 33 years as the first head of the Department of Radiotherapy.

Dr Peters has an extensive background in both the research and clinical areas of radiotherapy. "My main interest," he said, "is to apply radiobiological principles developed in the laboratory to the clinical practice of radiation oncology as part of cancer patient management."

Dr Peters holds memberships in many professional organizations, including the Royal Australasian College of Radiologists, the Royal College of Radiologists, the American College of Radiology, the American Society of Therapeutic Radiologists, the British Institute of Radiology, and the Radiation Research Society. As a student at the University of Queensland Medical School in Queensland, Australia, he received prizes for the highest marks in the study of internal medicine, surgery, obstetrics, gynecology, and psychiatry. During his last year in medical school, he received First Class Honors and the University Gold Medal.

After receiving his medical degree, Dr Peters served as a resident medical officer of the Royal Brisbane Hospital in Brisbane, Queensland. While at the Queensland Radium Institute from 1968 to 1971, he received training in radiotherapy and served as an anatomy, physiology, and pathology lecturer and as a staff radiotherapist. Dr Peters then moved to Northwood, Middlesex, England, where he served as a research fellow in the Gray Laboratory Cancer Research Campaign at Mt. Vernon Hospital for three years. He served as a lecturer and the locum director of the Richard Dimbleby Research Laboratory at St. Thomas' Hospital in London for one year before joining the UT MDAH staff in 1975 as an associate professor of radiotherapy. Dr Peters returned to his native country of Australia in 1979 to become senior radiation oncologist and clinical radiobiologist at the Institute of Oncology and Radiotherapy at the Prince of Wales Hospital in Randwich, Australia, before returning to UT MDAH to accept his new position.

Guidelines Developed for Drug Preparation

The UT MDAH Department of Pharmacy recently developed guidelines for the handling of antineoplastic agents. The guidelines were developed because a study, which the department carried out in conjunction with The University of Texas School of Public Health at Houston and The University of Texas Graduate School of Biomedical Sciences at Houston, showed that the level of mutagenic activity was elevated in a group of pharmacy personnel who prepared these substances.

The study, conceived in 1979, was conducted using six employees who prepared antineoplastic agents in horizontal laminar flow hoods. Investigators collected the subjects' urine for eight consecutive days—six days during which they were exposed to the agents, followed by two days when they were not. Urine was also collected for eight consecutive days from three unexposed controls. The investigators tested the urine against three salmonella organisms using the Ames reverse mutation assay to assess the level of mutagenic activity.

The study revealed a definite exposure problem for pharmacy personnel who prepare antineoplastic agents in horizontal laminar flow hoods. To define sources of exposure, the investigators tested the subjects' urine for eight additional consecutive days, during which time the subjects wore respiratory masks while working in the horizontal laminar flow hoods. The level of mutagenic activity in their urine did not decrease significantly. Results were similar when surgical gloves were used, but mutagenic activity decreased significantly when the subjects worked in a Class II, Type B vertical laminar flow biological safety cabinet.

Members of the Department of Pharmacy developed a set of guidelines for the handling of antineoplastic agents, based on their findings and those of institutions in other countries. The guidelines cover the use of protective equipment (biological safety cabinets and protective garments) and personnel policies; monitoring methods; and compounding, administering, and disposal techniques.

"The guidelines were developed for use in our institution," said Roger W. Anderson, MS, RPh, director of the Department of Pharmacy, "but we recommend them for use in all situations. In hospitals, we recommend that all mixing be done centrally, in the pharmacy, where all the guidelines should be applied. In physicians' offices, recommendations concerning protective garments and compounding, administering, and monitoring techniques should be followed."

Because the study revealed a definite exposure problem, Mr Anderson said that the next step is to determine whether the increased mutagenic activity indicates a health risk in exposed individuals by testing for the presence of chromosomal effects. Epidemiological studies would then be needed to determine what, if any, long-term effects might be expected.

No conclusions can yet be drawn about the extent of the health risk. However, Mr Anderson strongly recommends that precautionary measures be taken by all who work with antineoplastic agents, regardless of volume. "Although we found no evidence of any immediate health risk, we are dealing with diseases that have latent periods."

Guidelines for Handling Antineoplastic Agents*

Biological Safety Cabinets

1. All mixing of antineoplastic drugs shall be performed in a Class II Vertical Laminar Flow Biological Safety Cabinet. The preferred cabinet is the Type B (Type 2) with outside venting, according to NSF Standard 49 specifications.
2. Special aseptic techniques and precautions must be utilized because of the vertical (downward) airflow.
3. No other IV admixtures should be prepared in Biological Safety Cabinets designated for the mixing of antineoplastic agents.
4. The Biological Safety Cabinets should be certified by a qualified technician semiannually, or any time the cabinet is physically moved.
5. The exhaust plenum of the Biological Safety Cabinet should contain a charcoal filter in addition to the HEPA filter.
6. The Biological Safety Cabinet must be operated with blower on—24 hours per day—seven days per week.
7. Drug preparations shall be performed only with the viewing window at the required access opening.

Gloves and Protective Gowns

1. Disposable gloves must be worn for all procedures involving antineoplastic drugs. Double gloving is recommended when cleaning up spills.
2. Disposable protective barrier garments should be worn for all procedures. These garments should have a closed front, long sleeves, and closed cuff (either elastic or knit). Disposable protective aprons may be worn as a barrier in lieu of closed front garments.
3. All potentially contaminated garments must not be worn outside the work area.

Compounding Techniques

1. Hands must be washed thoroughly before gloving and after removal [of gloves].
2. Care must be taken to avoid puncturing of gloves and possible self-inoculation.
3. Syringes and IV sets with luer-lock fittings should be used whenever possible.
4. A sterile plastic-backed absorbent drape should be placed on the work surface during mixing procedures. The drape should be exchanged whenever significant spillage occurs, or at the end of each production sequence.
5. Vials should be vented to eliminate internal pressure or vacuum.
6. Before opening ampules, care should be taken to ensure that no liquid remains in the tip of the ampule. A sterile gauze sponge should be wrapped around the neck of the ampule while opening.
7. Final drug measurement should be performed prior to removing the needle from the stopper of the vial.
8. A non-splash collection vessel should be available in the Biological Safety Cabinet to discard excess drug solutions.
9. The external surface of final IV containers should be wiped with alcohol soaked sponges prior to removal from the Biological Safety Cabinet.
10. Special procedures shall be followed for major spills or acute exposures.

Administering Techniques

1. Disposable gloves shall be worn during all antineoplastic drug administration activities.
2. Syringes and IV sets with luer-lock fittings should be used whenever possible.
3. Special care must be taken in priming IV sets. The distal tip cover must be removed before priming. Priming should be performed into a sterile gauze sponge, which then is disposed of appropriately.

Disposal Recommendations

1. All disposable items that have potentially come in contact with antineoplastic drugs during compounding or administration must be disposed of in specifically designated containers. These cardboard box containers shall have plastic liners containing an absorbent substance. All box seams shall be taped before removal from the work area. Designated content description labels and a "Biohazard" symbol shall be placed on each container.
2. All hazardous waste containers shall be disposed of by proper incineration.
3. General cleaning of the work area must be performed using dust containment procedures. If vacuum cleaning is used, it must be through a central filtered system.

Personnel Policy Recommendations

1. All personnel must receive special training in working with antineoplastic agents.
2. The number of personnel working with these agents should be minimized.
3. Eating, drinking, smoking, application of cosmetics, or similar activities are not permitted during compounding or drug administration procedures.
4. Access to the compounding area must be limited to only necessary authorized personnel.
5. The personnel working with these agents should be observed regularly by supervisory personnel to ensure compliance.
6. Acute exposure episodes must be documented. The employee must be referred for professional examination.

Monitoring Methods

1. Routine urinalysis testing should be performed to monitor the effectiveness of protective measures.
2. A permanent registry shall be maintained of all employees who handle antineoplastic drugs.

*Presented at the 16th Annual American Society of Hospital Pharmacists Midyear Clinical Meeting, December 7, 1981, in New Orleans, Louisiana. Reprinted with permission of the *American Journal of Hospital Pharmacy.*

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Three Books Published

The ***1981 Year Book of Cancer,*** compiled and edited by R. Lee Clark, MD, Russell W. Cumley, PhD, and Robert C. Hickey, MD, is now available from Year Book Medical Publishers (Chicago, Year Book Medical Publishers, 1981, $37.95, 502 pages). This year's volume, the 25th in the *Year Book of Cancer* series, contains 289 abstracts of articles about new developments in cancer diagnosis, treatment, and research.

As in the past, emphasis is placed on early detection as the best weapon against cancer mortality. The volume includes abstracts that cite progress in the use of computerized axial tomography for the diagnosis, staging, and follow-up of cancer patients. The development of the monoclonal antibody technique, one of the most dramatic advances in immunology, is discussed in another abstract.

The volume also reviews the development of various treatment modalities, including the use of interferon, chemotherapy in conjunction with hyperthermia and with autologous bone marrow transplantation, and alternatives to mastectomy. One abstract reviews the analgesic effects of β-endorphin in man, which is receiving considerable attention as a method of cancer support therapy.

The ***1981 Year Book of Cancer*** concludes with a special article by Robert J. Keating, PhD, Ronald D. Hutchins, MS, and Eugene M. McKelvey, MD, "Research of Imminent Impact on the Treatment of Cancer.' This article outlines some recent developments that will enhance capabilities for the diagnosis of cancer and the therapy and supportive care of cancer patients.

Raven Press has published ***Gastrointestinal Cancer,*** the compilation of proceedings of the 25th Annual Clinical Conference, held November 5-7, 1980 (New York, Raven Press, 1981, $45.00, 474 pages). Editors of the volume are John R. Stroehlein, MD, Department of Medicine, and Marvin M. Romsdahl, MD, PhD, Department of Surgery.

The volume reviews current concepts in gastrointestinal cancer treatment and research, including epidemiology, intravenous hyperalimentation, and immunological and biochemical markers. Many aspects of gastroesophageal and pancreatic cancer are discussed, as are topics relating to hepatobiliary and large bowel cancer. The order of presentation progresses from diagnosis, to management, to results of treatment. Major emphasis is placed on new diagnostic methods and directions for future research, including the use of animal tumor models to study the metastatic process and the development of new therapeutic agents. Highlights of the volume include an improved description of premalignant lesions involving the gastrointestinal tract, presentations on the identification of risk factors, a presentation on the development of immunolcgical tests, and summaries of important developments during the past decade, including nutritional support, interventional radiology, and the development of fiberoptic endoscopy.

Appleton-Century-Crofts recently published ***Introduction to Diagnostic Electron Microscopy,*** edited by Bruce Mackay, MD, PhD, Department of Pathology (New York, Appleton-Century-Crofts, 1981, $32.50, 262 pages). As the editor states in the Introduction, the book's aim is to provide a starting point for pathologists or residents who have had limited exposure to the subject of electron microscopy. As electron microscopy has become increasingly important in surgical pathology and diagnostic problem solving, the need for such a volume, he contends, has increased. ***Introduction to Diagnostic Electron Microscopy*** is intended to meet this need for sound information on technical procedures, specimen procurement and preparation, and interpretation of ultrastructural observations and reports. It addresses the specific applications of diagnostic electron microscopy to kidney biopsy, skeletal muscle and nerve biopsy, hematologic disorders, diagnostic microbiology, cytodiagnosis, and tumor diagnosis and attempts to stimulate interest in the technique's wide-ranging contributions to diagnostic medicine.

Accuracy . . .

Continued from page 1

its normal one, the process of nucleotide insertion or deletion in the anticodon loop of the tRNA. According to Dr Murgola, such events can lead to a shift of the effective anticodon of the tRNA one nucleotide to the left or right of the original anticodon.

Dr Murgola pointed out that his novel findings answer some questions, but raise others, about the functional role of certain modified nucleosides characteristically found in specific tRNAs. These modified nucleosides, he explained, are variations of the four common nucleosides in RNA—uridine (U), cytidine (C), adenosine (A), and guanosine (G). Some examples of modified nucleosides are Q, a modification of G; Cm, a ribosemethylated modification of C; and ms^2i^6A, a variant of A.

Dr Murgola's recent research has been directed toward clarifying the specific roles of modified nucleosides in the accurate translation of the genetic code. The significance of this research, he said, can be seen in light of two other considerations.

"During the last 12 years or so, tRNA alterations have been observed to occur during differentiation, dedifferentiation, and virus infection and in several types of tumor cells. Only recently, however, have researchers obtained evidence concerning the precise molecular nature of some of the tumor-associated tRNA alterations, such as changes in nucleoside modification. An example of this would be the conversion of G to Q in certain tRNAs during DMSO-induced differentiation of murine erythroleukemia cells into erythroid cells."

"The second consideration," he continued, "is that some substances, such as interferon, can affect the activity of tRNA and its degree of nucleoside modification. These facts lead to questions about the basic molecular mechanisms involved in oncogenesis. And since levels of modified nucleosides excreted in a patient's urine can be measured, it may be possible to monitor disease progression or the course of chemotherapy by following levels of specific nucleosides."

Dr Murgola and Norman E. Prather, PhD, also of the Department of Molecular Biology, will be pursuing answers to the questions raised by these findings on tRNA modification and translational accuracy. They will work in collaboration with laboratories at the Universities of Uppsala and Umeå in Sweden, the Institut de Biologie Physico-Chimique in Paris, and the Free University of Brussels.

Wataru W. Sutow

Psychiatric Treatment . . .

Continued from page 1

In addition, he considers religious background, which may influence the patient's attitude toward the pain itself and, thus, the treatment. "Pain is such a highly complex disease that many issues must be addressed before trying to treat it," he said.

After studying the results of the psychiatric examination, Dr Adams selects one or more psychotropic compounds to treat the patient's chronic pain. However, the psychiatric examination also serves to determine the presence or absence of any other central nervous system disorder, such as depressive illness.

The incidence of depressive illness in cancer patients is fairly high, according to Dr Adams. "Stress, disease, and cytotoxic agents can all induce changes in a patient's central nervous system, which may result in depressive illness," he said.

Because of its fairly high incidence, depressive illness is frequently considered to be a natural occurrence in cancer patients, and is thus all too frequently excused, according to Dr Adams. However, this is not the case at UT MDAH, he said. "To overlook depressive illness is to overlook a serious disease. And because depressive illness can deleteriously affect many aspects of a patient's life, we place particular importance on treating this disease."

Dr Adams uses antidepressants, rather than psychological methods of treatment, to treat depressive illness. "Depressive illness, like chronic pain, is a central nervous system disorder. It is not treatable with psychotherapy: It is a somatic disease and requires somatic treatment," he said.

The treatment of chronic pain and depressive illness is an important aspect of cancer patient care, according to Dr Adams. "Because of the effects that these disorders can have on a patient's life, they should not be overlooked," he said.

Wataru W. Sutow Dies

Wataru W. Sutow, MD, a pioneer in the use of chemotherapy for the treatment of childhood solid tumors, died December 20, 1981, at the age of 69. Dr Sutow, who recently retired as professor of pediatrics, joined the UT MDAH staff in 1954.

Dr Sutow achieved dramatic results in pediatric oncology. He developed chemotherapeutic regimens for the treatment of osteosarcoma that resulted in a survival rate of over 60%—a rate three times higher than that achieved before the use of chemotherapy. Of this achievement, Charles A. LeMaistre, MD, president, said, "Twenty years ago, Dr Sutow maintained that drugs could be used as an adjunct or alternative to radiotherapy and surgery in treating childhood solid tumors, although popular opinion at that time was skeptical of the value of drugs in treating cancer. Dr Sutow's regimens for treatment of osteosarcoma produced some of the most dramatic results ever achieved in pediatric oncology."

Dr Sutow also demonstrated that multidrug chemotherapy and coordinated radiotherapy increase the survival rate for patients with rhabdomyosarcoma, and he obtained outstanding results in the treatment of Wilms' tumor by introducing the use of vincristine. According to Jan van Eys, MD, PhD, head of the Department of Pediatrics, "We now accept the nonsarcomatous variety of Wilms' tumor as a routinely curable cancer—a cancer under control. Dr Sutow's insistence that vincristine is an effective agent against that tumor has been part of that benchmark achievement."

The author of more than 170 scientific papers, Dr Sutow was a contributor to numerous books and was the senior editor of *Clinical Pediatric Oncology.* He served as the first chairman of the Pediatric Division of the Southwest Cancer Chemotherapy Study Group, as chairman of its Childhood Solid Tumor Committee, and as a member of its Pediatric Executive Committee. He was also a member of the Intergroup Rhabdomyosarcoma Study Committee and the National Wilms' Tumor Study Committee.

Dr Sutow received the Research Career Award in Pediatric Oncology from the U.S. Public Health Service in 1963, and in 1976, at UT MDAH's annual Clinical Conference, he was named a corecipient, with Franz M. Enzinger, MD, of the 11th annual Heath Memorial Award for outstanding contributions to the better care of the cancer patient. He received UT MDAH's Distinguished Service Award in 1977.

Dr Sutow earned his bachelor's degree from Stanford University in 1939 and his medical degree from the University of Utah College of Medicine in 1945. After completing his internship and residency, he went to Hiroshima, Japan, where he was head of the Pediatric Department and director of Pediatric Research for the Atomic Bomb Casualty Commission. While in Japan, he studied the effects of in utero exposure to the atomic bomb fallout. Dr Sutow continued to study the effects of radioactive fallout after joining the UT MDAH staff. He served as a research collaborator for the Brookhaven National Laboratory, making numerous trips to the Marshall Islands to assess residents' exposure to radioactive fallout after contaminants from a thermonuclear explosion on Bikini Atoll were carried across the islands by high-altitude winds.

At memorial services, Robert C. Hickey, MD, executive vice

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newsletter

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Edward Atkinson, PhD	Biomathematics	David Murray, PhD	Physics
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Gabriel Lopez, MD	Developmental Therapeutics	James Watson, DDS	Dental Oncology
Jack Martin, DDS	Dental Oncology	Alfred Yung, MD	Internal Medicine

Dr Sutow . . .

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president, Dr van Eys, and H. Grant Taylor, MD, professor of pediatrics, paid tribute to Dr Sutow. Dr van Eys said, "Thousands of children owe their lives not just to the drugs introduced by Wat Sutow, but to his untiring efforts that successfully changed the attitudes of his then more famous colleagues about childhood solid tumors."

Dr Taylor said of Dr Sutow, "I have never known a physician with higher regard for the ideals and ethics of medicine. Wat was not content with the role of simply being the custodian of the dying patient. He fought disease with his intellect, his training, and his imagination and intuition. He was first and foremost a physician, and his becoming an oncologist simply enhanced the former."

Dr Sutow is survived by his wife, Mary; his brother, Masao Sutow of Seattle, Washington; and three children, Edmund Sutow of Guadalajara, Mexico, Ellen Williams of San Carlos, California, and Tina Van Dam of Midland, Michigan. He had one grandchild.

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