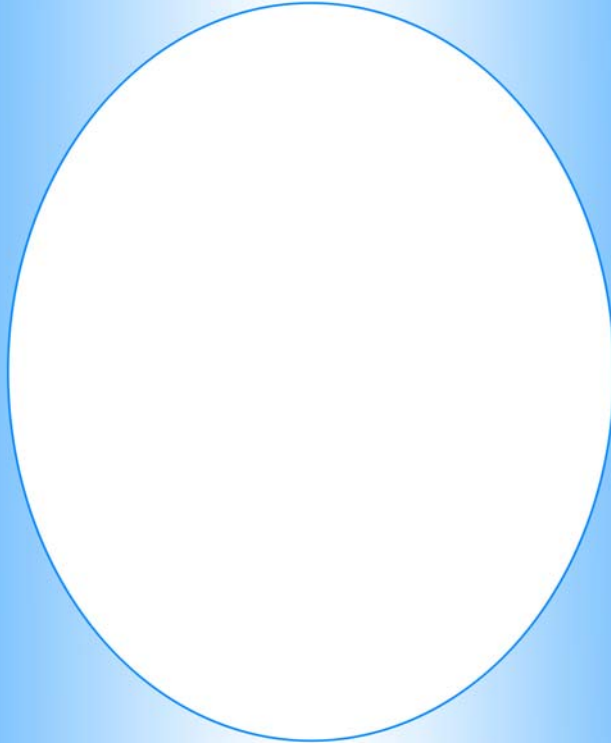




Princess Chulabhorn
Distinguished Lecture Series III



**Innovative Scientific Paradigms
in Cancer Chemotherapy**

December 13, 2005

The Convention Center,
Chulabhorn Research Institute
Bangkok, Thailand



ทรงมีพระปณิธานว่า
จะทำให้ประเทศไทยมีศักยภาพ
ในการเป็นศูนย์กลางถ่ายเทเทคโนโลยี
จากประเทศที่พัฒนาแล้วไปสู่ประเทศที่กำลังพัฒนาในอนาคต

PROFESSOR DR. HER ROYAL HIGHNESS PRINCESS CHULABHORN

Her Royal Highness Princess Chulabhorn, the youngest daughter of Their Majesties King Bhumibol Adulyadej and Queen Sirikit, was born on 4 July 1957 at Ambara Villa at Dusit Palace in Bangkok, Thailand. She received her early education at Chitrlada School and decided to study science, so as to be able to assist with the scientific aspects of Their Majesties' development projects. H.R.H. Princess Chulabhorn obtained a B.Sc. degree in Chemistry with first class honors at Kasetsart University in 1979, receiving the Dr. Tab Nilanidhi Prize for her outstanding results, and subsequently completed her Ph.D. in Organic Chemistry at Mahidol University in 1985.



H.R.H. Princess Chulabhorn has been a lecturer at Mahidol University since 1985. She was the third person in the world to be awarded UNESCO's Einstein Medal for her continuous effort in promoting scientific collaboration in Asia and the Pacific, and also the first Asian to be invited to join the Royal Society of Chemistry in England, as an Honorary Fellow and Chartered Chemist. She is also chairperson of the Natural Product Chemistry and Polymer Committee of the Japan Society for the Promotion of Science National Research Council of Thailand Collaborative Programme. In addition, she has been visiting professor at universities in Japan and the United States and has received numerous honorary doctoral degrees from universities in the United States, the United Kingdom, Japan and elsewhere. Among her other accomplishment, she has been a special advisor to the United Nations Environment Programme, a member of the special high-level council for the International Decade for Natural Disaster Reduction of the United Nations, and an executive member of the Board of International Organization for Chemical Sciences in Development. Recent awards have included in 2000, the IAUP Award of the International Association of University Presidents, and in 2002, the EMS-Hollaender International Fellow Award.

As a qualified scientist, H.R.H. Princess Chulabhorn knows well the role that science can play in the development of the nation, and having completed her studies in Thailand, she was able to appreciate the problems faced by Thai scientists, such as limited research funds, lack of modern equipment, and shortage of high caliber personnel. Thus, on the auspicious occasion of His Majesty King Bhumibol Adulyadej's 60th Birthday Anniversary, H.R.H. Princess Chulabhorn established the Chulabhorn Research Institute in honor of His Majesty the King, with one of the aims being to provide research facilities for projects initiated by Their Majesties King Bhumibol Adulyadej and Queen Sirikit.

The Chulabhorn Research Institute (CRI) is an autonomous, multidisciplinary research institute, which receives major financial support from the Royal Thai Government through the Ministry of Education.

Currently CRI has two research buildings - the first research building which now houses chemistry research, and the biomedical research building with the animal facilities attached accommodates 6 life-science laboratories. In this research building there is a floor of central equipment facilities and lab-space for hands-on practical training. There is also an administrative building with a library, computer unit, teaching and small conference rooms and a canteen. The conference center at the far end of the site has a hotel-accommodation facility which has 70 units and a separate guest-house facility for long-term visitors.



The ultimate goal of the Chulabhorn Research Institute, as envisaged by H.R.H. Princess Chulabhorn, is to improve the quality of life of the Thai people by the development and application of science and technology. The activities of the institute may be divided into **four major areas, namely research, education and training, scientific exchange, and special programs.**

RESEARCH

Research is the core activity, with work conducted either as individual research projects or organized as a comprehensive program drawing on the interrelated work in the Institute's 9 laboratories, namely the laboratories of Biochemistry, Biotechnology, Medicinal Chemistry, Chemical Carcinogenesis, Environmental Toxicology, Immunology, Natural Products, Organic Synthesis and Pharmacology. It also has a state-of-the-art animal facility operated in accordance with Good Laboratory Practices (GLP), an Aquatic Toxicology Laboratory equipped for Whole Effluent Toxicity Testing (WET), and an Inhalation Toxicology Laboratory for rodents, equipped for both whole-body and nose-only exposures. When completed by the end of 2005, this rodent inhalation exposure facility will allow CRI to carry out experimental studies, in addition to environmental monitoring studies.

EDUCATION AND TRAINING ACTIVITIES

Education and training activities are undertaken in the belief that the development of human resources in science and technology is vital for national development. Four programs are now being undertaken.

- (1) THE PRINCESS CHULABHORN SCIENCE CONGRESS PROGRAM is a series of international congresses initiated by H.R.H. Princess Chulabhorn to provide a forum for the exchange of the latest advances in research among the international scientific community. Past congresses include the Princess Congress I on Natural Products (December 1987), the Princess Congress II on Environmental Science and Technology (November 1992), the Princess Congress III on Water Resources (December 1995), the Princess Congress IV on Chemicals in the 21st Century (November 1999), and the Princess Congress V on Evolving Genetics and Its Global Impacts (August 2004).



- (2) THE INTERNATIONAL CENTER FOR ENVIRONMENTAL AND INDUSTRIAL TOXICOLOGY (ICEIT), which has been designated a UNEP Center of Excellence for Environmental and Industrial Toxicology by United Nations Environmental Programme (UNEP) in 1990. ICEIT organizes international training programs, undertakes research, maintains databank services (the UNEP-International Register of Potentially Toxic Chemicals, IRPTC), and issues a quarterly newsletter.



As of today, ICEIT has designed and implemented both short-term and long-term education and training programs at national, regional and international levels:

- Short-term Training Program in Environmental Toxicology.
- Long-term Program: Interuniversity Post-graduate Education Program on Environmental Toxicology, Technology and Management (M.Sc. and Ph.D. Levels) and Diploma Program in Environmental Toxicology.

(Additional information on ICEIT Website-<http://www.cri.or.th/~emtox>)

- (3) THE BIOSCIENCE PROGRAM: This multidisciplinary program covers specialized areas in biomedical science such as cancer, AIDS and infectious diseases.
- (4) THE CHEMICAL SCIENCE PROGRAM places particular emphasis placed on organic chemistry including organic synthesis, natural products and some aspects of medicinal chemistry.

SCIENTIFIC EXCHANGE PROGRAM

CRI believes that science is international and transcends national frontiers. In its role as a center for national and international cooperation, CRI aims to initiate scientific collaboration between institutes that will complement and enhance the programs of both partners. The scope of collaboration includes joint research and training programs to promote mutual direct contact of scientists, training of scientific support staff, and exchange of scientific information and visits. At present, multidisciplinary collaboration with various international academic and research institute has been initiated and formalized. Memoranda of scientific agreements have been signed between CRI and a number of institutes and international organizations , such as Columbia University (USA), Johns Hopkins University (USA), the National Institutes of Health (USA), United Nations University, the International Agency for Research on Cancer (IARC), the University of California, Irvine (USA), Queen's University (Canada), the University of Ottawa (Canada), and Lincoln University (New Zealand), the University of Aarhus (Denmark), the M.D. Anderson Cancer Center (USA), Lincoln University (New Zealand), the Deutsches Krebsforschungszentrum (Germany), the University of Utrecht, the Netherlands and Tulane University (USA) to promote exchange of knowledge and information, technology transfer and research collaboration.

SPECIAL PROJECTS AND PROGRAMS

As a center for both national and international cooperation, CRI has established several special programs which are of national and global importance in terms of their urgency and need. These special projects and programs involve collaborative association with national and international institutions to advance the nation's development while safeguarding and enhancing the people's quality of life.

FUTURE PLAN

Our future plan is the construction of the Chulabhorn Cancer Center and the Chulabhorn Graduate School, which should be completed by the year 2007.

The Princess Chulabhorn Distinguished Lecture Series was inaugurated on 14 July 1993 to commemorate the auspicious occasion of Professor Dr. Her Royal Highness Princess Chulabhorn's Thirty-Sixth Birthday Anniversary, in recognition of her achievements as a scientist and her role as a dedicated champion of science.

The aim of the lecture series is to promote the development of science, according to the wishes of H.R.H. Princess Chulabhorn, by providing the opportunity for scientists in Thailand of all disciplines to benefit from the insights of renowned scientists throughout the world. The inaugural event consisted of three lectures by Nobel Laureates from various disciplines, namely Professors D.H.R. Barton, R. Huber, and B.S. Blumberg. For the Second Princess Chulabhorn Distinguished Lecture Series in December 1996, H.R.H. Princess Chulabhorn chose "Cancer: from Molecular Biology to Treatment" as the theme because of the Institute's research interests in cancer, which is one of the leading causes of death in Thailand. On this occasion lectures were given by Professors D. Baltimore (Nobel Laureate in Medicine), E.F. Becker, and R.D. Klausner.

Now, for the Third Princess Chulabhorn Distinguished Lecture Series, H.R.H. Princess Chulabhorn has chosen the theme "**Innovative Scientific Paradigms in Cancer Chemotherapy**". Since the Chulabhorn Research Institute, building on its long-established research interests in the area of cancer, is currently in the process of establishing a cancer treatment center.

For some years, H.R.H. Princess Chulabhorn has engaged in research and teaching as a faculty member of the Department of Oncology at Siriraj Hospital, one of the two main teaching hospitals of Mahidol University in Bangkok. From her work at Siriraj Hospital, H.R.H. Princess Chulabhorn has gained a clear perception of the urgent need to further develop cancer treatment and research facilities in Thailand.

The Chulabhorn Cancer Center, which is scheduled to open in 2007, will be one of the most advanced specialist treatment centers and will meet the highest international standards. The establishment of the Center will augment existing national resources in this area of treatment and will seek cooperation with other research institutes in Thailand and overseas to undertake joint activities on various aspects of cancer, such as the mechanisms by which the disease is caused, methods for prevention of the disease, the development of new drugs, and the effective care and treatment of patients.

The organizers hope that the theme of the Third Distinguished Lecture Series will set important guidelines for the work of the Chulabhorn Cancer Center and will provide inspiration to all participants to contribute to this national effort.

Professor Philip A. Sharp

Center for Cancer Research, Massachusetts Institute of Technology, U.S.A.



A world leader of research in molecular biology and biochemistry, **Dr. Phillip A. Sharp** is Institute Professor at the Massachusetts Institute of Technology.

Much of Dr. Sharp's scientific work has been conducted at MIT's Center for Cancer Research, which he joined in 1974 and directed from 1985 to 1991. He subsequently led the Department of Biology from 1991 to 1999. His research interests have centered on the molecular biology of gene expression relevant to cancer and the mechanisms of RNA splicing; his landmark achievement was the discovery of RNA splicing in 1977. This work provided one of the first indications of the startling phenomenon of "discontinuous genes" in mammalian cells. The

discovery that genes contain nonsense segments that are edited out by cells in the course of utilizing genetic information is important in understanding the genetic causes of cancer and other diseases. Dr. Sharp's research opened an entire new area in molecular biology and forever changed the field. For this work he received the 1993 Nobel Prize in Physiology or Medicine. His lab has now turned its attention to understanding how RNA molecules act as switches to turn genes on and off (RNA interference). These newly discovered processes have revolutionized cell biology and could potentially generate a new class of therapeutics. (<http://web.mit.edu/biology/www/facultyareas/facresearch/sharp.shtml>).

Dr. Sharp has authored over 330 scientific papers. He has received numerous awards and honorary degrees, and has served on many advisory boards for the government, academic institutions, scientific societies, and companies. His awards include the Gairdner Foundation International Award, General Motors Research Foundation Alfred P. Sloan, Jr. Prize for Cancer Research, and the Albert Lasker Basic Medical Research Award. He is elected member of the National Academy of Sciences, the Institute of Medicine, the American Academy of Arts and Sciences, and the American Philosophical Society.

A native of Kentucky, Dr. Sharp earned a B.A. degree from Union College, KY in 1966, and a PhD in chemistry from the University of Illinois, Champaign-Urbana in 1969. He did his postdoctoral training at the California Institute of Technology, where he studied the molecular biology of plasmids from bacteria in Professor Norman Davidson's laboratory. Prior to joining MIT, he was Senior Scientist at Cold Spring Harbor Laboratory.

In 1978 he co-founded Biogen (now Biogen Idec) and in 2002, he co-founded Alnylam Pharmaceuticals, an early-stage therapeutics company; he serves on the boards of both companies.

Professor Ryoji Noyori

RIKEN and Department of Chemistry, Nagoya University, Japan



Ryoji Noyori was educated at Kyoto University and became an Instructor at the same university in 1963. He was appointed Associate Professor at Nagoya University in 1968, spent a postdoctoral year at Harvard in 1969-1970 and, shortly after returning to Nagoya, was promoted to Professor in 1972. In 2003, he was appointed President of RIKEN and also University Professor at Nagoya. Noyori is a Member of the Japan Academy and the Pontifical Academy of Sciences, and a Foreign Member of the National Academy of Sciences, USA, and the Royal Society among others. His research has long focused on the fundamentals and applications of molecular catalysis based on organometallic chemistry,

particularly asymmetric catalysis and what is now known as “green” chemistry. In 2001, he shared the Nobel Prize in Chemistry with W. S. Knowles and K.B. Sharpless.

Professor John M. Essigmann

*Biological Engineering Division and Department of Chemistry,
Massachusetts Institute of Technology, U.S.A.*

Professor Ram Sasisekharan

Biological Engineering Division, Massachusetts Institute of Technology, U.S.A.



Ram Sasisekharan Ph.D. [1992 Harvard Medical School], a Professor at the Biological Engineering Division Massachusetts Institute of Technology, has been in the forefront of the emerging field of glycomics or the study of sugars. He is affiliated with the MIT centers for Biomedical Engineering and Environmental Health Sciences. He has over hundred scientific publications, over forty patents or applications and half a dozen book chapters to his credit.

Dr. Sasisekharan has won numerous awards, including the 1999 Burroughs Wellcome Fund Young Investigator Award: Awarded to the most promising young faculty members who bring new ways of thinking and new experimental approaches to life sciences; 1999 Beckman Foundation Young Investigator Award: Awarded to the most promising young faculty members in the chemical and life sciences (this is one of the most prestigious awards or recognition for a junior faculty member in the U.S); 1999 Edgerly Science Partnership Award; the 1998, 1999, 2000 and 2001 CaPCure Award, CaPCure Foundation: Award given to outstanding prostate cancer research programs and the 2003 Global Technovator Award. He earned the B.S. from Bangalore University (1985), the M.A. from Harvard University (1987) and the Ph.D. from Harvard Medical School (1992).

Dr. Sasisekharan is a member of the Steering Committee of the International Consortium for Functional Glycomics and has served on study section panels of the National Institutes of Health. He is a Core Member of the Nanotechnology Laboratory, MIT and sits on the Steering committee of Momenta Pharmaceuticals/Sandoz-Novartis Joint Venture. He has founded biotechnology companies [including Momenta Pharmaceuticals] and is or has been an advisor to Research Institutes [including being a member of the Advisory Board, Princess Chulabhorn Research Institute, Thailand], Start-up and Venture enterprises [including Chief Advisor, MVM Ventures, UK], Biotechnology or Pharmaceutical Companies.

Professor Neal Rosen

*Departments of Medicine and Molecular Pharmacology and Chemistry
Memorial Sloan-Kettering Cancer Center, U.S.A.*



SCIENTIFIC PROGRAM COMMITTEE

Wichit	Srisa-an	Chairperson
<i>Khunying</i> Mathuros	Ruchirawat	Vice Chairperson
Skorn	Mongkolsuk	Member
Kavi	Ratanabanangkoon	Member
Somsak	Ruchirawat	Member
Jutamaad	Satayavivad	Member
M.R. Jisnuson	Svasti	Member
Supanna	Techasakul	Member

The success of various activities of the Chulabhorn Research Institute undoubtedly reflects the inspiring leadership, far-sighted vision, and selfless dedication of H.R.H. Princess Chulabhorn, who has devoted so much of her time and energy for the promotion of science in Thailand. For this reason, the Princess Chulabhorn Distinguished Lecture Series was inaugurated on this auspicious occasion of H.R.H. Princess Chulabhorn's 48th birthday anniversary.

A new venture is now to be added to the list of the Institute's activities: the creation of a cancer center. This initiative reflects H.R.H. Princess Chulabhorn's perception from her work in Siriraj Hospital of the urgent need to further develop cancer treatment and research facilities in Thailand. Thus the theme of the Third Distinguished Lecture Series, ***"Innovative Scientific Paradigms in Cancer Chemotherapy"***, very much reflects Her Royal Highness Princess Chulabhorn's special interest.



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PROGRAM

The Third Princess Chulabhorn Distinguished Lecture Series

Innovative Scientific Paradigms in Cancer Chemotherapy

December 13, 2005

08.30 Registration

09.30 Opening Ceremony and Opening Address

Professor Dr. H.R.H. Princess Chulabhorn

10.00 "The Biology and Therapeutic Potential of Short RNAs"

Professor Phillip A. Sharp (Nobel Laureate in Medicine)

10.45 "Tethered Toxins: Combination Cancer Therapy with a Single Molecule"

Professor John M. Essigmann

11.30 "Understanding and Exploiting the Roles of Glycans in Cancer"

Professor Ram Sasisekharan

12.15 L U N C H

14.00 "Pursuing Practical Elegance in Chemical Synthesis"

Professor Ryoji Noyori (Nobel Laureate in Chemistry)

14.45 "Mechanism-Based Cancer Therapy: The Promise and the Challenge"

Professor Neal Rosen

15.30 Presentation of Medals

Closing Ceremony

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