


The Chemical and Biological Engineering Department of the
University at Buffalo School of Engineering and Applied Sciences
Is Proud to Announce the Inaugural Lecture of the

Eli Ruckenstein Lecture Series




“Normalizing tumor microenvironment to treat cancer: From mathematical model to mouse to man”

Rakesh K. Jain

Andrew Werk Cook
Professor of Tumor Biology
Department of Radiation Oncology
Harvard Medical School

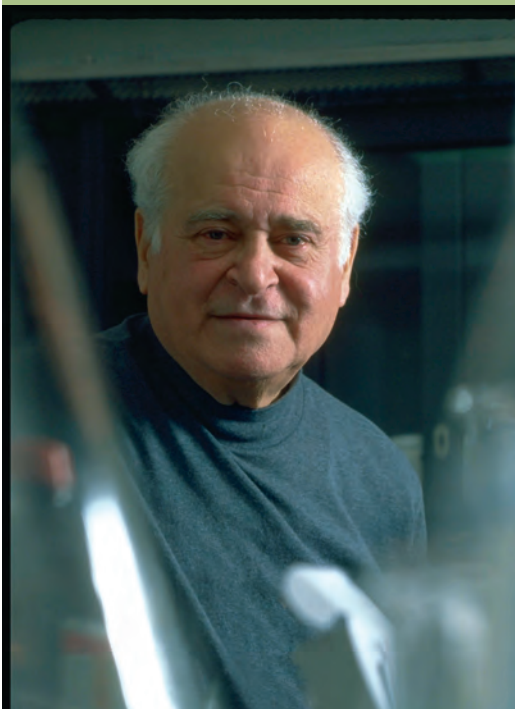
Director, Edwin L. Steele
Laboratory of Tumor Biology
Massachusetts General Hospital



Monday, May 4, 2009
Enter at 10:45 a.m.
Lecture to commence at 11 a.m.

Screening Room
First floor, Center for the Arts
UB Amherst Campus

Reception to follow



About Eli Ruckenstein:

Eli Ruckenstein, SUNY Distinguished Professor, has been on the faculty of the University at Buffalo for nearly forty years. Over this time, his prolific and imaginative research has advanced almost every area of interest to chemical engineering. Ruckenstein spent his formative years behind the Iron Curtain, in Romania, where — with a combination of native intellect, genuine scientific curiosity, and sheer strength of will — he prepared himself for a lifetime of achievement in engineering and science. In Romania his work quickly gained international recognition, and he escaped to the West in 1969, joining UB in 1973.

Eli Ruckenstein has received countless honors paying tribute to work across many fields of research, including the Alpha Chi Sigma Award (for his work in transport phenomena), the Kendall Award (colloids), the Langmuir Lecture (polymers), the Murphree and Walker Awards (catalysis), and the Humboldt Award (surfactants). These contributions and more were further recognized with the National Medal of Science, given to him in a White House ceremony in 1999. Ruckenstein was elected to the National Academy of Engineering in 1990, and he received the Founders Award from the Academy in 2004. The American Institute of Chemical Engineers honored him with their Founders Award, and has formally designated him as one of Fifty Eminent Chemical Engineers of the Foundation Age.

The Ruckenstein Lecture Series

is supported by the Ruckenstein Fund, a new endowment with an ongoing campaign. Funds generated from this endowment will be used to support the Ruckenstein Lecture Series and provide resources to improve teaching and research laboratories in the Department.

www.cbe.buffalo.edu

The UB Department of Chemical and Biological Engineering

offers a world-class undergraduate education while pursuing integrative research and graduate training at the frontiers of chemical engineering, in the main areas of nanoscale science and engineering; computational science and engineering; and biochemical and biomedical engineering.

The Department was founded in 1961 and is among the youngest in the Nation. From the start its founders inculcated it with a deep respect for scholarship, and as a consequence the Department quickly grew to the national prominence that it continues to enjoy today. The Department is now undergoing a second phase of growth. Since 2006 faculty size has increased from 13 to 20, and our ranks now include three members of the National Academy of Engineering. Visit: www.cbe.buffalo.edu.

"Normalizing tumor microenvironment to treat cancer: From mathematical model to mouse to man"

Rakesh K. Jain, Ph.D.

Andrew Werk Cook Professor of Tumor Biology, Harvard Medical School
Director, Edwin L. Steele Laboratory of Tumor Biology, Department of Radiation Oncology,
Massachusetts General Hospital

Abstract:

Cancerous tumors require blood vessels to grow and spread to other organs. Dr. Jain demonstrated that the blood vessels of tumors are abnormal – not only in their structure, but also in their function. Using a mathematical model, he showed consequences of this abnormality – specifically, how this abnormality contributes directly to malignant properties of a cancer as well as prevents treatments from reaching and attacking tumor cells. Dr. Jain proposed a novel concept that "normalizing" tumor vessels would allow cancer therapies to penetrate the mass and to function more effectively. He then went on to show first in mice and then in cancer patients, that drugs originally designed to destroy tumor vessels can, paradoxically, also repair them, creating a window of opportunity to attack the cancer most effectively. This concept is also opening doors to treating other vascular disorders, such as macular degeneration, a leading cause of blindness in the U.S.

About Rakesh K. Jain:

Jain is a pioneer in the fields of tumor biology, drug delivery, *in vivo* imaging and bioengineering. Trained as a chemical engineer, he has developed the world's leading laboratory for the quantitative study of tumor physiology. He is known for discovering the physiological barriers to delivery and efficacy of anticancer drugs, for proposing strategies to overcome these barriers and for translating these strategies from bench to bedside. His work has fundamentally changed thinking about how molecularly targeted therapeutics, especially antiangiogenic agents, actually work in animal models and cancer patients, and how to combine them optimally with cytotoxic therapies to improve survival rates in cancer patients.

A mentor to more than 100 doctoral and postdoctoral students from multiple disciplines, and a collaborator of over 100 clinicians and scientists worldwide, Dr. Jain's findings are summarized in over 460 publications, including three in *Scientific American*. He serves on advisory panels to government, industry and academia, and is a member of ten journal editorial boards, including *Nature Reviews Cancer* and *Nature Reviews Clinical Oncology*. He has received over 30 major awards and lectureships, including a Guggenheim Fellowship, an NCI-Research Career Development Award and an NCI-Outstanding Investigator Grant. He is a member of the Institute of Medicine, the National Academy of Engineering, and the American Academy of Arts and Sciences.





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