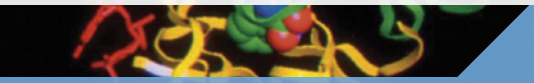
The Chemical and Biological Engineering Department of the University at Buffalo School of Engineering and Applied Sciences is Proud to Announce

The 2015 Eli Ruckenstein Lecture



"Biomaterials and biotechnology: From the discovery of the first angiogenesis inhibitors to the development of controlled drug delivery systems and the foundation of tissue engineering"

Dr. Robert S. Langer

David H. Koch Institute Professor

Massachusetts Institute of Technology

Thursday, April 23, 2015
1:00 p.m.

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

Reception to follow immediately after – Atrium

R.s.v.p. cbe@buffalo.edu or 716.645.1174

The School of Engineering and Applied Sciences

About Eli Ruckenstein:

Eli Ruckenstein, SUNY Distinguished Professor, joined the faculty of the University at Buffalo in 1973. 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 began what would become a professional lifetime of achievement in engineering and science, receiving the George Spacu Award for Research in Surface Phenomena from the Romanian Academy of Science as well as awards from the Romanian Department of Education for teaching, for research in turbulent heat and mass transfer, and for research in distillation.

In 1969, he escaped to the West, where his prolific and imaginative research has advanced almost every area of interest to chemical engineering. He has received the Alpha Chi Sigma Award for his work in transport phenomena, the Walker Award for his work in catalysis, and the Founders Award for his overall contributions to science from the American Institute of Chemical Engineers and the Kendall Award for his research in colloids and interfaces, the Langmuir Lecture Award for his contributions to macromolecules, the Schoellkopf Medal for his work in supported metal catalysts, and the Murphree Award in Industrial and Engineering Chemistry from the American Chemical Society. His work in biomolecules was recognized with the Creativity Award from the National Science Foundation. He has presented two Berkeley Lectures in Chemical Engineering and is a winner of the Chancellor Charles P. Norton Medal from SUNY Buffalo. He is a fellow of the AIChE and the American Nano Society.

Eli Ruckenstein was elected to the U. S. National Academy of Engineering in 1990, and in 2004 he was chosen to receive the Academy's Founders Award. He has also been elected to the American Academy of Arts and Sciences, and he has received the Humboldt Award from Germany for his work in surfactants. The Hauptman-Woodward Medical Research Institute named him one of their inaugural Pioneers of Science awardees. His seminal contributions across such a broad range of disciplines were further recognized when the President of the United States awarded him the National Medal of Science in a White House ceremony in 1999. His impact upon the development of the chemical engineering profession resulted in the American Institute of Chemical Engineers designating him as one of 50 Eminent Chemical Engineers of the Foundation age.

The Ruckenstein Lecture Series

is supported by the Ruckenstein Endowment Fund

Previous Lecturers

2009 Rakesh K. Jain, Harvard Medical School and Massachusetts General Hospital
2010 George Stephanopoulos, Massachusetts Institute of Technology
2011 Pablo G. Debenedetti, Princeton University
2012 Dennis C. Prieve, Carnegie Mellon University
2013 Nicholas A. Peppas, University of Texas at Austin
2014 Mark E. Davis, California Institute of Technology

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 CBE department has undergone tremendous growth in the past few years, and added five new faculty to our ranks, which include three members of the National Academy of Engineering.

www.cbe.buffalo.edu

"Biomaterials and biotechnology: From the discovery of the first angiogenesis inhibitors to the development of controlled drug delivery systems and the foundation of tissue engineering"

Dr. Robert S. Langer

David H. Koch Institute Professor
Massachusetts Institute of Technology

Abstract:

Advanced drug delivery systems are having an enormous impact on human health. We start by discussing our early research on developing the first controlled release systems for macromolecules and the isolation of angiogenesis inhibitors, and how these led to numerous new therapies. For example, new drug delivery technologies including nanoparticles and nanotechnology are now being studied for use in treating cancer and other illnesses. We then discuss ways of developing novel microchips for drug delivery. Approaches for creating new biomaterials are then evaluated and examples where such materials are used in brain cancer and shape memory applications are discussed. Finally, by combining mammalian cells, including stem cells, with synthetic polymers, new approaches for engineering tissues are being developed that may someday help in various disease. Examples in the areas of cartilage, skin, blood vessels and spinal cord repair are discussed.

About Robert S. Langer:

Robert S. Langer is the David H. Koch Institute Professor and has written nearly 1,300 articles. He also has nearly 1,100 patents worldwide. Dr. Langer's patents have been licensed or sublicensed to over 300 pharmaceutical, chemical, biotechnology and medical device companies. He is the most cited engineer in history.

He served as a member of the United States Food and Drug Administration's SCIENCE Board, the FDA's highest advisory board, from 1995-2002 and as its Chairman from 1999-2002.

Dr. Langer has received over 220 major awards. He is one of 7 individuals to have received both the United States National Medal of Science (2006) and the United States National Medal of Technology and Innovation (2011). He also received the 2002 Charles Stark Draper Prize, considered the equivalent of the Nobel Prize for engineers, the 2008 Millennium Prize, the world's largest technology prize, the 2012 Priestley Medal, the highest award of the American Chemical Society, the 2013 Wolf Prize in Chemistry, the 2014 Breakthrough Prize in Life Sciences, the 2014 Kyoto Prize and the 2015 Queen Elizabeth Prize for Engineering.

Forbes Magazine (1999) and *Bio World* (1990) have named Dr. Langer as one of the 25 most important individuals in biotechnology in the world. *Discover* Magazine (2002) named him as one of the 20 most important people in this area. *Forbes* Magazine (2002) selected Dr. Langer as one of the 15 innovators worldwide who will reinvent our future. *Time* Magazine and CNN (2001) named Dr. Langer as one of the 100 most important people in America and one of the 18 top people in science or medicine in America (America's Best). *Parade* Magazine (2004) selected Dr. Langer as one of six "Heroes whose research may save your life."

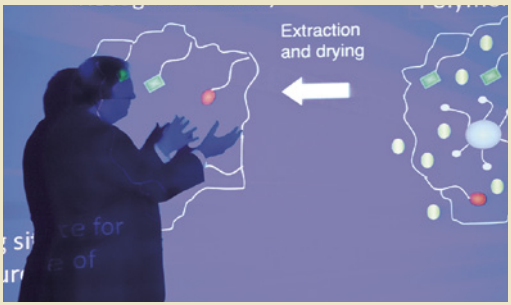
Join us for the 2015 Eli Ruckenstein Lecture

The Ruckenstein Lecture Series honors Eli Ruckenstein, a prolific researcher who has made (and continues to make) contributions in almost every subfield of chemical engineering.

Each year the Series brings to our campus a distinguished scholar in chemical engineering to speak about research activities in his or her laboratory, trends in the field, and larger problems in society that chemical engineers can address.

Thursday, April 23rd at 1:00 p.m.

UB Center for the Arts Screening Room



Thursday, April 23rd at 2:30 p.m.

UB Center for the Arts Atrium

UB CBE Alumni/Student Reception

- Wine, beer, soft drinks, and snacks will be served
- R.s.v.p. cbe@buffalo.edu or call 716.645.1174

Email: cbe@buffalo.edu ▬ 716.645.1174 ▬ www.cbe.buffalo.edu

UB CBE Friends and alumni – let's stay in touch!

Reconnect with UB CBE:

- Send us your "Faces of CBE" profile
- Participate in our student intern program
- Give a lecture to CBE student clubs
- Like us on Facebook and LinkedIn
- Sign up for the CBE monthly e-bulletin
- COME TO AN EVENT!
  NEXT UP: APRIL 23RD, RUCKENSTEIN LECTURE AND UB CBE ALUMNI/STUDENT RECEPTION

Contact Us:

- To R.s.v.p. and learn more about how you can reconnect,
  write to: cbe@buffalo.edu
  call: 716.645.1174
  go online: www.cbe.buffalo.edu