

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

## The 2014 Eli Ruckenstein Lecture

### "Fighting Cancer with Nanoparticle Medicines: The Nanoscale Matters!"

#### Mark E. Davis

Warren and Katharine Schlinger  
Professor of Chemical Engineering  
California Institute of Technology

Member, City of Hope  
Comprehensive Cancer Center,  
Experimental Therapeutics Program

Friday, May 2, 2014

Lecture 2:30 p.m.

Screening Room

CBE Alumni/Student Mixer

4:00 p.m.

*RSVP [cbe@buffalo.edu](mailto:cbe@buffalo.edu)  
or 716.645.1174*

The School of Engineering and Applied Sciences



University at Buffalo The State University of New York

REACHING OTHERS



## 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 Dr. Nicholas A. Peppas, University of Texas at Austin

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 is now undergoing a phase of tremendous growth as we expect to add several new faculty in our ranks that already include three members of the National Academy of Engineering.

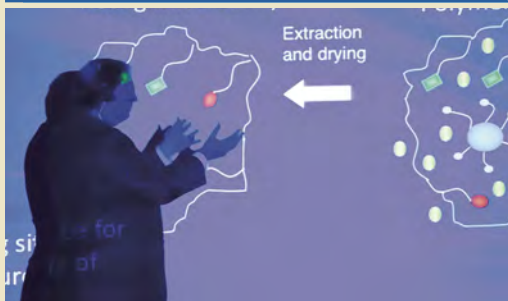
## Join us for the 2014 Eli Ruckenstein Lecture

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.

Friday, May 2nd at 2:30 p.m.

UB Center for the Arts Screening Room



Friday, May 2nd at 4:00 p.m.

UB Center for the Arts Art Gallery

### UB CBE Alumni/Student Mixer

- UB Art Gallery (in Center for the Arts)
- Wine, beer, soft drinks and snacks will be served

R.S.V.P. [cbe@buffalo.edu](mailto:cbe@buffalo.edu) or call 716.645.1174



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

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NEXT UP: MAY 2ND,  
UB CBE ALUMNI/STUDENT MIXER

### Contact Us:

- To R.S.V.P. and learn more about how you can reconnect, write to: [cbe@buffalo.edu](mailto:cbe@buffalo.edu)  
call: 716.645.1174  
go online: [www.cbe.buffalo.edu](http://www.cbe.buffalo.edu)

# “Fighting Cancer with Nanoparticle Medicines: The Nanoscale Matters!”

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Warren and Katharine Schlinger Professor of Chemical Engineering  
California Institute of Technology

*Member, City of Hope Comprehensive Cancer Center, Experimental Therapeutics Program*

## Abstract:

Papyrus writings from 1600-1500 BC describe cancer and attempts at its treatment. Today, centuries later, cancer remains a devastating disease. Given the long history of difficulties in developing cancer therapies, why is there excitement about nanoparticle medicine (nanomedicines) for fighting cancer? In this lecture, I will present the current understandings of why these engineered, nanosized medicines (that are highly multifunctional chemical systems) have the potential to provide “game changing” ways to treat cancer. The nanoscale matters. I will illustrate this point by demonstrating how physical insights at the nanoscale allow for the development of nanoparticles that can function as intended in animals and humans. The data from humans will be used to show how we have translated two independent nanoparticle cancer therapeutics from laboratory curiosities to experimental therapeutics in human clinical trials.

## About Mark E. Davis:

Mark E. Davis is the Warren and Katharine Schlinger Professor of Chemical Engineering at the California Institute of Technology. He is a member of the Experimental Therapeutics Program of the Comprehensive Cancer Center at the City of Hope and the Jonsson Comprehensive Cancer Center at UCLA. He has over 400 scientific publications, two textbooks and over 60 U.S. patents. Professor Davis is a founding editor of *CaTTech* and has been an associate editor of *Chemistry of Materials* and the *AIChE Journal*. He is the recipient of numerous awards including the Colburn and Professional Progress Awards from the *AIChE* and the Somorjai, Ipatieff, Langmuir, Murphree, and Gaden Prizes from the *ACS*. Professor Davis was the first engineer to win the NSF Alan T. Waterman Award. He was elected to the National Academy of Engineering in 1997, the National Academy of Sciences in 2006 and the Institute of Medicine of the National Academies in 2011. Professor Davis’ research efforts involve materials synthesis in two general areas; namely, zeolites and other solids that can be used for molecular recognition and catalysis, and polymers for the delivery of a broad range of therapeutics. He is the founder of *Insert Therapeutics Inc.*, *Calando Pharmaceuticals, Inc.* a company that created the first RNAi therapeutic to reach the clinic for treating cancer, and *Avidity Nanomedicines*. He has been a member of the scientific advisory boards of *Symyx* (Nasdaq: SMMX) and *Alnylam* (Nasdaq: ALNY). Professor Davis has achieved All American Status for Masters Track and Field in the 400, 200 and 100 Meter Dashes. In 2011, he won the 400 Meter Dash for men of age 55-59 at the Masters World Championship.

