

## OKLAHOMA SCHOOL OF SCIENCE AND MATHEMATICS

*Oklahoma stands out among other states in our dedication to providing an outstanding science and mathematics education to its gifted students at a time when our nation falls behind other countries in these areas.*

*With just 22 classes graduated, OSSM alumni/alumnae are already bringing substantial benefits to our state as they complete their degrees and move into their professions.*



- Eighty-five percent of OSSM alumni are remaining in scientific, technology, engineering, and mathematics (STEM) fields for their careers!
- Of OSSM graduates now employed (many are still in undergraduate and graduate school or completing residencies in medical school), more than 60% are employed in Oklahoma.
- The fields of study and careers most chosen by OSSM graduates are engineering (aerospace, biomedical, chemical, civil, computer, electrical, mechanical, petroleum); medicine, medical research, and other health sciences; and other fields including computer science, technology, education, scientific research, business, and law.
- Many OSSM alums are employed in many of Oklahoma's finest corporations, hospitals and technical firms such as AT&T, Artificial Lift Company, Baptist Hospital, Benham Companies, Boeing, Chesapeake Energy, C. H. Guernsey, Cardinal Engineering, Chevron Phillips, Devon Energy, Ditch Witch, Dobson Communications, FAA, Hall Estill, LexisNexis, Mercy Hospital, MidFirst Bank, OG&E, Oklahoma Cardiovascular Associates, Oklahoma Center for Neuroscience, Oklahoma Heart Hospital, Oklahoma Medical Research Foundation, Oklahoma State Bureau of Investigation, the Oklahoman, SAIC, St. John Hospital, Standard Aero, Stillwater Medical Center, Tinker Air Force Base, University of Oklahoma and OU College of Medicine, University of Tulsa, World Telemetry, and many more.
- A full fourth of Tulsa's most successful start-up companies in 2012 were begun by OSSM alumni.
- Of the more than 100 students who have earned M.D. degrees (another 100 are currently in medical school), more than half have done so in Oklahoma medical schools.
- OSSM students are actively recruited by the finest universities, colleges and technical institutes from across the states; however, more than half choose to pursue their higher education in Oklahoma.

OSSM

Senator Penny Williams Distinguished Lecture Series

*Presents*

## “How Parkinson’s Disease Starts and How It Might Be Stopped”

*By*

*2014 Capra Scholar*

**GREGORY A. PETSKO, D.PHIL.**

*Arthur J. Mabon Professor of Neurology and Neuroscience and  
Director, Helen and Robert Appel Alzheimer’s Disease Research Institute Weill Cornell Medical College*

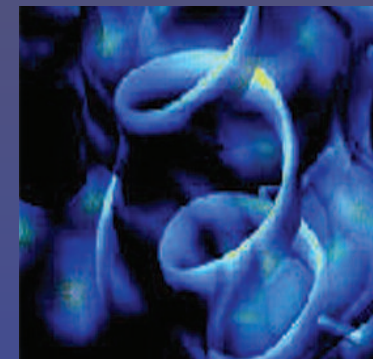
*Adjunct Professor of Biomedical Engineering Cornell University*

*Gyula and Katica Tauber Professor of Biochemistry and Chemistry, Emeritus Brandeis University*

*Adjunct Professor of Neurology Harvard Medical School*

*Past-President, American Society for Biochemistry and Molecular Biology*

*President, International Union of Biochemistry and Molecular Biology*



April 22, 2014

Kirkpatrick Auditorium

Oklahoma School of Science and Mathematics

## Gregory A. Petsko, D.Phil.

B.S. Chemistry, Princeton 1970  
D. Phil. Molecular Biophysics, Oxford 1973

Professor Petsko's research interests have always centered upon the structural basis of biochemical properties, specifically the determination of protein three-dimensional structure and the relationship of that structure to biological function. His approach is to bring a chemical perspective to bear on problems in biochemistry, structural biology, cell biology, and human health. Most of his work has been, and continues to be, done in collaboration with his friend and Brandeis colleague Professor Dagmar Ringe. His primary research tools are: protein X-ray crystallography, molecular dynamics, computational biophysics, and, more recently, yeast genetics. These tools are applied to diverse biochemical problems such as: the structural origins of enzyme catalytic power; the functional role of protein flexibility; the biochemistry and genetics of the quiescent state of the eukaryotic cell, using yeast as a model organism; and the causes and treatment of neurodegenerative diseases such as Alzheimer's, Parkinson's, and Lou Gehrig's Diseases.

In the Fall of 1995, his research activities expanded when he did a year's sabbatical work in yeast genetics in the laboratory of Professor Ira Herskowitz at UCSF. As a result, Professor Petsko now has a budding yeast genetics program concerned with the biology of the quiescent state of the eukaryotic cell. In 2003, he and Professor Ringe expanded their program scope yet again, this time in the direction of translational research aimed at curing human disease. They co-founded the new field of Structural Neurology, in which the tools of structure-based drug discovery are applied to find new treatments for Parkinson's, Lou Gehrig's, and Alzheimer's Diseases, and Lewy Body Dementia. To facilitate this work, they both accepted adjunct appointments as Professors of Neurology at the Brigham and Women's Hospital of Harvard Medical School. He is currently focusing on several specific problems: enzymatic catalysis of hydrogen ion transfer, the role of metal ions in bridged bimetallic enzymes, and the relationship of protein flexibility to protein function.

Dr. Petsko graduated Summa Cum Laude in Chemistry from Princeton University in 1970 and received a Rhodes scholarship to Oxford

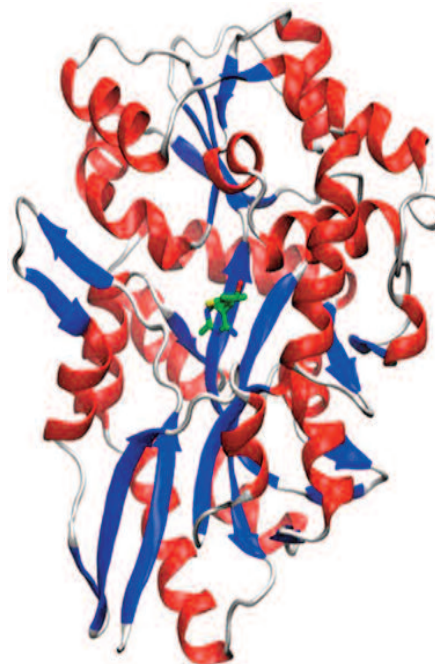
University where he completed his doctoral research in Molecular Biophysics in 1973. After a brief postdoctoral sojourn in Biochemistry in Paris, he was an Instructor and Assistant Professor of Biochemistry at Wayne State University School of Medicine (1973-1978) before moving to Massachusetts Institute of Technology where he served as an Associate Professor of Chemistry (1978-1985) and Professor of Chemistry (1985-1989). In 1990, he was appointed the Lucille P. Markey Professor in Biochemistry and Chemistry at Brandeis University. From 1994 to 2006, he served as the Director of the Rosenstiel Basic Medical Sciences Research Center at Brandeis University and since 1996 has held the title of Gyula and Katica Tauber Professor of Biochemistry and Molecular Pharmacodynamics.

He served as Chair of the Biochemistry Department at Brandeis and has been recognized numerous times for outstanding accomplishments as a researcher and educator. Professor Petsko has recently become Professor of Neurology and Neuroscience at Weill-Cornell Medical College in New York City and on January 1, 2014, Director of the Helen and Robert Appel Alzheimer's Disease Research Institute there.

## SENATOR PENNY WILLIAMS DISTINGUISHED LECTURE SERIES

Senator Penny Williams, Tulsa, former Chair of the Senate Education Committee as well as the Legislative Arts Caucus, has been a leader in education, science and technology, and arts and humanities issues in the Oklahoma legislature. After serving four terms in the State House of Representatives, she was elected to the State Senate in 1988 where she served until 2004. In 1983, then State Representative Williams introduced House bill 1286 which created the Oklahoma School of Science and Mathematics. Marshaling co-authors and battling for scarce funds, her tireless advocacy secured the passage of the bill and continuing support of OSSM.

In appreciation for the far-sighted vision of this special public servant, and in tribute to her role as the sine qua non of OSSM, her friends and friends of the school have created and begun the endowment of these lectures that will bring national and international figures in the arts and sciences to the Oklahoma School of Science and Mathematics. The contribution of ideas of speakers like Dr. Gregory Petsko to our state's intellectual milieu is the greatest and most appropriate gratitude that we can offer Senator Williams.



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### PIANIST

Miss Casey Shannon, OSSM Class of 2014 (Weleetka High School, OK)

### WELCOME & INTRODUCTION OF SPECIAL GUESTS

Dan Little, Esq.  
Chairman, Board of Trustees, OSSM

### INTRODUCTION OF DR. PETSKO

J. Donald Capra, M.D.  
President Emeritus, Oklahoma Medical  
Research Foundation  
President, Capra Consulting, LLC

### LECTURE

Gregory Petsko, D.Phil.

### REMARKS

The Honorable Penny Williams  
Oklahoma State Representative 1981-  
1988; Oklahoma State Senator 1989-2004

### CLOSING

Frank Y. H. Wang, Ph.D.  
President, Oklahoma School of Science  
and Mathematics

SPECIAL THANKS TO  
THE ZARROW FOUNDATION • MR. RALPH SPENCER  
DRS. J. DONALD AND PAT CAPRA