

# The Department of Chemistry and Biochemistry

presents the

## 30<sup>th</sup> Annual B.R. Baker Memorial Lecture

*Ground State Conformations and  
Transition State Structures in Enzyme Catalysis*

**T.C. Bruice**

Research Professor in Chemistry and Biochemistry  
University of California, Santa Barbara

4:00 pm Thursday, October 21, 2004  
Chem 1179

University of California, Santa Barbara

Professor B.R. BAKER, WHOSE MEMORY WE HONOR TODAY, WAS Professor of Chemistry at UCSB from 1966 until his death in 1971. Baker's graduate work on the structural elucidation and synthesis of *Cannabis* constituents marked the beginning of a prolific career in chemistry of natural products. He undertook many diverse projects of medicinal interest including the synthesis of antihemorrhagic vitamin K analogues, biotin derivatives, compounds with hormone activity, sulfones with activity against tuberculosis, and alkaloids. He published two books and more than 370 papers that included a series of papers on the structure and synthesis of the antimalarial alkaloid from *Hydrangea* that filled an entire issue of the *Journal of Organic Chemistry* in 1952. He determined the structure of the first known nucleoside antibiotic, puromycin, and synthesized it in 1955. This achievement came long before the discovery of the structure of transfer ribonucleic acid (tRNA). Puromycin was later shown to mimic the structure of tRNA and became an important tool of research in molecular biology. Puromycin was too toxic for cancer chemotherapy, but it aroused Bill's interest in this field. Few of the myriad of compounds that he had so meticulously synthesized showed any antitumor activity *in vivo*, so he sought a more rational approach to cancer chemotherapy. Perhaps his greatest contribution to medicinal chemistry was the concept of active-site-directed irreversible enzyme inhibition of substrate-identical enzymes. A monograph summarizing this approach to drug design promptly became one of the classic works in the field.

The B.R. Baker Memorial Endowment Fund was established in 1973; the income from this endowment is used to support lectures in those areas of chemistry with which Baker was closely identified and to which he devoted his life. These areas included studies in the synthesis of antihemorrhagic vitamin K analogues, biotin derivatives, compounds with hormone activity, sulfones with activity against tuberculosis, and alkaloids.

Professor B.R. Baker was a professor of Chemistry at UCSB from 1966 until his death in 1971.

## T.C. Bruice

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**Thomas C. Bruice** (Ph.D., 1954) has served on the faculties of Yale, Johns Hopkins and Cornell prior to coming to UCSB in 1964. He has been a Guggenheim Fellow and is a member of the National Academy of Sciences, American Academy of Arts and Sciences and a fellow of the Royal Society of Chemistry. He has received the major awards of the American Chemical Society in the sub-disciplines of Bioorganic and Bioinorganic chemistries, physical organic chemistry and biochemistry.

## Previous speakers include:

- Paul Berg, Stanford University 1975
- Joseph Bertino, Yale University 1975
- Nelson J. Leonard, University of Illinois 1976
- Jeremy R. Knowles, Harvard University 1978
- Bruce N. Ames, U.C. Berkeley 1979
- Linus Pauling 1980
- Carl Djerassi, Stanford University 1981
- Daniel V. Santi, U.C. School of Medicine, San Francisco 1982
- Christopher T. Walsh, Harvard Medical School 1984
- Stephen J. Benkovic, The Pennsylvania State University 1985
- Alan R. Fersht, Imperial College, London 1986
- Harry B. Gray, California Institute of Technology 1987
- Richard Lerner, Scripps Clinic and Research Foundation 1988
- E.J. Corey, Harvard University 1989
- Sir James W. Black, Kings College School of Medicine, London 1990
- Peter G. Schultz, University of California, Berkeley 1991
- Peter B. Dervan, California Institute of Technology 1992
- Olke C. Uhlenbeck, University of Colorado 1993
- Richard Holm, Harvard University 1994
- Chi-Huey Wong, The Scripps Research Institute 1995
- David S. Sigman, Molecular Biology Institute, UCLA 1996
- Daniel E. Koshland, Jr., UC Berkeley 1997
- Harold A. Sheraga, Cornell University 1998
- Richard E. Dickerson, University of California, Los Angeles 1999
- Joanne Stubbe, Massachusetts Institute of Technology 2000
- Steve Benner, The University of Florida 2001
- Gregory Petsko, Brandeis University 2002
- Jack Dixon, University of California San Diego 2003