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Adjunct Professor in Cornell University's Department of Plant Biology

David Stern obtained a M.Phil. degree from Cambridge University in 1982 in the laboratory of Richard B. Flavell. His research was on plant mitochondrial genome structure and expression. In a serendipitous finding, he discovered that the maize mitochondrial genome contained a long DNA sequence derived from chloroplast DNA. An article describing the discovery of so-called "promiscuous DNA" was published in Nature, and catalzyed Stern's interest in the origin and regulation of plant organellar genomes. He matriculated at Stanford University to pursue Ph.D. research in William F. Thompson's laboratory at the Carnegie Institution of Washington, Department of Plant Biology (now the Carnegie Institute of Science). While Dr. Thompson was on sabbatical, Stern teamed with Jeffrey D. Palmer to explore the extent of chloroplast DNA sequence integration into various plant mitochondrial genomes. These and related studies formed the basis of his thesis research.

After obtaining his Ph.D. in 1986, Stern was awarded an NSF Plant Biology Fellowship to conduct postdoctoral research at the University of California, Berkeley, with Wilhelm Gruissem. At Berkeley, Stern began to develop biochemical methods to study *cis* elements and *trans*-acting factors that regulate chloroplast gene expression. He focused on RNA binding proteins and enzymatic activities that are involved in 3' end maturation and stability of chloroplast mRNAs. Stern accepted a faculty position at the Boyce Thompson Institute in 1989 where he continued his research on plant organelle gene expression, including a sabbatical in France in 1995-96 funded by a Guggenheim Fellowship and a French government prize. He was appointed President of the Boyce Thompson Institute in 2004. Stern is currently an Adjunct Professor at Cornell University and is a Fellow of the American Association for the Advancement of Science. He teaches a graduate course on the molecular biology of plant organelles and maintains an active research program while overseeing the activities of BTI and its close relationship with Cornell University.

Research Summary

The underlying research theme in the Stern laboratory is nuclear-cytoplasmic interactions. Within this framework, we study how chloroplast genes and metabolic activities are regulated

by the products of nuclear genes, usually acting at the transcriptional or post-transcriptional level. Chloroplasts, as the site of photosynthesis as well as other metabolic pathways, have numerous roles in plant development, and responses to environmental stimuli. Our laboratory focuses on how these roles are modulated through intensive studies of global and individual gene regulation under normal growth or stress conditions. We use different techniques including genetics, plant transformation, and biochemistry to unravel these processes.