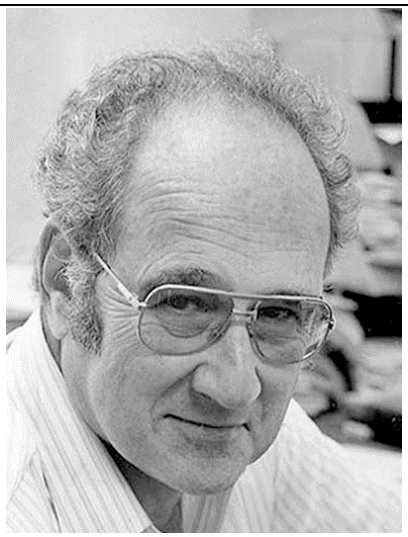

Milton Zaitlin

April 2, 1927 – October 11, 2016

Dr. Milton Zaitlin, Emeritus Professor of Plant Pathology and Plant-Microbe Biology passed away at the age of 89 on October 11, 2016 after a brief illness. He was internationally recognized for his seminal contributions to our understanding of plant viruses, and his 46-year career spanned the advent of molecular plant virology, a field in which he was a major contributor.

Milt was born in Mt. Vernon, NY on April 2, 1927. When Milt's father became ill, the family moved west to settle in Los Angeles in the late 1930s. After serving in the US Navy toward the end of WWII (1944-45), he obtained a B.S. degree in Plant Pathology from the UC Berkeley in 1949. His first experience in research was at Caltech (1949-1950) as part of a team showing that smog damage to plants was caused by a combination of gasoline, ozone (or NO_2) and UV light. Milt pursued graduate study at UCLA under Samuel G. Wildman, developing a serological virus detection system in orchids and receiving his Ph.D. in 1954.

Milt began independent work as a Research Officer in the Division of Plant Industry of the CSIRO, in Canberra, Australia (1954-1958). There, he began his lifelong pursuit toward understanding the workings of tobacco mosaic virus (TMV) and its effect on plants.

Upon returning to the US, he took a position in 1958 as an Assistant Professor in the Department of Horticulture, University of Missouri, and Columbia. There he continued studies of TMV replication using isolated cells, which resulted in a single authored Nature paper, and investigated the effects of TMV on chloroplast components. In 1960, Milt was invited to take a position in Albert Siegel's laboratory in the Department of Agricultural Biochemistry, University of Arizona, and Tucson, where he soon joined the faculty and advanced to full professor. During that time Milt and Al had a very productive collaboration, carrying out both joint and separate

research projects. Milt and his colleagues were early pioneers in the generation and analysis of TMV coat protein mutants. He also studied the time course of TMV replication, which led to the discovery of a high molecular weight protein and a low molecular weight RNA, later shown to be a replication component and the subgenomic messenger RNA of the coat protein, respectively. Milt accepted a position in 1973 in the Department of Plant Pathology, Cornell University, Ithaca, NY, where he continued his study of TMV and its genes. Results from those studies led to the determination of the genetic map of TMV and its mode of gene expression, years before the nucleotide sequence was known. He showed that TMV did not need a functional coat protein either for infectivity or to activate a hypersensitive resistance response in tobacco, and that TMV could be disassembled in frog cells and the RNA translated, demonstrating that the plant cell wall was not needed for this process. Milt's lab also showed that TMV was actually a population of co-habiting virus strains and mutants, and that the so-called subliminal infection was a type of resistance mechanism by which inoculated leaf cells supported virus replication at normal levels, but the virus could not move to adjacent cells. His work on TMV and its interaction with chloroplasts importantly demonstrated that TMV RNA could enter chroroplasts. He also broadened his research scope to include viroids and satellites of plant viruses. In later years, an increased focus on viral replication culminated in his lab's successful use of several viral replicase genes in transgenic plants to effect resistance to infection by those viruses, and he worked towards understanding the mechanism underlying this resistance. He retired from his faculty position on December 31, 1996, and became an Emeritus Professor in 1997. During his career, Milt took three sabbatical leaves: to the CSIRO Division of Plant Industry in Canberra (1966-1967, supported by a Fulbright Scholarship and Guggenheim Fellowship); to the Department of Biochemistry and Biophysics at UC Davis (1979-1980); and to the John Innes Institute, Norwich, UK (1986-1987).

Those who have had the privilege of working with Milt recognize him as a committed teacher, as a mentor for the training of graduate students and post-doctoral scientists, and as a colleague and host for the numerous sabbatical visitors who came to his lab. His weekly lab meetings will be remembered by all for their rigor, frank commentary, and insights provided. All lab members were expected to report at every meeting upon their progress and ideas developed during the past week; the drive and incentives were palpable. Data were examined carefully; criticism and praise intermingled. Above all, Milt created an environment that fostered scientific exchange, growth and learning. For students and more junior scientists, this early exposure to the scientific process was extraordinary.

Milt is also recognized in the virology community for the rigor, fairness, and professionalism with which he handled manuscripts, as editor for the journals *Virology* (1966-1984) and *Molecular Plant-Microbe Interactions* (1987-1990). Milt was one of the founding members of the American Society for Virology and hosted the first meeting of this organization in 1982 at Cornell, as well as the tenth anniversary meeting in 1992. When the New York State Center for Advanced Technology created a Biotechnology Program at Cornell, he was the first Associate Director (1983-1990) and the second Director (1990-1991). For his pioneering efforts and his discoveries, Milt was honored by election as a Fellow of the American Association for the Advancement of Science (1969) and of the American Phytopathological Society (APS, 1978), and he was conferred the Award of Distinction of the APS (2006), which has been granted to only 15 individuals since its inception in 1967.

Milt enjoyed music, especially classical and jazz, as well as occasional forays into blackjack and poker. During his time in Arizona, he enjoyed taking his young family on summer vacations, exploring the southwest with an old station wagon, a tent trailer, and several dogs. He is survived by his wife of 65 years, Marjorie, and their four children, David, Michael, Deborah, and Paul, as well as six grandchildren and one great grandson. He will be sorely missed by his immediate family and those related through science and his mentorship.

Written by Peter Palukaitis, Keith Perry and Candace Collmer, with invaluable input from Andy Jackson