

XVth International *Toxoplasma* Congress *In memoriam* Professor Elmer Pfefferkorn (1931-2019) and Dr. Lorraine Pfefferkorn (1937-2019)

By David Roos



Left: The first International *Toxoplasma* Congress (Squam Lake NH, 1989), back row: Greg Felice, Jim Fishback, David Sibley, Jack Remington, Alan Sher, Jack Frenkel, David Roos, Keith Joiner, Ben Luft, Bill Carrant; second row: Joe Schwartzmann, Elmer Pfefferkorn†, Takuro Endo, Louis Weiss, Françoise Darcy, Philippe Thulliez, Marie-France Cesbron, Judy Smith, Alan Johnson, Yasuhiro Suzuki, Takashi Asai, Jitender (JP) Dubey; kneeling: Lloyd Kasper, Rima McLeod, Jean François Dubremetz, John Boothroyd, unknown. **Right:** Ever the educator, Elmer Pfefferkorn explains the *Toxoplasma* life cycle.

The field of modern *Toxoplasma* research has lost two of its most important founding visionaries: Drs. Elmer and Lorraine Pfefferkorn passed away on the 25th of March and 17th of April 2019 in Hanover NH (US). As a doctoral student and faculty member at Harvard Medical School, Elmer Pfefferkorn isolated and biochemically characterized some of the first temperature-sensitive mutants of animal viruses. Moving to Dartmouth Medical School, he and Lorraine pioneered the development of *Toxoplasma gondii* as an experimentally-accessible system for exploring host-parasite interactions. In a series of 10 highly influential papers published between 1976 and 1981, the Pfefferkorns developed methodology for *Toxoplasma* mutagenesis, exploiting these mutants to characterize parasite metabolic pathways and the biochemical basis of susceptibility and resistance to a variety of inhibitors. Defined mutants also allowed them to conduct the first marked sexual cross (in cats), demonstrating Mendelian inheritance; to elucidate important aspects of parasite interactions with the infected cell; and to explore the feasibility

of vaccination strategies using crippled parasite isolates. As Lorraine completed her PhD and embarked on a career in immunology, Elmer, his trainees, and colleagues characterized some of the first antigens defining the *Toxoplasma* surface, internal organelles, cytoskeletal compartments, and life cycle stages. This work laid many of the foundations for modern biochemical, cell biological, immunological, molecular genetic, and genomic research on *Toxoplasma gondii* and related parasites. In addition to their scientific contributions, the Pfefferkorns were well known as educators, mentors & administrators: Elmer chaired the Microbiology department for decades, and his microbiology classes were legendary entertaining and information-packed; he mentored a generation of physicians and research scientists (including Nobel laureate J Michael Bishop). Lorraine was a tireless advocate for the effective engagement and recognition of women in science. Their intellectual rigor and low key good humor will be sorely missed... but the Pfefferkorn's legacy lives on in many ways, including this conference.