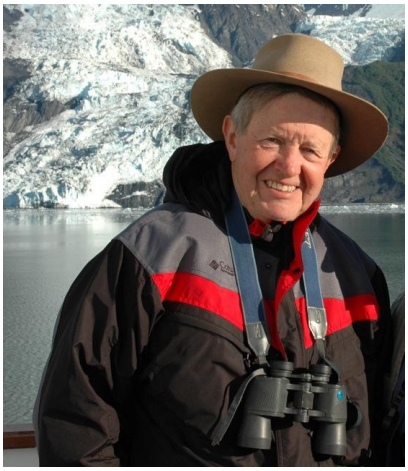

IN MEMORIAM

James William Fristrom
Professor of Molecular and Cell Biology, Emeritus
UC Berkeley
1936 - 2013

James Fristrom was born in Chicago to Carl Julius Fristrom and Katherine Kermeen Fristrom. He graduated from Francis Parker School in Chicago. During those high school summers, Jim and his brother spent many weeks riding and experiencing the life of a ranch hand at a ranch in Colorado, so perhaps it's no surprise he elected to go west to Reed College in Portland, OR. He graduated from Reed in 1959, Phi Beta Kappa in Biology. He then crossed the nation to earn a PhD in genetics from Rockefeller University (1964), where he studied with one of the giants of genetics, E. L. Tatum. During his stint as a graduate student, he spent part of a year working in the lab of Ernst Hadorn in Zurich. Hadorn was an internationally renowned geneticist and the world's expert on the development of imaginal discs in the larvae of the fruitfly, Drosophila melanogaster. Imaginal discs are small islands of cells in the body wall of larva that give rise to the appendages and some internal organs of the adult fly. This exposure to imaginal discs had life- long consequences for Jim, as we describe below. After graduate work, Jim returned to the West once again and did post- doctoral research at California Institute of Technology in Pasadena, where he worked with another very important figure in genetics, H. K. Mitchell. While in Mitchell's lab he devised an audacious technique for isolation of the imaginal discs en masse, which served as a basis for much of his important scientific work and had a substantial impact on modern genetic studies.

Jim joined the Genetics Department, in the College of Natural Resources (CNR) at the University of California, Berkeley in 1965, moving quickly through the ranks. He spent his entire academic career, aside from sabbatical leaves, at UC Berkeley. When the biology departments were reorganized in 1988-89, he became Professor in the Genetics Division of the Molecular and Cell Biology Department

Jim’s research was aimed at understanding the mechanisms by which tissues change shape during the development of an organism and how those changes can be orchestrated by hormones. To that end, Jim studied the process of metamorphosis in the fruit fly when the organism changes its form dramatically over the course of a few days from a worm- like larva to a winged insect that emerges from a pupal case. As mentioned earlier, Jim’s research focused on imaginal discs, which are pockets of cells set side in the larva that generate adult structures such as the wing and the leg. This change is activated by an interplay between two hormones: juvenile hormone and ecdysone. At a time when little was known about the mechanisms underlying the actions of steroid hormones, Jim’s laboratory combined genetic and biochemical approaches to understand how the steroid hormone, ecdysone, regulates changes in the properties of imaginal disc cells. These studies were facilitated by the bulk disc isolation procedure that Jim had developed early

in his career and by his ability to study disc development in culture. Jim's laboratory characterized the properties of genes regulated by ecdysone, most notably the Broad complex of genes. His group also identified a variety of proteins found in the cuticle and hemolymph (blood). Of particular note were his studies of the morphological changes in the disc induced by hormones. In this respect, Jim's laboratory made important contributions to our understanding of the phenomenon of disc eversion, where the discs are brought to the outer surface of the organism during metamorphosis. Together with his wife, Dianne Fristrom, Jim wrote a chapter entitled "The metamorphic development of the adult epidermis" in a book published by Cold Spring Harbor Press in 1993 that is still considered the authoritative review of the subject.

Jim retired in 1994, but continued doing genetics experiments in laboratories of colleagues until the last months of his life; only a few weeks before he passed away he was attending lab meetings and engaged in serious scientific discussions. During his retirement he also spent many hours helping screen admission portfolios of aspiring new students to the University.

Jim was heavily involved in undergraduate teaching of genetics. For many decades he was the lead teacher in a first course in genetics for undergraduates, serving students in both CNR and the College of Letters and Science. He was a beautifully organized lecturer and his course enjoyed a wonderful reputation. In 1980 he published, with Phillip Spieth (a colleague in the Genetics Department), a textbook for use in undergraduate courses, "Principles of Genetics." This was widely used in colleges and universities, and a second edition (co- authored with L.C. Clegg), was published in 1988. Jim's wife, and life- long scientific collaborator, Dianne, did the illustrations for the book. It is fair to say that this book was one of very few introductory texts in genetics that was deep and comprehensive, yet accessible, which made it an inspiration to many cohorts of aspiring geneticists.

The Fristrom lab was a busy, productive, and happy place, with a succession of graduate students and post- docs, many of whom went on to notable careers in academia and science. His teaching of undergraduates and mentoring of graduate students and post- docs was exemplary. The Fristrom home was a frequent and welcoming gathering place for students, graduate students, post- docs and sabbatical visitors. The visitors and post- docs that were attracted to his lab enriched the intellectual life of many biologists on the faculty and their students. Jim's wife, Dianne, was an important part of the welcoming atmosphere in the lab and Fristrom home. We note that Dianne was a principal scientific collaborator on the body of research that emerged from the Fristrom lab.

Jim was the energetic leader of an application to NIH for a training grant in genetics, a source of support for many cohorts of graduate students. In addition to his work in preparing these competitive applications, he served as administrative head of the group for many years (1979-82 and 1986-89). He was also served as chairman of the Department of Genetics from 1979 to 1982, enhancing its international reputation and prominence

Jim enjoyed an international reputation in the field of genetics. His scientific contributions were considered by his peers as of the highest order, and he enjoyed the esteem of the world's top geneticists. He and Dianne spent part of 1974 as UNESCO visiting scientists at the Hungarian Academy of Science in Szeged, Hungary, where he had substantial impact on the post- war development of genetics in that part of the world. Those connections and his influence in Eastern Europe were maintained throughout his career. He served on grant review panels for the NIH and American Cancer Society, served as reviewer and associate editor for journals in his field, and was a well- known and highly respected contributor to his field.

Jim is remembered by family, colleagues, and friends as one of those rare individuals that could remain calm and in good humor during the most difficult of circumstances. He bore bravely a long illness of lymphoma and its attendant complications. His equanimity and good humor never failed him, and was, and is, a blessing to those who knew him.

He will be greatly missed by his surviving wife, Dianne, two sons James and Edward, two granddaughters, Sofia and Zara, and brother Carl.

Fred Wilt
John Gerhart
Iswar Hariharan