



IN MEMORIAM

Walter Anthony Nelson- Rees
Research Geneticist
UC Berkeley
1929 – 2009

Walter Nelson- Rees's research struck fear into the hearts of biomedical scientists as they waited to learn whether the cell lines they were utilizing for their research would turn out to be something other than what they thought they were. He will be remembered by the scientific community as the person who sounded the alarm about the issue of cell line misidentification and who led the crusade to correct the problem by appropriate cell line authentication. His legacy to biomedical research, especially the fields of cancer research, developmental biology, and infectious diseases is monumental.

Nelson- Rees received his B.A. (1951) and M.S. (1952) in biology from Emory University in Atlanta, Georgia. After a three- year enlistment with the U.S. Army as a biological research assistant, he enrolled at the University of California, Berkeley, in 1956 and received his Ph.D. in genetics in 1960, working with Professor Spencer W. Brown on sex determination in the mealy bug. He gained subsequent experience in the field of cytogenetics, specifically chromosome morphology, supported by a National Institute of Health postdoctoral fellowship for studies in Mexico and Guatemala, and a Fulbright Fellowship for research at the Max Planck Institute in Tübingen, Germany. His career as a research geneticist at Berkeley began in 1962. He served as co- director of the Cell Culture Laboratory of the School of Public Health. This laboratory was located at the Naval Biosciences Laboratory in Oakland and was funded by the National Cancer Institute to establish, characterize, store, and distribute cell lines to researchers. Building on the initial work of Stanley Gartler, who raised early suspicions of cell line misidentification using enzyme profiles as markers, Nelson- Rees and his team detected a larger range of variation using Giemsa chromosome banding patterns, state- of- the- art technology at that time. This opened a huge Pandora 's Box, revealing that at least 40 commonly used cell lines serving as model systems for studies on breast, prostate, ovarian, and various other cancers had been inadvertently contaminated and completely "taken over" by a rapidly proliferating cell line, HeLa, derived from a cancer of the uterine cervix. This meant that any organ- or tissue- specific conclusions based on research with the contaminated cell lines were erroneous. His research group also detected about 240 other cases of both intra- and interspecies misidentification due to contamination or mislabeling. A conservative estimate would be that results reported in at least 500 publications are erroneous and more than 20 million dollars of research funding has been wasted as a consequence of cell line misidentification.

When his seminal series of manuscripts exposing the misidentified cell lines was published in the premier journal *Science* between 1975 and 1981, the reaction ran the gamut between graceful acceptance and aggressive hostility. Some took in stride the painful realization that years of work and precious funding dollars had gone down the drain. They notified all laboratories to which they had distributed the misidentified cell lines and notified journals in which they had reported research utilizing the lines, so that an editorial alert could be published. Others were reluctant to accept Nelson- Rees's work as valid and continued to use the

contaminated cell lines. Still others were openly hostile. In an editorial published in another premier journal, *Nature*, Nelson- Rees was called a “self- appointed vigilante.” His publications were referred to by some opponents as the “hit list” because of their potentially devastating effects on professional reputations. Nelson- Rees reported receiving an anonymous telegram offering him a one- way ticket to South Africa. His contributions to elucidating the extent of cell line contamination and his struggle to obtain cooperation from the scientific community to resolve the dilemma were described by San Francisco journalist Michael Gold in the engaging book *A Conspiracy of Cells* (1986).

Since his retirement in 1981, other scientists have continued research on cell line identification. The advent of molecular methods enabled the application of DNA fingerprinting to cell lines and vindicated beyond any doubt the results of Nelson- Rees and his team. Today few would challenge the validity and importance of their research. Many however, are still in denial about the possibility that misidentified cell lines could ever be a problem in their own laboratory, either through inadvertent cross- contamination with other cell lines used in the same laboratory, or through receiving an unknowingly contaminated or mislabeled cell line from another laboratory. Fortunately, there are a number of us who, inspired by Nelson- Rees’s work, are continuing the efforts to prevent the spread and use of misidentified cell lines. The sale of known contaminated cell lines has stopped and some journals and granting agencies are now requiring cell line authentication before acceptance of a manuscript for publication or funding of a research project. We feel that “Walter rides again” and his spirit remains with us.

In addition to his research, Nelson- Rees contributed many professional services to the National Cancer Institute, Society for In Vitro Biology, International Congress on Genetics, American Type Culture Collection (the largest repository of cell lines in the world), and the W. Alton Jones Cell Science Center, Lake Placid, New York, where he was an adjunct faculty member. He served on the editorial boards of the *Journal of American Veterinary Medical Association*, *Journal of the National Cancer Institute*, *Applied Microbiology*, and *In Vitro*. He contributed to teaching as a lecturer in the School of Public Health at Berkeley. In 2004, he received the Lifetime Achievement Award from the Society for In Vitro Biology in recognition of his outstanding career, and in 2007, *Science* featured him in a “NewsFocus” piece on cell line misidentification.

Following his retirement in 1981, Walter focused his attention on art history and authored or coauthored several biographies of California artists. He and his partner, James Coran, bought, sold, and catalogued historical paintings by early California artists and became well- known contributors to art endeavors in the Bay Area and California. Their private collection of over 900 art works, their home, and all of their possessions were tragically destroyed in the devastating Oakland hills fire of October 20, 1991.

Walter Nelson- Rees began his life in Cuba, born to a Danish- English mother and a German father; he grew up in both Cuba and Germany. In 1953, he was naturalized as a U.S. citizen. His life of 80 years ended in San Francisco on January 23, 2009, from complications of a broken hip suffered in a fall several months before. He is survived by his domestic partner of 50 years, James Coran, a sister- in- law, Maria Rees, two nieces and two nephews, and their families.

Gertrude Case

Buehring
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