Masatoshi Nei, Kyoto prize-winning evolutionary geneticist, dies at 92

BY SUDHIR KUMAR AND GREG FORNIA · 5/19/23

Dr. Nei was arguably the most eminent scientist in our college, if not the whole university. He was incredibly influential in the field of evolutionary biology. His passing is a massive loss to the scientific community, not only at Temple University, but also in Philadelphia, and around the world.

- Dean Michael L. Klein, College of Science and Technology

Champion of the neutral theory of molecular evolution, inventor of Nei's distance and Laura H. Carnell Professor at Temple University

Dr. Masatoshi Nei was a pioneering evolutionary geneticist and a laureate of the prestigious Kyoto Prize. His extraordinary life, which spanned 92 years, was marked by transformative contributions to evolutionary genetics and biology.

Nei's legacy has shaped our understanding of evolution at the molecular level. He passionately advocated the neutral theory of

molecular evolution, which holds that most evolutionary changes and polymorphisms within species are not caused by natural selection, but by random genetic drift. One of a select few to have a statistic named for him, he invented the influential "Nei's distance," a cornerstone of population genetic analyses. He also stewarded the development of neighbor-joining, a method for creating phylogenetic trees, and of Molecular Evolutionary Genetics Analysis (MEGA) software.

"Professor Nei was an extraordinary scientist who developed much of the theory and analytical methods that brought evolutionary biology into the 21st century and the age of genomics," said Jody Hey, professor of biology and director of Temple's Center for Computational Genetics and Genomics. "He also had tremendous impact through the books he wrote, the journals he started, and through the students he taught, many of whom are world leading scientists in their own right."

Nei was a master at developing elegantly simple statistical methods that illuminated evolutionary patterns and processes using molecular data. His more than 300 scientific contributions were among the key catalysts that converted evolutionary biology into a quantitative, predictive discipline. The widespread application of his methods and tools across biological disciplines

employing molecular data made him one of the most cited scientists in the world, with over 400,000 citations.

A prolific writer, Nei authored seminal works like *Molecular Population Genetics and Evolution* (1975), *Molecular Evolutionary Genetics* (1987), *Molecular Evolution and Phylogenetics* (2000) and *Mutation-Driven Evolution* (2013). In 1983, he co-founded the prestigious journal *Molecular Biology and Evolution*. He penned his memoir, *My Life as a Molecular Evolutionist, in 2021*.

A testament to his achievements, Nei was the recipient of numerous accolades, including the Kyoto Prize in Basic Sciences (2013), International Prize for Biology (2002) and Thomas Hunt Morgan Medal (2006). He was elected to the US National Academy of Sciences (1997) and the American Academy of Arts and Sciences (1990). In 2017, Nei won the prestigious, Philadelphia-based John Scott Award for contributing to the "comfort, welfare and happiness" of humankind. Past winners include Marie Curie, Thomas Edison, Jonas Salk and Nikola Tesla.

Nei earned his PhD from Kyoto University in 1959. After appointments in Japan, he moved to the United States, joining Brown University in 1969. He was a professor at the University of Texas Health Science Center at Houston and Pennsylvania State University before becoming an adjunct Laura H. Carnell Professor

at Temple University (2015) in the Institute for Genomics and Evolutionary Medicine (iGEM).

“Masatoshi’s passing is a profound loss to the global scientific community. He leaves behind a devoted wife, two children, their families, and countless colleagues and students, who benefited from his warmth, collaboration, wisdom and mentorship,” said Temple’s Sudhir Kumar, Laura H. Carnell Professor and director of iGEM. “As we mourn his loss, we also celebrate the life of a scientist who forever transformed our understanding of the world at a molecular level. His work, legacy and memory will undoubtedly continue to inspire and influence future generations.”

For more information on Dr. Nei's career, go to https://igem.temple.edu/nei

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