

## Professor Motoo Kimura



Date of Birth : November 13, 1924

Nationality : Japanese

Address :

Department of Population Genetics  
National Institute of Genetics  
Mishima, Japan 411

### Education and Career :

1947	M. Sc., Kyoto University
1947—1949	Research Assistant, Kyoto University
1949—1957	Research Member, National Institute of Genetics
1956	Ph. D., University of Wisconsin
1956	D. Sc., Osaka University
1957—1964	Laboratory Head, National Institute of Genetics
1964—1988	Head, Department of Population Genetics, National Institute of Genetics
1984—1988	Professor, National Institute of Genetics
1988—	Visiting Professor and Professor Emeritus, National Institute of Genetics

### Professional Activities :

1963, 1965	Visiting Professor, University of Pavia, Italy
1966	Visiting Professor, University of Wisconsin, U.S.A.
1969	Visiting Professor, Princeton University, U.S.A.
1973	Visiting Professor, Stanford University, U.S.A.
1973—	Foreign Associate, National Academy of Sciences, U.S.A.
1976—	Correspondant Etranger, Académie des Sciences, Inscriptions et Belles Lettres, Toulouse, France
1978—	Foreign Honorary Member, American Academy of Arts and Sciences, U.S.A.
1980—1984	President, Genetics Society of Japan

Honors, Prizes and Awards :

Genetics Society of Japan Prize, 1959  
Weldon Memorial Prize, Oxford University, 1965  
Japan Academy Prize, 1968  
Japan Society of Human Genetics Prize, 1970  
Order of Cultural Merits, Japan, 1976  
Member of Japan Academy, 1982  
Chevalier de l'Ordre National du Mérite, French Government, 1986  
Asahi Prize, Asahi Shimbun, Japan, 1987  
John J. Carty Award for the Advancement of Science, National Academy of Sciences of U.S.A., 1987  
Honorary Member of the Genetical Society of Great Britain, 1987—

Books :

*Outline of Population Genetics* (Japanese), Baifukan, Tokyo, 1960  
  
*Diffusion Models in Population Genetics* as Methuen's Review Series in Applied Probability, Vol. 2, 1964  
  
*An Introduction to Population Genetics Theory* (with James F. CROW), Harper and Row, New York, 1970  
  
*Theoretical Aspects of Population Genetics* (with Tomoko OHTA), Princeton University Press, Princeton, 1971  
  
*The Neutral Theory of Molecular Evolution*, Cambridge University Press, Cambridge, England, 1983  
  
*My Views on Evolution* (Japanese), Iwanami Shoten, 1988

Published Articles:

Kimura, M. (1955) Stochastic processes and distribution of gene frequencies under natural selection. *Cold Spring Harbor Symp.* 20:33-53  
  
Kimura, M. (1962) On the probability of fixation of mutant genes in a population. *Genetics* 47:713-719.  
  
Kimura, M. and J. F. Crow (1964) The number of alleles that can be maintained in a finite population. *Genetics* 49:725-738.  
  
Kimura, M. (1968) Evolutionary rate at the molecular level. *Nature* 217:624-626  
  
Kimura, M. and T. Ohta (1969) The average number of generations until fixation of a mutant gene in a finite population. *Genetics* 61:763-771.  
  
(Many others)

### Academic achievements :

For the last thirty years, Professor Kimura has made many contributions to mathematical, population and evolutionary biology.

One of his important contributions is the development of diffusion models. He published a series of papers treating the transient distribution of gene frequency in finite populations in terms of diffusion models in probability theory. These papers have provided an important means of studying the evolutionary change of natural populations and are now regarded as classics in population genetics. He has since developed various mathematical models of population genetics including the probability of fixation of mutant genes, the population dynamics of linked loci, and the maintenance of genetic variability due to mutation, selection, and random genetic drift. He has also provided a theoretical basis for molecular population genetics. He has revolutionized theoretical population genetics whose tradition goes back to the great works of R. A. Fisher, J. B. S. Haldane, and Sewall Wright. Furthermore, with the advent of molecular biology, he pioneered a new field where principles of both population and molecular genetics are synthesized and resulting theoretical framework serves for investigating the mechanism of evolution at the molecular level.

In 1968 Professor Kimura proposed the neutral theory of molecular evolution that the evolutionary change of genes or proteins occurs mostly by random fixation of neutral or nearly neutral mutations rather than positive Darwinian selection, and the large extent of protein polymorphism observed in natural populations represents a phase of this molecular evolution. The neutral theory has had an enormous impact not only in population genetics but also in evolutionary biology in general. It has stimulated a great deal of research throughout the world to test its validity. During the last twenty years the evolutionary study of DNA and proteins has generated a large amount of data to support Professor Kimura's hypothesis, and this neutral theory is now accepted by a large proportion of evolutionists. In the study of molecular evolution, it has already become a guiding principle for analyzing and interpreting data. His recent book (Kimura, 1983) on *The Neutral Theory of Molecular Evolution* is likely to become a milestone in evolutionary biology.

Professor Kimura's work of unifying population genetics with molecular evolutionary studies is outstanding, and it will remain as one of the most important achievements in the twentieth century biology.