

# W. Ford Doolittle Biography

## W. Ford Doolittle

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# Biography

Ford Doolittle is a Professor in the Department of **Biochemistry** at Dalhousie University in Halifax, Nova Scotia, Canada. He is also Director of the Canadian Institute of Advanced Research Program in Evolutionary Biology. Doolittle is one of the world's premier evolutionary biologists, who has used molecular techniques to explore the similarities and disparities between the genetic material in a variety of prokaryotic and eukaryotic organisms. In particular, his pioneering studies with the evolutionarily ancient archaeobacteria have led to a fundamental re-evaluation of the so-called "tree of life."

Doolittle was born in Urbana, Illinois. Following his high school education, he received a B.A. in Biological Sciences (magna cum laude) from Harvard College in 1963, and a Ph.D. in Biological Sciences from Stanford University in 1969. He was a Postdoctoral Fellow in Microbiology at the University of Illinois from 1968 to 1969, and at the National Jewish Hospital and Research Center in Denver from 1969 to 1971. From there he moved to Dalhousie University as an Assistant Professor in the Department of Biochemistry in 1971. He became an Associate Professor in 1976, and a Professor in 1982.

Doolittle and his colleagues have made fundamental contributions to the field of evolutionary biology. Specifically, Doolittle has pioneered studies examining the origin of the nuclear genetic material in eukaryotic cells, the origin of the organizing genetic material known as introns, and the genetic organization and regulation of the archaeobacteria that inhabit thermal hot springs. The latter **bacteria** are among the most ancient **microorganisms** known, and knowledge of their genetic composition and behavior has clarified the early events of **evolution**.

From Doolittle's research, it is now known that mitochondria, the so-called "powerhouse" of eukaryotic cells, were once autonomous bacteria. Mitochondria arose from the integration of the ancient bacteria and a eukaryote and the establishment of a symbiotic relationship between the two. In addition, prokaryotic cells may well have evolved by acquiring genes from other species, even **eukaryotes**. This concept, which Doolittle has dubbed lateral **gene** transfer, challenges a fundamental pillar of evolution, which is the separateness of the kingdoms of life. For example, a fundamental scientific opposition to genetically modified organisms is that the acquisition of eukaryotic genes by the altered bacteria violates evolutionary laws.

Doolittle has received numerous awards and honors for his research, including the Award of Excellence from the Genetics Society of Canada and a fellowship in the Royal Society of Canada.