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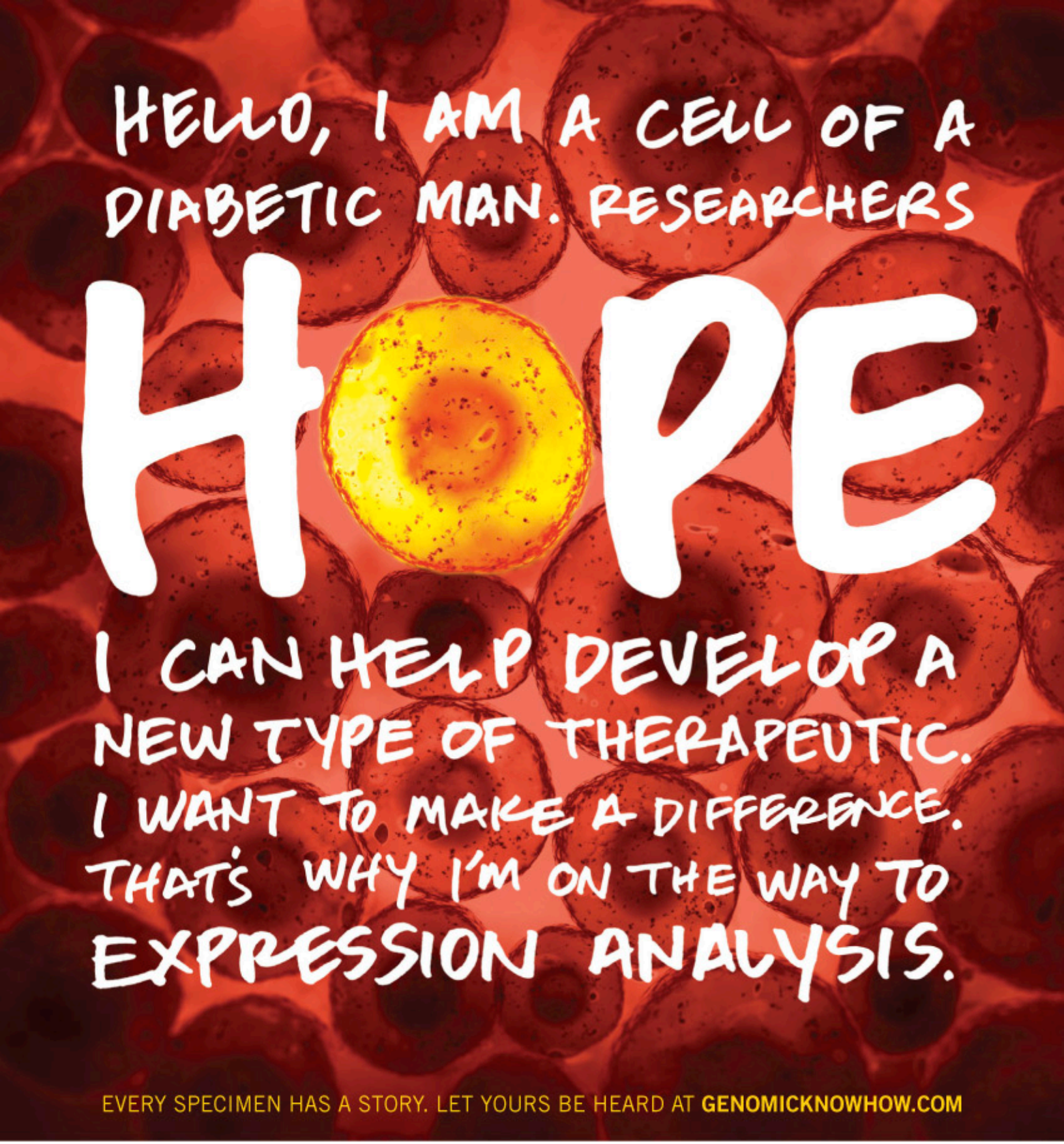

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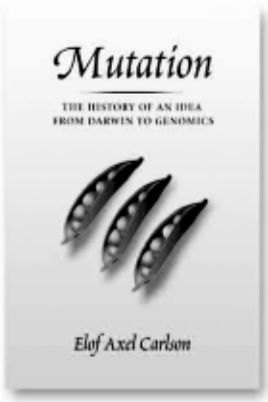
MUTATION

THE HISTORY OF AN IDEA FROM DARWIN TO GENOMICS



By Elof Axel Carlson, *Professor Emeritus, State University of New York at Stony Brook; Visiting Scholar, Institute for Advanced Study, Indiana University*

Today, most scientists regard the term "mutation" as a description of a change in an individual gene, and more precisely as some minute alteration of the DNA of that gene, especially a nucleotide substitution. But the idea of mutation has changed considerably from the pre-Mendelian concepts of Darwin's generation, who viewed "fluctuating variations" as the raw material on which evolution acted, to today's up-to-the-minute genomic context of mutation. *Mutation: The History of an Idea from Darwin to Genomics* explores six generations of mutation research, providing the background—the people and the ideas—for this biological journey.

After exploring Darwin's and Francis Galton's concepts of mutation, Carlson shows how the 1900 rediscovery of Gregor Mendel's experiments let to a discontinuous model of evolution by mutation and how cytological investigations led to the chromosome theory of heredity of classical genetics in which there was random mutation in genes. Carlson details how Mendelian and biometric approaches to heredity and evolution were closely tied and how induction of mutations by radiation and chemical mutagens led to biochemical investigations of gene action, shifting attention to the chemistry of the gene. The interpretation of the gene as DNA and the deciphering of the genetic code then gave rise to molecular interpretations of mutation, views that also impacted evolutionary biology, population genetics, commercial development of plants and animals, and human genetics.

This book shows how generational definitions or assessments of mutation have responded to the technologies added to science and the experiments that abounded with the inquiries of each successive generation. These observations are combined with an exploration of how the nonscientific public has shifted its understanding and concern about mutations over the past 150 or more years. Carlson's historical approach in this book—examining the evolution of a concept—reveals the way science works, incrementally by small steps of additions and replacements rather than by dramatic, and rare, paradigm shifts.

2011, 163 pp., illus. (11 b/w), index
Hardcover $55 **ISBN 978-1-936113-30-9**

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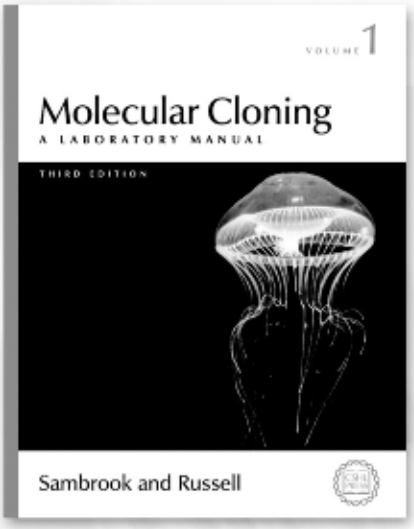

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