

Book Review

An Introduction to Molecular Anthropology. By Mark Stoneking. Wiley-Blackwell: Hoboken, NJ, USA, 2017; \$129.95; ISBN: 978-1-118-06162-6.

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Mark Stoneking, who is a member of the Editorial Board of *OBM Genetics*, has written a textbook on molecular anthropology [1]. As far as I know it is the first of its kind. Mark is a geneticist currently working as a Group Leader of the Max Planck Institute for Evolutionary Anthropology, of Max Planck Gesellschaft at Leipzig, and Honorary Professor of Biological Anthropology, University of Leipzig, Leipzig, Germany. He is one of the world's first scientists who have been making use of modern molecular genetic methods to study human evolution and especially the migration of modern humans. This started when he worked as a graduate student under supervision of Allan Wilson at the University of California at Berkeley. Together with Rebecca Cann, he contributed to the Out of Africa Theory in 1987 by introducing the Mitochondrial Eve, the common mother of all living humans. This work was based on the study of RFLP variation in mitochondrial DNA. From a worldwide sample of placentas Mark and Rebecca found that Africans harboured the most mtDNA variation -about twice as much, on average, as Europeans- and that the variation outside of Africa appeared to be a subset of the variation in Africa. This strongly suggested an African origin. A molecular clock approach dated the origin of all the human mtDNA diversity to about 200,000 years ago.

Since then, Mark's whole career has been devoted to the study of human evolution, first, by looking at the DNA and thereafter by studying the impact of culture on human evolution. In his article in this issue he treats a few examples. He invites the reader interested in further details and/or additional examples to consult his book from which this material is drawn. In this book, molecular anthropology is defined as the use of molecular genetic methods to address questions and issues of anthropological interest. More specifically, molecular anthropology uses genetic evidence to obtain insights into human origins, migrations and population history as well as the role of natural selection during human evolution.

The book consists of three sections. The first six chapters are devoted to basic genetics and can be skipped by professionals in this discipline. The next section includes again six chapters which provide an overview of the different types of genetic data and analyses which are employed in molecular anthropological studies. Especially the chapters dealing with the analysis of genetic data from populations (chapter 10) and inferences about demographic history (chapter 12) will most likely contain a lot of new information for most readers of *OBM Genetics* with a clinical background. In the same way, the last eight chapters reveal many interesting results. Chapter 13 deals with our closest living relatives and the different views of the evolutionary relationships of humans and apes. Chapter 14, on the origins of our species, starts with a discussion of the concept of race. Thereafter different models for the origin of modern humans are discussed by making use of three sources of genetic evidence: mitochondrial, Y-chromosomal and autosomal DNA. Chapter 15 is completely devoted to ancient DNA and the study of archaic humans, for which the Max Planck Institute, where Mark is based, is world famous. In chapter 16 dispersal and migration are treated: Out of Africa—how many times, when, and which way did they go? Most interesting are the descriptions of the colonisations of the Americas and Polynesia. In the latter case Mark is not only using genetic data but also archaeological materials (mainly pottery) and linguistic evidence.

Selection is divided over the next two chapters. The selection that is shared by all modern humans is called species-wide selection. Local selection on the other hand, means genetic adaptations that are specific to a subset of humans, as they reflect selection due to some local circumstances. This category contains the example of lactase persistence that Mark is treating in his opinion paper in this journal and which tells us that the study of selection on human evolution is not only interesting in itself, but also from the clinical viewpoint since it can explain the origin and existence of many genetic diseases. The topic of lactase persistence could also have been treated in the chapter on genes and culture, because it is related to the spread of farming and the domestication of animals.

In the final chapter on ongoing and future developments in molecular anthropology the following two topics especially attracted my attention: the microbiome and the selective forces involved in skin pigmentation. A lot of progress has been made in the study of skin colour variation, but the final chapter still needs to be written. I hope that Mark Stoneking will do so in the next edition of this book which contains many interesting aspects of applied human evolution but which at the same time runs the risk of being outdated soon because the developments in the field are fast.

I wish that this book will be used in many courses, not only in anthropology but also in genetics, since it is clear that natural selection is at the basis of many diseases. Modern medicine cannot be understood without understanding the principles of human evolution, which can explain normal and abnormal variation and differences between individuals and populations. In this respect *An Introduction to Molecular Anthropology* can be of help to both the student as well as the advanced reader, since it not only gives a lot of methods and data but also a personal reflection of an experienced scientist.

Reference

1. Stoneking M. *An Introduction to Molecular Anthropology*. Hoboken, NJ, USA: Wiley-Blackwell; 2017.



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