

## Our Genes

Situated at the intersection of natural science and philosophy, *Our Genes* explores historical practices, investigates current trends, and imagines future work in genetic research to answer persistent, political questions about human diversity. Readers are guided through fascinating thought experiments, complex measures and metrics, fundamental evolutionary patterns, and in-depth treatment of exciting case studies. The work culminates in a philosophical rationale, based on scientific evidence, for a moderate position about the explanatory power of genes that is often left unarticulated. Simply put, human evolutionary genomics – our genes – can tell us much about who we are as individuals and as collectives. However, while they convey scientific certainty in the popular imagination, genes cannot answer some of our most important questions. Alternating between an up-close and a zoomed-out focus on genes and genomes, individuals and collectives, species and populations, *Our Genes* argues that the answers we seek point to rich, necessary work ahead.

RASMUS GRØNFELDT WINTHER is a philosopher of science, researcher, writer, educator, diver, and explorer. He is Professor of Humanities at University of California, Santa Cruz and Affiliate Professor of Transformative Science at the GLOBE Institute at University of Copenhagen.

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Rasmus Grønfeldt Winther  
Frontmatter  
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# *Our Genes*

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*A Philosophical Perspective on Human  
Evolutionary Genomics*

RASMUS GRØNFELDT WINTHER

*Professor of Humanities at University of California, Santa Cruz*

*Affiliate Professor of Transformative Science  
at the GLOBE Institute at University of Copenhagen*



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*For Us.*

*And with extreme gratitude to  
Aage Bisgaard Winther, Helen Longino, and Amir Najmi.*

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## Preface

*Our Genes* would not exist without Helen Longino's push to collect and revise some of my papers, and to write new material. Nor would it exist without constant dialogue with statistician and polymath Amir Najmi, nor without Aage Bisgaard Winther's gentle paternal nudging and multifarious support.

The origins of my thinking about these matters can be discerned in the acknowledgments of the published papers that served as springboards for various chapters. Here I wish to focus on interlocutors who have helped with this book, with *Our Genes*, in particular. The evolutionary genomics material has been made as strong as possible by dialogue with various geneticists and statisticians: Michael "Doc" Edge, A.W.F. Edwards, Marcus Feldman, Ryan Giordano, Melissa Ilardo, Richard C. Lewontin, Søren Mørk, Amir Najmi, Rasmus Nielsen, John Novembre, Noah Rosenberg, Mark Thompson, Michael J. Wade, and Eske Willerslev. Philosophers of science with whom I've discussed the relevant technical and general topics over the years include John Dupré, Sébastien Dutreuil, Claus Emmeche, Peter Godfrey-Smith, Christopher D. Green, James Griesemer, Ian Hacking, Philippe Huneman, Jonathan M. Kaplan, Elisabeth A. Lloyd, Helen Longino, Carlos López Beltrán, Roberta Millstein, Richard Otte, Hans-Jörg Rheinberger, Alex Rosenberg, Elliott Sober, and Denis Walsh. No book gets written without "invisible support" – friends with whom one can discuss the ebbs and flows, the chaos and order, involved in building a book. For their ears and for their words of wisdom, I am especially grateful to Marie Raffin, Ann Lipson, Céline Malraux, Marco del Seta, Mette Bannergaard Johansen, Finn Bannergaard Johansen, Heidi Svenningsen Kajita, Annika Döring, Lars Friis Mikkelsen, Jácome "Jay" Armas, Annette Spicker Bruhn, Edward Lipson, April Snøfrid Kleppe, Jasmine Alinder, Brian Cantwell Smith, Marit Liv Miners, Andrew Miners, and Tom Ryckman. Laura Laine and Mats Wedin assisted with the figures; Lucas McGranahan and Gloria Sturzenacker expertly edited various chapters;

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Molly Gage gave the whole project a magnificent, deep edit; Amy Marks and Gary Smith skillfully copy edited the final manuscript; and Helmut Filacchione helped compile the index. Also wonderful was the team at Cambridge University Press: Katrina Halliday, Jenny van der Meijden, Aleksandra Serocka, and Susan Francis. Artists who produced images and served as sounding boards for the visual aspect of the book were Marie Raffn, Pablo Carlos Budassi, and Larisa DePalma. Finally, University of California, Santa Cruz, Universidad Nacional Autónoma de México, Stanford University, and University of Copenhagen, especially the Niels Bohr Institute, are the institutions where I have been graciously afforded ample opportunity to develop many of the ideas in this book.

In completing this book, now my fourth, I have come to appreciate an analogy. When you have multiple children, I am told that you love each of them intensely, in unique ways. I have learned that this certainly holds for your books — you love each in its own way. Writing books and raising children present similar challenges and gifts. Near-infinite amounts of attention, patience, and unconditional love are required. Ultimately, just as you are forever changed in raising a child, so are you in writing a book. Both processes lead to the interactive emergence of self-knowledge and self-awareness. I can only hope that those of us lucky enough to receive these gifts can make use of them in a mindful way, putting our acquired consciousness to good use far beyond our engagement with our families and with our books.

### Original Sources

This book was initially based on a number of articles that were substantively revised and pared down, and significant amounts of new material was added. All reprint permissions have been secured from the publishers, and all coauthors have given their permission.

**Chapters 2 and 8:** Rasmus Grønfeldt Winther. 2019. A Beginner's Guide to the New Population Genomics of *Homo sapiens*: Origins, Race, and Medicine. *The Harvard Review of Philosophy* 26: 135–151.

**Chapter 3:** Rasmus Grønfeldt Winther, Ryan Giordano, Michael D. Edge, and Rasmus Nielsen. 2015. The Mind, the Lab, and the Field: Three Kinds of Populations in Scientific Practice. *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 52: 12–21.

**Chapter 4:** Jonathan M. Kaplan and Rasmus Grønfeldt Winther. 2013. Prisoners of Abstraction? The Theory and Measure of Genetic

Variation, and the Very Concept of “Race.” *Biological Theory* 7(4): 401–412 (reprinted and adapted, with permission, from *Biological Theory*, volume 7 special issue, The Meaning of “Theory” in Biology. © Springer Nature 2012); and Rasmus Grønfeldt Winther and Jonathan M. Kaplan. 2013. Ontologies and Politics of Biogenomic “Race.” *Theoria. A Journal of Social and Political Theory* 60(136): 54–80.

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**Chapter 6:** Rasmus Grønfeldt Winther. 2018. “Race and Biology.” In *The Routledge Companion to the Philosophy of Race*, ed. P. Taylor, L. Alcoff, and L. Anderson. London: Routledge, pp. 305–320.

**Chapter 9:** Jonathan M. Kaplan and Rasmus Grønfeldt Winther. 2014. Realism, Antirealism, and Conventionalism about Race. *Philosophy of Science*, 81(5): 1039–1052 (copyright 2014 by the Philosophy of Science Association).

**Chapter 10:** Rasmus Grønfeldt Winther. 2014. Determinism and Total Explanation in the Biological and Behavioral Sciences. *eLS*. Available: <https://onlinelibrary.wiley.com/doi/10.1002/9780470015902.a0024143>

## A Note on the Graphics

Although color graphics are often desirable, we have aimed to simplify production and keep costs down for readers. Therefore a selection of figures has been included in color, either in a color plate section (with black and white versions of all figures in the running text) or in situ dependent on format.