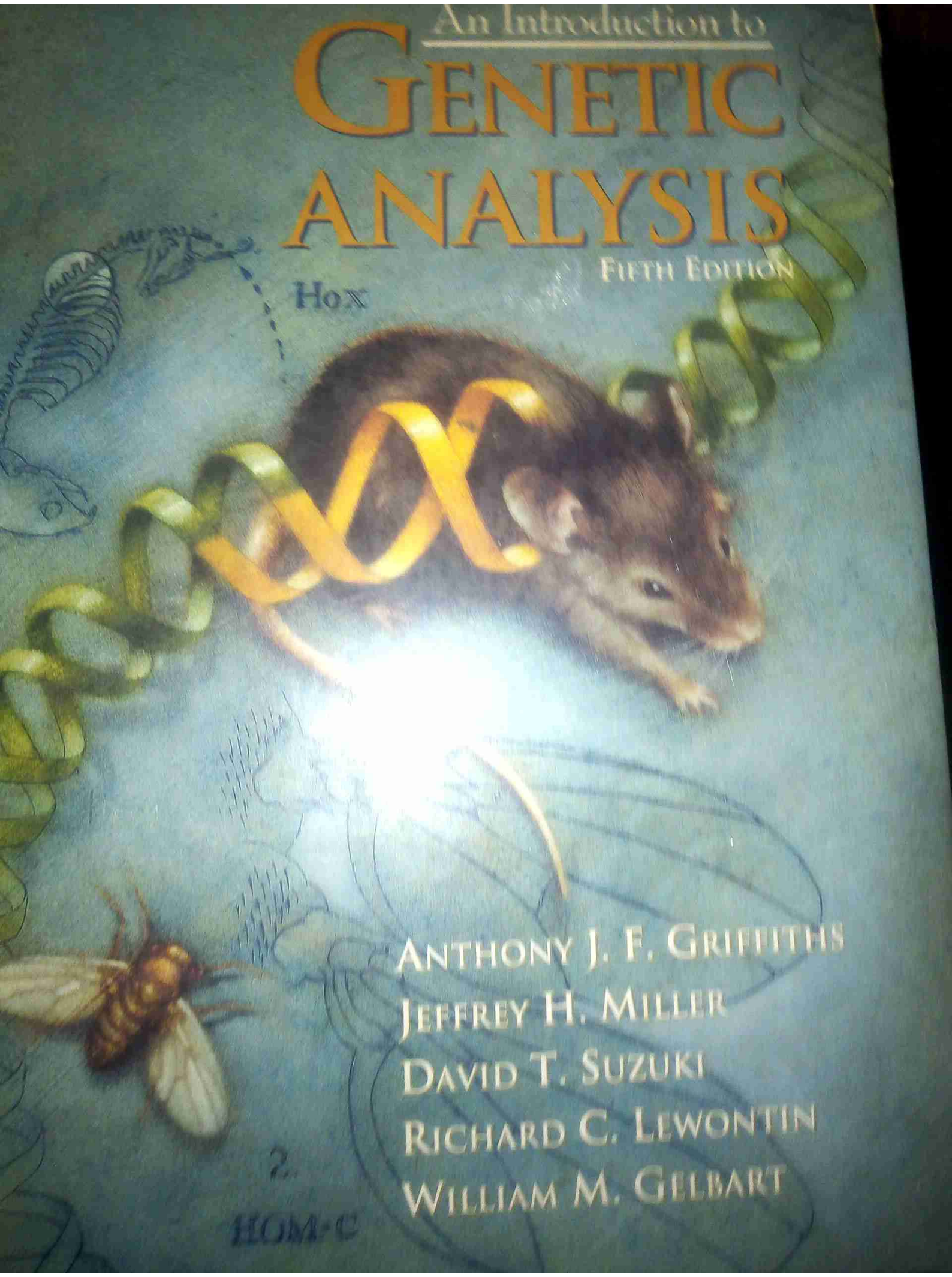
An Introduction to GENETIC ANALYSIS

FIFTH EDITION



ANTHONY J. F. GRIFFITHS
JEFFREY H. MILLER
DAVID T. SUZUKI
RICHARD C. LEWONTIN
WILLIAM M. GELBART

The Cover

One of the most exciting observations in modern genetics is that quite divergent animals use the same types of master regulatory genes to develop body plans that are very different in structure. The Hox (homeobox) gene cluster in vertebrates and the HOM-C (homeotic complex) cluster in insects are evolutionarily conserved sets of genes that control the individual identities of the body segments from head to tail. By classical genetic and recombinant DNA–based "gene knockout" experiments, it has been possible to demonstrate that the Hox and HOM-C genes function in parallel ways: when either a Hox or HOM-C gene is inactivated, a posteriorly located segment is converted to a more anterior identity. Normally, the fruit fly *Drosophila* has only one pair of wings, coming from the second thoracic segment. When one of the HOM-C genes is inactivated, the third thoracic segment also generates a pair of wings, producing a four-winged fly. In the mouse, the lumbar vertebrae do not have ribs. When one of the Hox genes is inactivated, the first lumbar vertebra (circled in the skeleton) is transformed into a thoracic vertebra bearing ribs. (See Chapter 22 for details.) Cover illustration by Neil Brennan, copyright 1993.

Library of Congress Cataloging-in-Publication Data

An Introduction to genetic analysis. — 5th ed. / Anthony J.F. Griffiths . . . [et al.]
p. cm.
Includes bibliographical references and index.
ISBN 0-7167-2285-2
1. Genetics. 2. Genetics—Methodology. I. Griffiths, Anthony J. F.
[DNLM: 1. Genetics. QH 430 I608]
QH430.I62 1993
575.1—dc20
DNLM/DLC
for Library of Congress 92-48977
CIP

Printed in the United States of America

4 5 6 7 8 9 0 RRD 9 9 8 7 6 5

Contents in Brief

Contents