

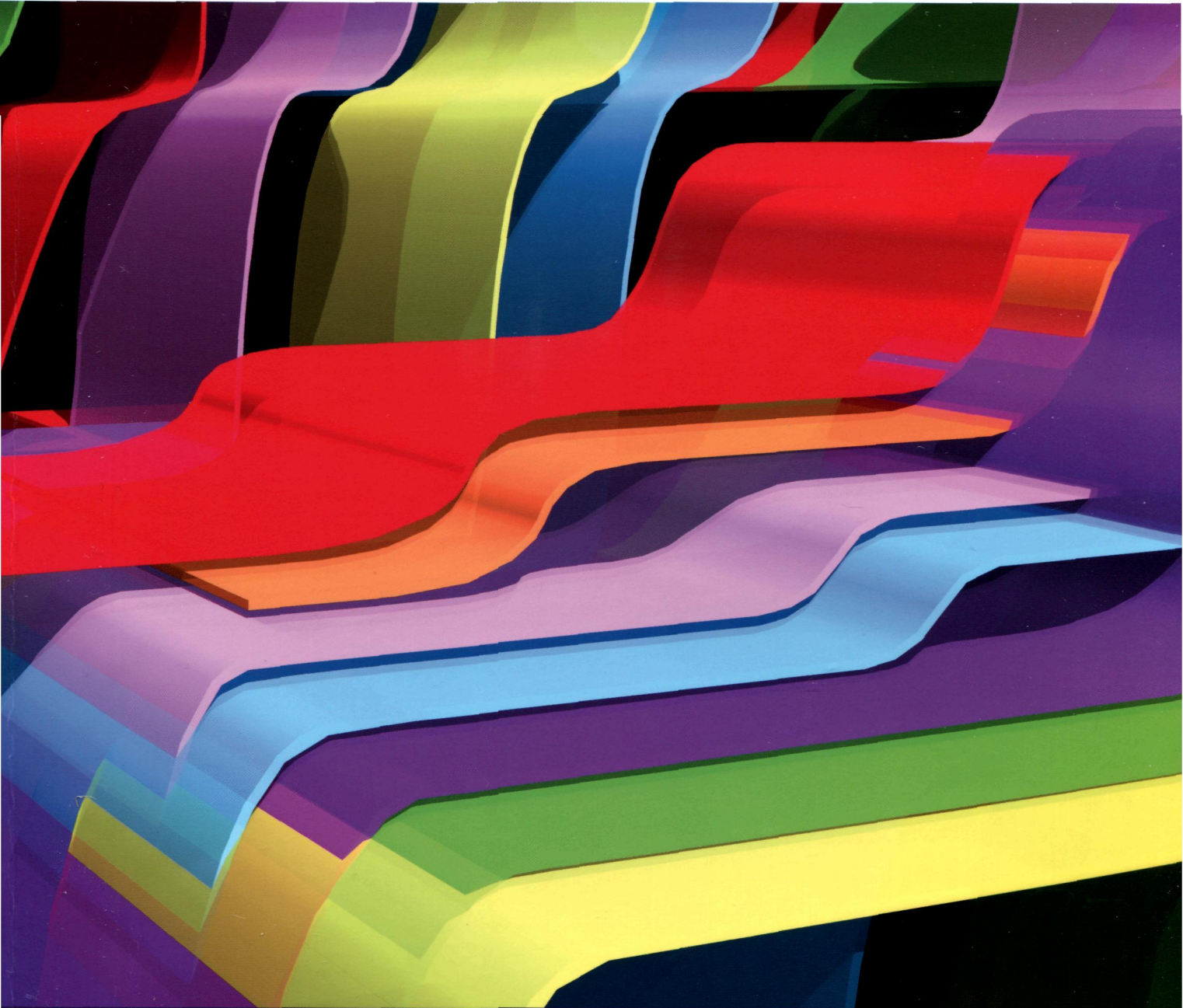
# nature

---

# REVIEWS

december 2013 volume 14 no. 12  
[www.nature.com/reviews](http://www.nature.com/reviews)

## GENETICS



### EXPERIMENTAL EVOLUTION

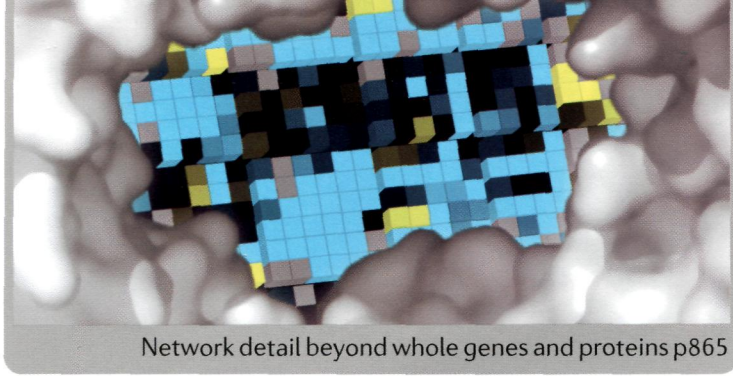
Fresh insights into genome dynamics

### Polycomb group proteins

Complexity of complexes

# CONTENTS

December 2013  
volume 14 no. 12



Network detail beyond whole genes and proteins p865

## REVIEWS

### 827 Genome dynamics during experimental evolution

Jeffrey E. Barrick and Richard E. Lenski

This Review describes how whole-genome sequencing of experimental populations of microorganisms and other species is yielding new insights into evolutionary processes. These details include variation in mutation rates, diverse genetic routes to adaptation and dynamic interactions within and between populations.

### 840 Evolution of crop species: genetics of domestication and diversification

FEATURED ARTICLE

Rachel S. Meyer and Michael D. Purugganan

The recent improvement in technologies to identify genetic variants linked with quantitative traits has allowed the identification of variants that are associated with crop domestication. This Review considers these approaches and their application to the study of crop domestication.

### 853 A new world of Polycombs: unexpected partnerships and emerging functions

Yuri B. Schwartz and Vincenzo Pirrotta

Polycomb group (PcG) proteins have long been known to have repressive functions. Recently, novel complexes of PcG proteins have been identified and have been shown to have novel molecular and biological functions, which are discussed in this Review.

### 865 High-resolution network biology: connecting sequence with function

Colm J. Ryan, Peter Cimermančič, Zachary A. Szpiech, Andrej Sali, Ryan D. Hernandez and Nevan J. Krogan

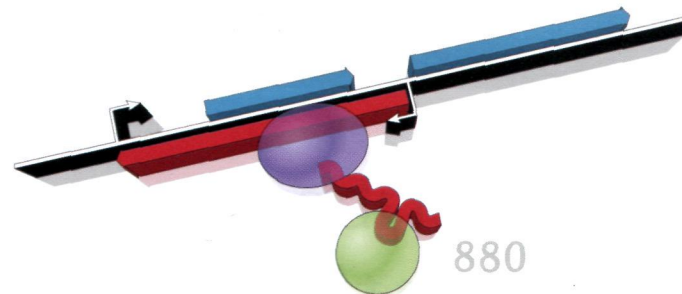
Network analyses of protein–protein, genetic and drug–gene interactions have typically been limited to analyses at the whole-protein and whole-gene levels. This Review discusses how high-resolution network analyses at the domain and residue levels are providing valuable insights into diverse research fields that range from structural biology to human disease.

### 880 Gene regulation by antisense transcription



Vicent Pelechano and Lars M. Steinmetz

Antisense transcription is increasingly being recognized as an important regulator of gene expression across all kingdoms of life and through a range of regulatory modes. Antisense transcripts are also emerging as facilitators of rapid evolution of gene regulation.



## On the web [www.nature.com/reviews/genetics](http://www.nature.com/reviews/genetics)

### Advance online publication

We operate an advance online publication (AOP) service for authors and readers to view the latest articles published online ahead of print.

### Forthcoming articles:

Long non-coding RNAs: new players in cell differentiation and development  
Alessandro Fatica and Irene Bozzoni

Bacterial genome sequencing in the clinic: bioinformatic challenges and solutions  
W. Florian Fricke and David A. Rasko

Epistasis and quantitative traits: using model organisms to study gene–gene interactions  
Trudy F. C. Mackay

Nature Reviews Genetics (ISSN 1471-0056) is published monthly by Nature Publishing Group, a division of Macmillan Publishers Ltd, The Macmillan Building, 4 Crinan Street, London N1 9XW, UK. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form (electronic or otherwise) without prior permission from [permissions@nature.com](mailto:permissions@nature.com). US Periodicals postage paid at Jamaica, NY, and additional mailing post offices. US POSTMASTER: Send address changes to Nature Publishing Group, Air Business Ltd, c/o Worldnet Shipping Inc., 156-15, 146th Avenue, 2nd Floor, Jamaica, NY 11434, USA.  
© 2013 Macmillan Publishers Limited. All rights reserved. Printed in United Kingdom.

## SERIES ON NON-CODING RNA

<http://www.nature.com/nrg/series/noncoding>

### Links to further information

The full text of articles includes author biographies, links to glossary terms and links to websites and databases with relevant information.

### E-alert table of contents

Get monthly e-mail alerts to the content of this journal — sent FREE to your inbox — by registering online. Or sign up to receive the latest content as an RSS newsfeed by visiting [www.nature.com/reviews/genetics](http://www.nature.com/reviews/genetics)

### Twitter

Follow [Nature Reviews Genetics](https://twitter.com/NatureRevGenet) on Twitter for the latest news from the journal and beyond: @NatureRevGenet

### Online correspondence

Comments from readers about our articles. All correspondence will be highlighted on the table of contents and on e-mail alerts. See page 894.

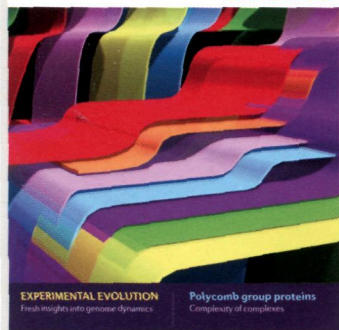


nature publishing group

**nature**  
REVIEWS

December 2013 Volume 14 No. 12  
www.nature.com/reviews

**GENETICS**



**EXPERIMENTAL EVOLUTION**  
From microbes into genome dynamics

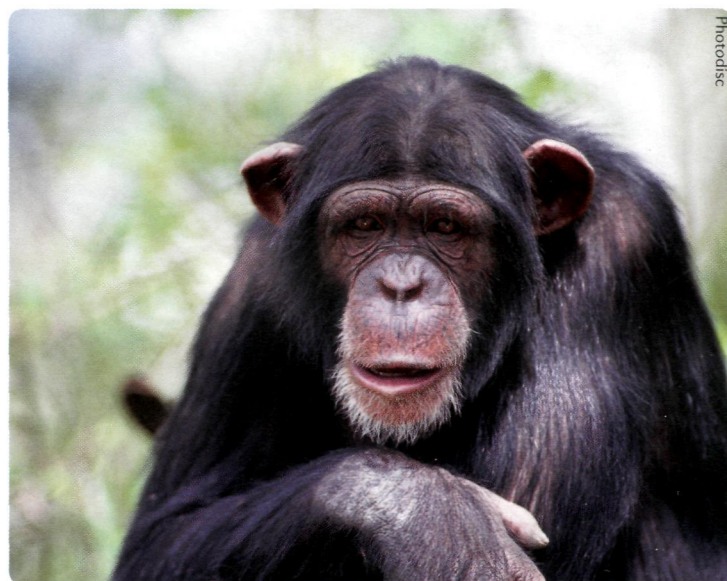
**Polycomb group proteins**  
Complexity of complexity

► **COVER:** 'A matter of course' by Patrick Morgan, inspired by the Review on p827.

821

**RESEARCH HIGHLIGHTS**

Selections from the recent scientific literature



Photodisc

Research highlight on retrotransposition and primate evolution p824

P.Morgan



Research highlight on how genetic variation affects chromatin p824

**EDITORIAL & PRODUCTION OFFICE**

The Macmillan Building, 4 Crinan Street, London N1 9XW, UK  
Tel: +44 (0)20 7843 3620  
Email: [NatureReviews@nature.com](mailto:NatureReviews@nature.com)  
[www.nature.com/reviews/genetics](http://www.nature.com/reviews/genetics)

**CHIEF EDITOR** Louisa Flintoft  
**SENIOR EDITOR** Mary Muers  
**ASSOCIATE EDITORS** Hannah Stower, Darren Burgess  
**ASSISTANT EDITOR** Isabel Lokody  
**COPY EDITOR** Esther Lau  
**SENIOR ART EDITOR (NRG)** Patrick Morgan  
**COPY EDITING MANAGER** Catriona Rodwell  
**SENIOR COPY EDITORS** Mariam Faruqi, Isabel Woodman  
**SENIOR EDITORIAL ASSISTANT** Laura Corns  
**EDITORIAL ASSISTANT** Emily Finn  
**MANAGING PRODUCTION EDITOR** Judith Shadwell  
**SENIOR PRODUCTION EDITOR** Simon Fenwick  
**ART CONTROLLER** Susanne Harris  
**SENIOR ART EDITOR** Vicky Summersby  
**PRODUCTION CONTROLLER** Natalie Smith  
**MANAGING EDITOR** Suzanne Farley  
**PUBLISHER** Alison Mitchell

**CUSTOMER SERVICES** [www.nature.com/help](http://www.nature.com/help)  
**PERSONAL SUBSCRIPTIONS** [subscriptions@nature.com](mailto:subscriptions@nature.com)  
**REPRINTS** [www.nature.com/reprints](http://www.nature.com/reprints)  
**ADVERTISING & SPONSORSHIP**  
[www.nature.com/advertising](http://www.nature.com/advertising)  
**SITE LICENCES**  
[www.nature.com/libraries/site\\_licenses/index.html](http://www.nature.com/libraries/site_licenses/index.html)  
**PRESS OFFICE** [press@nature.com](mailto:press@nature.com)  
**MARKETING** [marketing@nature.com](mailto:marketing@nature.com)

**MANAGEMENT OFFICES**  
**NPG LONDON** The Macmillan Building, 4 Crinan Street, London N1 9XW, UK. Tel: +44 (0)20 7833 4000  
**NPG NEW YORK** 75 Varick Street, 9th floor, New York, NY 10013-1917, USA. Tel: +1 212 726 9200  
**NPG ASIA-PACIFIC** Chiyoda Building 2-37 Ichigayatamachi, Shinjuku-Ku, Tokyo 16200843, Japan. Tel: +1 212 726 9200  
A list of other offices can be found at [www.nature.com/npg\\_/contact/offices.html](http://www.nature.com/npg_/contact/offices.html)

Copyright © 2013 Nature Publishing Group  
Printed in Wales by Cambrian Printers on acid-free paper.

**EDITORS**



LOUISA FLINTOFT



MARY MUERS



HANNAH STOWER



DARREN BURGESS



ISABEL LOKODY