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REVIEWS

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GENETICS

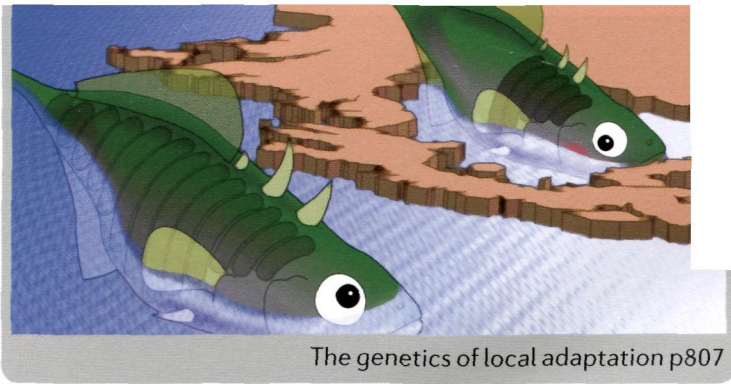


A GENETIC MEETING POINT

Convergent evolution in
diverse species

Cancer chromatin changes

Interplay between genetic and
epigenetic alterations



The genetics of local adaptation p807

CONTENTS

November 2013
volume 14 no. 11

REVIEWS

751 The genetic causes of convergent evolution *David L. Stern*

This Review distinguishes between three distinct routes by which similar genetic changes contribute to convergent evolution and discusses examples from diverse taxa. Convergent genetic evolution might result from the fact that some mutations both minimize pleiotropic effects and maximize adaptation.

765 Mutations in regulators of the epigenome and their connections to global chromatin patterns in cancer

Christoph Plass, Stefan M. Pfister, Anders M. Lindroth, Olga Bogatyrova, Rainer Claus and Peter Lichter

There is an increasing realization of epigenetic dysregulation in cancer, which comprises both the mutation of genes encoding epigenetic regulators and the broader disruptions to chromatin states of the epigenome. This Review discusses our latest understanding of these phenomena, their convergence and the implications for cancer biology and therapeutics.

781 Advanced genetic tools for plant biotechnology

FEATURED ARTICLE

Wusheng Liu, Joshua S. Yuan and C. Neal Stewart Jr
New tools for plant biotechnology are emerging, including synthetic promoters, 'tunable' transcription factors, genome-editing tools and site-specific recombinases. These tools promise to expand the range of plant biotechnology applications, especially when integrated with approaches for manipulating large DNA constructs.

794 Meiotic recombination in mammals: localization and regulation

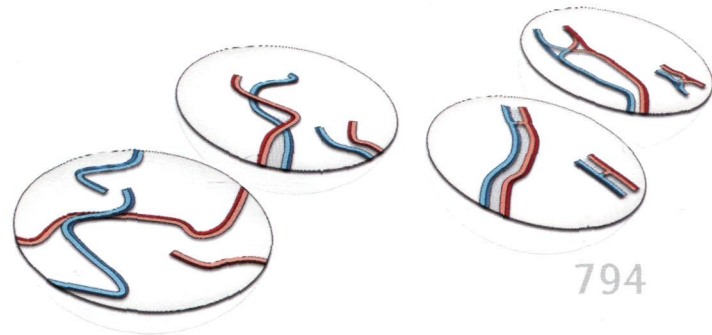
Frédéric Baudat, Yukiko Imai and Bernard de Massy

Genetic exchanges between homologous chromosomes are essential for producing haploid gametes and increase genetic diversity. Recent advances have provided insights into the mechanisms that specify recombination hot spots and the regulation of the exchange of genetic material between mammalian chromosomes.

807 Ecological genomics of local adaptation

Outi Savolainen, Martin Lascoux and Juha Merilä

Populations of many species show phenotypic adaptations in order to maximize their fitness in local environments. This Review describes various strategies for characterizing the genomic underpinnings of these adaptations and the key findings that are emerging.



794

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Jeffrey E. Barrick and Richard E. Lenski

High-resolution network biology: connecting sequence with function
Colm J. Ryan, Peter Cimermancic, Zachary A. Szpiech, Andrej Sali, Ryan D. Hernandez and Nevan J. Krogan

A new world of Polycombs: unexpected partnerships and emerging functions
Yuri B. Schwartz and Vincenzo Pirrotta

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Key points provides a bullet-pointed summary of the main topics covered in each article.

E-alert table of contents

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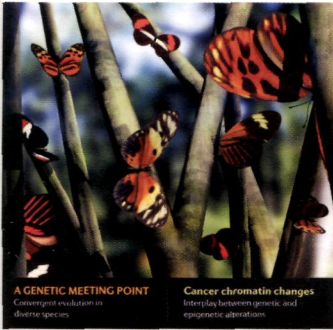


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► **COVER:** 'Wings apart' by Patrick Morgan, inspired by the Review on p751.

RESEARCH HIGHLIGHTS

745

Selections from the recent scientific literature



P. Morgan/NPG

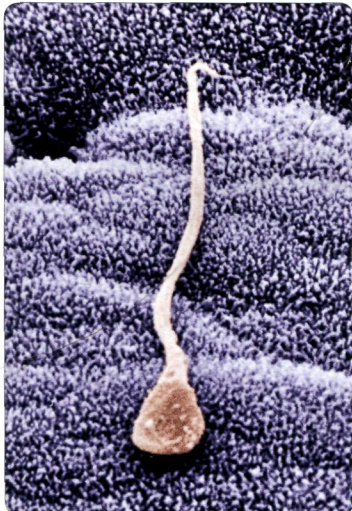
Research highlight on identifying enhancer target genes p749

820

Transgenerational epigenetic inheritance: how important is it? (erratum)

Ueli Grossniklaus, William G. Kelly, Anne C. Ferguson-Smith, Marcus Pembrey and Susan Lindquist

ImageSource/NPG



Germ cell poisoning for totipotency p745



751

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