

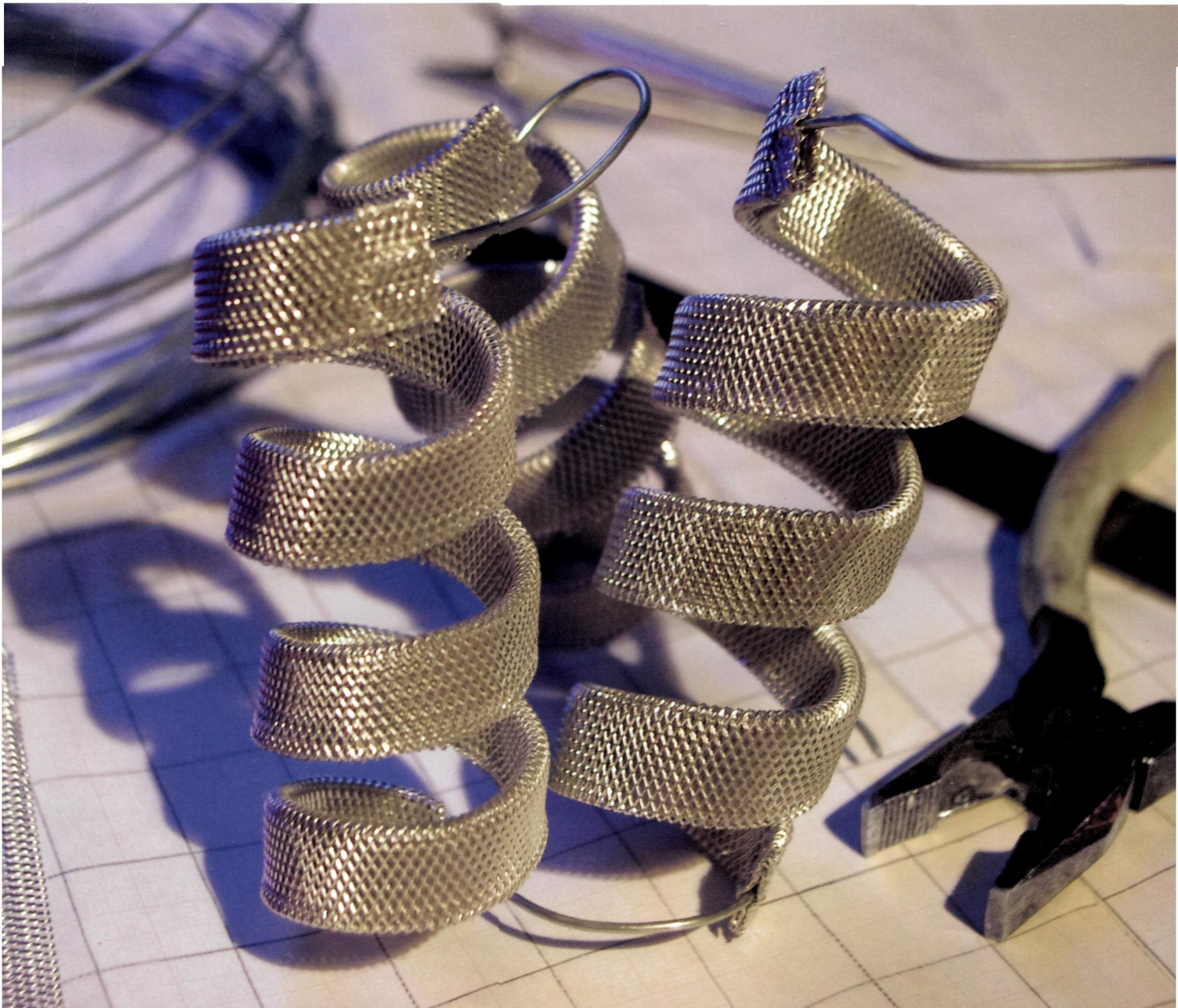
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REVIEWS

august 2013 volume 14 no. 8

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GENETICS

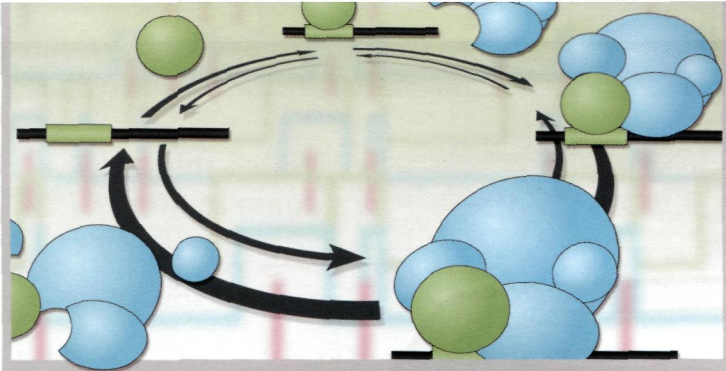


MOLECULAR EVOLUTION

Integrating biochemistry into evolutionary analyses

Silence is golden

The roles of piRNAs in controlling epigenetic states



The complexities of eukaryotic transcription dynamics p572

CONTENTS

August 2013
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REVIEWS

523 PIWI-interacting RNAs: from generation to transgenerational epigenetics



Maartje J. Luteijn and René F. Ketting

PIWI-interacting RNAs (piRNAs) have important roles in various species, particularly in silencing transposons in the germ line. This Review describes our latest understanding of various steps in this process, from the specification of piRNA-producing loci to piRNA processing and nuclear effector functions, including a role in transgenerational epigenetic inheritance.

535 Adult-specific functions of animal microRNAs



Kailiang Sun and Eric C. Lai

This Review discusses roles for microRNAs in adult animals — including in adult stem cells, metabolism and in cancer — and how functions in adults can be distinguished from developmental roles using a range of methods. Understanding adult-specific functions has implications for therapeutic manipulation of miRNAs.

549 Bringing genome-wide association findings into clinical use

FEATURED ARTICLE



Teri A. Manolio

Despite the impact of genome-wide association studies (GWASs) on disease genetics, there has been scepticism about their usefulness in clinical translation. This Review highlights pertinent examples in which clinical application has been achieved or is likely and considers the wider potential for translation.

559 Evolutionary biochemistry: revealing the historical and physical causes of protein properties

Michael J. Harms and Joseph W. Thornton

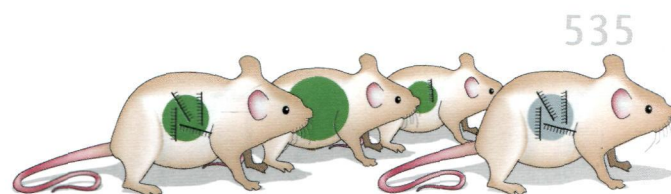
In this article, the authors present a synthesis of the emerging field of evolutionary biochemistry. This field has profited from the development of experimental techniques that allow the study of the physical mechanisms and evolutionary processes that have constrained and shaped biological molecules.

572 Eukaryotic transcriptional dynamics: from single molecules to cell populations



Antoine Coulon, Carson C. Chow, Robert H. Singer and Daniel R. Larson

Our understanding of transcription is being improved through single-molecule and genome-wide approaches. Quantitative models are also required to provide insights into the underlying mechanisms of transcription, and the authors discuss how experimental results and models can be brought together.



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Genomic imprinting and parent-of-origin effects on complex traits

Heather A. Lawson, James M. Cheverud and Jason B. Wolf

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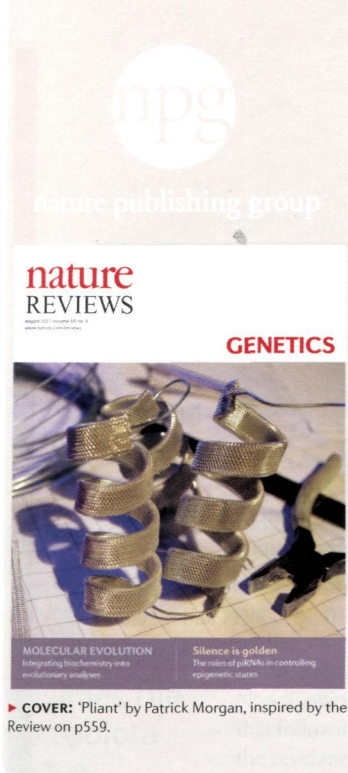
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The full text of articles includes author biographies, links to glossary terms and links to websites and databases with relevant information.

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



RESEARCH HIGHLIGHTS

517 Selections from the recent scientific literature

PERSPECTIVES

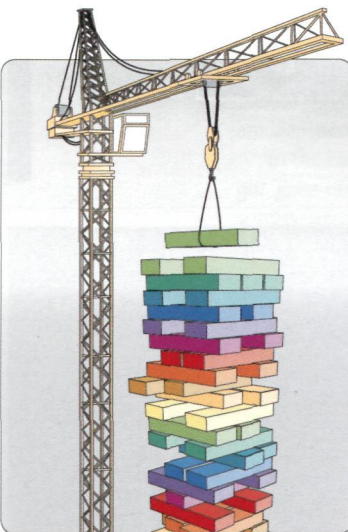
OPINION

585 From promises to practical strategies in epigenetic epidemiology

Jonathan Mill and Bastiaan T. Heijmans

The authors discuss strategies and challenges of population-based studies of epigenetic variation. Such studies should contribute to our understanding of the contribution of epigenetic factors to human disease, but need to be performed and interpreted with consideration of their limitations.

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Sequencing for disease architecture p518



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