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REVIEWS

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GENETICS

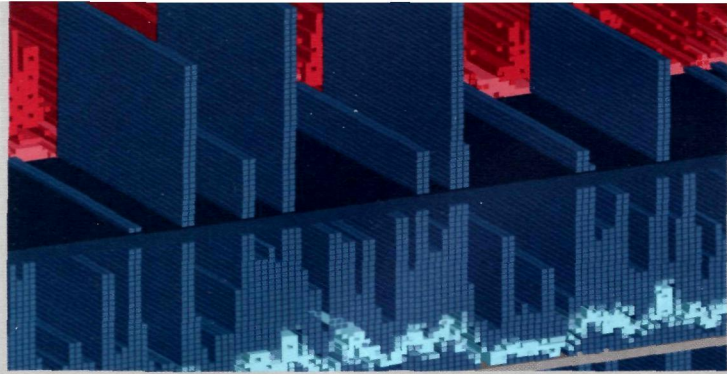


PARENTAL INFLUENCES

Imprinting and parent-of-origin effects in complex traits

Environmental challenges

Signalling and gene regulatory networks in plants



Roles for new genes in phenotypic evolution p645

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REVIEWS

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

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

Increasing evidence suggests that parent-of-origin effects, particularly genomic imprinting, contribute to complex traits. This Review discusses how such effects can be identified in order to expand our understanding of their roles in phenotypes such as human diseases and traits important for agriculture.

618 Single-cell sequencing-based technologies will revolutionize whole-organism science

FEATURED ARTICLE



Ehud Shapiro, Tamir Biezuner and Sten Linnarsson

Technologies that are based on next-generation sequencing are increasingly being used to study individual cells. The authors discuss the application of this approach to single-cell genomics and transcriptomics, and explore the implications for both basic research and medicine.

631 Spatiotemporal signalling in plant development

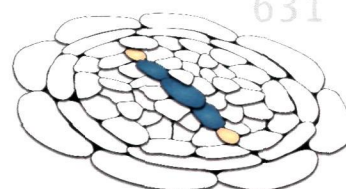
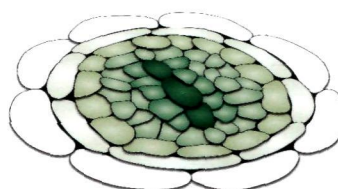
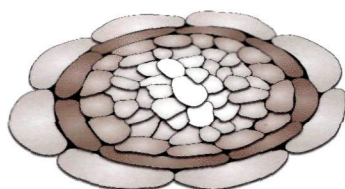
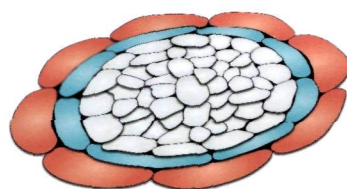
Erin Sparks, Guy Wachsman and Philip N. Benfey

This Review considers mechanisms by which information is transmitted over short and long distances during plant development and how different modes of signalling integrate with gene regulatory networks to allow plants to respond to their environment.

645 New genes as drivers of phenotypic evolution

Sidi Chen, Benjamin H. Krinsky and Manyuan Long

Genes that have originated in recent evolution are present in only a subset of organisms and are often assumed to be dispensable or redundant. This Review discusses our latest understanding of how new genes in diverse species have actually evolved to have important functions in diverse developmental and physiological processes in various organisms.



631

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Emerging patterns of somatic mutations in cancer

Ian R. Watson, Koichi Takahashi, P. Andrew Futreal and Lynda Chin

Rare disease genetics in the era of next-generation sequencing: discovery to translation

Kym M. Boycott, Megan R. Vanstone, Dennis E. Bulman and Alex E. MacKenzie

Recent human adaptation: genomic approaches, interpretation and insights

Laura B. Scheinfeldt and Sarah A. Tishkoff

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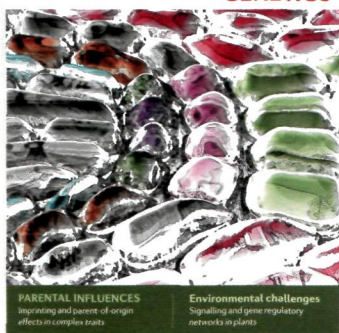
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PARENTAL INFLUENCES
Inheriting and learning of origin
effects in complex traits

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networks in plants

► COVER: 'Signally' by Patrick Morgan, inspired by the Review on p631.

R. M. Brueker, Vanderbilt University, USA



Research Highlight on the effects of the microbiome on speciation p598

RESEARCH HIGHLIGHTS

595 Selections from the recent scientific literature

PROGRESS

601 Omics technologies and the study of human ageing

Ana M. Valdes, Daniel Glass and Tim D. Spector

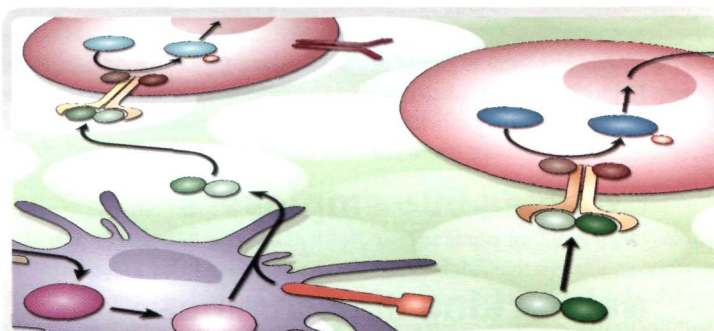
High-throughput technologies are starting to be applied to assess the complex molecular changes that occur with increasing age in humans. This Progress article introduces the emerging findings for transcriptomics, epigenomics, metabolomics and other 'omics' approaches.

ANALYSIS

661 Genetic insights into common pathways and complex relationships among immune-mediated diseases

Miles Parkes, Adrian Cortes, David A. van Heel and Matthew A. Brown

Research into the genetics of immune and inflammatory disease has experienced major recent advances owing to the availability of a custom single-nucleotide polymorphism (SNP) genotyping array — the Immunochip — developed specifically to investigate these disorders. In this Analysis, the authors assess findings from studies that have used this platform, and explore the shared and phenotype-specific genetic associations among several immune-mediated diseases.



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