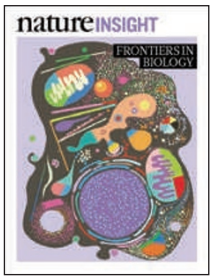
nature INSIGHT

FRONTIERS IN BIOLOGY

20 January 2011 / Vol 469 / Issue No 7330



Cover illustration by Nik Spencer

The Macmillan Building
4 Crinan Street
London N1 9XW, UK
Tel: +44 (0) 20 7833 4000
e: nature@nature.com

nature publishing group

The *Nature* Insight 'Frontiers in Biology' aims to cover timely and important developments in the broader field of biology, ranging from the subcellular to the organismal level, and including molecular mechanisms and biomedicine. The reviews in this Insight discuss in turn specific aspects of the aetiology of cancer, the response to infection and inflammatory disease, cardiovascular development and disease, and epigenetic mechanisms.

In the first review, Jane Visvader considers our current knowledge of the nature of the cells that give rise to cancer — the cells of origin. Tumours are heterogeneous in that different tumours within one organ can have different phenotypes, and individual tumours are made up of phenotypic and functionally heterogeneous cancer cells. The cellular origins of cancer are the subject of considerable debate as their influence can explain at least part of this heterogeneity. The article discusses key questions and concepts, as well as the implications for early cancer diagnosis and prevention.

The review by Beth Levine, Noboru Mizushima and Herbert Virgin covers new developments at the interface between autophagy and immunology. Autophagy is a protective cellular process in which proteins, organelles and pathogens are sequestered in a double-membrane structure before delivery to the lysosome for degradation. Defects in the function of the autophagy pathway, and also impaired autophagy function that is independent of degradation, have been linked to the pathogenesis of infectious diseases and inflammatory syndromes.

Eric Small and Eric Olson highlight recent progress in our understanding of the role of microRNAs in regulating cardiovascular function and disease mechanisms, and discuss the potential opportunities for new microRNA-based diagnostics and therapeutics.

The final review by Raphaël Margueron and Danny Reinberg provides an update on our knowledge about the histone methyltransferase Polycomb repressive complex 2 (PRC2) in regulating chromatin and gene expression, and its effects on development and cancer.

We hope that you will find the articles informative and stimulating.

Alex Eccleston, Barbara Marte, Deepa Nath & Clare Thomas
Senior Editors

CONTENTS

REVIEWS