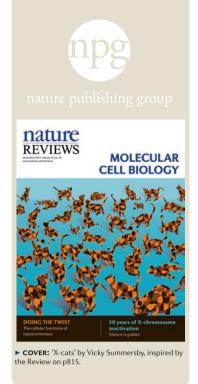
FROM THE FDITORS





ALISON SCHULDT







his issue features a Review by Jeannie T. Lee (page 815) to celebrate the golden anniversary of research on X-chromosome inactivation (XCI). Major progress has been made in the field following the first suggestion, 50 years ago, that one X chromosome in every female cell must be inactivated. Mary Lyon's findings led to the formulation of the 'dosage compensation hypothesis', which proposes that silencing of one of the two female X chromosomes allows gene dosages on the X chromosome to be balanced between males and females.

The discovery of XCI has given valuable insights into many fields, as some of the mechanisms that inactivate X chromosomes, such as regulatory networks of non-coding RNAs, are thought to be active on a genome-wide scale. For example, studies on XCI functionally characterized non-coding RNAs that act as regulators of Polycomb group (PcG) proteins, which contribute to XCI.

PcG proteins and their counteracting Trithorax group (TrxG) proteins function to maintain the 'memory' of a transcriptional state. On page 799, Cavalli and colleagues describe the diverse roles of TrxG proteins. Through their ability to methylate histones and remodel chromatin, TrxG proteins help to maintain active chromatin states and therefore have a role in several processes, including tumorigenesis, embryonic stem cell self-renewal, cell fate choice and proliferation.

We are also pleased to continue our Post-translational modifications series with a Review from Janke and Bulinski (page 773), which describes how microtubules can be modified by a range of post-translational modifications. These modifications, and our understanding of the enzymes that regulate them, have given insight into how microtubules can achieve a wide range of biochemical and cellular functions.

EDITORIAL OFFICES LONDON NatureReviews@nature.com

The Macmillan Building, 4 Crinan Street, London N1 9XW, UK Tel: +44 (0)20 7843 3620; Fax: +44 (0)20 7843 3629 CHIEF EDITOR: Alison Schuldt SENIOR EDITOR: Katharine Wrighton ASSOCIATE EDITORS: Kim Baumann, Rachel David COPY EDITOR: Antony Bickenson SENIOR COPY EDITORS: Yukie Ozawa, Catriona Rodwell, Man Tsuey Tse, Lucie Wootton COPY EDITING MANAGER: Lewis Packwood SENIOR ART EDITOR (NRMCB): Vicky Summersby

ART CONTROLLER: Susanne Harris SENIOR ART EDITORS: Patrick Morgan, Kirsten Lee MANAGING PRODUCTION EDITOR:

Iudith Shadwell SENIOR PRODUCTION EDITOR:

PRODUCTION CONTROLLER: Natalie Smith

SENIOR EDITORIAL ASSISTANT: Laura Corns **EDITORIAL ASSISTANT:** Ella Lines WEB PRODUCTION MANAGER: Deborah Anthony MARKETING MANAGERS: Tim Redding, Leah Rodriguez

MANAGEMENT OFFICES

LONDON nature@nature.com The Macmillan Building, 4 Crinan Street, Tel: +44 (0)20 7833 4000; Fax: +44 (0)20 7843 4596/7 OFFICE MANAGER: Laura Lee MANAGING EDITOR: Suzanne Farley PUBLISHER: James Butcher MANAGING DIRECTOR:

Steven Inchcoombe **EDITOR-IN-CHIEF, NATURE PUBLICATIONS:** Philip Campbell ASSOCIATE DIRECTORS: Jenny Henderson,

EDITORIAL PRODUCTION DIRECTOR: lames McOuat

PRODUCTION DIRECTOR: Yvonne Strong

DIRECTOR, WEB PUBLISHING: Dan Pollock

HEAD OF WEB PRODUCTION: Alexander Thurrell

NEW YORK nature@natureny.com Nature Publishing Group, 75 Varick Street, 9th floor, New York, NY 10013-1917, USA Tel: +1 212 726 9200; Fax: +1 212 696 9006

CHIEF TECHNOLOGY OFFICER: Howard Ratner

Luigi Squillante

HEAD OF INTERNAL SYSTEMS DEVELOPMENT: Anthony Barrer HEAD OF SOFTWARE SERVICES:

GLOBAL HEAD OF ADVERTISING AND SPONSORSHIP: Dean Sandersor HEAD OF NATURE RESEARCH & REVIEWS MARKETING: Sara Girard

TOKYO nature@natureasia.com

Chiyoda Building 5F, 2-37-1 Ichigayatamachi, Shinjuku-ku, Tokyo 162-0843, Japar Tel: +81 3 3267 8751; Fax: +81 3 3267 8746

ASIA-PACIFIC PUBLISHER: Antoine E. Bocquet MANAGER: Koichi Nakamura

ASIA-PACIFIC SALES DIRECTOR: Kate Yoneyama

SENIOR MARKETING MANAGER: MARKETING/PRODUCTION MANAGER:

Takesh Murakai INDIA 5A/12 Ansari Road, Daryganj,

New Delhi 110 002, India Tel/Fax: +91 11 2324 4186 SALES AND MARKETING MANAGER, INDIA:

Harpal Singh Gill Copyright © 2011 Nature Publishing Group

Research Highlight images courtesy of Getty Images unless otherwise credited. Printed in Wales by Cambrian Printers on acid-free paper