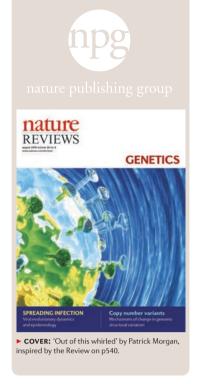
FROM THE FDITORS











the mechanisms underlying phenotypes, and molecular genetics documents how components interact; but now, an even deeper understanding of biological phenomena is being obtained by a mathematical description of the underlying principles. Take developmental biology, for example. How many morphogen molecules does a cell 'see'? And how many surface receptors are active at any one time? These and other questions are being addressed by increasingly sophisticated microscopy and image processing tools, coupled to mathematical modelling. The fruitful steps towards obtaining a quantitative view of developmental

iology is gradually turning into an 'exact' science. Genetics hints at

biology are described by Oates and colleagues (p517), who — using examples from planar cell polarity to gene oscillations — emphasize the merit of this framework in enabling the interplay between theory and experiment. The authors also offer guidelines for conducting research in this young area, from making friends with theorists (see also an editorial in Nature Cell Biol. 11, 667; 2009) to selecting the most appropriate model.

Other challenging areas of genetics are being subjected to unprecedented scrutiny by new tools, from high-throughput genomic technologies to better analytical methods. Examples include a deeper understanding of quantitative traits (see the Review by Mackay and colleagues on p565) and of the subtleties underlying traditional concepts such as fitness (described by Orr on p531), and a dynamic description of viral sequence evolution (as covered by Pybus and Rambaut on p540).

A quantitative mindset not only brings biology closer to being a numerical science but is also hugely valuable in allowing knowledge to be integrated across many scales — temporal, geographical and across levels of biological organization.

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: Louisa Flintoft SENIOR EDITOR: Tanita Casci **ASSOCIATE EDITOR:** Mary Muers ASSISTANT EDITOR: Meera Swami COPY EDITOR: Elizabeth Neame SENIOR COPY EDITORS: Craig Nicholson, Man Tsuey Tse, Gillian Young SENIOR ART EDITOR (NRG): Patrick Morgan ART CONTROLLER: Susanne Harris SENIOR ART EDITOR: Vicky Summersby MANAGING PRODUCTION EDITOR: **Judith Shadwell** SENIOR PRODUCTION EDITOR:

SENIOR EDITORIAL ASSISTANT: Laura Firman **EDITORIAL ASSISTANT:** Jacques Smit WEB PRODUCTION MANAGER: Deborah Anthony MARKETING MANAGERS: Tim Redding,

MANAGEMENT OFFICES

LONDON nature@nature.com The Macmillan Building, 4 Crinan Street, London N1 9XW, UK Tel: +44 (0)20 7833 4000: Fax: +44 (0)20 7843 4596/7 OFFICE MANAGER: Kiersty Darnell PUBLISHER: Stephanie Diment MANAGING DIRECTOR: Steven Inchcoombe **EDITOR-IN-CHIEF, NATURE PUBLICATIONS:** ASSOCIATE DIRECTORS: Jenny Henderson, Tony Rudland EDITORIAL PRODUCTION DIRECTOR:

PRODUCTION DIRECTOR: Yvonne Strong

DIRECTOR, WEB PUBLISHING: Timo Hannay HEAD OF WEB PRODUCTION:

Alexander Thurrell NATUREJOBS PUBLISHER: Della Sar

NEW YORK nature@natureny.com Nature Publishing Group, 75 Varick Street, 9th floor, New York, NY 10013-1917, USA

Tel: +1 212 726 9200;

CHIEF TECHNOLOGY OFFICER: Howard Ratn

HEAD OF INTERNAL SYSTEMS DEVELOPMENT: Anthony Barrera

HEAD OF SOFTWARE SERVICES: Luigi Squillante

HEAD OF GLOBAL ADVERTISING, SALES AND SPONSORSHIP: Dean Sanderson HEAD OF NATURE RESEARCH & REVIEWS MARKETING: Sara Girard **BUSINESS DEVELOPMENT EXECUTIVE:** David Bagshav

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:

INDIA 5A/12 Ansari Road, Daryganj, New Delhi 110 002, India Tel/Fax: +91 11 2324 4186

Takesh Murakai

SALES AND MARKETING MANAGER, INDIA: Harpal Singh Gill

Copyright © 2009 Nature Publishing Group Research Highlight images courtesy of Getty Images unless otherwise credited. Printed in Wales by Cambrian Printers on acid-free paper

PRODUCTION CONTROLLER:

Natalie Smith