

nature REVIEWS

NATURE REVIEWS MICROBIOLOGY

EDITORIAL OFFICES

LONDON NatureReviews@nature.com The Macmillan Building,
4 Crinan Street, London N1 9XW

Tel: +44 (0)20 7843 3620; Fax: +44 (0)20 7843 3629

CHIEF EDITOR: David O'Connell

ASSOCIATE EDITORS: Susan Jones, Sheilagh Molloy

ASSISTANT EDITOR: Shannon Amoils

COPY EDITOR: Annie Tremp

ART EDITOR: Natasha Wallington

EDITORIAL SUPPORT MANAGER: Emma Green

ART CONTROLLER: Nicola Hawes

SENIOR ART EDITORS: Susanne Harris, Claudia Bentley

MANAGING PRODUCTION EDITOR: Judith Shadwell

DEPUTY PRODUCTION EDITOR: Simon Fenwick

OFFICE MANAGER: Luisa Estanislao

EDITORIAL ASSISTANT: Sheryl Ocampo

WORLD WIDE WEB: <http://www.nature.com/reviews>

ASSOCIATE DIRECTOR, WEB PUBLISHING: Timo Hannay

GLOBAL ELECTRONIC PRODUCTION MANAGER: Jeremy Macdonald

ELECTRONIC PRODUCTION MANAGER, UK: Amanda Ward

ELECTRONIC PRODUCTION COORDINATORS: Catherine Alexander,
Puja Kamdar, Christina Large, Alexander Thurrell, Amy Wagner

MANAGEMENT OFFICES

LONDON nature@nature.com The Macmillan Building, 4 Crinan Street,
London N1 9XW Tel: +44 (0)20 7833 4000; Fax: +44 (0)20 7843 4596/7

MANAGING DIRECTOR: Annette Thomas

PUBLISHER: Hugh Blackburn

ASSOCIATE DIRECTORS: Jenny Henderson, Tony Rudland

EDITOR-IN-CHIEF, NATURE PUBLICATIONS: Philip Campbell

GLOBAL HEAD OF ADVERTISING SALES: Fabien Savenay

MARKETING MANAGERS: Anna Duguid, Kellie Lane

EDITORIAL PRODUCTION MANAGER: James McQuat

PRODUCTION MANAGER: Yvonne Strong

PRODUCTION CONTROLLER: Natalie Smith

NEW YORK nature@natureny.com 345 Park Avenue South, 10th Floor,
New York, NY 10010-1707 Tel: +1 212 726 9200; Fax: +1 212 696 9006

CHIEF TECHNOLOGY OFFICER: Howard Ratner

NEW TECHNOLOGY OFFICER: Greg Suprock

HEAD OF WEB SERVICES: Anthony Barrera

US HEAD OF DISPLAY ADVERTISING: Stephen Schwartz

NATUREJOBS PUBLISHER: Ben Crowe

HEAD OF NATURE RESEARCH & REVIEWS MARKETING: Sara Girard

TOKYO nature@naturejpn.com Chiyoda Building, 2-37 Ichigayatamachi,
Shinjuku-ku, Tokyo 162-0843 Japan

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: Peter Yoshihara

MARKETING/PRODUCTION MANAGER: Takesh Murakami

INDIA 5A/12 Ansari Road, Daryaganj, New Delhi 110 002, India

Tel/Fax: +91 11 324 4186

SALES AND MARKETING MANAGER, INDIA: Harpal Singh Gill

Display advertising

display@natureny.com (USA) or display@nature.com (UK/ROW)

GLOBAL HEAD OF DISPLAY ADVERTISING: John Michael

Tel: +44 (0) 20 7843 4960; Fax: +44 (0) 20 7843 4749

US HEAD OF DISPLAY ADVERTISING: Stephen Schwartz

Tel: +1 212 726 9256; Fax: +1 212 696 9481

EUROPEAN HEAD OF DISPLAY ADVERTISING: Gerard Preston

Tel: +44 (0) 20 7843 4965; Fax: +44 (0) 20 7843 4749

BUSINESS DEVELOPMENT MANAGER: Claire Hines

Tel: +44 (0) 20 7843 4971; Fax: +44 (0) 20 7843 4749

SALES EXECUTIVES

NEW ENGLAND: Sheila Reardon

Tel: +1 617 399 4098; Fax: +1 617 426 3717

NEW YORK, MID-ATLANTIC, SOUTH EAST: Jim Breault

Tel: +1 212 726 9334; Fax: +1 212 726 9481

NORTHWEST: Mathieu Desjardins

Tel: +1 415 781 6422; Fax: +1 415 781 3805

MIDWEST: Mike Rossi Tel: +1 212 726 9255; Fax: +1 212 696 9481

WESTERN REGION: George Lui

Tel: +1 415 781 3804; Fax: +1 415 781 3805

EASTERN ENGLAND/SCOTLAND, ITALY, SPAIN, ISRAEL:

Matthew Wilkinson Tel: +44 (0) 20 7843 4959;

Fax: +44 (0) 20 7843 4749

NORTHERN GERMANY: Gerard Preston

Tel: +44 (0) 20 7843 4960; Fax: +44 (0) 20 7843 4749

SOUTH/WEST UK, SCANDINAVIA, THE NETHERLANDS:

Marianne Boulakas Tel: +44 (0) 20 7843 4969; Fax: +44 (0) 20 7843 4749

SOUTHERN GERMANY, SWITZERLAND, AUSTRIA, FRANCE, BELGIUM:

Sabine Hugl-Fürst Tel: +41 52761 3386; Fax: +41 52761 3419

JAPAN: nature@naturejpn.com

Rinoko Asami, Nature Japan KK

Tel: +81 3 3267 8751; Fax: +81 3 3267 8746

Original design by Jane Walker

Copyright © 2005 Nature Publishing Group

Printed in Wales by Cambrian Printers on acid-free paper

Despite concerted efforts to curb the indiscriminate prescription of antimicrobials, drug-resistant microorganisms persist, and it is becoming clear that the resolution of this public health problem will not be achieved by a reduction in antibiotic use alone. Rather, the problem of drug resistance calls for a broader approach that takes into account the complexities of microbial physiology and the fitness benefits that are conferred to the pathogen by antibiotic-resistance proteins. In this month's journal, we feature two articles that discuss this topical issue. On page 566, Eitan Bibi and colleagues provide support for the argument that factors other than antibiotic selection can promote the persistence of antibiotic-resistance genes. The authors focus on two antibiotic-efflux transporters, Tet(L) and MdfA, and contend that their persistence is due to their alternative physiological roles in bacterial alkali homeostasis.

On page 547, James Anderson considers the interplay of factors that contribute to the evolution of anti-fungal drug resistance. Here, the fitness effects of combined, synergistic resistance mechanisms are crucial for the maintenance of resistance in fungal populations. On a positive note, the author describes how evolution experiments can be used to predict resistance during the drug-development stage, and he suggests ways in which the evolution of drug resistance can be impaired in fungi.

From the tussle for supremacy between man and microorganism we turn to the fight for prokaryotic survival in the waters of lakes and oceans, where predation by protists and lysis by viruses cause high microbial mortality. On page 537, Jakob Pernthaler enthuses about the complex interactions that take place between aquatic predators and their prey, the outcome of which has important ecological and evolutionary implications.



Chief Editor

David O'Connell

Associate Editors

Susan Jones

Sheilagh Molloy