



nature publishing group



► **COVER:** 'Packaging machines' by Philip Patenall, inspired by the Review on p647.

**T**he field of bacterial transcriptomics has been revolutionized in the past few years by the technological advances that have been made in sequencing capacity and by the tools that have become available for analysis. As described by Serrano and colleagues on page 658, these 'omic' approaches have revealed that the bacterial transcriptome is far more complex and dynamic than had been previously expected, with alternative transcripts within operons, small regulatory RNAs, epigenetic modifications, and spatial organization within the chromosome and the cell all affecting transcription.

Another area that has seen huge technological progress in recent years is the imaging of microorganisms. Among the powerful techniques that can now be employed, imaging mass spectrometry (IMS) allows the two-dimensional visualization of trace metals, metabolites, surface lipids, peptides and proteins directly from biological samples. In an Innovation article on page 683, Watrous and Dorrestein introduce the range of IMS approaches that is now available to microbiologists and discuss how they can be used to spatially map atoms and molecules in samples that range in scale from single cells to whole communities.

Finally, technology also underpins the recent breakthroughs that have been made in understanding how tailed bacteriophages are able to package their genomic DNA into viral particles such that the DNA is 100 times more compact than in solution. On page 647, Casjens describes how new structural insights into the packaging-motor proteins, coupled with single-molecule DNA-packaging experimental systems, have begun to provide detailed mechanistic insights into these packaging systems for the first time since they were discovered more than four decades ago.



CHRISTIAAN VAN OOIJ



SHEILAGH MOLLOY



ANDREW JERMY



CESAR SANCHEZ



JOANNA HUDDLESTON

**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:** Christiaan van Ooij  
**SENIOR EDITORS:** Sheilagh Molloy, Andrew Jermy  
**ASSOCIATE EDITOR:** Cesar Sanchez  
**ASSISTANT EDITOR:** Joanna Huddleston  
**SENIOR COPY EDITOR (NRMICRO):**  
Lucie Wootton

**SENIOR COPY EDITORS:** Yukie Ozawa,  
Catriona Rodwell, Man Tsuey Tse  
**COPY EDITING MANAGER:** Lewis Packwood  
**ART EDITOR:** Philip Patenall

**ART CONTROLLER:** Susanne Harris  
**SENIOR ART EDITORS:** Vicky Summersby,  
Patrick Morgan, Kirsten Lee  
**MANAGING PRODUCTION EDITOR:**  
Judith Shadwell

**SENIOR PRODUCTION EDITOR:** Simon Fenwick  
**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,  
London N1 9XW, UK  
Tel: +44 (0)20 7833 4000;  
Fax: +44 (0)20 7843 4596/7

**OFFICE MANAGER:** Laura Firman  
**PUBLISHER:** James Butcher  
**MANAGING DIRECTOR:**  
Steven Inchcoombe  
**EDITOR-IN-CHIEF, NATURE PUBLICATIONS:**  
Philip Campbell  
**ASSOCIATE DIRECTORS:** Jenny Henderson,  
Dominic Pettit  
**EDITORIAL PRODUCTION DIRECTOR:**  
James McQuat

**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  
**HEAD OF INTERNAL SYSTEMS DEVELOPMENT:**  
Anthony Barrera  
**HEAD OF SOFTWARE SERVICES:**  
Luigi Squillante  
**GLOBAL HEAD OF ADVERTISING AND  
SPONSORSHIP:** Dean Sanderson  
**HEAD OF NATURE RESEARCH & REVIEWS  
MARKETING:** Sara Girard

**TOKYO** nature@natureasia.com  
Chiyoda Building 5F, 2-37-1 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** SA/12 Ansari Road, Daryaganj,  
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