CONTENTS

Combining Experiments with Modeling and Computational Methods to Study Animal Locomotion
Organized by Laura A. Miller and Silas Alben

553 Using Computational and Mechanical Models to Study Animal Locomotion
Laura A. Miller, Daniel I. Goldman, Tyson L. Hedrick, Eric D. Tytell, Z. Jiang, Joannetta Yen and Silas Alben

574 Passive Robotic Models of Propulsion by the Bodies and Caudal Fins of Fish
George V. Lauder, Brooke Pianka and Silas Alben

588 When Skeletons Are Geared for Speed: The Morphology, Biomechanics, and Energetics of Rapid Animal Motion
Matthew J. McHenry

597 Swimming in the Intermediate Reynolds Range: Kinematics of the Pteropod Limacina helicina
Yin Chang and Joannetta Yen

616 Interfacing Mathematics and Biology: A Discussion on Training, Research, Collaboration, and Funding
Laura A. Miller and Silas Alben

Comparative Proteomics of Environmental and Pollution Stress
Organized by Lars Tomanek

622 Introduction to the Symposium “Comparative Proteomics of Environmental and Pollution Stress”
Lars Tomanek

626 Analysis of Tissue Proteomes of the Gulf Killifish, Fundulus grandis, by 2D Electrophoresis and MALDI-TOF/TOF Mass Spectrometry
Naga V. Abbaraju, Mohamed Nazim Broutghou, Ian K. Townley, Qiang, Zhang, Guangdi Wang, Richard B. Cole and Bernard B. Ross

634 Latitudinal Variations in Protein Expression After Heat Stress in the Salt Marsh Mussel Geukensia demissa
Peter A. Fields, Kelly M. Cox and Kelly R. Karch

648 Environmental Proteomics of the Mussel Mytilus: Implications for Tolerance to Stress and Change in Limits of Biogeographic Ranges in Response to Climate Change
Lars Tomanek

655 Proteinic Responses of Sea Urchin Embryos to Stressful Ultraviolet Radiation
N. L. Adams, J. P. Campanale and K. R. Foltz

661 Proteomics to Assess the Role of Phenotypic Plasticity in Aquatic Organisms Exposed to Pollution and Global Warming
Frédéric Silvestre, Virginie Gillardin and Jennifer Dorts

679 Exploring Androgen-Regulated Pathways in Teleost Fish Using Transcriptomics and Proteomics
Christopher J. Horrocks and Nancy D. Denslow

705 Challenges for Biological Interpretation of Environmental Proteomics Data in Non-model Organisms
W. Wesley Dowd
Cover image: Three-dimensional vortex wake behind the tail of a freely-swimming shark (spiny dogfish, *Squalus acanthias*). The wake of freely swimming sharks has been shown to consist of two linked vortex rings, colored here by vorticity. Passive robotic models have been used by Lauder et al. ("Passive Robotic Models of Propulsion by the Bodies and Caudal Fins of Fish") to generate vortex wakes similar to those of live fishes. Photo by Brooke Flammang, "Passive Robotic Models of Propulsion by the Bodies and Caudal Fins of Fish."
Subscriptions

A subscription to *Integrative and Comparative Biology* comprises 6 issues. Prices include postage; for subscribers outside the Americas, issues are sent air freight. Airmail rates are available on request. Integrative and Comparative Biology Advance Access contains papers that have recently been accepted but have not yet been included within an issue. Advance Access is updated daily.

Annual Subscription Rate (Volume 52, 6 issues, 2012)
Institutional
Print edition and site-wide online access: US$833/£556/€833
Print edition only: US$763/£509/€763
Site-wide online access only: US$673/£449/€673

Please note: US$ rates apply in the US and Canada, € in Europe, and UK£ in the UK and Rest of World. Payment for orders to be delivered within Europe (excluding the UK) should be made in euros.

There are other subscription rates available; for a complete listing, please visit www.icb.oxfordjournals.org/subscriptions.

Full prepayment in the correct currency is required for all orders. Orders are regarded as firm, and payments are not refundable. Subscriptions are accepted and entered on a complete volume basis. Claims cannot be considered more than four months after publication or date of order, whichever is later. All subscriptions in Canada are subject to GST. Subscriptions in the EU may be subject to European VAT. If registered, please supply details to avoid unnecessary charges. For subscriptions that include online versions, a proportion of the subscription price may be subject to UK VAT. Personal rates are applicable only when a subscription is for individual use and are not available if delivery is made to a corporate address.

The current year and two previous years’ issues are available from Oxford University Press. Previous volumes can be obtained from the Periodicals Service Company, 11 Main Street, Germantown, NY 12526, USA. E-mail: psc@periodicals.com. Tel: (518) 537-4700. Fax: (518) 537-5899. Web: www.periodicals.com/oxford.

Contact information: Journals Customer Service Department, Oxford University Press, Great Clarendon Street, Oxford OX2 6DP, UK. E-mail: jnls.cust.serv@oup.com. Tel: +44 (0)1865 353907. Fax: + 44 (0)1865 353485. In the Americas, please contact: Journals Customer Service Department, Oxford University Press, 2001 Evans Road, Cary, NC 27513, USA. E-mail: jnlorders@oup.com. Tel: (800) 852-7323 (toll-free in USA/Canada) or (919) 677-0977. Fax: (919) 677-1714. In Japan, please contact: Journals Customer Service Department, Oxford University Press, Tokyo 4-5-10-8F Shiba, Minato-ku, Tokyo 108-8386, Japan. E-mail: custserv.jp@oup.com. Tel: (03) 3813 1461. Fax: (03) 3818 1522.

Methods of payment: (i) Cheque (payable to Oxford University Press, Cashiers Office, Great Clarendon Street, Oxford OX2 6DP, UK) in G# Sterling (drawn on a UK bank), US$ Dollars (drawn on a US bank), or EU£ Euros. (ii) Bank transfer to Barclays Bank Plc, Oxford Group Office, Oxford (bank sort code 20-65-18) (UK), overseas only Swift code BARC GB 22 (G# Sterling to account no. 70299332, IBAN GB89BARC20651870299332; US$ Dollars to account no. 66014600, IBAN GB27BARC20651866014600; EU£ Euros to account no. 78923655, IBAN GB16BARC206518923655). (iii) Credit card (Mastercard, Visa, Switch or American Express).

Postal information


Oxford Journals Environmental and Ethical Policies

Oxford Journals, a division of Oxford University Press, is committed to working with the global community to bring the highest quality research to the widest possible audience. Oxford Journals will protect the environment by implementing environmentally friendly policies and practices wherever possible. Please see http://www.oxfordjournals.org/ethicalpolicies.html for further information on environmental and ethical policies.

Permissions

For information on how to request permissions to reproduce articles or information from this journal, please visit www.oxfordjournals.org/permissions.

Advertising

Advertising, inserts and artwork enquiries should be addressed to Advertising and Special Sales, Oxford Journals, Oxford University Press, Great Clarendon Street, Oxford, OX2 6DP, UK. Tel: +44 (0)1865557467; Fax: +44 (0)1865 353774. E-mail: jnlsadvertising@oup.com.

Disclaimer

Statements of fact and opinion in the articles in *Integrative and Comparative Biology* are those of the respective authors and contributors and not of *Integrative and Comparative Biology*, the Society for Integrative and Comparative Biology, or Oxford University Press. Neither Oxford University Press, the Society for Integrative and Comparative Biology, nor *Integrative and Comparative Biology* make any representation, express or implied, in respect of the accuracy of the material in this journal and cannot accept any legal responsibility or liability for any errors or omissions that may be made. The reader should make her or his own evaluation as to the appropriateness or otherwise of any experimental technique described.

© 2012 The Society for Integrative and Comparative Biology

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior written permission of the publisher or a license permitting restricted copying issued in the UK by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1P 9HE, or in the USA by the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

*Integrative and Comparative Biology* is printed on acid-free paper that meets the minimum requirements of ANSI Standard Z39.48-1984 (Permanence of Paper).

Oxford University Press is a department of the University of Oxford. It furthers the University’s objective of excellence in research, scholarship, and education by publishing worldwide.

*Integrative and Comparative Biology* is covered by the following major indexing services: Aquatic Sciences and Fisheries Abstracts, Biological Abstracts, Biological and Agricultural Index, Chemical Abstracts, Current Contents, General Science Index, MEDLINE, Science Citation Index, and Zoological Record.

Typset by Cenveo Publisher Services, Bangalore, India; Printed by Sheridan Press, USA.