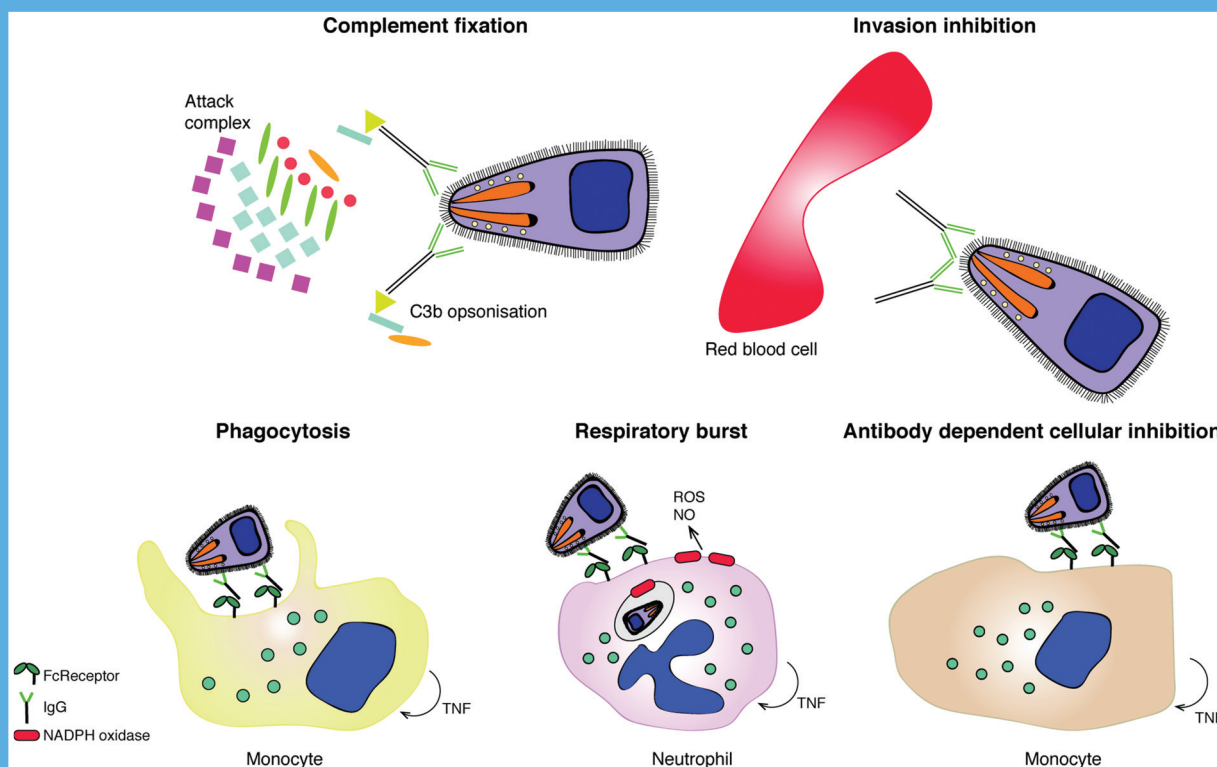


# PARASITOLOGY

[journals.cambridge.org/par](http://journals.cambridge.org/par)

Submit your paper online

<http://mc.manuscriptcentral.com/par>



Editor-in-Chief  
R. S. Phillips

Editor – Special Issues  
J. T. Ellis

Editors  
A. Bell, A. Hemphill, C. Holland, J. R. Stothard,  
J. Wastling

CAMBRIDGE  
UNIVERSITY PRESS

## Parasitology

EDITOR-IN-CHIEF  
R. S. PHILLIPS

EDITOR – SPECIAL ISSUES  
J. T. ELLIS

### EDITORS

A. BELL, A. HEMPHILL, C. HOLLAND, J. R. STOTHARD, J. WASTLING

### EDITORIAL POLICY

Parasitology publishes definitive papers on all aspects of pure and applied parasitology including biochemistry, molecular biology, immunology, genetics, ecology and physiology and also the application of new techniques, long-term epidemiology studies, advances in the understanding of life-cycles, chemotherapy and major systematic revisions. Papers should normally be full length with an explanatory introduction and detailed discussion of the findings reported. Shorter reports of particularly important findings will also be considered.

**To submit papers online, go to <http://mc.manuscriptcentral.com/par/>**

- 
- |  |  |
|--|--|
| R. AROIAN, University of California, San Diego, USA                              | NADIRA KARUNAWEEERA, University of Colombo, Sri Lanka                |
| A. BOWMAN, University of Aberdeen, UK  | F. KATZER, Moredun Research Institute, UK                            |
| C. BRITTON, University of Glasgow, UK  | J. LACOURSE, Liverpool School of Tropical Medicine, UK               |
| KATHARINE CARTER, University of Strathclyde, UK                                  | ZHAO-RONG LUN, Sun Yat-Sen University, P.R. China                    |
| KEVIN COUPER, University of Manchester, UK                                       | M. McALLISTER, University of Adelaide, Australia                     |
| M. DE NAZARÉ CORREIA SOEIRO, Fundação Oswaldo Cruz, Brazil                       | SERGE MORAND, CNRS, ISEM, University of Montpellier, France          |
| PAUL DENNY, Durham University, UK  | E. MORGAN, University of Bristol, UK                                 |
| JENNY DUNN, University of Lincoln, UK  | D. OUTLAW, Mississippi State University, USA                         |
| A. FENTON, University of Liverpool, UK   | T. SCHETTERS, Intervet International, The Netherlands                |
| CAROLINE FREY, Canadian Food Inspection Agency, Saskatoon, Canada                | U. TATU, Indian Institute of Science, India                          |
| DIANA HANSEN, The Walter and Eliza Hall Institute of Medical Research, Australia | J. T. TIMI, Universidad Nacional de Mar del Plata-CONICET, Argentina |
| H. HELMBY, London School of Hygiene & Tropical Medicine, UK                      | PAUL TORGERSON, Vetsuisse Faculty, Switzerland                       |
| G. HIDE, University of Salford, UK   | MARK VINEY, University of Bristol, UK                                |
| ABDUL JABBAR, University of Melbourne, Australia                                 | R. A. WILSON, University of York, UK                                 |
| JOSEPH JACKSON, University of Salford, UK  | ANNETTA ZINTL, University College Dublin, Ireland                    |
| M. K. JONES, Queensland Institute of Medical Research, Australia                 |  |
- 

**Parasitology** (ISSN 0031–1820) is published monthly and semi-monthly in April and September.

**Subscriptions** may be sent to any bookseller or subscription agent or direct to the publisher: Cambridge University Press, University Printing House, Shaftesbury Road, Cambridge CB2 8BS, UK. Subscriptions in the USA, Canada and Mexico should be sent to Cambridge University Press, Journals Fulfillment Department, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA. All orders must be accompanied by payment.

The subscription price (excluding VAT) of Volume 146, 2019 which includes print and electronic access is £1927 (US \$3274 in the USA, Canada and Mexico), for fourteen parts; the electronic-only price for institutional subscribers is £1541 (US \$2624 in the USA, Canada and Mexico); separate parts cost £158 or US \$259 each (plus postage). EU subscribers (outside the UK) who are not registered for VAT should add VAT at their country's rate. VAT registered subscribers should provide their VAT registration number. Japanese prices for institutions are available from Kinokuniya Company Ltd, P.O. Box 55, Chitose, Tokyo 156, Japan. Periodicals postage paid at New York, NY and at additional mailing offices. POSTMASTER: send address changes in USA, Canada and Mexico to Parasitology, Cambridge University Press, 1 Liberty Plaza, Floor 20, New York, NY 10006, USA.

Information on back volumes, permissions and advertising is given on the inside back cover.

The Journal is listed in the major relevant abstracting and indexing services worldwide, including Abstracts on Hygiene and Communicable Disease, Biological Abstracts, Biotechnology Research Abstracts, Chemical Abstracts, Current Awareness in Biological Science, Current Contents, Dairy Science Abstracts, Excerpta Medica, Helminthological Abstracts, Index Medicus, Index Veterinarius, IABS, Protozoological Abstracts, Reviews of Applied Entomology, Tropical Diseases Bulletin, Veterinary Bulletin.

Information on *Parasitology* and all other Cambridge journals can be accessed via [journals.cambridge.org](http://journals.cambridge.org).

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests.

Please see [www.fsc.org](http://www.fsc.org) for information.