

Biochemical Journal

The Biochemical Society, London © 2006

Volume 393, part 2

15 January 2006

<http://www.BiochemJ.org>

Editorial Board

Chair

G. Banting • Bristol

Vice Chair, The Americas

G. Salvesen • La Jolla

Reviews Editor

A. Toker • Boston

Deputy Chairs

D. R. Alessi • Dundee

S. V. Graham • Glasgow

S. Gutteridge • Newark, DE

D. Hoekstra • Groningen

N. M. Hooper • Leeds

J. P. Kehrer • Pullman, WA

C. MacKintosh • Dundee

K. H. Mayo • Minneapolis

P. R. Shepherd • Auckland

H. M. Wallace • Aberdeen

M. P. Walsh • Calgary

Publisher

P. J. Starley

Production Editor

M. D. Cunningham

Executive Editor

M. R. Thorne

Senior Staff Editor

S. M. Hobday

Staff Editors

L. Ball

E. A. G. Elloway

J. W. Mockridge

Editorial Assistant

E. E. C. Bible

Administrative Editor, US Office

S. Schendel

J. Arino (Barcelona)

A. Baici (Zurich)

J. L. Blank (Cambridge, MA)

M. Blatt (Glasgow)

P. G. Board (Canberra)

P. J. Booth (Bristol)

A. Boraston (Victoria, BC)

L. Bosca (Madrid)

Y. Bourne (Marseille)

B. Brüne (Frankfurt)

D. Carling (London)

I. Collinson (Bristol)

G. P. Côté (Kingston, Ont.)

J. R. Couchman (London)

V. Darley-Usmar (Birmingham, AL)

D. M. Davis (London)

D. A. Day (Sydney)

C. S. Duckett (Ann Arbor)

B. Engelmann (Munich)

R. M. Epand (Hamilton, Ont.)

P. Fay (Rochester, NY)

D. A. Fell (Oxford)

R. Ferraris (Newark, NJ)

B. Foxwell (London)

J.-M. Frère (Liège)

A. Galione (Oxford)

P. G. W. Gettins (Chicago)

D. A. F. Gillespie (Glasgow)

R. Golsteyn (Croissy-sur-Seine)

S. Goodbourn (London)

P. A. Grimaldi (Nice)

B. Hallberg (Umeå)

B. Halliwell (Singapore)

P. I. Harris (Leicester)

L. Hedstrom (Waltham, MA)

F. G. Hegardt (Barcelona)

S. High (Manchester)

I. B. Holland (Orsay)

J. Hsuan (London)

S. Huber (Urbana, IL)

R. Kalluri (Boston)

B. Kalyanaraman (Milwaukee)

M. G. Kazanietz (Philadelphia)

G. F. King (Farmington, CT)

I. M. Kovach (Washington D.C.)

J. E. Ladbury (London)

J. H. Lakey (Newcastle upon Tyne)

R. Leduc (Sherbrooke)

M. A. Lemmon (Philadelphia, PA)

E. R. Levin (Long Beach, CA)

D. W. Litchfield (London, ON)

L. Machesky (Birmingham)

E. Manser (Singapore)

P. Maurel (Montpellier)

R. J. Mayer (Nottingham)

M. Meisterernst (Munich)

H. Mellor (Bristol)

I. Morgan (Glasgow)

A. J. Morris (Lexington, KY)

B. Mulloy (South Mimms)

A. W. Munro (Manchester)

M. P. Murphy (Cambridge)

H. Y. Naim (Hannover)

M. E. Noble (Oxford)

L. M. Obeid (Charleston)

M. Parenti (Monza)

M. A. J. Parry (Harpending)

S. Patel (London)

G. Pavitt (Manchester)

M. Paulsson (Cologne)

L. Persson (Lund)

A. D. Postle (Southampton)

D. R. Richardson (Sydney)

S. Roberts (Manchester)

J. Sandy (Tampa)

N. Savery (Bristol)

J. R. Sayers (Sheffield)

S. C. Sealton (New York)

G. S. Shelness (Winston-Salem, NC)

A. Sim (Callaghan, NSW)

B. F. Sloane (Detroit)

E. Smythe (Sheffield)

S. Stack (Chicago)

C. W. Taylor (Cambridge)

M. Thumm (Goettingen)

A. B. Tobin (Leicester)

M. Torti (Pavia)

C. Troy (New York)

D. M. F. van Aalten (Dundee)

M. van der Woude (York)

B. Vanhaesebroeck (London)

S. G. Ward (Bath)

M. Welham (Bath)

J. York (Durham, NC)

C. Zurzolo (Paris)



- The *Biochemical Journal* (ISSN 0264-6021 for print/online journal; ISSN 1470-8728 for online only journal) is published and distributed by Portland Press Ltd on behalf of the Biochemical Society (the owner), and appears twice monthly.
- **Editorial and publishing offices:** *Biochemical Journal*, Portland Press Ltd, Third Floor, Eagle House, 16 Procter Street, London WC1V 6NX, U.K.
- **Biochemical Journal**, c/o Mercury Airfreight International Ltd, 365 Blair Road, Avenel, NJ 07001, U.S.A.
- **Subscriptions department:** Portland Customer Services, P.O. Box 32, Commerce Way, Colchester CO2 8HP, U.K.
- All rights reserved. Apart from any fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act, 1988, this publication may be reproduced, stored or transmitted, in any forms or by any means, only with the prior permission in writing of the publishers, or in the case of reprographic reproduction in accordance with the terms of permissions granted by copyright clearing houses such as the Copyright Licensing Agency (U.K.) or the Copyright Clearance Center (U.S.A.). The CCC item-fee code for this publication is 0264-6021/2006/\$40.00 + 0.00. Inquiries concerning reproduction outside those terms should be sent to the publishers at the above-mentioned address.
- Although, at the time of going to press, the information contained in this publication is believed to be correct, neither the authors nor the editors nor the publisher assume any responsibility for any errors or omissions herein contained. Opinions expressed in articles are not necessarily those of the editors, the publisher or the owner.
- Periodicals postage paid at Rahway, NJ, U.S.A.
- **Postmaster:** send address corrections to *Biochemical Journal*, c/o Mercury Airfreight International Ltd, 365 Blair Road, Avenel, NJ 07001, U.S.A.
- **Cover illustration:** An apoptotic body bound to a LOX-1-FLAG-transfected HeLa cell. For further details, see Murphy et al. (2006) *Biochem. J.* **393**, 107–115.

● **General policy** The *Biochemical Journal* publishes papers in English in all fields of biochemistry and cellular and molecular biology, provided that they make a sufficient contribution to biochemical knowledge. Papers may include new results obtained experimentally, descriptions of new experimental methods of biochemical importance, or new interpretations of existing results. Novel theoretical contributions will be considered equally with papers dealing with experimental work. All work presented should have as its aim the development of biochemical concepts rather than the mere recording of facts. Preliminary, confirmatory or inconclusive work will not be published. The *Biochemical Journal* will not publish material that has been wholly or largely published elsewhere, even as a preliminary communication or in refereed symposium proceedings or on the World Wide Web (WWW); equally, fragmentation of research into the 'least publishable unit' is discouraged.

Submission of a paper implies that it has been approved by all the named authors, that all persons entitled to authorship have been so named, that it reports unpublished work that is not under consideration elsewhere, and that if the paper is accepted for publication the authors will transfer to the Biochemical Society the copyright in the paper, which will then not be published elsewhere in the same form, in any language, without the consent of the Society. Authors will be required to sign an undertaking to these effects.

Authors may suggest potential reviewers for their papers, but the journal is under no obligation to follow such suggestions. Authors may also specify the names of those they wish to be excluded from the review process, and such wishes are usually respected unless, in the opinion of the journal, such a request unreasonably excludes all the expertise available to it in that scientific area.

To allow the reviewers to assess possible overlap with previous work, all submitted papers must be accompanied by duplicate copies of the author's relevant published work, including that on the WWW, and of all related papers in press or under editorial consideration in this or other journals.

The following types of paper are included in the journal.

● **Research Papers** are the normal form of publication, and may be of any length that is

justified by their content. However, because of pressure for space in the journal, no paper, whatever its scientific merits, will be accepted if it exceeds the minimum length required for precision in describing the experiments and clarity in interpreting them. As a guide, most Research Papers published in the *Biochemical Journal* are of between six and eight printed pages. A concise well-written paper tends to be published more rapidly.

● **Accelerated Publications (APs)** are short (normally four printed pages) papers bringing particularly novel and significant findings to the attention of the research community. It is intended that a decision on acceptance or rejection will be made within 10 working days of receipt, and publication of accepted APs in an issue will follow within 2 months. APs receive full but accelerated reviewing. The criteria of 'novelty and significance' are strictly enforced, and papers may be rejected solely on the grounds of lack of novelty and significance. APs are not a path to accelerated publication of sound but non-urgent material. Authors must include in their letter of submission a brief statement of why they believe their AP merits accelerated treatment. Papers reporting nucleotide sequences only are not acceptable as APs. One colour figure will be published free of charge in APs; subsequent figures will cost £300 each.

● **Reviews** will usually be solicited, although unsolicited reviews will be considered for publication. Prospective writers of reviews should first consult the Reviews Editor, via the editorial office, and should enclose a short (one page) summary of the area they propose to cover.

● **Procedure for submission** These instructions do not replace the official *Biochemical Journal* Instructions to Authors (<http://www.BiochemJ.org>). Authors are encouraged to refer to these for overall guidelines on submitting a paper. Before preparing papers for the journal, authors should consult a current issue to make themselves familiar with the general format, such as the use of cross-headings, layout of tables and figures and citation of references. A full page of text in the *Biochemical Journal* contains approximately 1200 words; when calculating the printed length of papers, allowance must be made for the space occupied by tables and figures and the number of text words reduced accordingly.

The numerical system of references must be used. A reference to 'unpublished work'

must be accompanied by the names of all persons concerned: a reference to a 'personal communication' must be supported by written permission for the quotation from the person or persons concerned; both of these types of citation are permitted in the text only, not in the list of references.

● **Submit manuscripts online** Authors should submit manuscripts electronically using the Online Submission and Review System available at <http://www.BiochemJ.org/submit/>

● **Immediate Publications** Manuscripts are published online in PDF format as soon as they are accepted, unless on submission the author requests that this not be done. Immediate Publications are listed in and accessible through Medline, and are freely available to anyone with Internet access.

● **Queries and correspondence** Authors in the Americas should address all queries and correspondence about their submission to: Dr Sharon Schendel, BJ USA, The Burnham Institute, 10901 N. Torrey Pines Road, La Jolla, CA 92037, U.S.A. (telephone +1 858 713 6283; fax +1 858 713 6284; email editorial@biochemjusa.org). Authors in the U.K., the rest of Europe, Japan and the rest of the world should contact: The Publisher, *Biochemical Journal*, Portland Press Ltd, Third Floor, Eagle House, 16 Procter Street, London WC1V 6NX, U.K. (telephone +44 20 7280 4110; fax +44 20 7280 4169; email editorial@portlandpress.com).

● **Colour figures** The first colour figure is published at no charge provided that one author has been a member of the Biochemical Society for at least 2 years and that the use of colour is deemed scientifically necessary by the reviewers (a saving of £550). Subsequent colour figures in the same paper cost £300 each.

● **Multimedia adjuncts** The Biochemical Journal Online offers authors the opportunity to enhance their papers with multimedia adjuncts (e.g. time-lapse movies, three-dimensional structures, animated schemes). These will be submitted to peer review alongside the manuscript. To submit a paper with a multimedia adjunct, please attach the file when you submit your manuscript electronically. Preferred formats are QuickTime for time-lapse movies and PDB for structures. There is no extra charge associated with the publication of a multimedia adjunct online.

Other information

The *Biochemical Journal* is published and distributed by Portland Press Ltd on behalf of the Biochemical Society. It is published twice monthly; in 2006 volumes 393–400 (three parts each) will appear. The subscription also includes an author and key-word index.

● **Abstracted by/indexed in:** BIOBASE, BIOSIS, CAB International, Chemical Abstracts Service, Current Contents, EMBASE, International Food Information Service, Medline/Index Medicus, Proquest Information & Learning, Science Citation Index.

● **Subscription rates** Institutional subscription rates for 2006 are shown below. Subscribers to the *Biochemical Journal* can subscribe additionally to *Biochemical Society Transactions* and *Biotechnology and Applied Biochemistry* on a joint subscription at a reduced rate. Terms are cash with order (US\$ in N. America, £ sterling for rest of the world, or US\$ equivalent at current rate of exchange; subscribers in the EU may pay in £ sterling or Euros), or against pro forma

invoice. Orders should be sent to the address shown, or through your usual agent.

	N.	Rest of world	Euro price
One year (8 vols)	America	world	price
Print and online	US\$3084	£1630	€2774
Online only	US\$2600	£1378	€2340
Single issues (print only)	US\$152	£80	€136

Overseas rates include airfreight delivery. Priority delivery is available at an additional cost of £64.90/€110.

VAT is due on some supplies to subscribers within the UK, and to non-registered subscribers elsewhere in the EU. If in the EU please state your VAT number otherwise VAT may be charged at the appropriate national rate.

● **Electronic back archive** This is freely available to all users with Internet access.

● **Microfiche and back issues** Volumes 102–336 of the *Biochemical Journal* are available

on microfiche. Back issues are also available. Further details may be obtained from the address below.

● Subscription Department

Portland Customer Services
P.O. Box 32, Commerce Way
Colchester CO2 8HP, Essex, U.K.
(telephone 01206 796351; fax 01206 799331;
email sales@portland-services.com).

● **Advertising** Enquiries about advertising should be addressed to: Mark Burgess, Editorial Department, Portland Press, Third Floor, Eagle House, 16 Procter Street, London WC1V 6NX, U.K. (telephone +44 20 7280 4110; fax +44 20 7280 4169; email editorial@portlandpress.com).

● The paper and cover-boards used in this journal are sourced from sustainable, managed and renewed commercial forests, and are fully recyclable. The bleaching process used for the pulp is 100% ECF (elemental chlorine free).

**Online Commentary**

Unexpected similarity between the cytosolic West Nile virus NS3 and the secretory furin-like serine proteinases

Published on the Internet 23 December 2005,

doi:10.1042/BJ20051787

(see accompanying paper pp. 503–511)

N.G. Seidah

e1–e3

Research Papers

Identification of a mitochondrial transporter for pyrimidine nucleotides in *Saccharomyces cerevisiae*: bacterial expression, reconstitution and functional characterization

Published as BJ Immediate Publication 29 September 2005,

doi:10.1042/BJ20051284

C.M.T. Marobbio, M.A. Di Noia and F. Palmieri

441–446

Kinetic, inhibition and structural studies on 3-oxoacyl-ACP reductase from *Plasmodium falciparum*, a key enzyme in fatty acid biosynthesis

Published as BJ Immediate Publication 14 October 2005,

doi:10.1042/BJ20050832

S.R. Wickramasinghe, K.A. Inglis, J.E. Urch, S. Müller, D.M.F. van Aalten and A.H. Fairlamb

447–457

Effects of N-linked glycosylation on the creatine transporter

Published as BJ Immediate Publication 19 September 2005,

doi:10.1042/BJ20050857

N. Straumann, A. Wind, T. Leuenberger and T. Wallimann

459–469

Analysis of the hypoxia-sensing pathway in *Drosophila melanogaster*

Published as BJ Immediate Publication 21 September 2005,

doi:10.1042/BJ20050675

N. Arquier, P. Vigne, E. Duplan, T. Hsu, P.P. Therond, C. Frelin and G. D'Angelo

471–480

A novel role for a *Drosophila* homologue of cGMP-specific phosphodiesterase in the active transport of cGMP

Published as BJ Immediate Publication 19 October 2005,

doi:10.1042/BJ20051505

J.P. Day, M.D. Houslay and S.-A. Davies



481–488

A novel ARF-binding protein (LZAP) alters ARF regulation of HDM2

Published as BJ Immediate Publication 21 September 2005,

doi:10.1042/BJ20050960

J. Wang, X. He, Y. Luo and W.G. Yarbrough

489–501

Cleavage targets and the D-arginine-based inhibitors of the West Nile virus NS3 processing proteinase

Published as BJ Immediate Publication 17 October 2005,

doi:10.1042/BJ20051374

S.A. Shiryaev, B.I. Ratnikov, A.V. Chekanov, S. Sikora, D.V. Rozanov, A. Godzik, J. Wang, J.W. Smith, Z. Huang, I. Lindberg, M.A. Samuel, M.S. Diamond and A.Y. Strongin



503–511

Regulation of the sphingosine-recycling pathway for ceramide generation by oxidative stress, and its role in controlling c-Myc/Max function

Published as BJ Immediate Publication 4 October 2005,

doi:10.1042/BJ20051083

I. Sultan, C.E. Senkal, S. Ponnusamy, J. Bielawski, Z. Szulc, A. Bielawska, Y.A. Hannun and B. Ogretmen

513–521

The intersubunit lock-and-key motif in human glutathione transferase A1-1: role of the key residues Met⁵¹ and Phe⁵² in function and dimer stability

Published as BJ Immediate Publication 29 September 2005,

doi:10.1042/BJ20051066

C.S. Alves, D.C. Kuhnert, Y. Sayed and H.W. Dirr

523–528

Herpes simplex virus type 1-encoded glycoprotein C contributes to direct coagulation Factor X–virus binding <i>Published as BJ Immediate Publication 7 October 2005, doi:10.1042/BJ20051313</i>	J.R. Livingston, M.R. Sutherland, H.M. Friedman and E.L.G. Pryzdial	529–535
Proteomic analysis of mouse kidney peroxisomes: identification of RP2p as a peroxisomal nudix hydrolase with acyl-CoA diphosphatase activity <i>Published as BJ Immediate Publication 27 September 2005, doi:10.1042/BJ20050893</i>	R. Ofman, D. Speijer, R. Leen and R.J.A. Wanders	537–543
Salivary agglutinin and lung scavenger receptor cysteine-rich glycoprotein 340 have broad anti-influenza activities and interactions with surfactant protein D that vary according to donor source and sialylation <i>Published as BJ Immediate Publication 28 September 2005, doi:10.1042/BJ20050695</i>	K.L. Hartshorn, A. Ligtenberg, M.R. White, M. van Eijk, M. Hartshorn, L. Pemberton, U. Holmskov and E. Crouch	545–553
Vasodilator-stimulated phosphoprotein (VASP) is phosphorylated on Ser ¹⁵⁷ by protein kinase C-dependent and -independent mechanisms in thrombin-stimulated human platelets <i>Published as BJ Immediate Publication 3 October 2005, doi:10.1042/BJ20050796</i>	J.K.T. Wentworth, G. Pula and A.W. Poole	555–564
Minimal features of paxillin that are required for the tyrosine phosphorylation of focal adhesion kinase <i>Published as BJ Immediate Publication 27 October 2005, doi:10.1042/BJ20051241</i>	R. Wade and S. Vande Pol	565–573
Reactivity of free thiol groups in type-I inositol trisphosphate receptors <i>Published as BJ Immediate Publication 21 September 2005, doi:10.1042/BJ20050889</i>	S.K. Joseph, S.K. Nakao and S. Sukumvanich	575–582
Transport of polyamines in <i>Drosophila</i> S2 cells: kinetics, pharmacology and dependence on the plasma membrane proton gradient <i>Published as BJ Immediate Publication 26 October 2005, doi:10.1042/BJ20050981</i>	R. Romero-Calderón and D.E. Krantz	583–589
Multiple functions of <i>I0036</i> in the regulation of the pathogenicity island of enterohaemorrhagic <i>Escherichia coli</i> O157:H7 <i>Published as BJ Immediate Publication 26 October 2005, doi:10.1042/BJ20051201</i>	N.-P. Tsai, Y.-C. Wu, J.-W. Chen, C.-F. Wu, C.-M. Tzeng and W.-J. Syu	591–599
The differential role of Smad2 and Smad3 in the regulation of pro-fibrotic TGF β 1 responses in human proximal-tubule epithelial cells <i>Published as BJ Immediate Publication 27 October 2005, doi:10.1042/BJ20051106</i>	M.K. Phanish, N.A. Wahab, P. Colville-Nash, B.M. Hendry and M.E.C. Dockrell	601–607



Editorial Advisory Panel

- M. Abrahamson (Lund)
L. Agius (Newcastle upon Tyne)
P. Aisen (New York)
A. Aitken (Edinburgh)
B. Akerström (Lund)
L. Alhonen (Kuopio)
B. Allen (Montréal)
A. Aplin (Albany, NY)
G. J. Arlaud (Grenoble)
B. Ashby (Philadelphia)
K. S. Authi (London)
- A. J. Baines (Canterbury)
F. A. Barr (Martinsried)
M. P. Barrett (Glasgow)
C. H. Barton (Southampton)
J. F. Bateman (Parkville)
G. Baverel (Lyon)
D. R. Bell (Nottingham)
D. S. Bendall (Cambridge)
A. Benedetti (Siena)
J. P. Bennett (Hull/York)
A. Berry (Leeds)
R. J. Beynon (Liverpool)
O. Billker (London)
C. D. Bingle (Sheffield)
G. Black (Newcastle upon Tyne)
G. E. Blair (Leeds)
M. A. Bogoyevitch (Nedlands)
G. B. Bolger (Birmingham, AL)
A. R. Boobis (London)
M. D. Bootman (Cambridge)
K. M. Botham (London)
E. Brailoiu (Philadelphia)
S. Bratton (Austin, TX)
D. Brdiczka (Konstanz)
R. G. Brennan (Portland, OR)
D. N. Brindley (Edmonton, Alb.)
K. Brocklehurst (London)
S. Broer (Canberra)
G. Brown (Birmingham)
H. Brumer (Stockholm)
U. T. Brunk (Linköping)
N. Bryant (Glasgow)
N. J. Bulleid (Manchester)
S. J. W. Busby (Birmingham)
- K. Cain (Leicester)
J. J. Calvete (Valencia)
E. A. Carrey (London)
C. Casals (Madrid)
A. M. Caswell (Leeds)
L. Chamberlain (Glasgow)
K. E. Chapman (Edinburgh)
Y. Chen (Indianapolis)
U. Christensen (Copenhagen)
M. C. M. Chung (Singapore)
P. Codogno (Villejuif)
P. Cohen (Dundee)
S. J. Cook (Cambridge)
J. R. Coorssen (Calgary)
A. P. Corfield (Bristol)
D. A. Cowan (Cape Town)
R. Cramer (Davos)
C. E. Creutz (Charlottesville)
K. Croft (Perth)
M. Crossley (Sydney)
C. M. Cuchillo (Barcelona)
J. M. Cuezva (Madrid)
W. Cushley (Glasgow)
- C. Dani (Nice)
R. M. Daniel (Hamilton)
C. J. Danpure (London)
V. L. Davidson (Jackson, MS)
M. J. Davies (Sydney)
- S. Dawson (Nottingham)
C. Day (Dunedin)
V. De Filippis (Padua)
H. de Groot (Essen)
H. R. De Jonge (Rotterdam)
L. Dekker (Cambridge)
A. DeLong (Providence, RI)
N. Demaurex (Geneva)
Q. Deveraux (San Diego)
J. Ding (Shanghai)
C. Dingwall (Harlow)
F. E. Domann (Iowa City)
D. Donner (Indianapolis)
C. J. Dorman (Dublin)
K. T. Douglas (Manchester)
J. A. Downs (Cambridge)
C. P. Downes (Dundee)
A. Draeger (Bern)
K. Drickamer (Oxford)
M. A. Driscoll (Piscataway, NJ)
B. Drøbak (Norwich)
R. M. Drummond (Glasgow)
M. Duchon (London)
M. J. Dufton (Glasgow)
R. Duggleby (Brisbane)
- J. M. Edwardson (Cambridge)
L. Ellerby (Novato)
E. Ellis (Glasgow)
A. Enyedi (Budapest)
P. M. Epstein (Farmington)
F. Erdodi (Debrecen)
C. Erneux (Brussels)
- T. Feizi (London)
S. Ferguson-Miller (East Lansing, MI)
L. M. Field (Harpending)
M. C. Field (Cambridge)
L. M. Fisher (London)
P. R. Flatt (Londonderry)
D. R. Flower (Newbury)
G. Forloni (Milan)
F. Foufelle (Paris)
K. R. Fox (Southampton)
M. Francis (Umeå)
P. Fuentes-Prior (Barcelona)
M. H. Fukami (Bergen)
- C. G. Gahmberg (Helsinki)
J. T. Gallagher (Manchester)
T. Galli (Paris)
J. C. Garcia-Barrón (Murcia)
B. Garner (Sydney)
M. Gassman (Zurich)
K. Gaus (Sydney)
B. Geiger (Rehovot)
R. A. Geremia (Grenoble)
V. Gerke (Muenster)
J. D. Gitlin (St Louis, MO)
D. E. Goll (Tucson, AZ)
A. Gomez-Muñoz (Bilbao)
M. Goppelt-Struebe (Erlangen)
R. A. Gottlieb (La Jolla)
G. W. Gould (Glasgow)
L. Graeve (Stuttgart)
J. C. Gray (Cambridge)
A. W. Griffioen (Maastricht)
S. Grinstein (Toronto)
T. Grune (Dusseldorf)
D. Guenini (Basel)
S. J. Gunst (Indianapolis)
A. Guse (Hamburg)
- A. Halestrap (Bristol)
A. Hall (London)
G. C. Hansson (Gothenburg)
J. Harris (San Diego)
- G. M. Hatch (Winnipeg)
P. T. Hawkins (Cambridge)
J. D. Hayes (Dundee)
T. Herbert (Leicester)
K. Heremans (Leuven)
A. C. Herington (Brisbane)
H. Hiasa (Minneapolis)
K. Hinchliffe (Manchester)
J. A. Hiscox (Leeds)
M. Hodgkin (Coventry)
K. Hoebe (La Jolla)
A. A. Holder (London)
G. D. Holman (Bath)
M. J. Holness (London)
D. Holowka (Ithaca, NY)
J. Horowitz (Raleigh, NC)
M. D. Houslay (Glasgow)
A. Hudmon (West Haven, CT)
H. Hundal (Dundee)
J. Huntingdon (Cambridge)
I. Hussain (Harlow)
J. C. Hutton (Denver)
E. Hyde (Birmingham)
- Y. Ikehara (Fukuoka)
R. A. Iles (London)
A. Imberty (Grenoble)
G. B. Irvine (Belfast)
R. E. Isaacs (Leeds)
C. M. Isacke (London)
H. Ischiropoulos (Philadelphia, PA)
T. Ishikawa (Yokohama)
P. B. Iynedjian (Geneva)
- K. H. Jakobs (Essen)
S. Janecek (Bratislava)
D. R. Janero (Bedford, MA)
S. M. Jarvis (London)
N. C. Jones (Manchester)
S. K. Joseph (Philadelphia, PA)
L. B. Justement (Birmingham, AL)
- K. E. Kadler (Manchester)
E. Kalkhoven (Utrecht)
P. Karran (South Mimms)
S. Kato (Tokyo)
D. J. Keeling (Loughborough)
G. Kemp (Liverpool)
P. J. Knelly (Blacksburg, VA)
S. Keyse (Dundee)
C. M. Kielty (Manchester)
M. R. Kini (Singapore)
T. M. Kitson (Palmerston North)
L. Kjellen (Uppsala)
E. Klipp (Berlin)
E. Knecht (Valencia)
W. Kolch (Glasgow)
O. Kost (Moscow)
Y. Kuroki (Sapporo)
J. Kuznicki (Warsaw)
J. Kwon (Seoul)
- S. Lamande (Parkville, Vic.)
D. A. Lane (London)
M. Laurent (Orsay)
P. J. Lea (Lancaster)
D. S. Leake (Reading)
A. LeBlanc (Quebec)
P. Lefebvre (Lille)
M. Leippe (Kiel)
M. A. Lemmon (Philadelphia)
P. J. Lenting (Utrecht)
C. C. Leslie (Denver)
T. Levade (Toulouse)
R. E. Lewis (Omaha, NE)
R. Lightowlers
(Newcastle upon Tyne)
J. E. Lillehaug (Bergen)
- K. A. Lillycrop (Southampton)
J. M. Lord (Coventry)
M. G. Low (New York)
M. Lowe (Manchester)
R. Ludowyke (Sydney)
K. A. Lukyanov (Moscow)
P. A. Lund (Birmingham)
M. Lyon (Manchester)
- D. J. MacEwan (Norwich)
J. Mackrill (Cork)
G. Maga (Pavia)
A. I. Magee (London)
C. C. Malbon (Stony Brook, NY)
W. Maltese (Toledo, OH)
J. P. G. Malthouse (Dublin)
G. E. Mann (London)
J. S. Marchant (Minneapolis)
D. Martin (Dundee)
J. Martin (Tübingen)
P. Martin (Glasgow)
R. W. Mason (Wilmington)
A. Matagne (Leige)
S. Matthews (Dundee)
B. Mayer (Graz)
M. J. McConville (Parkville)
I. J. McEwan (Aberdeen)
R. A. J. McIlhinney (Oxford)
D. McIntosh (London)
L. McLellan (Dundee)
A. G. McLennan (Liverpool)
P. A. Meacock (Leicester)
D. W. Meek (Dundee)
A. K. Menon (Madison)
A. R. Merrill (Guelph)
E. Metzner (Luebeck)
D. J. Meyer (London)
J. A. Miernyk (Columbia)
A. H. Millar (Crawley, West. Aus.)
J. L. A. Mitchell (DeKalb, IL)
G. Molle (Montpellier)
G. B. Moorhead (Calgary)
A. Morgan (Liverpool)
S. Morley (Brighton)
S. Morris (Pittsburgh)
N. Moustaid Moussa (Knoxville, TN)
A. Moustakas (Uppsala)
G. Murphy (Cambridge)
- H. Nagase (London)
T. Nagatsu (Aichi)
V. Natarajan (Baltimore)
A. R. Nebreda (Madrid)
P. Newsholme (Dublin)
R. Nibbs (Glasgow)
C. Nobes (Bristol)
R. I. Norman (Leicester)
M. A. Nugent (Boston, MA)
- T. Oberley (Madison, WI)
R. M. O'Doherty (Pittsburgh)
J. O'Donnell (Memphis)
V. O'Donnell (Cardiff)
K. Omori (Saitama)
L. A. J. O'Neill (Dublin)
R. P. J. Oude Elferink (Amsterdam)
- F. Palmieri (Bari)
G. Panayotou (Vari)
K. Pantopoulos (Montreal)
B. Payrastré (Toulouse)
J. D. Pearson (London)

EDITORIAL ADVISORY PANEL (continued)

- D. Pei (Minneapolis)
T. M. Penning (Philadelphia)
S. Pervaiz (Singapore)
J. M. Pfeilschifter (Frankfurt)
T. Pihlajaniemi (Oulu)
T. S. Pillay (Nottingham)
J. Pines (Cambridge)
B. V. Polevoda (Rochester, NY)
V. Ponnambalam (Leeds)
R. Y. Poon (Hong Kong)
F. Possmayer (London, Ont.)
D. Poyner (Birmingham)
N. C. Price (Glasgow)
C. A. Pritchard (Leicester)
I. Prior (Liverpool)
D. Prockop (New Orleans)
M. Puceat (Montpellier)
M. Pusch (Genova)
S. Pyne (Glasgow)
- B. Qualmann (Magdeburg)
- C. Rabouille (Edinburgh)
Z. Radić (La Jolla)
S. Rahman (London)
D. P. Ramji (Cardiff)
M. Rattray (London)
F. X. Real (Barcelona)
B. Reaves (Bath)
S. Rebuffat (Paris)
C. P. F. Redfern (Newcastle upon Tyne)
R. J. Reece (Manchester)
B. H. A. Rehm (Palmerston North)
G. A. Reid (Edinburgh)
P. S. Rennie (Vancouver)
I. Richard (Evry)
C. C. Rider (Egham)
M. H. Rider (Brussels)
- K. Rittinger (London)
J. D. Robertson (Kansas City)
N. Robinson (Newcastle)
H. L. Rodenck (Cambridge)
L. Rönstrand (Malmö)
G. Rotilio (Rome)
- J.-M. Sabatier (Marseille)
D. B. Sacks (Boston, MA)
P. Saftig (Kiel)
J. P. Salier (Rouen)
C. Sanderson (Cambridge)
M. F. G. Schmidt (Berlin)
M. L. Schmitz (Bern)
N. S. Scrutton (Leicester)
M. C. Seabra (London)
A. W. Segal (London)
Y. Shai (Rehovot)
L. M. Shantz (Hershey, PA)
S. B. Shears (Research Triangle Park, NC)
D. Sheehan (Cork)
T. Shimizu (Seidah)
Y. Shimomura (Nagoya)
P. Shore (Manchester)
K. Siddle (Cambridge)
F. M. Sladek (Riverside, CA)
D. M. Smith (Macclesfield)
M. Solioz (Bern)
S. Souchelnytskyi (Uppsala)
S. Spadari (Pavia)
F. Spener (Graz)
C. Springer (Sutton)
M. R. Stark (Dundee)
H. Stennicke (Bagsvaerd)
W. Stöcker (Mainz)
G. J. Strous (Utrecht)
T. W. Sturgill (Charlottesville)
K. E. Suckling (Stevenage)
A. Surolia (Bangalore)
C. Sutherland (Dundee)
- B. Svensson (Kgs. Lyngby)
- L. J. Takemoto (Manhattan, KS)
T. Takenawa (Tokyo)
K. M. Taylor (Cardiff)
A. Tepikin (Liverpool)
M. Thelen (Bellinzona)
G. Thiel (Homburg)
M. S. Thomas (Sheffield)
N. S. B. Thomas (London)
D. Thornton (Manchester)
C. Tickle (Dundee)
T. Toda (London)
P. J. Tonge (Stony Brook)
D. Tosh (Bath)
P. Trayhurn (Liverpool)
G. C. Tsokos (Silver Spring, MD)
J. Turnbull (Liverpool)
B. M. Turner (Birmingham)
- B. Ullman (Portland, OR)
H. D. Ulrich (South Mimms)
S. Urbé (Liverpool)
- L. M. G. van Golde (Utrecht)
J. van Hellemond (Utrecht)
E. van Schaftingen (Brussels)
A. Varadi (Budapest)
N. C. Veitch (Kew)
G. Verhoeven (Leuven)
H. Vidal (Lyon)
F. Villarroya (Barcelona)
J. F. G. Vliegenthart (Utrecht)
H. Vogel (Calgary)
- M. C. Wahl (Göttingen)
M. J. Warren (London)
N. J. Watmough (Norwich)
S. P. Watson (Birmingham)
- A. Watts (Oxford)
D. J. Waxman (Boston)
K. G. Welinder (Aalborg)
R. E. Wettenhall (Parkville)
M. Wheatley (Birmingham)
C. Wheeler-Jones (London)
P. J. White (Warwick)
J. Whitehead (Brisbane)
D. G. Wilkinson (London)
I. Wilson (Wien)
S. A. Wilson (Sheffield)
J.-O. Winberg (Tromsø)
S. J. Winder (Sheffield)
C. C. Winterbourn (Christchurch, NZ)
S. G. Withers (Vancouver)
R. Wojcikiewicz (Syracuse, NY)
P. Wojtaszek (Poznan)
S. Wolf (Jena)
J. M. Woof (Dundee)
M. C. Wright (Aberdeen)
S. Wright (Leeds)
F. Wuytack (Leuven)
- F. Xu (Davis, CA)
- H. Yagisawa (Hyogo-ken)
T. Yamaya (Sendai)
H. Yang (Singapore)
J. Ye (Sydney)
I. Young (Belfast)
L. S. Young (Birmingham)
S. P. Young (Birmingham)
H. Yu-Keung (Singapore)
D. I. Yule (Rochester, NY)
- I. Zachary (London)
R. Zamoyaska (London)
J. M. Zapata (La Jolla)
J. Zhang (Warwick)

Index of Authors

	PAGE		PAGE		PAGE		PAGE
Alves, C. S.	523	Hartshorn, M.	545	Ogretmen, B.	513	Szulc, Z.	513
Arquier, N.	471	He, X.	489				
		Hendry, B. M.	601	Palmieri, F.	441	Therond, P. P.	471
Bielawska, A.	513	Holmskov, U.	545	Pemberton, L.	545	Tsai, N.-P.	591
Bielawski, J.	513	Houslay, M. D.	481	Phanish, M. K.	601	Tzeng, C.-M.	591
		Hsu, T.	471	Ponnusamy, S.	513		
Chekanov, A. V.	503	Huang, Z.	503	Poole, A. W.	555	Urch, J. E.	447
Chen, J.-W.	591			Pryzdial, E. L. G.	529		
Colville-Nash, P.	601	Inglis, K. A.	447	Pula, G.	555	van Aalten, D. M. F.	447
Crouch, E.	545					Vande Pol, S.	565
		Joseph, S. K.	575	Ratnikov, B. I.	503	van Eijk, M.	545
D'Angelo, G.	471			Romero-Calderón, R.	583	Vigne, P.	471
Davies, S.-A.	481	Krantz, D. E.	583	Rozanov, D. V.	503		
Day, J. P.	481	Kuhnert, D. C.	523			Wade, R.	565
Diamond, M. S.	503			Samuel, M. A.	503	Wahab, N. A.	601
Di Noia, M. A.	441	Leen, R.	537	Sayed, Y.	523	Wallimann, T.	459
Dirr, H. W.	523	Leuenberger, T.	459	Seidah, N. G.	e1	Wanders, R. J. A.	537
Dockrell, M. E. C.	601	Ligtenberg, A.	545	Senkal, C. E.	513	Wang, Jialiang	489
Duplan, E.	471	Lindberg, I.	503	Shiryaev, S. A.	503	Wang, Jun	503
		Livingston, J. R.	529	Sikora, S.	503	Wentworth, J. K. T.	555
Fairlamb, A. H.	447	Luo, Y.	489	Smith, J. W.	503	White, M. R.	545
Frelin, C.	471			Speijer, D.	537	Wickramasinghe, S. R.	447
Friedman, H. M.	529	Marobbio, C. M. T.	441	Straumann, N.	459	Wind, A.	459
		Müller, S.	447	Strongin, A. Y.	503	Wu, C.-F.	591
Godzik, A.	503			Sukumvanich, S.	575	Wu, Y.-C.	591
		Nakao, S. K.	575	Sultan, I.	513		
Hannun, Y. A.	513			Sutherland, M. R.	529	Yarbrough, W. G.	489
Hartshorn, K. L.	545	Ofman, R.	537	Syu, W.-J.	591		