

Biochemical Journal

The Biochemical Society, London © 2006

Volume 398, part 2
1 September 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. Kehler • 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

Executive Editor

M. R. Thorne

Production Manager

M. D. Cunningham

Senior Staff Editor

S. M. Hobday

Staff Editors

L. Ball

E. A. G. Elloway

J. W. Mockridge

Administrative Editor, US Office

S. Schendel

J. Arino (Barcelona)
A. Baici (Zurich)
J. L. Blank (Cambridge, MA)
M. Blatt (Glasgow)
P. G. Board (Canberra)
M. A. Bogoyevitch (Perth, WA)
P. J. Booth (Bristol)
A. Boraston (Victoria, BC)
L. Bosca (Madrid)
Y. Bourne (Marseille)
B. Brüne (Frankfurt)
N. J. Buckley (Leeds)
D. Carling (London)
I. Collinson (Bristol)
G. P. Côté (Kingston, Ont.)
J. R. Couchman (London)
V. Darley-Usoar (Birmingham, AL)
D. M. Davis (London)
D. A. Day (Sydney)
R. Docampo (Athens, GA)
D. Doyle (Oxford)
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. Gallone (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. Haris (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)
J. Miernyk (Columbia, MO)
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)

G. Panayotou (Vari)
M. Parenti (Monza)
M. A. J. Parry (Harpenden)
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)
M. C. Seabra (London)
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)
M. Torti (Pavia)
D. Tosh (Bath)
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)
C. Winterbourn (Christchurch, NZ)
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 0264-6021/2005/\$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:** The equinatoxin from *Actinia equina* approaching a lipid membrane. The image was kindly supplied by Gregor Anderluh (Department of Biology, Biotechnical Faculty, University of Ljubljana, Ljubljana, Slovenia).

Instructions to Authors

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 unrefereed 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).

COPE The *Biochemical Journal* is a member of the Committee on Publication Ethics and endorses its guidelines, which are available at <http://publicationethics.org.uk>

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. America	Rest of world	Euro price
One year (8 vols) 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 Ltd, Third Floor, Eagle House, 16 Procter Street, London WC1V 6NX, U.K., tel.: +44 (0)20 7280 4110, fax: +44 (0)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).



1906–2006
Centenary

Subscribing organizations are encouraged to copy and distribute this table of contents for non-commercial purposes

Biochemical Journal
Volume 398, part 2
1 September 2006

<http://www.BiochemJ.org>

Review

Regulatory circuits controlling white versus brown adipocyte differentiation

Published on the Internet 15 August 2006,
doi:10.1042/BJ20060402

J.B. Hansen and K. Kristiansen

153–168

Research Papers

Identification and functional characterization of hCLS1, a human cardiolipin synthase localized in mitochondria

Published as BJ Immediate Publication 23 May 2006,
doi:10.1042/BJ20060303

Identification of three crucial histidine residues (His¹¹⁵, His¹³² and His²⁹⁷) in porcine deoxyribonuclease II

Published as BJ Immediate Publication 31 May 2006,
doi:10.1042/BJ20060564

Saccharomyces cerevisiae cells have three Omega class glutathione S-transferases acting as 1-Cys thiol transferases

Published as BJ Immediate Publication 18 May 2006,
doi:10.1042/BJ20060034

Evidence for inactivation of cysteine proteases by reactive carbonyls via glycation of active site thiols

Published as BJ Immediate Publication 4 May 2006,

doi:10.1042/BJ20060019

A novel Δ⁹ acyl-lipid desaturase, DesC2, from cyanobacteria acts on fatty acids esterified to the *sn*-2 position of glycerolipids

Published as BJ Immediate Publication 11 May 2006,

doi:10.1042/BJ20060039

The histone acetyltransferases CBP/p300 are degraded in NIH 3T3 cells by activation of Ras signalling pathway

Published as BJ Immediate Publication 17 May 2006,

doi:10.1042/BJ20060052

Endogenous ADP-ribose enables calcium-regulated cation currents through TRPM2 channels in neutrophil granulocytes

Published as BJ Immediate Publication 9 May 2006,

doi:10.1042/BJ20060183

Novel genes encoding six kinds of three-finger toxins in *Ophiophagus hannah* (king cobra) and function characterization of two recombinant long-chain neurotoxins

Published as BJ Immediate Publication 12 May 2006,

doi:10.1042/BJ20060004

Ras activation in response to phorbol ester proceeds independently of the EGFR via an unconventional nucleotide-exchange factor system in COS-7 cells

Published as BJ Immediate Publication 18 May 2006,

doi:10.1042/BJ20060160

D. Chen, X.-Y. Zhang and Y. Shi

169–176

Y.-C. Cheng, C.-C. Hsueh, S.-C. Lu and T.-H. Liao

177–185



A. Garcerá, L. Barreto, L. Piedrafita, J. Tamarit and E. Herrero

187–196

J. Zeng, R.A. Dunlop, K.J. Rodgers and M.J. Davies

197–206

S. Chintalapati, J.S.S. Prakash, P. Gupta, S. Ohtani, I. Suzuki, T. Sakamoto, N. Murata and S. Shivaji

207–214

S. Sánchez-Molina, J.L. Oliva, S. García-Vargas, E. Valls, J.M. Rojas and M.A. Martínez-Balbás

215–224

I. Heiner, J. Eisfeld, M. Warnstedt, N. Radukina, E. Jüngling and A. Lückhoff

225–232



J. Li, H. Zhang, J. Liu and K. Xu

233–242

I. Rubio, K. Rennert, U. Wittig, K. Beer, M. Dürst, S.L. Stang, J. Stone and R. Wetzker

243–256

Polyamine-modulated c-Myc expression in normal intestinal epithelial cells regulates p21Cip1 transcription through a proximal promoter region <i>Published as BJ Immediate Publication 17 May 2006,</i> doi:10.1042/BJ20060217	L. Liu, X. Guo, J.N. Rao, T. Zou, B.S. Marasa, J. Chen, J. Greenspon, R.A. Casero, Jr and J.-Y. Wang	257-267
The tert-butylhydroquinone-mediated activation of the human thioredoxin gene reveals a novel promoter structure <i>Published as BJ Immediate Publication 22 May 2006,</i> doi:10.1042/BJ20060076	S.A. Osborne, H.-J.K. Hawkes, B.L. Baldwin, K.A. Alexander, T. Svingen, F.M. Clarke and K.F. Tonissen	269-277
Inhibition of MEK/ERK1/2 signalling alters endothelial nitric oxide synthase activity in an agonist-dependent manner <i>Published as BJ Immediate Publication 23 May 2006,</i> doi:10.1042/BJ20060371	J.M. Cale and I.M. Bird	279-288
Nucleotides bind to the C-terminus of CIC-5 <i>Published as BJ Immediate Publication 11 May 2006,</i> doi:10.1042/BJ20060142	L. Wellhauser, H.-H. Kuo, F.L.L. Stratford, M. Ramjee singh, L.-J. Huan, W. Luong, C. Li, C.M. Deber and C.E. Bear	289-294
Lopap, a prothrombin activator from <i>Lonomia obliqua</i> belonging to the lipocalin family: recombinant production, biochemical characterization and structure-function insights <i>Published as BJ Immediate Publication 31 May 2006,</i> doi:10.1042/BJ20060325	C.V. Reis, S.A. Andrade, O.H.P. Ramos, C.R.R. Ramos, P.L. Ho, I. de F.C. Batista and A.M. Chudzinski-Tavassi	295-302
Novel transcripts of <i>Nox1</i> are regulated by alternative promoters and expressed under phenotypic modulation of vascular smooth muscle cells <i>Published as BJ Immediate Publication 26 May 2006,</i> doi:10.1042/BJ20060300	N. Arakawa, M. Katsuyama, K. Matsuno, N. Urao, Y. Tabuchi, M. Okigaki, H. Matsubara and C. Yabe-Nishimura	303-310
Phosphorylation of hepatitis B virus Cp at Ser ⁸⁷ facilitates core assembly <i>Published as BJ Immediate Publication 2 June 2006,</i> doi:10.1042/BJ20060347	H.Y. Kang, S. Lee, S.G. Park, J. Yu, Y. Kim and G. Jung	311-317



279-288



295-302



303-310

Editorial Advisory Panel

M. Abrahamson (Lund)

L. Agius (Newcastle upon Tyne)

P. Aisen (New York)

A. Aitken (Edinburgh)

B. Akerström (Lund)

S. Alexson (Huddinge)

L. Alhonen (Kuopio)

B. Allen (Montréal)

A. Aplin (Albany, NY)

B. Ashby (Philadelphia)

K. S. Authi (London)

A. J. Baines (Canterbury)

F. A. Barr (Martinsried)

M. P. Barrett (Glasgow)

G. J. Barritt (Adelaide)

C. H. Barton (Southampton)

J. F. Bateman (Parkville)

G. Baverel (Lyon)

I. Behrmann (Luxembourg)

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)

D. J. Blackbourn (Birmingham)

G. E. Blair (Leeds)

G. B. Bolger (Birmingham, AL)

R. A. Bonomo (Cleveland, OH)

A. R. Boobis (London)

M. D. Bootman (Cambridge)

K. M. Botham (London)

E. Brailoiu (Philadelphia)

S. Bratton (Austin, TX)

D. Brdliczka (Konstanz)

R. G. Brennan (Portland, OR)

D. N. Brindley (Edmonton, Alb.)

K. Brocklehurst (London)

S. Broer (Canberra)

A. Brown (Sydney)

G. Brown (Birmingham)

H. Brumer (Stockholm)

U. T. Brunk (Linkoping)

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)

R. A. J. Challiss (Leicester)

L. Chamberlain (Glasgow)

K. E. Chapman (Edinburgh)

A. Chariot (Liege)

Y. Chen (Indianapolis)

C. H. K. Cheng (Hong Kong)

R. Chiesa (Milan)

A. K. Choudhury (Rochester, MN)

U. Christensen (Copenhagen)

M. C. M. Chung (Singapore)

A. C. Clark (Raleigh, NC)

P. Codogno (Villejuif)

P. Cohen (Dundee)

S. J. Cook (Cambridge)

J. R. Coorsen (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. Cuevza (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. V. Dekker (Cambridge)

A. DeLong (Providence, RI)

N. Demaurex (Geneva)

Q. Deveraux (San Diego)

J. Ding (Shanghai)

C. Dingwall (Newcastle upon Tyne)

F. E. Domann (Iowa City)

D. Donner (San Francisco)

C. J. Dorman (Dublin)

K. T. Douglas (Manchester)

S. Dove (Birmingham)

C. P. Downes (Dundee)

J. A. Downs (Cambridge)

A. Draeger (Bern)

K. Drickamer (London)

M. A. Driscoll (Piscataway, NJ)

B. K. Drøbak (Norwich)

R. M. Drummond (Glasgow)

M. Duchen (London)

M. J. Dufton (Glasgow)

J. M. Edwardson (Cambridge)

L. Ellerby (Novato)

E. Ellis (Glasgow)

A. P. Enyedi (Budapest)

P. M. Epstein (Farmington)

F. Erdodi (Debrecen)

C. Erneux (Brussels)

T. Feizi (London)

S. Ferguson-Miller (East Lansing, MI)

L. M. Field (Harpden)

M. C. Field (Cambridge)

L. M. Fisher (London)

P. R. Flatt (Coleraine)

D. R. Flower (Newbury)

G. Forloni (Milan)

F. Foufelle (Paris)

K. R. Fox (Southampton)

M. S. Francis (Umeå)

P. Fuentes-Prior (Barcelona)

C. G. Gahmberg (Helsinki)

J. T. Gallagher (Manchester)

T. Galli (Paris)

J. C. Garcia-Barrón (Murcia)

K. D. Garlid (Portland, OR)

B. Garner (Sydney)

M. Gassman (Zurich)

K. Gaus (Sydney)

B. Geiger (Rehovot)

V. Gerke (Muenster)

J. D. Gitlin (St Louis, MO)

D. E. Goll (Tucson, AZ)

A. Gomez-Muñoz (Bilbao)

M. Goppelt-Streube (Erlangen)

R. A. Gottlieb (La Jolla)

G. W. Gould (Glasgow)

I. Gout (London)

L. Graeve (Stuttgart)

J. C. Gray (Cambridge)

J. E. Gray (Sheffield)

N. K. Gray (Edinburgh)

A. W. Griffioen (Maastricht)

S. Grinstein (Toronto)

T. Grune (Dusseldorf)

D. Guerini (Basel)

S. J. Gunst (Indianapolis)

A. H. Guse (Hamburg)

A. P. 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)

B. Henrissat (Marseille)

T. P. Herbert (Leicester)

K. Heremans (Leuven)

A. C. Herrington (Brisbane)

H. Hiasa (Minneapolis)

K. Hincliffe (Manchester)

J. A. Hiscox (Leeds)

M. Hodgkin (Coventry)

K. Hoebe (La Jolla)

J.-H. S. Hofmeyr (Matieland)

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)

W. Hunziker (Singapore)

I. Hussain (Harlow)

J. C. Hutton (Denver)

E. I. Hyde (Birmingham)

Y. Ikebara (Fukuoka)

R. A. Iles (London)

A. Imberty (Grenoble)

G. B. Irvine (Belfast)

R. E. Isaac (Leeds)

C. M. Isacke (London)

H. Ischiropoulos (Philadelphia, PA)

T. Ishikawa (Yokohama)

P. B. Ilyedjian (Geneva)

E. L. Jacobson (Tucson, AZ)

K. H. Jakobs (Essen)

P. Jameson (Christchurch)

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. J. Kemp (Liverpool)

P. J. Kennelly (Blacksburg, VA)

A. J. Kettnerman (Nakhon Pathom)

S. Keyse (Dundee)

M. R. Kini (Singapore)

T. M. Kitson (Palmerston North)

L. Kljellen (Uppsala)

E. Klipp (Berlin)

E. Knecht (Valencia)

W. Kolch (Glasgow)

O. A. Kost (Moscow)

Y. Kuroki (Sapporo)

J. Kuznicki (Warsaw)

J. Kwon (Seoul)

E. W. Lam (London)

S. Lamande (Parkville, Vic.)

D. A. Lane (London)

M. Laurent (Orsay)

D. S. Leake (Reading)

A. LeBlanc (Quebec)

P. Lefebvre (Lille)

M. Leippe (Kiel)

P. J. Lenting (Utrecht)

C. C. Leslie (Denver)

T. Levade (Toulouse)

R. E. Lewis (Omaha, NE)

R. Lightowers

(Newcastle upon Tyne)

J. R. Lillehaug (Bergen)

K. A. Lillycrop (Southampton)

J. S. Lindsey (Pullman, WA)

J. M. Lord (Coventry)

P. S. Lorenzo (Honolulu)

M. Lowe (Manchester)

A. Luckhoff (Aachen)

R. Ludowyke (Sydney)

K. A. Lukyanov (Moscow)

P. A. Lund (Birmingham)

M. Lyon (Manchester)

J. A. MacDonald (Calgary)

D. J. MacEwan (Norwich)

L. Mach (Vienna)

J. Mackrill (Cork)

G. Maga (Pavia)

A. I. Magee (London)

C. C. Malbon (Stony Brook, NY)

W. A. Maltese (Toledo, OH)

J. P. G. Maithouse (Dublin)

V. Mamidipudi (Stanford, CA)

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. Metzen (Luebeck)

D. J. Meyer (London)

A. H. Millar (Crawley, West. Aus.)

J. L. A. Mitchell (DeKalb, IL)

V. Mizrahi (Johannesburg)

H. Y.-K. Mok (Singapore)

G. Molle (Montpellier)

G. B. Moorhead (Calgary)

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)
T. J. T. Pinheiro (Warwick)
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. G. Print (Auckland)
I. Prior (Liverpool)
C. A. Pritchard (Leicester)
D. Prokopp (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)
E. L. Raven (Leicester)
J. A. Raven (Dundee)
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)

D. J. Riese (West Lafayette, IN)
K. Rittinger (London)
J. D. Robertson (Kansas City)
N. J. Robinson (Newcastle)
H. L. Roderrick (Cambridge)
L. Rönstrand (Malmö)
G. Rotilio (Rome)

J.-M. Sabatier (Marseille)
D. B. Sacks (Boston, MA)
P. Saftig (Kiel)
J. P. Salier (Rouen)
C. M. Sanderson (Cambridge)
M. F. G. Schmidt (Berlin)
M. L. Schmitz (Bern)
L. Schomburg (Berlin)
N. S. Scrutton (Leicester)
A. W. Segal (London)
Y. Shai (Rehovot)
L. M. Shantz (Hershey, PA)
S. B. Shears (Research Triangle Park, NC)
D. Sheehan (Cork)
T. Shimizu (Aoba-ku)
Y. Shimomura (Nagoya)
P. Shore (Manchester)
K. Siddle (Cambridge)
L. Sistonen (Turku)
F. M. Sladek (Riverside, CA)
A. G. Smith (Leicester)
D. M. Smith (Macclesfield)
M. Soberon (Cuernavaca)
M. Solioz (Bern)
S. Soucheinlytskyi (Uppsala)
S. Spadari (Pavia)
J. Spencer (Bristol)
F. Spener (Graz)
C. Springer (Sutton)
M. J. R. Stark (Dundee)
H. Stennicke (Bagsvaerd)
W. Stöcker (Mainz)
A. Y. Strongin (La Jolla, CA)
G. J. Strous (Utrecht)
T. W. Sturgill (Charlottesville)

K. E. Suckling (Stevenage)
A. Surolia (Bangalore)
C. Sutherland (Dundee)
B. Svensson (Kngs. 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)
J. Tovar-Torres (Egham)
P. Trayhurn (Liverpool)
G. C. Tsokos (Silver Spring, MD)
J. E. 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)
K. Venkateswarlu (Bristol)
G. Verhoeven (Leuven)
H. Vidal (Lyon)
J. H. Viles (London)
F. Villarroyna (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)
G. Werner-Felmayer (Innsbruck)
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)
S. G. Withers (Vancouver)
R. Wojcikiewicz (Syracuse, NY)
P. Wojtaszek (Poznań)
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)
J. Yim (Seoul)
I. S. Young (Belfast)
L. S. Young (Birmingham)
S. P. Young (Birmingham)
D. I. Yule (Rochester, NY)

I. Zachary (London)
R. Zamyska (London)
J. M. Zapata (La Jolla)
J. Zhang (Warwick)
Z. Zhang (Hunan)
X.-L. Zheng (Calgary)
M. Ziegler (Bergen)

Index of Authors

	PAGE		PAGE		PAGE	
Alexander, K. A.	269	Guo, X.	257	Marasa, B. S.	257	Stang, S. L.
Andrade, S. A.	295	Gupta, P.	207	Martínez-Balbás, M. A.	215	Stone, J.
Arakawa, N.	303			Matsubara, H.	303	Stratford, F. L. L.
Baldwin, B. L.	269	Hansen, J. B.	153	Matsuno, K.	303	Suzuki, I.
Barreto, L.	187	Hawkes, H.-J. K.	269	Murata, N.	207	Svingen, T.
Batista, I. de F. C.	295	Heiner, I.	225	Ohtani, S.	207	Tabuchi, Y.
Bear, C. E.	289	Herrero, E.	187	Okigaki, M.	303	Tamarit, J.
Beer, K.	243	Ho, P. L.	295	Oliva, J. L.	215	Tonissen, K. F.
Bird, I. M.	279	Hsueh, C.-C.	177	Osborne, S. A.	269	
		Huan, L.-J.	289			Urao, N.
Cale, J. M.	279	Jung, G.	311	Park, S. G.	311	
Casero, Jr, R. A.	257	Jüngling, E.	225	Piedrafita, L.	187	Valls, E.
Chen, D.	169			Prakash, J. S. S.	207	
Chen, J.	257	Kang, H. Y.	311	Radukina, N.	225	Wang, J.-Y.
Cheng, Y.-C.	177	Katsuyama, M.	303	Ramjeesingh, M.	289	Warnstedt, M.
Chintalapati, S.	207	Kim, Y.	311	Ramos, C. R. R.	295	Weilhauser, L.
Chudzinski-Tavassi, A. M.	295	Kristiansen, K.	153	Ramos, O. H. P.	295	Wetzker, R.
Clarke, F. M.	269	Kuo, H.-H.	289	Rao, J. N.	257	Wittig, U.
Davies, M. J.	197			Reis, C. V.	295	
Deber, C. M.	289	Lee, S.	311	Rennert, K.	243	Xu, K.
Dunlop, R. A.	197	Li, C.	289	Rodgers, K. J.	197	
Dürst, M.	243	Li, J.	233	Rojas, J. M.	215	Yabe-Nishimura, C.
		Liao, T.-H.	177	Rubio, I.	243	Yu, J.
Eisfeld, J.	225	Liu, J.	233			
		Liu, L.	257	Sakamoto, T.	207	Zeng, J.
Garcerá, A.	187	Lu, S.-C.	177	Sánchez-Molina, S.	215	Zhang, H.
García-Vargas, S.	215	Lückhoff, A.	225	Shi, Y.	169	Zhang, X.-Y.
Greenspon, J.	257	Luong, W.	289	Shivaji, S.	207	Zou, T.