

THE BIOCHEMICAL JOURNAL

Volume 208, No. 1

15 October 1982



London: The Biochemical Society © 1982

Editorial and Publishing Offices

The Biochemical Journal,
7 Warwick Court,
London WC1R 5DP, U.K.

Subscription Department

The Biochemical Society Book Depot,
P.O. Box 32, Commerce Way,
Colchester CO2 8HP, Essex, U.K.

The Biochemical Journal is published and distributed by the Biochemical Society. It is published twice monthly, alternate issues being devoted to **Molecular Aspects** and to **Cellular Aspects** of biochemistry. It is planned that in 1983 eight volumes, each volume being made up of three issues, will be published.

Subscription Rates to the Biochemical Journal. For non-members of the Biochemical Society the subscription rates for 1983 are shown below.

Subscribers to the *Biochemical Journal* can subscribe additionally to *Biochemical Society Transactions* on a joint subscription, saving £15.00 (U.K. and Overseas) or \$25.00 (N. America). The methods of despatch of both publications are shown below.

Terms are cash with order (£ sterling for subscribers other than in North America or U.S. \$ equivalent at current rate of exchange) or against proforma invoice. Orders and subscriptions should be sent to the address above, or through your usual agent.

	U.K. & Overseas	U.S.A., Canada & Mexico
1 year (8 volumes)	£405	U.S. \$860
Per volume	£52	U.S. \$110
Per part	£19	U.S. \$40
		(includes surcharge for Accelerated Surface Post)
1 year (8 volumes)	Japan only £440	
Per volume	£56	
Per part	£20	

Airfreight to U.S.A., Canada and Mexico. The subscription rates for North America include an element for this service.

Microforms. (a) Microfilm (35mm): Volumes 1–101. (b) Microfiche (98-image): Volumes 102–200.

Details are available from the Society's Colchester office.

Advertisements. Applications for advertising space should be sent to the Advertising Department at the Society's London address above. Copy is required eight weeks before publication date. Rate cards are available on request.

Second-class postage paid at New York, NY, U.S.A.

EDITORIAL BOARD

Chairman

C. I. Pogson

Deputy Chairmen

A. J. Kenny
A. J. Cornish-Bowden
J. A. Lucy
D. N. Brindley
P. J. Garlick

P. M. Bayley

W. J. Brammar
J. W. Bridges
K. Brocklehurst
M. J. Clemens
B. A. Cooke
N. Crawford
R. T. Dean
P. C. Engel
J. E. Fothergill

D. E. Griffiths
B. A. Haddock
J. L. Harwood
F. W. Hemming
M. D. Houslay
L. Hue
O. T. G. Jones
J. E. Kay
P. F. Knowles
P. Lund
R. M. Marchbanks
G. Murphy
N. B. Myant
K. B. M. Reid
G. C. K. Roberts
J. E. Scott
M. J. A. Tanner
P. Tulkens
J. E. Walker
R. T. Walker

The Editorial Board includes two members nominated by the British Biophysical Society

Editorial Manager

A. G. J. Evans

Editorial Secretary

A. S. Beedle

Instructions to Authors. The *Policy of the Journal and Instructions to Authors* appeared in *Biochem. J.* (1981) 193, 1–27. A summarized version appears in part 2 of each volume.

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 the prior permission of the copyright owner.

PHOTOCOPYING

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made in the U.S.A. for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per-copy fee through the Copyright Clearance Center Inc. (P.O. Box 765, Schenectady, New York 12301, U.S.A.) for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale.

THE BIOCHEMICAL SOCIETY

OFFICERS AND
COMMITTEE, 1982-83

Chairman of the Committee
S. V. Perry, F.R.S.

Treasurer
B. Spencer

General Secretary
D. Robinson

Publications Secretary
G. B. Ansell

Meetings Secretary
R. H. Burdon, F.R.S.E.

Committee
M. Akhtar, F.R.S.

P. Banks

N. H. Carey

K. S. Dodgson

T. J. Franklin

J. L. Harwood

J. A. Lucy

P. Lund

R. D. Marshall

J. Mowbray*†

R. N. Perham

C. F. Phelps

C. I. Pogson*†

P. J. Quinn

K. F. Tipton

A. R. Williamson

Executive Secretary
A. I. P. Henton

* Ex officio Member of Committee

† Representative of Editorial Board of the *Biochemical Journal*

‡ Representative of Group Secretaries

The Biochemical Society exists to advance the science of biochemistry through meetings and publications. Several meetings a year are held, each at a different place; original papers are presented and special topics are discussed at symposia and colloquia. Persons interested in biochemistry are eligible for election as Members. Details of further facilities accorded to Members, and forms of application for membership, are available from the Executive Secretary, The Biochemical Society, 7 Warwick Court, London WC1R 5DP [01-242 1076 (4 lines)].

MICROFILM AND MICROFICHE

Part I: MICROFILM

The Biochemical Journal, Volumes 1 to 101, is currently available on microfilm (size 35 mm).

				£	p	U.S.\$
Set no. 1	1906-1925 inclusive	Volumes 1-19	(19 reels)	145.00		330.00
Set no. 2	1926-1937 inclusive	Volumes 20-31	(22 reels)	165.00		380.00
Set no. 3	1938-1950 inclusive	Volumes 32-47	(21 reels)	158.00		365.00
Set no. 4	1951-1958 inclusive	Volumes 48-70	(24 reels)	180.00		415.00
Set no. 5	1959-1963 inclusive	Volumes 71-89	(21 reels)	90.00		210.00
Set no. 6	1964-1966 inclusive	Volumes 90-101	(12 reels)	90.00		210.00

Individual reels may be purchased at £10.00 (U.S.\$22.00) per reel. Complete run: Sets 1-6, less 10%.

Part II: MICROFICHE

The Biochemical Journal, Volumes 102-200 (with indexes), is currently available on microfiche (of archival quality, silver positive, 98-image format).

Year	Volumes	Subscribers to printed journal		Non-subscribers	
		£	p	£	p
1967					
to 1973	Each year (complete)	30.00		70.00	35.00
1974/5	Each year (complete)	40.00		95.00	50.00
1976/7	Each year (complete)	50.00		110.00	100.00
1978	169-176	68.00		145.00	110.00
1979	177-184	68.00		145.00	110.00
1980	185-192	98.00		220.00	135.00
1981	193-200	120.00		260.00	160.00

Complete run, 1967-1981 (99 volumes): £670.00 (U.S.\$1500.00) to subscribers to printed journal; £950.00 (U.S.\$2090.00) to non-subscribers.

Postage and packing *free* by surface mail. Air-mail £3.00 (U.S.\$7.00) extra for each year.

**The Biochemical Society Book Depot, P.O. Box 32,
Commerce Way, Colchester CO2 8HP, U.K.**

NOTICE TO LIBRARIANS

Indexes. Volume indexes were discontinued at the beginning of 1981. Annual indexes will be supplied to subscribers as soon as possible after the end of each year.

Preliminary pages. Volume preliminary pages (previously supplied at the end of part 3 of each volume) were discontinued from volume 195. The preliminary pages in each issue have been rearranged and paginated so that they can be assembled to give a set of volume preliminary pages; page (i) is the volume title page supplied with part 1 of each volume.

THE BIOCHEMICAL JOURNAL

CELLULAR ASPECTS

VOLUME 208

1982

EDITORIAL BOARD

Chairman

C. I. Pogson

Deputy Chairmen

A. J. Kenny

A. J. Cornish-Bowden

J. A. Lucy

D. N. Brindley

P. J. Garlick

Editorial Manager

A. G. J. Evans

P. M. Bayley

W. J. Brammar

J. W. Bridges

K. Brocklehurst

M. J. Clemens

B. A. Cooke

N. Crawford

R. T. Dean

P. C. Engel

J. E. Fothergill

D. E. Griffiths

B. A. Haddock

J. L. Harwood

F. W. Hemming

M. D. Houslay

L. Hue

O. T. G. Jones

J. E. Kay

P. F. Knowles

P. Lund

R. M. Marchbanks

G. Murphy

N. B. Myant

K. B. M. Reid

G. C. K. Roberts

J. E. Scott

M. J. A. Tanner

P. Tulkens

J. E. Walker

R. T. Walker

Editorial Secretary

A. S. Beedle

The Editorial Board
includes two members
nominated by the British
Biophysical Society



London: The Biochemical Society © 1982

THE BIOCHEMICAL SOCIETY, 7 WARWICK COURT, LONDON WC1R 5DP

ISSN: 0306-3283

INDEX OF AUTHORS

	PAGE		PAGE	PAGE
Allred, J. B.	247	Fuller, S. J.	53	Meats, J. E.
Barter, P. J.	1	Gallagher, J. T.	69	Melnykovych, G.
Bijsterbosch, M. K.	61	Gatehouse, J. A.	119	Mirbahar, R. B.
Birch, B.	89	Gellerfors, P.	77	Møller, J. V.
Blackledge, G.	69	Godfrey, P. P.	153	Moore, P. A.
Bladon, P. T.	179	Goetz, P. G.	231	Morris, A. J.
Bos, G.	27	Goldspink, D. F.	147	Nelson, B. D.
Boulter, D.	119	Goodson, J.	247	Ord, M. G.
Bouma, J. M. W.	61	Gray, S. L.	47	
Bowden, P. E.	179	Gruber, M.	61	
Bown, D.	119			
Brugh, M. R.	159	Haegele, K.	189	Padel, U.
Brunengraber, H.	231	Halestrap, A. P.	221	Paterson, A. R. P.
		Hamann, A.	109	Poli, G.
Calvert, G. D.	1	Hammond, J. R.	83	Ramachandran, C. K.
Caterson, I. D.	53	Heath, J. K.	235	Rand, W. M.
Cheeseman, K. H.	129	Hennemann, G.	27	Randle, P. J.
Chesterton, C. J.	239	Holmsen, H.	9	Russell, R. G. G.
Clanachan, A. S.	83	Hopkins, G. J.	1	
Coleman, R.	153	Houston, J. P.	35	Schwoch, G.
Crawford, A.	35			Seiler, N.
Crowther, D.	69	Isacke, C. M.	235	Sharma, S. K.
Croy, R. R. D.	119	Jarvis, S. M.	83	Sheikh, M. I.
Cummings, B.	141	Kaplan, J.	19	Shidoji, Y.
Cunliffe, W. J.	179	Kaplan, K. L.	9	Silverman-Jones, C. S.
Dabeva, M. D.	101	Kaser, M. R.	141	Slater, T. F.
Dangelmaier, C. A.	9	Kelly, F. J.	147	Söling, H.-D.
Davies, D. R.	171	Khanna, N. C.	43	Stocken, L. A.
De Luca, L. M.	159	Knödgen, B.	189	Tomera, J. F.
Denton, R. M.	221	Krenning, E. P.	27	Turnock, G.
Dianzani, M. U.	129	Kushner, J. P.	19	
Docter, R.	27	Laidman, D. L.	93	Unger, C.
Donner, D. B.	211	Lembra, L.	153	Vargas, A. M.
Dudov, K. P.	101	Lim, L.	199	Vose, B.
Duursma, A. M.	61	Lindén, M.	77	Ward, J. H.
Ebsworth, N. M.	35	MacNeil, S.	35	White, J. O.
Elder, M. G.	199	Mapungwana, S. M.	171	Wiggins, G.
Esterbauer, H.	129	Marr, W.	199	Wood, E. J.
Evans, I. M.	119	McGuire, M. K. B.	35	Wraith, D. C.
Fekkes, D. F.	27			