

# Edited for the British Pharmacological Society by

J.F. Mitchell (*Chairman*)

G.M. Lees (*Secretary*)

Margaret Day (*Press Editor*)

C.V. Wedmore (*Assistant Press Editor*)

## EDITORIAL BOARD

D.J. Back  
Liverpool  
T. Bennett  
Nottingham  
N.J.M. Birdsall  
London  
A.F. Brading  
Oxford  
C.M. Bradshaw  
Manchester  
K.T. Bunce  
Ware  
G. Burnstock  
London  
M.K. Church  
Southampton  
M.G. Collis  
Macclesfield  
G.A. Cottrell  
Fife  
J.A.J.H. Critchley  
Edinburgh  
T.C. Cunnane  
Oxford  
A.C. Dolphin  
London  
W. Feniuk  
Ware  
R.J. Flower  
Bath  
L.G. Garland  
Beckenham  
A.R. Green  
London  
M.C. Harris  
Birmingham  
G. Henderson  
Cambridge  
C.R. Hiley  
Cambridge  
R.G. Hill  
Cambridge  
R.W. Horton  
London  
P.P.A. Humphrey  
Ware  
P.G. Jenner  
London  
Kathleen A. Kane  
Glasgow  
W.A. Large  
London  
D. Lodge  
London

J.C. McGrath  
Glasgow  
A.T. McKnight  
Harlow  
R.J. Marshall  
Newhouse  
S.R. Nahorski  
Leicester  
D.A.A. Owen  
Welwyn Garden City  
C.P. Page  
London  
B.K. Park  
Liverpool  
M.H.T. Roberts  
Cardiff  
P.J. Roberts  
Southampton  
C. Robinson  
Southampton  
M.A. Simmonds  
London  
R.C. Small  
Manchester  
J.M. Sneddon  
London  
M. Spedding  
Edinburgh  
T.L.B. Spriggs  
Cardiff  
I.P. Stolerman  
London  
P.V. Taberner  
Bristol  
D.A. Terrar  
Oxford  
D.R. Tomlinson  
Nottingham  
M.B. Tyers  
Ware  
R.M. Wadsworth  
Glasgow  
D.I. Wallis  
Cardiff  
D.F. Westman  
Sunderland  
B.J.R. Whittle  
Beckenham  
T.J. Williams  
Harrow  
G.N. Woodruff  
Harlow  
J.M. Young  
Cambridge

## CORRESPONDING EDITORS

P.R. Adams  
Stony Brook, U.S.A.  
K.P. Bhargava  
Lucknow, India  
C. Bell  
Melbourne, Australia  
F.E. Bloom  
La Jolla, U.S.A.  
A.L.A. Bours  
Clayton, Australia  
N.J. Dun  
Maywood, U.S.A.  
R.F. Furchgott  
New York, U.S.A.  
T. Godfraind  
Brussels, Belgium  
S.Z. Langer  
Paris, France  
R.J. Miller  
Chicago, U.S.A.  
R.C. Murphy  
Denver, U.S.A.  
E. Muscholl  
Mainz, F.R.G.  
R.A. North  
Portland, U.S.A.  
M. Otsuka  
Tokyo, Japan  
M.J. Rand  
Melbourne, Australia  
S. Rosell  
Södertälje, Sweden  
P. Seeman  
Toronto, Canada  
L. Szekeres  
Szeged, Hungary  
B. Uvnäs  
Stockholm, Sweden  
P.A. Van Zwieten  
Amsterdam, Netherlands  
V.M. Varagich  
Belgrade, Yugoslavia  
G. Velo  
Verona, Italy  
Wang Zhen Gang  
Beijing, China  
M.B.H. Youdim  
Haifa, Israel

Papers will be considered for publication on all aspects of pharmacology, including chemotherapy.

Manuscripts (two copies) should be sent to Dr G.M. Lees, Editorial Office, British Journal of Pharmacology, University of Aberdeen, Marischal College, Aberdeen AB9 1AS. Authors should consult the instructions inside the back cover and Vol. 81, 415-422 (1984).

The *British Journal of Pharmacology* is published monthly by the Scientific & Medical Division, The Macmillan Press Ltd, Houndmills, Basingstoke, Hampshire RG21 2XS. Telephone: Basingstoke 29242. ISSN 0007-1188.

Registered Office: 4 Little Essex Street, London WC2R 3LF.

The journal is covered by *Current Contents* and *Excerpta Medica*.

Annual subscription UK £215. Rest of world, £255 (or equivalent in any other currency). (Orders must be accompanied by remittance. Prices correct at time of publication).

Cheques should be made payable to Macmillan Journals Limited. All circulation, subscription or general enquiries should be sent to: The Macmillan Press Ltd, P.O. Box 500, Leicester, LE99 0AA, UK.

Overseas subscribers may make payments into UK Post Office Giro Account No. 519 2455. Full details must accompany the payment.

Second Class postage paid at New York, NY.  
US Mailing Agent: Expeditors of the Printed Word Ltd, 515 Madison Avenue, New York, NY 10022.

Enquiries concerning advertising space and rates should be addressed to: David R. Guthrie, Advertising Dept., The Macmillan Press Ltd, Brunel Road, Houndmills, Basingstoke, Hampshire, England RG21 2XS. Telephone: 0256 29242 Fax: 0256 479476

Publisher: Harry Holt.  
Production Services: Nigel McNeil-Smith.  
Advertising: David R. Guthrie.  
Promotion: Richard Gedyne.  
Circulation Services: A.L. Clark.

© Copyright: Scientific & Medical Division, The Macmillan Press Ltd, 1988. All rights of reproduction are reserved in respect of all papers, articles, illustrations, etc., published in this journal in all countries of the world.

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by The Macmillan Press Ltd for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of \$1.00 per copy, plus \$0.10 per page is paid directly to CCC, 21 Congress St., Salem, MA 01970, U.S.A.

0007-1188/88 \$1.00 + \$0.10

# MEETINGS CALENDAR

## 28-30 September 1988

**Third International Conference on Drug Absorption**, Edinburgh, Scotland. (Secretariat, EEP Consultants Ltd., 26-28 Albany Street, Edinburgh EH1 3QH).

## 3-5 October 1988

**Second International Conference on the Pharmacology of Cerebral Ischaemia**, Marburg, FRG (Dr. J. Jennings, M & S Conferences Ltd., The Studio, 12 High Street, Wheat-hampstead, Herts., U.K.).

## 3-5 October 1988

**Symposium on Variability in Pharmacokinetics and Drug Response**, Gothenburg, Sweden. (Swedish Academy of Pharmaceutical Sciences, P.O. Box 1136, S-111 81 Stockholm, Sweden.)

## 5-7 October 1988

**International Conference on the Cardiovascular Pharmacology of 5-HT**, Amsterdam, Netherlands. (Dr. P. Bevan, 5-HT Congress, P.O. Box 2, 1380 AA Weesp, The Netherlands.)

## 12-13 November 1988

**Symposium on Nausea and Vomiting: a Multidisciplinary Perspective**, Ottawa, Canada. (Dr. R.K. Harding, Physiology Dept., Ottawa University, 451 Smyth Road, Ottawa, Ontario, K1H 8M5, Canada.)

## 19-21 December 1988

**British Pharmacological Society Winter Meeting**, London, U.K. (Closed meeting for members and guests.)

## 21 December 1988

**Biochemical Society Neurochemical Group Colloquium on Receptor Structure and Gene Expression**, London, U.K. (Dr. E.C. Hulme, NIMR, The Ridgeway, Mill Hill, London NW7 1AA).

## 29 March-1 April 1989

**International Symposium on Serotonin**, Florence, Italy. (Dr. F.M. Maggi, Institute of Pharmacological Sciences, University of Milan, Via Balzaretti 9, 20133 Milan, Italy).

## 2-5 April 1989

**Seventh National Meeting of the Brain Research Association**, Sheffield, U.K. (Dr. N. Payne, Dept. of Anatomy, Sheffield University, Sheffield, U.K.)

## 5-7 April 1989

**British Pharmacological Society Spring Meeting**, Bristol, U.K. (Closed meeting for members and guests.)

## 7 April 1989

**British Pharmacological Society. Symposium on the NMDA Receptor**, Bristol, U.K. (Dr. G.L. Collingridge, Department of Pharmacology, The Medical School, University of Bristol, Bristol, BS8 1TD, U.K.)

## 22-26 May 1989

**Second Meeting of the International Neurotoxicology Association**, Barcelona, Spain. (Dr. E. Rodriguez Farre, Dept. of Pharmacology & Toxicology, CSIC, Jorge Girona Salgado, 18-26, E-08034, Spain).

## 12-14 July 1989

**British Pharmacological Society Summer Meeting**, Leeds, U.K. (Closed meeting for members and guests)

## 16-21 July 1989

**Vth International Congress of Toxicology**, Brighton, U.K. (IUTOX '89, Congress House, 65 West Drive, Sutton, Surrey SH2 7NB, U.K.)

## 13-15 September 1989

**British Pharmacological Society Autumn Meeting**, Manchester, U.K. (Closed meeting for members and guests)

## 3-5 January 1990

**British Pharmacological Society Winter Meeting**, London, U.K. (Closed meeting for members and guests)

## 18-20 April 1990

**British Pharmacological Society Spring Meeting**, Sheffield, U.K. (Closed meeting for members and guests)

## 29 May-1 June 1990

**Fondazione Giovanni Lorenzini Conference on Prostaglandins and Related Compounds**, Florence, Italy (Fondazione Giovanni Lorenzini, Via Monte Napoleone, 23, 20121 Milan, Italy.)

## 1-6 July 1990

**IUPHAR 11th International Congress of Pharmacology**, Amsterdam, Netherlands (Contact to be advised.)

The Indices to Volumes 93 and 94 together with the Cumulative Contents will be published with the December 1988 issue

# British Journal of Pharmacology

VOLUME 95 NUMBER 2 OCTOBER 1988

## SHORT COMMUNICATIONS

- 325 LIM, S.P. & BOLTON, T.B. A calcium-dependent rather than a G-protein mechanism is involved in the inward current evoked by muscarinic receptor stimulation in dialysed single smooth muscle cells of small intestine

## PAPERS

- 329 OKAMOTO, T., KURAHASHI, K. & FUJIWARA, M. Effects of naloxone and opioid agonists on gastric excitatory responses to stimulation of the vagus nerve in cats
- 335 MOLLOY, A.G. & WADDINGTON, J.L. Behavioural responses to the selective D<sub>1</sub>-dopamine receptor agonist R-SK&F 38393 and the selective D<sub>2</sub>-agonist RU 24213 in young compared with aged rats
- 343 SILBERSTEIN, D.J., BOWMER, C.J. & YATES, M.S. Dibromosulphophthalein: its pharmacokinetics and binding to hepatic cytosol proteins in rats with acute renal failure
- 353 CHRISTENSEN, S. & PETERSEN, J.S. Effects of furosemide on renal haemodynamics and proximal tubular reabsorption in conscious rats
- 361 SASSEN, L.M.A., DEN BOER, M.O., RENSEN, R.J., SAXENA, P.R. & VERDOUW, P.D. Bisoprolol improves perfusion of ischaemic myocardium in anaesthetized pigs
- 371 FARMER, S.G., CANNING, B.J. & WILKINS, D.E. Adenosine receptor-mediated contraction and relaxation of guinea-pig isolated tracheal smooth muscle: effects of adenosine antagonists
- 379 STEWART, A.G. & PIPER, P.J. Vasodilator actions of acetylcholine, A23187 and bradykinin in the guinea-pig isolated perfused heart are independent of prostacyclin
- 385 LI, C., MAJEWSKI, H. & RAND, M.J. Facilitation of noradrenaline release from sympathetic nerves in rat anococcygeus muscle by activation of prejunctional  $\beta$ -adrenoceptors and angiotensin receptors
- 393 YANAGISAWA, T., HASHIMOTO, H. & TAIRA, N. The negative inotropic effect of nicorandil is independent of cyclic GMP changes: a comparison with pinacidil and cromakalim in canine atrial muscle
- 399 EBNER, F. & SIEGL, H. Diffusion characteristics dissociate ouabain binding from inotropic effect in guinea-pig myocardium
- 405 AL-DAMLUJI, S., ROSS, G., TOUZEL, R., PERRETT, D., WHITE, A. & BESSER, G.M. Modulation of the actions of tyrosine by  $\alpha_2$ -adrenoceptor blockade
- 413 BELVISI, M.G., CHUNG, K.F., JACKSON, D.M. & BARNES, P.J. Opioid modulation of non-cholinergic neural bronchoconstriction in guinea-pig *in vivo*

- 419 ANDRIANTSITOHAINA, R. & STOCLET, J.C. Potentiation by neuropeptide Y of vasoconstriction in rat resistance arteries
- 429 BREGESTOVSKI, P., BAKHRAMOV, A., DANILOV, S., MOLDOBAEVA, A. & TAKEDA, K. Histamine-induced inward currents in cultured endothelial cells from human umbilical vein
- 437 ROBERTS, M.H.T., DAVIES, M., GIRDLESTONE, D. & FOSTER, G.A. Effects of 5-hydroxytryptamine agonists and antagonists on the responses of rat spinal motoneurons to raphe obscurus stimulation
- 449 FEUERSTEIN, T.J., HEDLER, L., JACKISCH, R. & HERTTING, G. An *in vitro* model of 1-methyl-4-phenyl-pyridinium (MPP<sup>+</sup>) toxicity: incubation of rabbit caudate nucleus slices with MPP<sup>+</sup> followed by biochemical and functional analysis
- 459 HISAYAMA, T., SHINKAI, M., TAKAYANAGI, I., MORIMOTO, S.I. & ISHIDA, K. Mechanism of action of nicotine in isolated iris sphincter preparations of rabbit
- 465 HISAYAMA, T., SHINKAI, M., TAKAYANAGI, I. & TOYODA, T. Mechanism of action of nicotine in isolated urinary bladder of guinea-pig
- 473 DALY, C.J., McGRATH, J.C. & WILSON, V.G. An examination of the postjunctional  $\alpha$ -adrenoceptor subtypes for (-)-noradrenaline in several isolated blood vessels from the rabbit
- 485 DALY, C.J., McGRATH, J.C. & WILSON, V.G. Pharmacological analysis of postjunctional  $\alpha$ -adrenoceptors mediating contractions to (-)-noradrenaline in the rabbit isolated lateral saphenous vein can be explained by interacting responses to simultaneous activation of  $\alpha_1$ - and  $\alpha_2$ -adrenoceptors
- 501 DALY, C.J., DUNN, W.R., McGRATH, J.C. & WILSON, V.G. An attempt at selective protection from phenoxybenzamine of postjunctional  $\alpha$ -adrenoceptor subtypes mediating contractions to noradrenaline in the rabbit isolated saphenous vein
- 512 AKBARALI, H.I., BIEGER, D. & TRIGGLE, C.R. Inhibition of field stimulation-evoked relaxations in rat oesophageal smooth muscle by the calcium antagonist PN 200-110
- 519 AKBARALI, H.I., BIEGER, D., OHIA, S.E. & TRIGGLE, C.R. Similarity of relaxations evoked by BRL 34915, pinacidil and field-stimulation in rat oesophageal tunica muscularis mucosae
- 526 TSUDA, Y., OYAMA, Y., CARPENTER, D.O. & AKAIKE, N. Effects of Ca<sup>2+</sup> on the transient outward current of single isolated *Helix* central neurones
- 531 SCHOEFFTER, P., DION, R. & GODFRAIND, T.

continued on inside back cover

- Modulatory role of the vascular endothelium in the contractility of human isolated internal mammary artery
- 544 LU, W., OKAMURA, T., BIAN, K., INATOMI, A. & TODA, N. Prostaglandins involved in contractions by angiotensin II and bradykinin of isolated dog sphincter pupillae
- 551 WEBBER, S.E., SALONEN, R.O. & WIDDICOMBE, J.G. H<sub>1</sub>- and H<sub>2</sub>-receptor characterization in the tracheal circulation of sheep
- 562 JACQUES, C.A.J., SPUR, B.W., CREA, A.E.G. & LEE, T.H. The contractile activities of lipoxin A<sub>4</sub> and lipoxin B<sub>4</sub> for guinea-pig airway tissues
- 569 LEFF, P. & MARTIN, G.R. Differences in agonist dissociation constant estimates for 5-HT at 5-HT<sub>2</sub>-receptors: a problem of acute desensitization?
- 578 SHAW, J.S., ROURKE, J.D. & BURNS, K.M. Differential sensitivity of antinociceptive tests to opioid agonists and partial agonists
- 585 FLETCHER, E.J., MARTIN, D., ARAM, J.A., LODGE, D. & HONORÉ, T. Quinoxalinediones selectively block quisqualate and kainate receptors and synaptic events in rat neocortex and hippocampus and frog spinal cord *in vitro*
- 598 HEWSON, G., LEIGHTON, G.E., HILL, R.G. & HUGHES, J. Quipazine reduces food intake in the rat by activation of 5-HT<sub>2</sub>-receptors
- 605 JULOU-SCHAEFFER, G. & FRESLON, J.L. Effects of ryanodine on tension development in rat aorta and mesenteric resistance vessels
- 614 BORCHGREVINK, P.C. & RYAN, M.P. Effects of magnesium, ouabain and bumetanide on <sup>86</sup>rubidium uptake in a human atrial cell line
- 619 ALOSACHIE, I. GODFRAIND, T. The modulatory role of vascular endothelium in the interaction of agonists and antagonists with  $\alpha$ -adrenoceptors in the rat aorta
- 630 CHRISTIE, M.I. & LEWIS, M.J. Vascular smooth muscle sensitivity to endothelium-derived relaxing factor is different in different arteries
- 637 RALEVIC, V. & BURNSTOCK, G. Actions mediated by P<sub>2</sub>-purinoceptor subtypes in the isolated perfused mesenteric bed of the rat
- 646 RANDALL, M.D., KAY, A.P. & HILEY, C.R. Endothelium-dependent modulation of the pressor activity of arginine vasopressin in the isolated superior mesenteric arterial bed of the rat
- 653 HOYLE, C.H.V., VLADIMIROVA, I.A. & BURNSTOCK, G. Pre- and postjunctional actions of purine and xanthine compounds in the guinea-pig caecum circular muscle
- 664 CORDER, R. & WITHRINGTON, P.G. A comparison of the differential effects of vasoactive intestinal peptide and peptide histidine isoleucine on the vascular and capsular smooth muscle of the dog spleen

#### MEETINGS CALENDAR

The Indices to Volumes 93 and 94 together with the Cumulative Contents will be published with the December 1988 issue