### 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**

N.J.M. Birdsall London A.T. Birmingham

Nottingham A.G.H. Blakelev Leicester

N.G. Bowerv London

C.M. Bradshaw Manchester

Julia Buckingham London

J.B. Caldwell

London **B.A. Callingham** 

Cambridge J.A.J.H. Critchley Edinburgh

Maureen M. Dale London

J.C. Foreman London

M.C. Harris Birmingham

G. Henderson Cambridge

C.R. Hiley Cambridge

R.G. Hill Cambridge

J.R.S. Hoult London

P.P.A. Humphrey

Ware L. Iversen

Hoddesdon D.H. Jenkinson

London P.G. Jenner

London W.E. Lindup

Liverpool

R. McBurney Newcastle

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

The British Journal of Pharmacology is published monthly by 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

Manuscripts (two copies) should be sent to Dr G. M. Lees, Editorial Office, University of Aberdeen, Marischal College, Aberdeen AB9 1AS. Authors should consult the instructions inside the back cover

Annual subscription UK £145.00; USA & Canada, US \$360, Airmail US \$440; Rest of world, £160, Airmail £210 (or equivalD.S. McQueen

Edinburah

C.A. Marsden Nottingham

I. Marshall

London

R.J. Marshall Newhouse

S Moncada

Beckenham

T.C. Muir Glasgow

M.E. Parsons

Welwyn Garden City

Priscilla J. Piper London

N.L. Povser

Edinburgh T.W. Robbins

Cambridge G.C.K. Roberts

London

T.L.B. Spriggs Cardiff T.W. Stone

London E. Szabadi

Manchester D.R. Tomlinson

Nottingham

E.M. Vaughan Williams Oxford

R.M. Wadsworth Glasgow

D I Wallis

Cardiff D.F. Weetman

Sunderland P.G. Withrington

London G.N. Woodruff

Hoddesdon

#### CORRESPONDING EDITORS

P.R. Adams

Galveston, U.S.A.

J. Axelrod

Bethesda, U.S.A. C. Bell

Melbourne, Australia

F.E. Bloom

La Jolla, U.S.A.

A L A Roura

Clavton, Australia

P.B. Dews

Boston, U.S.A.

T. Godfraind

Brussels, Belgium

L.I. Goldberg

Chicago, U.S.A. S.Z. Langer

Paris, France

R.A. Lewis

Harvard, U.S.A.

E. Muscholl

Mainz, Germany M. Otsuka

Tokyo, Japan

R.H. Roth

New Haven, U.S.A. M. Schachter

Alberta, Canada

S.H. Snyder

Baltimore, U.S.A.

L. Szekeres

Szeged, Hungary

B. Uvnas

Stockholm, Sweden

P.A. Van Zwieten

Amsterdam, Netherlands G. Velo

Verona, Italy M.B.H. Youdim

Haifa, Israel

ent in any other currency). (Orders must be accompanied by remittance. Prices correct at time of publication.)

Cheques should be made payable to Macmillan Press Limited: Subscription Department, Brunel Road, Basingstoke, Hampshire RG21 2XS, England.

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,

US Mailing Agent: Expeditors of the Printed Word, Inc., Suite 1217, 527 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.

Copyright: Scientific & Medical Division, The Macmillan Press Ltd, 1984. 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, pro-vided 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, USA

0007 - 1188/84 \$1.00 + \$0.10

# **British Journal of Pharmacology**

#### CONTENTS

#### **VOLUME 82 NUMBER 1 MAY 1984**

- 3 BOURA, A.L.A. & SVOLMANIS, A.P. Converting enzyme inhibition in the rat by captopril is accompanied by potentiation of carrageenin-induced inflammation
- 9 DOCHERTY, J.R. & McGRATH, J.C. The actions of cirazoline on the rat vas deferens
- 15 DOCHERTY, J.R. An investigation of presynaptic α-adrenoceptor subtypes in the pithed rat heart and in the rat isolated vas deferens
- 25 MACDONALD, A. & McGRATH, J.C. Post-natal development of functional neurotransmission in rat vas deferens
- 35 BUENO, L, FARGEAS, M.J., FIORAMONTI J. & HONDE, C. Effects of dopamine and bromocriptine on colonic motility in dog
- 43 PRIMOR, N. Pardaxin produces postjunctional muscle contraction in guinea-pig intestinal smooth muscle
- 51 HOF, R.P. The calcium antagonists PY 108-068 and verapamil diminish the effects of angiotensin II: sites of interaction in the peripheral circulation of anaesthetized cats
- 61 BRAMMER, J.P. & MAGUIRE, M.H. Arachidonate metabolism, 5-hydroxytryptamine release and aggregation in human platelets activated by palmitaldehyde acetal phosphatidic acid
- 73 KOMORI, S. & OHASHI, H. Presynaptic, muscarinic inhibition of non-adrenergic, non-cholinergic neuromuscular transmission in the chicken rectum
- 85 NORTH, R.A. & TOKIMASA, T. The time course of muscarinic depolarization of guinea-pig myenteric neurones
- 93 CHERUBINI, E. & NORTH, R.A. Actions of γaminobutyric acid on neurones of guinea-pig myenteric plexus
- 101 CHERUBINI, E. & NORTH, R.A. Inhibition of calcium spikes and transmitter release by γ-aminobutyric acid in the guinea-pig myenteric plexus
- 107 BEST, R., LEWIS, D. A. & NASSER, N. The antiulcerogenic activity of the unripe plantain banana (Musa species)
- 117 HINTZE, T.H., KALEY, G. & PANZENBECK, M.J. Mechanisms of reflex bradycardia and hypotension by metabolites of arachidonic acid in the cat

- 127 PACIOREK, P.M., PIERCE, V., SHEPPERSON, N.B. & WATERFALL, J.F. An investigation into the selectivity of a novel series of benzoquinolizines for α<sub>2</sub>-adrenoceptors in vivo
- 135 HERZIG, S. & MOHR, K. Action of ouabain on rat heart: comparison with its effect on guinea-pig heart
- 143 CEÑA, V., GARCIA, A.G., GONZALEZ-GARCIA, C. & KIRPEKAR, S.M. Orthograde and retrograde axonal transport of calmodulin in a cat noradrenergic neurone
- 151 BODEN, R., BOTTING, R., COULSON, P. & SPANSWICK, G. Effect of nonselective and selective inhibitors of monoamine oxidases A and B on pethidine toxicity in mice
- 155 CUSACK, N.J. & HOURANI, S.M.O. Some pharmacological and biochemical interactions of the enantiomers of adenylyl 5'-(β, γ-methylene)-diphosphonate with the guinea-pig urinary bladder
- 161 HOURANI, S.M.O. Desensitization of the guinea-pig urinary bladder by the enantiomers of adenylyl 5'-(β,γmethylene)-diphosphonate and by substance P
- 165 FOY, J.M. & NUHU, S.Z. Effect of burnetanide, frusemide and prostaglandin E<sub>2</sub> on the isolated perfused kidney of rat and rabbit
- 175 IZUMI, H. Release of kallikrein-like esterase and tonin from dispersed cells of the rat submandibular gland
- DEMENEIX, B.A., DESAULLES, E., FELTZ, P. & LOEFFLER, J-P. Dual population of GABA<sub>A</sub> and GABA<sub>B</sub> receptors in rat pars intermedia demonstrated by release of αMSH caused by barium ions
- 191 NORTHOVER, B.J. Alterations to the electrical activity of atrial muscle isolated from the rat heart, produced by exposure in vitro to amiodarone
- 199 BARBIERI, E.J., BOBYOCK, E., CHERNICK, W.S. & McMICHAEL, R.F. The calcium dependency of mucus glycoconjugate secretion by canine tracheal explants
- 207 ANDERSSON, P. & BERGSTRAND, H. Changes in bronchial anaphylactic reactivity induced in guinea-pigs by long-term treatment with histamine H<sub>2</sub>-agents
- 217 SARIA, A. Substance P in sensory nerve fibres contributes to the development of oedema in the rat hind paw after thermal injury

- 223 BRÜCKNER, R. & SCHOLZ, H. Effects of α-adrenoceptor stimulation with phenylephrine in the presence of propranolol on force of contraction, slow inward current and cyclic AMP content in the bovine heart
- 233 CLARKE, P.B.S. & KUMAR, R. Some effects of nicotine on food and water intake in undeprived rats
- 241 VARMA, D.R. & YUE, T.L. Influence of age, sex, pregnancy and protein-calorie malnutrition on the pharmacokinetics of salicylate in rats
- 249 ARCHER, T., JONSSON, G. & ROSS, S.B. A parametric study of the effects of the noradrenaline neurotoxin DSP4 on avoidance acquisition and noradrenaline neurones in the CNS of the rat
- 259 HOLZER, P. & LIPPE, I. Th. Substance P can contract the longitudinal muscle of the guinea-pig small intestine by releasing intracellular calcium

- 269 RINGDAHL, B. Muscarinic receptor occupation and receptor activation in the guinea-pig ileum by some acetamides related to oxotremorine
- 275 LINDENMEYER, M., SPÖRRI, S., STÄUBLI, M., STUDER, A. & STUDER, H. Does amiodarone affect heart rate by inhibiting the intracellular generation of triiodothyronine from thyroxine?
- 281 PARRATT, J.R., SHARMA, N. & ZEITLIN, I.J. Prostaglandins and thromboxane in the delayed phase of shock induced by Serratia marcescens endotoxin
- 289 FURMAN, B.L., McKECHNIE, K. & PARRATT, J.R. Failure of drugs that selectively inhibit thromboxane synthesis to modify endotoxin shock in conscious rats
- 295 MIWA, K. & TODA, N. Regional differences in the response to vasoconstrictor agents of dog and monkey isolated coronary arteries

#### **VOLUME 82 NUMBER 2 JUNE 1984**

#### **SHORT COMMUNICATION**

305 DANIOTTI S. & DEL SOLDATO, P. Comparative studies of the effects of some antimuscarinic agents on gastric damage and pupillary reflex in the rat

- 309 BRISTOW, M.R., GINSBURG, R., LASER, J.A., McAULEY, B.J. & MINOBE, W. Tissue response selectivity of calcium antagonists is not due to heterogeneity of [<sup>3</sup>H]-nitrendipine binding sites
- 321 ALTIERE, R.J. & DIAMOND, L. Relaxation of cat tracheobronchial and pulmonary arterial smooth muscle by vasoactive intestinal peptide: lack of influence by peptidase inhibitors
- 329 GRAY, D.A., LANGRIEGER, N., RESCHMAIER, J. & SIMON, E. The effect of acetylsalicylic acid on renal function in the Pekin duck
- 339 LEEUWIN, R.S., VAN DER WAL, J.K. & SPANJER, W. Interactions of cholinesterase inhibitors and glucocorticoids with ketamine and pentobarbitone-induced general anaesthesia in the rat: possible effects on central cholinergic activity
- 349 KANE, K.A., PARRATT, J.R. & WILLIAMS, F.M. An investigation into the characteristics of reperfusioninduced arrhythmias in the anaesthetized rat and their susceptibility to antiarrhythmic agents
- 359 BURNSTOCK, G., CROWE, R., KENNEDY, C. & TÖRÖK, J. Indirect evidence that purinergic modulation of perivascular adrenergic neurotransmission in the portal vein is a physiological process
- 369 BURNSTOCK, G., CUSACK, N.J. & MELDRUM, L.A. Effects of phosphorothioate analogues of ATP, ADP and AMP on guinea-pig taenia coli and urinary bladder

- 375 HILLIKER, K.S. & ROTH, R.A. Alteration of monocrotaline pyrrole-induced cardiopulmonary effects in rats by hydrallazine, dexamethasone or sulphinpyrazone
- 381 MOOCHHALA, S.M. & SAWYNOK, J. Hyperalgesia produced by intrathecal substance P and related peptides: desensitization and cross desensitization
- 389 CARRIER, R., CRAGOE, E.J., ETHIER, D., FORD-HUTCHINSON, A.W., GIRARD, Y., HALL, R.A., HAMEL, P., ROKACH, J., SHARE, N.N., STONE, C.A. & YUSKO, P. Studies on L-640,035: a novel antagonist of contractile prostanoids in the lung
- 397 BEDDELL, C.R., GOODFORD, P.J., KNEEN, G., WHITE, R.D., WILKINSON, S. & WOOTTON, R. Substituted benzaldehydes designed to increase the oxygen affinity of human haemoglobin and inhibit the sickling of sickle erythrocytes
- 409 DAVIES, J. & JOHNSTON, S.E. Selective antinociceptive effects of tizanidine (DS 103-282), a centrally acting muscle relaxant, on dorsal horn neurones in the feline spinal cord
- 423 AMELLAL, M., BINCK, M., FROSSARD, N., ILIEN, B. & LANDRY, Y. Sodium-potassium ATPase inhibition potentiates compound 48/80induced histamine secretion from mast cells
- 431 BEVAN, P. Effect of muscarinic ligands on the electrical activity recorded from the hippocampus: a quantitative approach
- BAILEY, S.J. & JORDAN, C.C. A study of [D-Pro<sup>2</sup>, D-Phe<sup>7</sup>, D-Trp<sup>9</sup>]-substance P and [D-Trp<sup>7,9</sup>]-substance P as tachykinin partial agonists in the rat colon

- 453 BRADSHAW, C.M., SHERIDAN, R.D. & SZABADI, E. Neuronal responses to noradrenaline in the cerebral cortex: evidence against the involvement of α<sub>2</sub>-adrenoceptors
- 459 ALTURA, B.T., ALTURA, B.M. & QUIRION, R. Identification of benzomorphan-κ opiate receptors in cerebral arteries which subserve relaxation
- 467 CLARE, K.A., SCRUTTON, M.C. & THOMPSON, N.T. Effects of α<sub>2</sub>-adrenoceptor agonists and of related compounds on aggregation of, and on adenylate cyclase activity in, human platelets
- 477 HEMSWORTH, B.A., SHREEVE, S.M. & VEI-TCH, G.B.A. 3-Hydroxy-N,N-dimethylpiperidinium: a precursor of a false cholinergic transmitter
- 485 CHEN, X., GILLIS, C.N. & MOALLI, R. Vascular effects of ginsenosides in vitro
- 493 BARDEN, A.E., MAHONEY, D.P., TUNNEY, A.M. & VANDONGEN, R. Frusemide releases renin in the rat kidney when prostacyclin synthesis is suppressed

- 501 KRSTEW, E., MCPHERSON, G.A., MALTA, E., MOLENAAR, P. & RAPER, C. Is Ro 03-7894 an irreversible antagonist at β-adrenoceptor sites?
- 509 ALLEN, J.M., BURKE, E.P., JOHNSTON, M.G. & McHALE, N.G. The inhibitory effect of aspirin on lymphatic contractility
- 515 KALSNER, S. & QUILLAN, M. A hypothesis to explain the presynaptic effects of adrenoceptor antagonists
- 523 ISHIDA, M. & SHINOZAKI, H. Glutamate inhibitory action of matrine at the crayfish neuromuscular iunction
- 533 IMAI, S., MATSUI, K., NAKAZAWA, M., TAKATSUKA, N., TAKEDA, K. & TAMATSU, H. Anti-arrhythmic effects of (-)-carnitine chloride and its acetyl analogue on canine late ventricular arrhythmia induced by ligation of the coronary artery as related to improvement of mitochondrial function

#### **VOLUME 82 NUMBER 3 JULY 1984**

## Introduction to the 9th International Congress of Pharmacology Issue

545 MITCHELL, J.F. The British Pharmacological Society and its Journals

#### **SHORT COMMUNICATION**

547 RUSH, B.D. & RUWART, M.J. Prazosin inhibits small intestinal transit in the rat

- 549 MITCHELL, H.W. Pharmacological studies into cyclooxygenase, lipoxygenase and phospholipase in smooth muscle contraction in the isolated trachea
- 557 CANFIELD, D.R. & DUNLAP, K. Pharmacological characterization of amine receptors on embryonic chick sensory neurones
- 565 LEFORT, J., ROTILIO, D. & VARGAFTIG, B.B. The platelet-independent release of thromboxane A<sub>2</sub> by Paf-acether from guinea-pig lungs involves mechanisms distinct from those for leukotriene
- 577 OKPAKO, D.T. & TAIWO, Y.O.O. Cyclooxygenase inhibitors antagonize indirectly evoked contractions of the guinea-pig isolated ileum by inhibiting acetylcholine release
- 587 CUTHBERT, A.W., HALUSHKA, P.V., MAR-GOLIUS, H.S. & SPAYNE, J.A. Role of calcium ions in kinin-induced chloride secretion
- 597 CUTHBERT, A.W., HALUSHKA, P.V., MAR-GOLIUS, H.S. & SPAYNE, J.A. Mediators of the secretory response to kinins

- 609 ANWYL, R., BRUTON, J.D. & McLOUGHLIN, J.V. The effects of external potassium, multivalent cations and temperature on caffeine contractures in rat skeletal muscle
- 615 ANWYL, R., BRUTON, J.D. & McLOUGHLIN, J.V. Potassium contractures and mechanical activation in rat skeletal muscle: effects of multivalent cations, temperature and tetracaine
- 623 GURNEY, A.M. & RANG, H.P. The channelblocking action of methonium compounds on rat submandibular ganglion cells
- 643 ANDREASEN, F. & CHRISTENSEN, J.H. Thiopentone-induced changes in the contraction pattern of vascular smooth muscle: the influence of albumin
- 651 BEIL, W. & SEWING, K.-FR. Inhibition of partially purified K+/H+-ATPase from guinea-pig isolated and enriched parietal cells by substituted benzimidazoles
- 659 CULLEN, K.D. & MARTIN, R.J. Effects of injectable anaesthetics on responses to L-glutamate and on spontaneous synaptic activity in lamprey reticulo-spinal neurones
- 667 ATCHISON, W.D., NARAHASHI T. & VOGEL, S.M. Endplate blocking actions of lophotoxin
- 673 DEBNAM, E.S. & THOMPSON, C.S. Effects of neomycin on galactose absorption across rat jejunum
- 679 COOPER, C.L. & MALIK, K.U. Effect of glucocorticoids on vascular reactivity to vasoactive hormones in rat isolated kidney: lack of relationship to prostaglandins

- 689 MATTHEWS, E.K. & SHOTTON, P.A. The control of <sup>86</sup>Rb efflux from rat isolated pancreatic islets by the sulphonylureas tolbutamide and glibenclamide
- 701 IMAMURA, I., MAEYAMA, K., WADA, H. & WATANABE, T. Determination of imidazole acetic acid and its conjugate(s) levels in urine, serum and tissues of rats: studies on changes in their levels under various conditions
- 709 HARVEY, A.L., HIDER, R.C., HODGES, S.J. & JOUBERT, F.J. Structure-activity studies of homologues of short chain neurotoxins from Elapid snake venoms
- 717 BENFEY, B.G., ELFELLAH, M.S., OGILVIE, R.I. & VARMA, D.R. Anti-arrhythmic effects of prazosin and propranolol during coronary artery occlusion and re-perfusion in dogs and pigs

- 727 ADVENIER, C., CERRINA, J., DUROUX, P., FLOCH, A. & RENIER, A. Effects of five different organic calcium antagonists on guinea-pig isolated trachea
- 735 MIRONNEAU, C., MIRONNEAU, J. & SAVINEAU, J.P. Maintained contractions of rat uterine smooth muscle incubated in a Ca<sup>2+</sup>-free solution
- 745 BECKER, C. & PORZIG, H. Recovery of β-adrenoceptors and cyclic AMP response after long term treatment of intact heart cells with β-blockers
- 757 BRYAN, L.J. & O'DONNELL, S.R. Stereoselectivity of extraneuronal uptake of catecholamines in guineapig trachealis smooth muscle cells

#### **VOLUME 82 NUMBER 4 AUGUST 1984**

#### **SHORT COMMUNICATION**

765 FÖRSTERMANN, U. & NEUFANG, B. The endothelium-dependent relaxation of rabbit aorta: effects of antioxidants and hydroxylated eicosatetraenoic acids

- 769 McGRATH, J.C. α-Adrenoceptor antagonism by apoyohimbine and some observations on the pharmacology of α-adrenoceptors in the rat anococcygeus and vas deferens
- 783 GILLO, B. & LASS, Y. The mechanism of steroid anaesthetic (alphaxalone) block of acetylcholineinduced ionic currents
- 791 BAKICH, V., BROWN, J., KWOK, Y.N. McIN-TOSH, C. & NISHIMURA, E. Contractile effects of cysteamine on the guinea-pig ileum
- 801 BELL, C. & ROME, A.C. Pharmacological investigations of the vasodilator nerves supplying the duck's foot
- 809 BREEZE, R.G., LAEGREID, W.W. & OLCOTT, B.M. Role of metabolism in the immediate effects and pneumotoxicity of 3-methylindole in goats
- 817 SAXENA, P.R. & VERDOUW, P.D. Effects of methysergide and 5-hydroxytryptamine on carotid blood flow distribution in pigs: further evidence for the presence of atypical 5-HT receptors

- 827 COLLIER, B., JOHNSON, G., QUIK, M. & WELNER, S. Effect of chemical destruction of adrenergic neurones on some cholinergic mechanisms in adult rat sympathetic ganglia
- 833 ANDREWS, P.L.R., DUTIA, M.B. & HARRIS, P.J. Angiotensin II does not inhibit vagally-induced bradycardia or gastric contractions in the anaesthetized ferret
- 839 BERRIE, C.P., BIRDSALL, N.J.M., HAGA, K., HAGA, T. & HULME, E.C. Hydrodynamic properties of muscarinic acetylcholine receptors solubilized from rat forebrain
- 853 BERRIE, C.P., BIRDSALL, N.J.M., HULME, E.C., KEEN, M. & STOCKTON, J.M. Solubilization and characterization of guanine nucleotide-sensitive muscarinic agonist binding sites from rat myocardium
- 863 BORDA, E.S., DE BRACCO, M.M., CANGIANI, S., FINIASZ, M. & STERIN-BORDA, L. α-Adrenoceptor stimulated lymphocytes trigger the mechanical response of vas deferens: participation of arachidonic acid metabolites
- 871 KRELL, R.D. & KUSNER, E.J. Differential effect of cyclo-oxygenase inhibition on antigen-and ionophore-induced release of slow reacting substance from fragmented guinea-pig lung
- 877 PRADO, W.A. & ROBERTS, M.H.T. Antinociception from a stereospecific action of morphine microinjected into the brainstem: a local or distant site of action?

- 883 FARMER, S.G. & LANIYONU, A.A. Effects of p-chlorophenylalanine on the sensitivity of rat intestine to agonists and on intestinal 5-hydroxytryptamine levels during Nippostrongylus brasiliensis infection
- 891 COX, H.M., MUNDAY, K.A. & POAT, J.A. Location of [125I]-angiotensin II receptors on rat kidney cortex epithelial cells
- 897 MCPHERSON, G.A., MALTA, E., MOLENAAR, P. & RAPER, C. The affinity and efficacy of the selective  $\beta_1$ -adrenoceptor stimulant RO363 at  $\beta_{-1}$  and  $\beta_2$ -adrenoceptor sites
- 905 **VOLUME INDEX**
- 925 CUMULATIVE CONTENTS