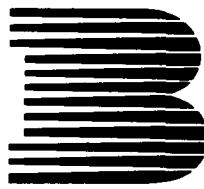


BIOCHEMICAL SOCIETY TRANSACTIONS



London: The Biochemical Society © 1985

Managing Editor D. C. WATTS

Book Reviews Editor B. MORELAND

Contents Volume 13, Part 2, April 1985

610th MEETING, STIRLING

Colloquium: Proteolysis as a Control Mechanism

Proteinases, proteolysis and regulation in yeast	D. H. WOLF	279
Regulation of proteinase activity in <i>Aspergillus nidulans</i>	L. STEVENS	283
Biosynthesis of rat α_2 -macroglobulin	W. NORTHEMANN, M. HEISIG, D. KUNZ, J. BAUER, M. BIRMELIN, T.-A. TRAN-THI, K. DECKER & P. C. HEINRICH	285
Cysteine proteinases of cellular slime moulds	M. J. NORTH	288
The ATP-dependent breakdown of proteins in mammalian mitochondria	M. DESAUTELS & A. L. GOLDBERG	290
Endopeptidase-24.11: a cell-surface enzyme for metabolizing regulatory peptides	A. J. KENNY, M. A. BOWES, N. S. GEE & R. MATSAS	293

Colloquium: The Use of Limited Proteolysis to Study the Domain Structure of Proteins

Fatty acid synthase: probing the structure of a multi-functional protein by limited proteolysis	D. G. HARDIE & A. D. McCARTHY	297
Functional domains involved in aromatic amino acid biosynthesis	J. R. COGGINS, M. R. BOOCOCK, M. S. CAMPBELL, S. CHAUDHURI, J. M. LAMBERT, A. LEWENDON, D. M. MOUSDALE & D. D. S. SMITH	299
Structural studies of chromatin by using proteases	C. CRANE-ROBINSON & L. BÖHM	303
Limited proteolysis of enzymes: the generation of functionally modified derivatives <i>in vitro</i> and <i>in vivo</i>	R. J. BEYNON, G. A. PLACE & P. E. BUTLER	306
The use of limited proteolysis in studies on protein folding and association	R. RUDOLPH	308

Colloquium: Polyamines

Control of ornithine decarboxylase in the cellular slime mould <i>Dictyostelium discoideum</i>	M. J. NORTH	313
Bacterial polyamines, structures and biosynthesis	G. H. TAIT	316
The di- and poly-amine oxidases of higher plants	T. A. SMITH	319
Polyamine oxidases	D. M. L. MORGAN	322

Inhibition of cell proliferation by polyamines does not depend on the cytotoxicity of acrolein	C. J. SMITH, J. J. HUSSAIN & J. C. ALLEN	326
Polyamine metabolism in mammalian cells in culture	H. M. WALLACE, S. H. MACGOWAN & H. M. KEIR	329
Polyamine metabolism and virus replication	J. D. WILLIAMSON	331
The identification and characterization of a polyamine-accumulation system in the lung	L. L. SMITH	332
COMMUNICATIONS		335
611th MEETING, GALWAY		
IRISH AREA SECTION GUEST LECTURES		
The application of some newer aspects of immunoassay to clinical endocrinology	A. TURKES, M. S. MORTON & K. GRIFFITHS	397
Chemistry and biology of the molybdenum cofactor	K. V. RAJAGOPALAN	401
Colloquium: Cellulases: Production, Properties and Applications		
Cellulose hydrolysis: the potential, the problems and relevant research at Galway	M. P. COUGHLAN	405
Properties of cellulolytic enzyme systems	T. M. WOOD	407
Regulation and cellulase biosynthesis and secretion in fungi	H. MERIVUORI, K. M. SIEGLER, J. A. SANDS & B. S. MONTENECOURT	411
Applications of cellulases	M. MANDELS	414
Colloquium: Monoclonal Antibodies in the Study of Differentiation		
Neutrophil differentiation antigens	T. G. COTTER	417
Amino acid sequence of lymphocyte-surface antigens	A. N. BARCLAY, M. J. CLARK & M. L. THOMAS	418
Differentiation antigens in acute leukaemia	D. J. REEN	420
Rat brain differentiation antigens	E. R. ABNEY	422
Monoclonal antibodies as probes for acetylcholine receptors	J. O. DOLLY & F. MEHRABAN	424
A carbohydrate differentiation antigen of granulocytes, brain and many tumours	M. A. KERR & N. C. McCARTHY	424
Stage-specific antigens of <i>Trichinella spiralis</i>	R. M. E. PARKHOUSE & N. M. ALMOND	426
Characterization of super-T-antigens in SV40-transformed monkey cell mutants	J. K. COLLINS & D. O'REILLY	429
Human lymphocyte antigens: a mini review	P. M. LYDYARD, P. BANGA, G. GUARNOTTA, P. WALKER, L. MACKENZIE & S. MARKANDAY	429
Colloquium: Aromatic Amino Acid Hydroxylases		
Regulatory properties of phenylalanine, tyrosine and tryptophan hydroxylases	S. KAUFMAN	433
On the mechanism of action of phenylalanine hydroxylase	S. BENKOVIC, D. WALICK, L. BLOOM, B. J. GAFFNEY, P. DOMANICO, T. DIX & S. PEMBER	436
Phenylalanine hydroxylase: metabolic aspects	C. I. POGSON, M. A. SANTANA & M. J. FISHER	439
Kynurenine hydroxylase: a potential rate-limiting enzyme in tryptophan metabolism	D. A. BENDER & G. M. MCCREANOR	441
Flavin-dependent hydroxylases	F. MÜLLER	443
COMMUNICATIONS		449
609th MEETING, LEEDS		
Colloquium: Controlled-Release Systems		
Factors affecting the oral absorption of esterified antibiotics	P. E. O. WILLIAMS	511
Liposomes as a controlled-release system	H. M. PATEL	513
The use of controlled-release glass for the controlled delivery of bioactive materials	C. F. DRAKE & W. M. ALLEN	516
Biodegradable polymers for the sustained release of peptides	F. G. HUTCHINSON & B. J. A. FURR	520
Stimulation of oil biodegradation by using slow-release fertilizers	A. D. SMITH	523
BIOCHEMICAL REVIEW		
Carbonic anhydrase: update and new horizons	N. CARTER & S. JEFFERY	531
BOOK REVIEWS		
		535

COMMUNICATIONS

610th MEETING, STIRLING

Proteinases in <i>Methylophilus methylotrophus</i>	P. W. WATT & M. J. NORTH	335
Purification and characterization of proteinases of the parasitic protozoan <i>Trichomonas vaginalis</i>	B. C. LOCKWOOD, M. J. NORTH & G. H. COOMBS	336
<i>Escherichia coli</i> mutants defective in the degradation of abnormal proteins	A. J. CARR, R. F. ROSENBERGER & A. R. HIPKISS	337
Comparative studies of rat cationic and anionic trypsins: inactivation of native enzymes	G. A. PLACE & R. J. BEYNON	338
A proteinase inhibitor from <i>Aspergillus nidulans</i>	L. STEVENS, H. ANSARI & D. DUNCAN	339
Ca ²⁺ -binding protein(s): activities of isolated enterocytes during crypt to villus maturation	Q. G. O. BATTIKHI	339
Influence of Ca ²⁺ and bile acids on trypsinogen autoactivation	B. H. MORELAND, R. P. E. SARKANY & R. A. WILSON	341
Comparison of muscle protein degradation rates in two strains of young chicks by using N ^t -methylhistidine excretion	C. L. SAUNDERSON & L. BRYAN	342
A scanning microcalorimetric study of procarboxypeptidase A and its tryptic pieces carboxypeptidase A and activation segment	J. L. LOPEZ, P. L. MATEO, M. CORTIJO, M. VILANOVA, A. MUÑOZ & F. X. AVILÉS	343
Nuclear magnetic resonance studies on the isolated activation segment from porcine pancreatic procarboxypeptidase A	F. X. AVILÉS, J. VENDRELL, F. J. BURGOS, C. TURNER, P. D. CARY & C. CRANE-ROBINSON	344
Computer graphic representation of the domain and subunit structure of large proteins	E. J. MILNER-WHITE, W. HAMILTON, C. LYLE & R. R. W. POET	345
Role of the C-terminal lysine residue in creatine kinase	R. RASANAYAGAM, R. J. EDWARDS & D. C. WATTS	346
Immune-mapping as a specific and sensitive probe for the characterization of proteins	O. G. L. DE MARCUCCI, G. H. D. CLARKSON & J. G. LINDSAY	347
Interaction between the N- and C-terminal domains of ovotransferrin	R. W. EVANS, A. D. MADDEN & K. J. PATEL	348
Limited proteolysis of the multifunctional protein CAD in the presence of substrates and effectors	E. A. CARREY	349
Relationship between ornithine decarboxylase activity, ribosomal RNA synthesis and cell proliferation in the mouse uterine epithelium	S. V. Y. CHENG, B. S. MACDONALD, S. LARY & J. W. POLLARD	350
Human pregnancy-associated polyamine oxidase: partial purification and properties	D. M. L. MORGAN	351
Polyamine oxidase activity in human and bovine milk	D. M. L. MORGAN & V. J. TOOTHILL	352
Involvement of polyamines in stimulus-secretion coupling in the pancreatic β -cell	P. J. BUNGAY & M. GRIFFIN	353
Aminoglycoside drug monitoring by using a fluorescent immunoassay	E. WAELKENS, S. ASSELBERGHHS & H. EYSSEN	354
Factors affecting the substrate-labelled fluorescent immunoassay for aminoglycoside antibiotic determination	E. WAELKENS, S. ASSELBERGHHS & H. EYSSEN	355
Effects of metyrapone and norharmane on microsomal mono-oxygenase and epoxide hydrolase activities	N. J. BULEID & J. A. CRAFT	356
Tissue and sex differences in basal and carcinogen-induced ethoxresorufin O-de-ethylase	K. IWASAKI, C. IOANNIDES & D. V. PARKE	357
Induction and suppression of cytochromes P-450 in rat tissues	D. J. ADAMS, F. OESCH, R. HARTMANN & C. R. WOLF	358
Induction of liver microsomal cytochrome P-452 by hypolipidaemic agents	G. G. GIBSON, S. K. BAINS, S. M. GARDINER, D. GILLETT & K. MANNWEILER	359
Role of fimbriae in the interaction of neutrophils and <i>Escherichia coli</i>	P. H. BESWICK & N. CHRISTOFI	360
Particle-stimulated oxidative reactions of neutrophils from a variety of species	S. A. YOUNG & P. H. BESWICK	361
Effects of high concentrations of protein on the equilibrium and kinetic properties of four enzymes	H. ANSARI, N. C. PRICE & L. STEVENS	362
Ca ²⁺ -dependent control of renin release	J. SULNER & A. BENNUN	363
A model for the regulation of haemoglobin affinity for oxygen	A. BENNUN, N. SEIDLER & V. DE BARI	364
Actions and interactions of diazepam, γ -aminobutyric acid and methohexitone at the rat ileum	F. A. WALI	366

Identification of a new human trophoblast antigen	M. CRAINIE & W. H. STIMSON	366
Modification of DNA with <i>N</i> -succinimidyl 3-(2-pyridyldithio)propionate	R. A. FALLON & A. D. B. MALCOM	367
An enzyme-linked immunoadsorbent assay for murine anti-DNA antibodies	D. G. GODFREY, W. H. STIMSON & J. WATSON	368
Monoclonal antibodies to human pregnancy serum-derived immune complexes react with ovarian cancer antigens	W. H. STIMSON, F. AL-AZZAWI & A. MCADAM	369
Immunochemistry of <i>Shigella flexneri</i> O-antigens: an analysis of the antigenic determinants of the basal (rough) region	D. A. R. SIMMONS	370
Steroid receptors in the thymus	A. B. MCCRUEDEN & W. H. STIMSON	371
Prostaglandins and breast cancer	J. WATSON, S. Y. CHUAH, D. C. SMITH & R. E. LEAKE	372
Occurrence of α -macrofoetoprotein and decidualization-associated protein in rat tissues during inflammation and pregnancy	N. A. TEIXEIRA & J. O'GRADY	373
Tightly bound metals in cyclic nucleotide phosphodiesterases	J. LONDESBOROUGH	374
Alterations of dihydropteridine reductase activity by lead	M. J. MCINTOSH, P. A. MEREDITH, A. GOLDBERG & M. R. MOORE	375
Concentration-dependent reduction in erythrocyte 5-aminolaevulinate dehydratase activity in epileptic patients on carbamazepine monotherapy	G. M. MCGUIRE, M. J. BRODIE, G. J. A. MACPHEE, M. R. MOORE & A. GOLDBERG	376
Multiple purification of ammonia-assimilation enzymes from <i>Escherichia coli</i>	E. R. ROBERTSON & L. JERVIS	377
Subunit hybridization of higher plant lactate dehydrogenases	R. A. GOODMAN & L. JERVIS	378
Purification of an alcohol dehydrogenase from <i>Sporotrichum pulverulentum</i>	J. RUDGE & G. F. BICKERSTAFF	379
Bacterial catalysis of the <i>N</i> -nitrosation of secondary amines	S. A. LEACH, B. CHALLIS, A. R. COOK, M. J. HILL & M. H. THOMPSON	380
Depression of protein synthesis after ischaemia in rat skeletal muscle unassociated with energy or redox status	P. A. MACLENNAN & M. J. RENNIE	382
Triphosphoinositide breakdown in B-lymphocytes	C. J. MEADE, M. K. BIJSTERBOSCH, G. A. TURNER & G. G. B. KLAUS	383
Striatal 5-hydroxytryptamine levels after experimental cerebral ischaemia	B. J. ALPS, C. M. BROWN, C. CALDER & A. T. KILPATRICK	384
Purification of glutamine synthetase from the non-N ₂ -fixing cyanobacterium <i>Phormidium laminosum</i>	J. L. SERRA, A. ALANÀ, F. BLANCO & M. J. LLAMA	384
Inhibition of lactose and casein synthesis in rabbit mammary explants by fractions of goat milk	C. J. WILDE & J. A. GAMBLE	385
Isoelectric focusing of silk fibroin polypeptides	Z.-T. SONG & P. T. SPEAKMAN	387
Incorporation of ³⁵ S into glycosaminoglycans of ovarian follicular granulosa cells	W. F. LONG, M. CLINTON, F. B. WILLIAMSON, J. S. M. HUTCHINSON & B. SEDDON	388
A role for glycosaminoglycans in cellular adhesion of relevance to the cancer state	D. GRANT, W. F. LONG & F. B. WILLIAMSON	389
Nature of a fibrinolytic acid proteinase from human plasma	N. PEJHAN & G. D. KEMP	390
Assessment and use of an assay system for a fibrinolytic acid proteinase from human plasma	G. K. WATTERSON, N. PEJHAN & G. D. KEMP	391
Factors affecting faecal bile acid concentrations: effects of fat and fibre	M. H. THOMPSON, R. W. OWEN, M. J. HILL & J. H. CUMMINGS	392
Increased photosystem II activity in <i>Agrostis agrestis</i> , <i>A. tenuis</i>	C. D. LINDSAY, A. I. OXBROW & C. HOUGHTON	393
Differences in the composition of the photosynthetic apparatus of lead-tolerant and non-tolerant ecotypes of <i>Agrostis tenuis</i>	C. D. LINDSAY, A. I. OXBROW & C. HOUGHTON	394
611th MEETING, GALWAY		
A comparison of various cellulose assay procedures for measuring the cellulolytic activity of <i>Trichoderma harzianum</i> E58	C. BREUIL & J. N. SADDLER	449
Thermophilic, anaerobic, cellulolytic bacteria from Icelandic hot springs	A. C. STAINTHORPE & R. A. D. WILLIAMS	450

CONTENTS

v

Purification and properties of endoglycanases from <i>Dichotomitus squalens</i>	X. ROUAI & M.-J. FOGLIETTI	451
The characterization of a commercial cellulase product from <i>Penicillium funiculosum</i> by fast protein liquid chromatography	S. R. PARR	452
Cellulase production by <i>Trichoderma reesei</i> on wheat straw	C. ACEBAL, M. P. CASTILLON, P. ESTRADA, I. MATA, E. COSTA, J. AGUADO, D. ROMERO & F. LACABA	453
The polysaccharide-debranching enzymes of <i>Klebsiella aerogenes</i> and <i>Bacillus polymyxa</i>	F. J. BOURKE & W. M. FOGARTY	455
Solid-state cultivation of <i>Talaromyces emersonii</i> on beet pulp	P. J. CONNELL, A. O'KENNEDY & C. MOLONEY, T. CURRAN, F. R. COMERTFORD & M. P. COUGHLAN	456
Physical properties of the endocellulases of <i>Talaromyces emersonii</i>	A. P. MOLONEY & M. P. COUGHLAN	457
Significance of Ca antigen expression in human breast tumours	D. P. TRIVEDI, H. BAUM & M. BAUM	458
Actin expression in human breast tissues using a monoclonal antibody	D. P. TRIVEDI, H. BAUM, T. C. HOLME & M. BAUM	458
Monoclonal antibodies specific for myelin produced in animals immunized with whole myelin	A. KHALILI-SHIRAZI, N. GREGSON & H. WEBB	459
Production and characterization of monoclonal antibodies to mitogen-activated human lymphocytes	I. DIX, F. HALLINAN, R. O'KENNEDY & D. J. REEN	460
A specific subset of neurons defined by a monoclonal antibody from patients with polyneuropathy and associated paraproteinæmia	N. A. GREGSON, S. LEIBOWITZ, M. KENNEDY & C. P. DENTON	461
Monoclonal antibodies against meningococcal polysaccharide with cross-reactivity against brain antigens	N. A. GREGSON, C. MORENO & M. R. LIFELY	462
Characterization of a cyclohexane hydroxylase and a cyclohexanone mono-oxygenase from a cyclohexane-degrading <i>Xanthobacter</i> sp.	M. K. TROWER, R. M. BUCKLAND & M. GRIFFIN	463
Tyrosine 2-hydroxylation by <i>Aeromonas salmonicida</i>	J. G. MORGAN, S. McGETTIGAN & J. DONLON	464
Phenylalanine hydroxylase levels in diabetic rats	K. HOWARD & J. DONLON	465
Phosphorylation of phenylalanine hydroxylase: its hormonal control and metabolic consequences	M. J. FISHER & C. I. POGSON	466
Adrenergic control of mitochondrial Ca^{2+} metabolism	A. R. KRALL, A. R. BEHAN & E. J. DUKE	467
Localization and hypotonic extraction of Ruthenium-Red-staining substances in mitochondria	A. R. BEHAN, A. R. KRALL & W. J. DOUGHERTY	468
An iodinated, irreversible inhibitor of monoamine oxidase	C. H. WILLIAMS & B. BELSHAW	469
Human aortic lipids: extraction, fractionation and identification	R. J. ELLIOTT, B. W. MOORE & J. D. BIGGART	471
The effect of surfactants and aortic lipids on the elastin elastase reaction	R. J. ELLIOTT & J. R. DARLING	472
Solid-phase enzyme-linked immunosorbent assay for the large scale-screening of hybridomas: non-specific effects and their solutions	K. CARROLL & R. O'KENNEDY	473
Effects of bovine milk on growth of animal cells in culture	E. MURPHY & M. CLYNES	474
Age-related differences in granulocyte chemotaxis and degranulation	B. McLAUGHLIN, K. O'MALLEY & T. G. COTTER	475
The use of ^1H nuclear magnetic resonance spectroscopy in the diagnosis of mucopolysaccharide diseases	A. V. SAVAGE & D. A. APPLEGARTH	476
Production and characterization of monoclonal antibodies against human apolipoproteins	D. BREEN, R. O'KENNEDY & F. HALLINAN	478
Molecular cloning of measles and canine distemper viruses	S. E. H. RUSSELL, J. D. HULL, D. DOHERTY, D. K. CLARKE, E. M. HOEY, B. K. RIMA & S. J. MARTIN	478
Development and applications of a rapid enzyme immunoassay for progesterone in saliva	D. F. TALLON, P. BUCKLEY, M. BRETT, J. P. GOSLING, M. M. DOOLEY & P. F. FOTRELL	479
Partial purification of myo-inositol oxygenase from ox kidney by using phenyl-Sepharose	M. N. GRAHAM & T. J. MANTLE	481
Studies on a cathepsin B-like enzyme in breast cancer	J. SIMON, M. J. DUFFY & M. G. HARRINGTON	481
The effect of exogenous vitamins on the proliferation of leukaemic cells in culture	C. J. O'DONNELL & T. G. COTTER	482
The determination of glucuronic and gulonic acid by high-pressure liquid chromatography	A. G. HEYENGA & T. J. MANTLE	483

Subcellular distribution of particulate post proline dipeptidyl aminopeptidase in guinea-pig brain	B. O'CONNOR, S. McGOVERN & G. O'CUINN	484
Some properties of a synaptosomal membrane-bound pyroglutamate aminopeptidase from guinea-pig brain	B. O'CONNOR & G. O'CUINN	485
Enzyme immunoassay of gliadin in food	D. F. MCKILLOP, J. P. GOSLING, F. M. STEVENS & P. F. FOTRELL	486
Coenzyme F ₄₂₀ analysis of mixed methanogenic populations	P. J. REYNOLDS, L. McKEVETT & E. COLLERAN	487
Preparation and identification of oxytic cells from human gastric mucosa	P. A. MOONEY, H. M. O'SULLIVAN & C. F. McCARTHY	488
Effect of slow-release catecholamines on rabbit serum lipoprotein levels	L. O'DONNELL, D. OWENS, P. COLLINS, A. JOHNSON & G. TOMKIN	489
Metal toxicity: complexing of alkyltin species with low- <i>M</i> _r ligands in aqueous solution	M. J. HYNES & M. O'DOWD	490
Deoxyribonuclease I and actin are present independently in the secretory granules of the bovine parotid	C. SMYTHE & F. G. WINDER	491
Release of the variant surface glycoprotein from <i>Trypanosoma brucei</i> occurs via cleavage of a phosphodiester linkage	D. G. JACKSON & H. P. VOORHEIS	493
Rapid purification of the membrane-bound and released forms of the variant surface glycoprotein from <i>Trypanosoma brucei</i>	D. G. JACKSON & H. P. VOORHEIS	493
Release of the variant surface glycoprotein from <i>Trypanosoma brucei</i> is stimulated by the local anaesthetic, benzyl alcohol	D. G. JACKSON & H. P. VOORHEIS	494
The transport of metabolites into goats' milk	A. FAULKNER, A. J. HENDERSON & D. R. BLATCHFORD	495
Glucose availability and lactose synthesis in the goat	A. FAULKNER	496
Alterations in algae biliproteins induced by freeze-drying	G. DOWNEY & P. O'CARRA	497
An assessment of the potential of peptidoglutaminase II in modifying the charge characteristics of protein	A. J. O'SHAUGHNESSY, B. P. GILL & D. R. HEADON	498
An effect of ADP-induced aggregation of rabbit platelets by dietary supplementation with polyunsaturated fatty acids and pyridoxal 5-phosphate	I. FAHELBOUM, C. TRITSCHLER & M. G. HARRINGTON	498
Degradation of sarcoplasmic proteins by endogenous muscle proteinases during incubation <i>in vitro</i>	N. PATESTOS & M. G. HARRINGTON	499
Surface glycoproteins of human haemopoietic cell lines and the effect of differentiation inducers	C. TURBERVILLE & M. A. HORTON	500
Nucleotide binding to ox kidney biliverdin reductase	E. M. RIGNEY & T. J. MANTLE	502
Effect of alkali and of detergent on the autoxidation of oxyhaemoglobin	C. SCAIFE & B. MASTERTON	502
A rapid enzyme-linked immunosorbent assay for total immunoglobulin A in serum	M. C. BOOTH, J. P. GOSLING, P. F. FOTRELL & C. F. McCARTHY	504
The effect of neuraminidase on chromatographic variants of N-acetyl-β-D-glucosaminidase from pig gastric mucosa	R. DEVERY, P. COLLINS & A. JOHNSON	505
Peptide synthesis by the murine epididymis	K. M. DEVINE & J. CARROLL	506
A functional membranous acceptor for dendrotoxin in rat brain: solubilization of the binding component	F. MEHRABAN, A. R. BLACK, A. L. BREEZE, D. G. GREEN & J. O. DOLLY	507
Preparation of labelled phosphatidylcholine and its participation in the lecithin-cholesterol acyltransferase reaction	W. C. LOVE, Y. BILTO & M. McGOWAN	508

610th MEETING, LEEDS

Microprocessor-controlled stirred-tank fermentation in optimization of yield of cytochrome P-450 in <i>Saccharomyces cerevisiae</i> NCYC 754	J. SALIHON, M. A. WINKLER & A. WISEMAN	526
Effect of culture shake speed and local oxygenation on the observed maximal accumulation of cytochrome P-450 in <i>Saccharomyces cerevisiae</i> at the fastest growth rate	D. J. KING, A. BLATIAC, A. WISEMAN & M. A. WINKLER	527
Intravenous endotoxin infusion by osmotic mini-pump in the rat	M. I. GORAN, K. N. FRAYN & R. A. LITTLE	528
Effect of soluble-glass boluses on the copper, cobalt and selenium status of sheep	S. B. TELFER, D. V. ILLINGWORTH, P. J. B. ANDERSON, G. ZERVA & G. CARLOS	529