## **Contents**

## Volume 5, Part 1, 1977

ANNUAL DINNER OF THE BIOCHEMICAL SOCIETY	PAGE 1
Speech by F. Dainton	
THE TWELFTH COLWORTH MEDAL LECTURE	
The adenosine triphosphatase reactions of myosin and actomyosin and their relation to energy transduction in muscle. By D. R. Trentham	5
566TH MEETING, CAMBRIDGE	
Colloquium: Energetics of Active Transport	
The electrochemical proton gradient in <i>Escherichia coli</i> membrane vesicles and its relationship to active transport. By S. Ramos & H. R. Kaback	23
The multiplicity of components, energization mechanisms and functions involved in galactose transport into Escherichia coli. By P. J. F. Henderson	25
Proton gradients across energy-transducing membranes. By K. Van Dam, A. H. C. A. Wiechmann, H. V. Westerhoff & K. J. Hellingwerf	28
Fundamental features of proton-coupled transport. By R. J. P. Williams	29
Colloquium: Monoclonal Antibodies	
The cross-reactive idiotypes of human erythrocyte cold agglutinins. By T. Feizi, J. Lecomte & R. Childs	32
The production of monoclonal antibodies by cell fusion (by title only). By G. Köhler	33
Fusion of myeloma cells with mouse lymphocytes (by title only). By G. J. Hämmerling, M. Reth, A. Radbruch, J. Hewitt & K. Rajewsky	33
Clonal diversification of antibody-producing cells in culture (by title only). By C. D. Wilde, C. Milstein & G. Köhler	33
Fusion of lymphoid cells (by title only), By T. Mosmann & A. R. Williamson	33
Colloquium: The Control of Phosphatidate Synthesis and Utilization	
Biosynthesis of glycerolipids via acyldihydroxyacetone phosphate. By A. K. Hajra	34
Phosphatidate phosphohydrolase and the regulation of glycerolipid biosynthesis. By H. J. Fallon, R. G. Lamb & S. C. Jamdar	37
The control of phosphatidate metabolism by amphiphilic drugs and by bivalent cations. By D. N. Brindley, M. Bowley, R. G. Sturton, P. H. Pritchard, S. L. Burditt & J. Cooling	

vi CONTENTS

	PAGE
Factors controlling the biosynthesis of individual phosphoglycerides in liver. $By$ B. Åkesson & R. Sundler	43
The biosynthesis of cytidine diphosphate diacylglycerol in the mammalian cerebral cortex. $By R. J.$ Thompson	49
Phosphatidate metabolism in stimulated synaptosomes. By J. N. Hawthorne & M. R. Pickard	52
Metabolism of phosphatidate at the plasma membrane. By D. Allan & R. H. Michell	55
Colloquium: Glycoproteins and Glycolipids in Membranes: Functional Aspects	
Molecular features of glycophorin A: The major sialoglycoprotein of the human erythrocyte membrane. By V. T. Marchesi	59
Structure and function of the mitochondrial glycoproteins (by title only). By E. Carafoli	59
Interaction of lectins with glycoproteins associated with intracellular membranes. $By\ J.\ G.\ Lindsay,\ L.\ M.\ Carswell\ \&\ G.\ K.\ Hunter$	60
Cytidine monophosphate $N$ -acetylneuraminate acid synthetase: A nuclear enzyme. $By$ W. Van Dijk & D. H. Van Den Eijnden	60
Ultrastructural studies on the formation and fate of the milk-fat-globule membrane. $By \ F. \ B. \ P. \ Wooding$	61
Surface carbohydrate of milk-fat-globule membrane. By R. Harrison	61
Possible functions of carbohydrates in lysosomal membranes. By R. Henning	62
Colloquium: Receptors	
The opiate receptor. By R. Simantov & S. H. Snyder	62
Interactions of alkaloids and peptides with opiate receptors. By E. C. Hulme	65
Enkaphalins: Peptide neurotransmitters acting at opiate receptors (by title only). By J. Hughes & H. W. Kosterlitz	69
Consequences of interaction between opioid and receptor. By H. O. J. Collier	70
The muscarinic receptor: Isolation and characterization (by title only). By E. Heilbronn	73
Muscarinic receptors: Biochemical studies. By N. J. M. Birdsall	74
A possible role for phosphatidylinositol breakdown in muscarinic cholinergic stimulus-response coupling. By R. H. Michell, L. M. Jones & S. S. Jafferji	77
Colloquium: Etioplasts	
Etioplast structure and its relevance to chloroplast development. By R. M. Leech	81
Development of photosynthetic electron transport in greening barley. By D. S. Bendall	84
Studies in vitro on plastid development. By W. T. Griffiths	88
Changes in plastid and mitochondrial envelopes during greening. $By$ A. R. Wellburn & R. Hampp	91

CONTENTS vii

	PAGE
Lipids and function of etiochloroplasts after ultraviolet, blue and red light-illumination. By M. Tevini, K. Herm & HD. Leonhardt	95
Protein synthesis by etioplasts. By S. G. Siddell & R. J. Ellis	98
Communications	
Identification of blood-sinusoidal plasma-membrane fractions from rat liver homogenates by radioiodinated-ligand binding. $By$ F. Carey & W. H. Evans	103
The relationship between calcium ion gates and the stimulation of phosphatidylinositol turnover. $By$ S. S. Jafferji & R. H. Michell	104
Evolutionary and seasonal adaptation of membranes to temperature. By A. R. Cossins	106
Interactions of phospholipids with sodium-plus-potassium ion-dependent adenosine triphosphatase. By M. I. De Caldentey & K. P. Wheeler	107
Modification of acyltransferase activity in lymphocyte membranes by cannabinoids and other lipids, $By$ J. H. Greenberg & A. Mellors	108
The labelling of lipid and protein components in isolated central-nervous-system myelin with dansyl chloride. By A. J. Crang & M. G. Rumsby	110
Evidence for the presence of the outer forespore membrane in dormant-spore integuments. By A. Crafts-Lighty & D. J. Ellar	113
Germination and subsequent outgrowth capacity of isolated forespores compared with mature spores of <i>Bacillus megaterium</i> KM. <i>By</i> G. S. A. B. Stewart & D. J. Ellar	116
Metabolism of membrane lipids during bacterial spore germination and outgrowth. By M. A. Koncewicz, D. J. Ellar & J. A. Posgate	118
Structure of the complex carbohydrate chains in the membrane glycoproteins of Semliki Forest virus. By M. Pesonen & O. Renkonen	120
Membrane saccharides of rat liver and malignant-cell nuclei. By R. W. Stoddart & M. R. Price	121
Partial purification of a plasma-membrane-associated tumour-specific antigen from a rat sarcoma by using immunoadsorbent column chromatography. By V. Preston & M. R. Price	123
Recovery of membrane micro-vesicles from human erythrocytes stored for transfusion: A mechanism for the erythrocyte discocyte-to-spherocyte shape transformation. By M. G. Rumsby, J. Trotter, D. Allan & R. H. Michell	126
Effect of calcium ions on the uptake of sugars through the human buccal mucosa. By J. M. McMullan, A. S. Manning & D. F. Evered	129
Quantitative studies of pinocytic uptake of $^{125}$ I-labelled polyvinylpyrrolidone by pig aortic smooth-muscle cells in culture. By D. S. Leake & D. E. Bowyer	130
Evidence for two metabolic pools of arterial cholesteryl esters in developing experimental atherosclerosis in the rabbit. By P. F. Davies & D. E. Bowyer	134
Metabolic characteristics of endocytosis of ferritin by gills of a marine bivalve mollusc. By S. G. George, B. J. S. Pirie & T. L. Coombs	136

viii CONTENTS

,	PAGE
Interaction of human blood platelets with the 2',3'-dialdehyde derivatives of adenosine diphosphate and adenosine triphosphate. By P. H. Pearce & M. C. Scrutton	138
Effects of photo-activated porphyrins on cell-surface properties. By D. Kessel	139
Reconstitution of a functional proton-translocating adenosine triphosphatase from the obligately anaerobic bacterium $Clostridium  pasteurianum$ . By D. J. Clarke & J. G. Morris	140
The identification of constituents of extracellular membranes in rabbit skeletal-muscle microsomal fractions. By E. J. Barrett & D. R. Headon	144
Reconstitution of the monosaccharide-transport system of the human erythrocyte membrane. $By$ J. K. Nickson & M. N. Jones	147
The influence of pH, low sodium ion concentration and methotrexate on the jejunal surface pH: A model for folic acid transfer. By FH. Lei, M. L. Lucas & J. A. Blair	149
Changes in the jejunal glycocalyx and their relationship to intestinal malabsorption. By S. K. Swanston, J. A. Blair, A. J. Matty, B. T. Cooper & W. T. Cooke	152
Effect of fatty acid mixtures on phytohaemagglutinin-stimulated lymphocytes of different species. By W. M. Tsang, C. Weyman & A. D. Smith	153
A re-evaluation of the fine structure of the living cell, and its consequences for biochemistry (by title only). By H. Hillman	154
Increase in brain tryptophan and 5-hydroxytryptamine on administration of phenothiazines to rats. By D. A. Bender & P. M. Cockcroft	155
A comparison of the effects of ischaemia on tissue flow, electrical activity and extracellular potassium ion concentration in cerebral cortex of baboons. By A. J. Strong, M. J. Goodhardt, N. M. Branston & L. Symon	158
The effects of middle-cerebral-artery occlusion on neurotransmitter metabolism in baboons. By M. J. Goodhardt, A. J. Strong, D. M. Bowen, P. White, N. M. Branston, L. Symon & A. N. Davison	160
Choline kinase and ethanolamine kinase activity in the cytoplasm of nerve endings from rat forebrain. $By$ S. Spanner & G. B. Ansell	164
Distribution of morphine and morphine metabolites in rat brain. By P. Bullock, S. Spanner & G. B. Ansell	166
Uptake and release of horseradish peroxidase from synaptosomes (by title only). By R. M. Marchbanks & S. Wonnacott	168
Characterization of acetylcholine-receptor protein from skeletal muscle. By O. J. Dolly, E. A. Barnard & R. G. Shorr	168
Isolation of a glutaminergic receptor fraction from locust muscle. By R. W. James, G. G. Lunt & J. F. Donnellan	170
Catecholamine receptors mediating cockroach salivary secretion. $By R. K. Smith$	173
The reactivity of anti-ganglioside antiserum with isolated cerebellar cells. $By$ N. A. Gregson, M. Pytharas & S. Leibowitz	174
Conversion of individual phosphatidates into rat brain lipid in vitro. By L. Binaglia, R. Roberti & G. Porcellati	175

CONTENTS ix

	PAGE
The active uptake of 5-hydroxytryptamine in snail ( <i>Helix pomatia</i> ) central nervous system and its energy source. By N. N. Osborne & V. Neuhoff	178
Biochemical and immunological studies of the monoamine-oxidizing activities of cultured and human cells. $By$ J. F. Powell & I. W. Craig	180
The binding of a specific muscarinic antagonist to subcellular fractions of the bovine caudate nucleus. By M. R. Gregg, S. Spanner & G. B. Ansell	182
The transport of radioactively labelled material after injection of $N-[^3H]$ acetyl-dependence in a defined area of the brain stem. By L. D. Loopuijt & J. Heijlman	184
Substance-P pathways in rat brain. By P. C. Emson, I. Kanazawa, A. C. Cuello & T. M. Jessell	187
Occupancy of muscarinic acetylcholine receptors stimulates a guanylate cyclase in neuroblastoma cells. By P. G. Strange, N. J. M. Birdsall & A. S. V. Burgen	189
A chemical-modification approach to the olfactory code. By A. Menevse, G. H. Dodd, T. M. Poynder & D. Squirrel	191
Isolation of oligodendrocytes and other cell lines from whole rat brain tissue. $By$ SW. Chao & M. G. Rumsby	194
Localization of cerebroside in central-nervous-system myelin lamellae: an initial approach. $By$ C. Linington & M. G. Rumsby	196
Action of endogenous neuraminidase on sialo compounds in the developing chick retina. By H. Dreyfus, S. Harth, A. Preti, P. F. Urban & P. Mandel	198
Stoicheiometries of proton translocation by mitochondria. By D. G. Nicholls	200
Inhibition of mitochondrial potassium ion flux by thallous ions. By J. J. Diwan & P. H. Lehrer	203
Oxidative phosphorylation: A new biological function for lipoic acid. By D. E. Griffiths, K. Cain & R. L. Hyams	205
Oxidative phosphorylation: A role for lipoic acid and unsaturated fatty acids. $By$ D. E. Griffiths & R. L. Hyams	207
Uncoupling agents: Arsenical analogues of pyrophosphate and their compounds. By H. B. F. Dixon, M. J. Sparkes & D. Webster	209
The structural specificity of the nucleotide-binding site and the reversible nature of the inhibition of proton conductance induced by bound nucleotides in brown-adipose-tissue mitochondria. By G. M. Heaton & D. G. Nicholls	
The basic biochemical lesion in shock. By G. R. N. Jones	213
Cancer: Energy uncoupling as a primary event in endotoxin-induced necrosis of the S180 sarcoma in situ. By G. R. N. Jones	214
The mechanism of the stimulation of pyruvate transport into rat liver mitochondria by glucagon. By A. P. Halestrap	216
Mechanism of action of somatostatin: Growth-hormone release, [ $^{45}$ Ca]calcium ion efflux and cyclic nucleotide metabolism of bovine anterior-pituitary slices in the presence of prostaglandin $E_2$ and 1-methyl-3-isobutylxanthine. By R. J. Bicknell, P. W. Young, J. G. Schofield & J. Albano	
Adenylate cyclase in plasma membranes purified from rat osteogenic sarcoma.  By A. Crawford R. Collin N. H. Hunt & T. I. Martin	222

x CONTENTS

	PAGE
Role of prostaglandins and adenosine 3': 5'-cyclic monophosphate in the control by insulin of growth-hormone synthesis <i>in vitro</i> . By A. Betteridge & M. Wallis	22,4
An inhibitor of mammalian collagenase from foetal rabbit bone in culture. $By$ A. Sellers, E. Cartwright, G. Murphy & J. J. Reynolds	227
Collagenase activity from cultured non-gravid rabbit uterus. $By$ E. Cartwright, G. Murphy, A. Sellers & J. J. Reynolds	229
α-D-Mannosidases in rat skeletal muscle. By R. R. Wallace & M. H. R. Lewis	231
The use of lectins in the detection and identification of human fungal pathogens. $By R. W. Stoddart \& B. M. Herbertson$	233
Renal damage in rats caused by dietary sucrose. By S. S. Kang, R. G. Price, K. R. Bruckdorfer, N. A. Worcester & J. Yudkin	235
Characterization of subunits of rat glomerular basement membrane. By S. A. Taylor & R. G. Price	236
The effect of cadmium administration on activities of enzymes in the urine of the rat and marmoset. $By$ R. J. Pierce, R. G. Price & J. S. L. Fowler	238
Changes in human hexosaminidase isoenzyme distribution in body fluids during the course of tissue damage. $By$ S. M. Tucker & R. G. Price	241
Disposition of oestrone sulphate by the isolated perfused rat kidney. By M. Höller, K. Dengler & H. Breuer	243
The effect of $p$ -nitrophenylarsonic acid on rat kidney glycosidases. By R. G. Price	246
Activity of N-acetyl- $\beta$ -D-glucosaminidase, $\alpha$ -L-fucosidase and $\alpha$ -D-mannosidase in the urine of normal individuals and patients with renal disease. By R. G. Price, R. Thorpe, S. M. Tucker & N. C. Phillips	248
The use of sodium fusidate in characterizing pancreatic esterase. By P. M. Mathias, D. P. R. Muller & J. T. Harries	251
Interaction of lactate dehydrogenase with $N^6$ -(6-aminohexyl)adenosine 5'-monophosphate-Sepharose. By M. G. Gore & C. R. Lowe	251
The stability of lipoamide dehydrogenase immobilized to agarose through spacer molecules of various lengths. By C. R. Lowe	253
The isolation of new warfarin-sensitive protein from bovine plasma. By C. V. Prowse & M. P. Esnouf	255
Cross-reactivity in the radioimmunoassay of ferritin with cells from high- and low-responder mice. By N. J. Deacon & A. Ebringer	256
Solubilization studies and properties of particulate NAD-independent malate dehydrogenase of <i>Acinetobacter calcoaceticus</i> (N.C.I.B. 8250). <i>By</i> M. Jones, R. Fernandes & H. K. King	258
L-Asparaginase activity in the fungus Aspergillus nidulans. By C. Drainas & J. A. Pateman	259
Carbon source catabolite-repression effects on <i>petite</i> mutation in yeast. By J. Z. Meyer, S. M. Homer & P. A. Whittaker	262
Autorepression of ethidium bromide mutagenesis in Kluyveromyces lactis, a petite-negative yeast. By J. Heritage & P. A. Whittaker	264

CONTENTS xi

	PAGE
A cadmium-binding glycoprotein from the liver of the plaice (Pleuronectes platessa). By J. Overnell, I. A. Davidson & T. L. Coombs	267
Ferredoxin-Sepharose as an affinity absorbent for the purification of glutamate synthase and other ferredoxin-dependent enzymes. By R. M. Wallsgrove & B. J. Miflin	269
Chemical basis of the electrophoretic variation between two naturally occurring alcohol dehydrogenase alloenzymes from <i>Drosophila melanogaster</i> . By D. R. Thatcher & R. Camfield	271
The separation of prolyl dipeptidase from other dipeptidases of bovine kidney. $By$ A. F. Akrawi & G. S. Bailey	272
A study of carbonic anhydrase covalently bound to a poly(acryloylmorpholine) network in aqueous/organic solvents. $By$ R. Epton, M. E. Hobson & G. Marr	274
Water-soluble coloured covalent conjugates of carbonic anhydrase and $N$ -( $sym$ -trinitroaryl)polyacrylamide/acrylhydrazide co-polymers. $By$ R. Epton, G. Marr & G. J. Morgan	277
Structural studies of human immunoglobulin D myeloma proteins: Circular-dichroic studies of two intact proteins and enzymically derived fragments. $By$ R. Jefferis, J. B. Matthews & P. Bayley	279
A novel purine nucleoside photoproduct. By S. N. Bose & R. J. H. Davies	282
Some relationships between fatty acid biosynthesis and esterification in rat adipocytes. By R. J. Henderson, W. W. Christie & J. H. Moore	284
The biosynthesis of short-chain triacylglycerols by microsomal fractions from lactating-cow mammary gland. $By$ M. O. Marshall & J. Knudsen	285
Fatty acid elongation by preparations from <i>Pisum sativum</i> . By J. L. Harwood & P. Bolton	287
Properties of [ $^{99m}$ Tc] technetium-labelled liposomes in normal and tumourbearing rats. $By$ V. J. Richardson, K. Jeyasingh, R. F. Jewkes, B. E. Ryman & M. H. N. Tattersall	290
Protection against malaria by sickle-cell trait. By H. Laser & R. Klein	292
The effect of dietary cholesterol on rat liver microsomal 3-hydroxy-3-methyl-glutaryl-coenzyme A reductase activity. $By$ Y. A. Baqir & R. Booth	294
The effects of morphine-like drugs and chlorpromazine on the synthesis of glycerolipids by homogenates of rat liver. By R. F. Sanderson, P. F. Dodds & D. N. Brindley	295
Re-activation of guinea-pig liver uridine diphosphate glucuronosyltransferase with 1-monoacyl phosphatidylcholine after extensive phospholipid deletion at 5°C with pure <i>Bacillus cereus</i> phospholipase C. <i>By</i> J. Allistone, M. Caldecourt, C. Berry & T. Hallinan	297
An exchange reaction catalysed by $\delta$ -aminolaevulinate synthase from <i>Rhodopseudomonas spheroides</i> . By A. Laghai & P. M. Jordan	299
The origin of hexahydrohippurate (cyclohexanoylglycine) in the urine of herbivores. By M. T. Balba & W. C. Evans	300
The methanogenic fermentation of aromatic substrates. By M. T. Balba & W. C. Evans	302

xii CONTENTS

	PAGE
The susceptibility of rainbow trout to fluoroacetate. By A. Bauermeister, C. J. Thompson & I. A. Nimmo	304
Effect of riboflavin deficiency on activity of NADH-FMN oxidoreductase (ferriductase) and iron content of rat liver. By Z. Zaman & R. L. Verwilghen	306
The effect of some foreign compounds on hepatic xenobiotic metabolism and on the urinary excretion of D-glucuronic acid metabolites in the rat. By B. G. Lake, R. C. Longland, R. A. Hodgson, B. J. Severn & S. D. Gangolli	308
The hepatic effects of orally administered di-(2-ethylhexyl) phthalate in the ferret. By B. G. Lake, P. G. Brantom, S. D. Gangolli, K. R. Butterworth, P. Grasso & A. G. Lloyd	310
Metabolic degradation of stable-isotope-labelled dimethylnitrosamine by rat liver. By R. C. Cottrell, B. G. Lake, J. C. Phillips & S. D. Gangolli	311
A radioautographic study of the hepatic uptake of circulating carcinoembryonic antigen by the mouse. By P. Thomas, M. S. C. Birbeck & P. Cartwright	312
The insulin-degrading activity of plasma-membrane fractions from rat liver. $By$ M. H. Wisher, D. I. Dron, P. H. Sönksen & J. H. Thomas	313
Detection and properties of the non- $\alpha$ -isomers of bilirubin-IX. By K. P. M. Heirwegh, N. Blanckaert, F. Compernolle, J. Fevery & Z. Zaman	316
The fate of bilirubin-IX $\alpha$ glucuronides in cholestatic bile: Sequential migration of the 1-acylaglycone to the 2-, 3- and 4-positions of glucuronic acid. By F. Compernolle, N. Blanckaert & K. P. M. Heirwegh	317
New data on halogenoalkane-induced lethality (by title only). By G. Ugazio, E. Burdino, P. Milillo & O. Danni	319
Effects of illumination of whole barley plants on the protochlorophyllide-activating system in the isolated plastids. $By$ R. E. Mapleston & W. T. Griffiths	319
The relationship between floral induction and $\gamma$ -tocopherol concentrations in leaves of <i>Xanthium strumarium</i> L. By R. W. Battle, D. L. Laidman & J. K. Gaunt	322
A possible involvement of protohaem in the induction of nitrate reductase in etiolated barley. $By$ A. Nasrulhaq-Boyce & O. T. G. Jones	324
Purification and properties of cytochrome f from higher plants. By J. C. Gray	326
Aspects of nucleic acid metabolism in wheat aleurone tissue. By K. Varty & D. L. Laidman	328
BOOK REVIEWS	331
BIOCHEMICAL REVIEWS	
The interdependence of mitochondrial maturation and glycogen metabolism in perinatal rat liver. $By$ J. K. Pollak	341
Enzyme-catalysed disulphide interchange and protein biosynthesis. By R. B. Freedman and H. C. Hawkins	348