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PLANT MEMBRANES - STRUCTURE, ASSEMBLY AND FUNCTION

Edited by J.L. HARWOOD and T.J. WALTON

This book records the proceedings of a meeting organized by the Phytochemical Society of Europe, the Membrane Group of the Biochemical Society and the Plant Metabolism Group of the Society for Experimental Biology and held at University College Cardiff in April 1988. Topics covered include membrane structure and its modification by different factors, synthesis of components and membrane assembly, molecular function of membrane components and physiological aspects of membranes.

Contents: Recent structural studies on biomembranes by P.I. Harris & D. Chapman; Identification and isolation of photosystem I and photosystem II pigment-proteins from higher plants by G.F. Peter, O. Machold & J.P. Thornber; Structure, function and biogenesis of nuclear-encoded proteins of photosystem II by B. Andersson & R.G. Herrmann; Lipid topology and the role of lipids in plant membrane structure by W.P. Williams; Use of yeast lipid-synthesis mutants in establishing membrane function by K.D. Atkinson; Surface electrical charges and their role in membrane function by J. Barber; Catabolic regulation of thylakoid membrane structure and function during senescence by H. Thomas; Heat stress and membranes by K.A. Santarius & E. Weis; Glycerolipid synthesis by J.L. Harwood; Processing peptidases of higher plant chloroplasts by P.D. Elderfield, J.E. Musgrove, P.M. Kirwin & C. Robinson; The synergistic effect of light and heat stress on the inactivation of photosystem II by G. Schuster, S. Schochat, N. Adir, D. Even, D. Ish-Shalom, B. Grimm, K. Kloppstech & I. Ohad; The molecular genetics of thylakoid proteins by T.A. Dyer; Properties of the photosystem II quinone binding region by M.C.W. Evans, J.H.A. Nugent, J.A.M. Hubbard, C. Demetriou, C.J. Lockett & A.R. Corrie; A veteran's look at the chloroplast $H^+ - ATPase$ and photosystem I reaction center by N. Nelson; Lipid-protein interactions and membrane function by K. Gounaris, D.J. Chapman & J. Barber; Plasma membrane $H^+ - ATPase$ by R.T. Leonard; Intracellular cannibalism in higher plant cells by R. Douce, R. Bigny, A. J. Dorne & C. Roby; Herbicide action on photosynthetic membranes by A. Trebst; Effects of water stress on photosynthesis and related processes by M. Speer, J.E. Schmidt & W.M. Kaiser; Chilling sensitivity and phosphatidylglycerol biosynthesis by N. Murata, O. Ishizaki & I. Nishida; Calcium, protein kinase and the plasma membrane by S. Gilroy, D. Blowers, M. Collinge, H. Harvey & A.J. Trewavas; Transport across membranes by J.A. Raven.

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The
BIOCHEMICAL JOURNAL

REVIEWS 1989

Edited by P. J. England

The *Biochemical Journal* has published reviews on broad topics of general interest to biochemists and scientists in related disciplines since 1982. These reviews have proved extremely successful and popular (one classic review was one of the most-cited papers of the last decade) and with the aim of making them readily available even to those who do not subscribe to the journal it was decided to produce an annual compilation of all the reviews published in the previous year. This is the first such volume. The 23 reviews published in 1989 covered a wide range of molecular and cellular biochemistry, from fundamental chemical enzymology via the intricacies of signal transduction mechanisms through to cell biology and whole-animal metabolism. *Biochemical Journal* reviews are intended for research scientists, but are written in such a way as to be intelligible to the non-specialist who wishes to learn about progress in other areas. They are thus ideally suited as material both for teaching staff and for senior students.

Contents:

Phosphotyrosyl protein phosphatases by *K.-H. W. Lau, J. R. Farley & D. J. Baylink*; The 2-oxo acid dehydrogenase complexes: recent advances by *S. J. Yeaman*; Calcium/calmodulin-dependent protein kinase II by *R. J. Colbran, C. M. Schworer, Y. Hashimoto, Y.-L. Fong, D. P. Rich, M. K. Smith & T. R. Soderling*; Comparison of butyrylcholinesterase and acetylcholinesterase by *A. Chatonnet & O. Lockridge*; The anomalous kinetics of sulphatase A by *A. B. Roy & T. J. Mantle*; Catalytic antibodies by *G. M. Blackburn, A. S. Kang, G. A. Kingsbury & D. R. Burton*; Recognition mechanisms in the synthesis of animal virus DNA by *R. T. Hay & W. C. Russell*; Detection of single base changes in nucleic acids by *R. G. H. Cotton*; High- M_r microtubule-associated proteins: properties and functions by *G. Wiche*; Complement membrane attack on nucleated cells: resistance, recovery and non-lethal effects by *B. P. Morgan*; Acylation of viral and eukaryotic proteins by *R. J. A. Grand*; Binding of plasminogen activators to fibrin: characterization and pharmacological consequences by *R. Fears*; Biochemistry of the chromogranin A protein family by *J.-P. Simon & D. Aunis*; Gas vesicle proteins by *A. E. Walsby & P. K. Hayes*; Calmodulin-binding proteins as calpain substrates by *K. K. W. Wang, A. Villalobo & B. D. Roufogalis*; High molecular mass intracellular proteases by *A. J. Rivett*; Metabolic interactions between eicosanoids in blood and vascular cells by *M. Lagarde, N. Gualde & M. Rigaud*; The eicosanoids and their biochemical mechanisms of action by *W. L. Smith*; Influence of polyamines on membrane functions by *F. Schuber*; Metabolism of the inositol phosphates produced upon receptor activation by *S. B. Shears*; Multiple actions of β -adrenergic agonists on skeletal muscle and adipose tissue by *Y. T. Yang & M. A. McElligott*; Fuel selection and carbon flux during the starved-to-fed transition by *M. C. Sugden, M. J. Holness & T. N. Palmer*; Sulphane sulphur in biological systems: a possible regulatory role by *J. I. Toohey*.

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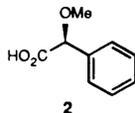
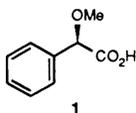
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Chiral Derivatizing Reagents

Chiral derivatizing reagents are useful for determining the enantiomeric purity of a wide variety of compounds, usually by NMR analysis. Also, suitable derivatives often find preparative utility via chromatographic resolutions. These reagents have been applied to the analysis of alcohols (including primary alcohols with an α -chiral center), diols, amino alcohols, amines, amino acids, etc. Some examples are described below.

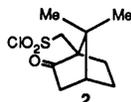
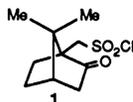


Resolution of a propynylamine¹ and of a diol in the synthesis of erythronolide A;² NMR analysis of the configuration of the bis-nor-Wieland-Miescher ketone.³

(1) Nisson, B.N.; Hacksell, V. *Acta Chem. Scand. Ser. B* 1988, B42, 55. (2) Corey, E.J. *et al. J. Am. Chem. Soc.* 1979, 101, 7131. (3) Trost, B.M.; Curran, D.P. *Tetrahedron Lett.* 1981, 22, 4929.

24,896-7 (R)-(-)- α -Methoxyphenylacetic acid, 99% (1) 1g \$27.80

24,898-3 (S)-(+)- α -Methoxyphenylacetic acid, 99% (2) 1g \$27.80

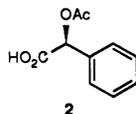
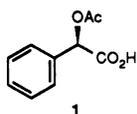


Suitable for use with D- and L-amino acids,¹ carbinols and amines.²

(1) Furukawa, H.; Sakakibara, F.; Kamei, A.; Ito, K. *Chem. Pharm. Bull.* 1975, 23, 1625. (2) Hoyer, G.A. *et al. Tetrahedron Lett.* 1972, 985.

**21,957-6 (+)-10-Camphorsulfonyl chloride, 97% (1) 5g \$11.50; 25g \$38.20
100g \$105.40**

30,194-9 (-)-10-Camphorsulfonyl chloride, 97% (2) 5g \$21.80; 25g \$73.60

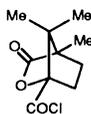


Direct resolution of an amino acid,¹ resolution of aryl methyl¹ and β -amino alcohols;² NMR assay of alcohols in the presence of an ester functionality.³

(1) Ramalingam, D. *et al. Tetrahedron* 1988, 44, 5597. (2) Parker, D.; Taylor, R.J. *ibid.* 1987, 43, 5451. (3) Batmangierlich, S.; Davidson, A.H. *Chem. Commun.* 1985, 20, 1399.

25,303-0 (R)-(-)-O-Acetylmandelic acid, 99% (1) 5g \$23.30

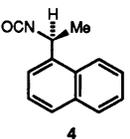
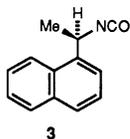
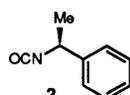
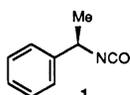
25,302-2 (S)-(+)-O-Acetylmandelic acid, 99% (2) 5g \$23.30



Resolving agent for 2,6-disubstituted bicyclo[3.3.1]nonanes¹; used for the optical assay of an amino alcohol² in a bicyclic sultam.³

(1) Gerlach, H. *Helv. Chim. Acta* 1978, 61, 2793. (2) William, R.M.; Sinclair, P.J.; Zhai, D.; Chen, D. *J. Am. Chem. Soc.* 1988, 110, 1547. (3) Vandewalle, M.; Van der Eycken, J.; Oppolzer, W.; Vulliod, C. *Tetrahedron* 1986, 42, 4035.

22,617-3 (1S)-(-)-Camphanic chloride, 98% 1g \$21.90; 5g \$91.10



Reagents for HPLC resolution of tertiary amines;¹ absolute-configuration analysis of dialkyl glycerols² and the antimalarial (+)-primaquine;³ resolving agent for alcohols, α -hydroxy esters and thiols.⁴

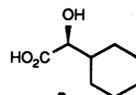
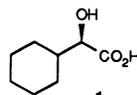
(1) Maibaun, J. *J. Chromatogr.* 1988, 436, 269. (2) Sonnet, P.E. *et al. ibid.* 1988, 436, 205. (3) Yu, Q.S.; Brossi, A.; Plippen-Anderson, J.L. *FEBS Lett.* 1987, 221, 325. (4) Pirkle, W.H.; Simmons, K.A.; Boeder, C.W. *J. Org. Chem.* 1979, 44, 4891.

22,057-4 (R)-(+)- α -Methylbenzyl isocyanate, 99% (1) 1g \$18.20; 5g \$59.20

22,056-6 (S)-(-)- α -Methylbenzyl isocyanate, 99% (2) 1g \$18.20; 5g \$59.20

**22,044-2 (R)-(-)-1-(1-Naphthyl)ethyl isocyanate, 98% (3) 250mg \$14.75
1g \$41.20**

**29,595-7 (S)-(+)-1-(1-Naphthyl)ethyl isocyanate, 99% (4) 250mg \$14.00
1g \$39.30**

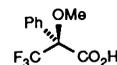


Used for the analysis of valine derivatives.

Goodman, M. *et al. Bioorg. Chem.* 1974, 3, 184.

30,114-0 (R)-(-)-Hexahydromandelic acid, 98% (1) 1g \$16.20

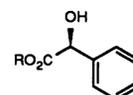
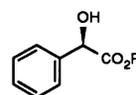
30,115-9 (S)-(+)-Hexahydromandelic acid, 98% (2) 1g \$16.20



Resolution and assay of alcohols and amines. Stable toward racemization under acidic and basic conditions.

Dale, J.A.; Mosher, H.S. *J. Am. Chem. Soc.* 1973, 95, 512.

31,803-5 (S)-(-)- α -Methoxy- α -(trifluoromethyl)phenylacetic acid, 99 + % 250mg \$17.90; 1g \$49.00



1, R = Me
3, R = Et

2, R = Me
4, R = Et

Versatile reagents for the NMR assay and resolution of carboxylic acids, alcohols, amines,¹ amino alcohols² and thiols.³

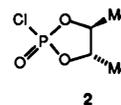
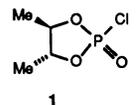
(1) Parker, D. *J. Chem. Soc., Perkin Trans. 2* 1983, 83. (2) Kashima, C.; Harada, K.; Omote, Y. *J. Chem. Soc., Perkin Trans. 1* 1987, 1495. (3) Klemisch, W.; Von Hohenberg, A. *Chromatogr. Commun.* 1985, 8, 37.

25,155-0 Methyl (R)-(-)-mandelate, 99 + % (1) 1g \$7.40; 5g \$29.50

25,154-2 Methyl (S)-(+)-mandelate, 99 + % (2) 1g \$7.40; 5g \$29.50

30,998-2 Ethyl (R)-(-)-mandelate, 99% (3) 5g \$20.00; 25g \$65.50

30,997-4 Ethyl (S)-(+)-mandelate, 99% (4) 5g \$20.00; 25g \$65.50



Derivatizing agents for the enantiomeric assay of alcohols and amines by ³¹P-NMR.

Anderson, R.C.; Shapiro, M.J. *J. Org. Chem.* 1984, 49, 1304. Johnson, C.R.; Elliott, R.C.; Penning, D. *J. Am. Chem. Soc.* 1984, 106, 5019.

**27,567-0 (4R,5R)-(+)-2-Chloro-4,5-dimethyl-1,3,2-dioxaphospholane-2-oxide, 98% (1) 250mg \$28.80
1g \$90.60**

**30,854-4 (4S,5S)-(-)-2-Chloro-4,5-dimethyl-1,3,2-dioxaphospholane-2-oxide, 98% (2) 250mg \$29.10
1g \$100.10**



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