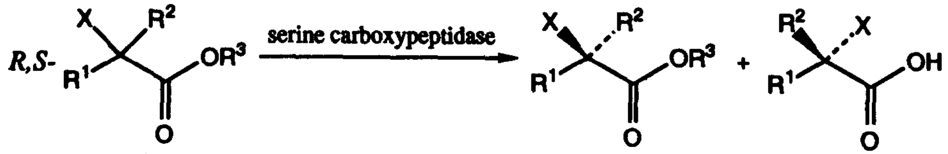
Enzymes for the Resolution of α-Tertiary-Substituted Carboxylic Acid Esters

BioMed. Chem. **1994**, *2*, 557

H. Kallwass, C. Yee, T. Blythe, T. McNabb, E. Rogers and S. Shames
Genzyme Corporation, One Kendall Square, Cambridge, MA 02139-1562



E > 450 for R^1 = 3-methoxy-4-hydroxybenzyl, R^2 = Me, X = -NHNH2, R^3 = Et, nBu

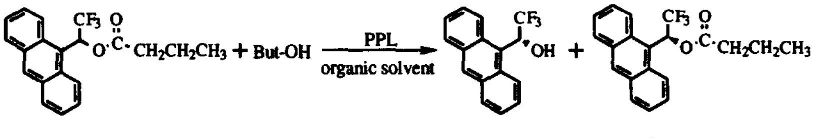
Serine carboxypeptidases are identified as efficient catalysts for kinetic resolutions of sterically hindered carboxylic acid esters. Preparative examples include α-alkyl-α-hydroxy, α-alkyl-α-amino and α-alkyl-α-hydrazino acids.

RESOLUTION OF RACEMIC STERICALLY HINDERED SECONDARY ALCOHOLS VIA ENZYMATIC ALCOHOLYSIS OF THEIR ESTERS. THE FIRST ENZYMATIC PREPARATION OF OPTICALLY PURE 2,2,2-TRIFLUORO-1-(9 ANTHRYL)ETHANOLS.

BioMed. Chem. **1994**, *2*, 567

Eleonora Shkolnik and Arie L. Gutman*
Department of Chemistry, Technion - Israel Institute of Technology, Haifa 32000, Israel

Both enantiomers of the title compound were conveniently obtained on a large scale via enzymatic alcoholysis of appropriate ester.



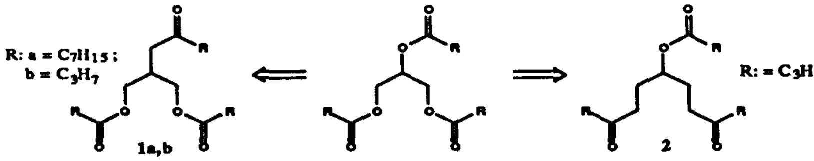
(R,S) (R) (S)

CARBA ANALOGUES OF TRIGLYCERIDES - ISOSTERIC MIMICS FOR NATURAL LIPIDS. NOVEL SUBSTRATES FOR THE DETERMINATION OF REGIO- AND ENANTIOSELECTIVITIES DISPLAYED BY LIPASES,

BioMed. Chem. **1994**, *2*, 573

M. Berger, B. Jakob and M. P. Schneider*, *FB 9 - Bergische Universität-GH-Wuppertal, D-42097 Wuppertal, Germany*

Abstract: The synthesis of triglyceride carba analogues 1a,b and 2 is reported and their identical behaviour towards lipases is demonstrated both by binding studies and enzymatic transformations.

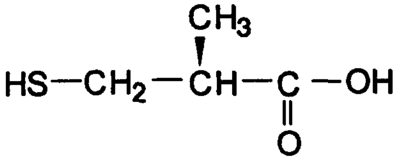


THE UTILIZATION OF 3-MERCAPTO-2-METHYLPROPIONATE AS SULPHUR SOURCE BY A PHOTOTROPHIC BACTERIUM

BioMed. Chem. **1994**, *2*, 589

Mark R. Smith, Will J.J. van den Tweel and Jan A.M. de Bont, Division of Industrial Microbiology, Department of Food Science, Wageningen Agricultural University, PO Box 8129, 6700 EV Wageningen, The Netherlands

Abstract: The utilization of 3-mercapto-2-methylpropionate by a photosynthetic bacterium is reported.



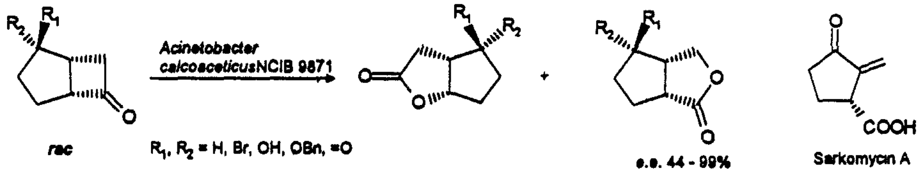
$$HS-CH_2-\overset{\overset{\displaystyle CH_3}{|}}{CH}-\underset{\underset{\displaystyle O}{\|}}{C}-OH$$

BioMed. Chem. 1994, 2, 595

Microbial Baeyer-Villiger Reaction of Bicyclo[3.2.0.]heptan-6-ones A Novel Approach to Sarkomycin A

Kurt Königsberger and Herfried Griengl*

Christian Doppler Laboratory for Chiral Compounds at the Institute of Organic Chemistry, Graz University of Technology, Graz, Austria



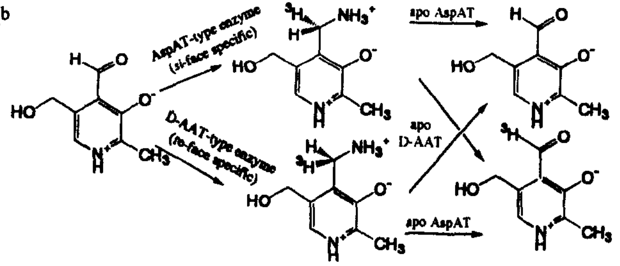
BioMed. Chem. 1994, 2, 605

A Simple Method for Determination of Stereospecificity of Aminotransferases for C-4' Hydrogen Transfer of the Coenzyme

K. Nishimura,[a] J. Ito,[b] T. Yoshimura,[b] N. Esaki[b] and K. Soda[b]

[a]*Department of Applied Chemistry and Biotechnology, Yamanashi University, 4-3-11 Takeda, Kofu, Yamanashi 400, Japan*

[b]*Institute for Chemical Research, Kyoto University, Uji, Kyoto-Fu 611, Japan*

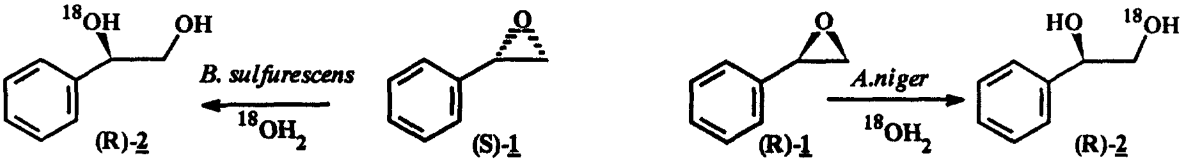


BioMed. Chem. 1994, 2, 609

Microbiological transformations. 29. Enantioselective hydrolysis of epoxides using microorganisms : a mechanistic study.

S. Pedragosa-Moreau, A. Archelas, R. Furstoss*

GCOBO, URA CNRS 1320, Faculté des Sciences de Luminy, case 901, 13288 Marseille Cedex 9, France.

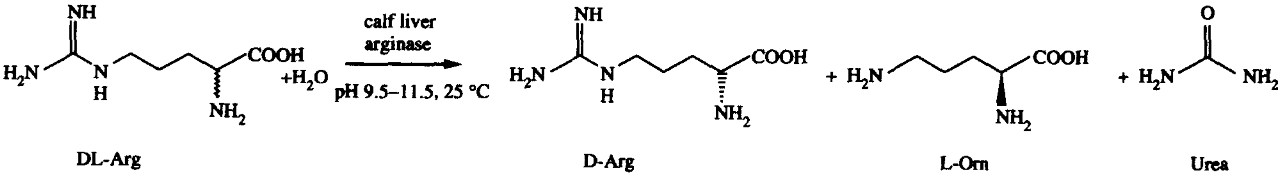


BioMed. Chem. 1994, 2, 617

An Enzymatic Route to L-Ornithine from Arginine—Activation, Selectivity and Stabilization of L-Arginase

Andreas S. Bommarius and Karlheinz Drauz

DEGUSSA AG, Organic and Biological Chemistry R&D P.O. Box 1345, D-63403 Hanau, Germany

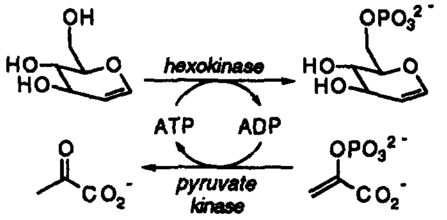


The complete enantioselectivity of calf liver arginase allows the splitting of D,L-Arg into the valuable pharmaceutical amino acids D-arginine and L-ornithine.

BioMed. Chem. 1994, *2*, 627

Selective Inhibition of Metabolic Enzymes by Enzymatically Synthesized D-Glucal-6-Phosphate

H. Keith Chenault* and Robert F. Mandes
Department of Chemistry and Biochemistry, University of Delaware, Newark, DE 19716

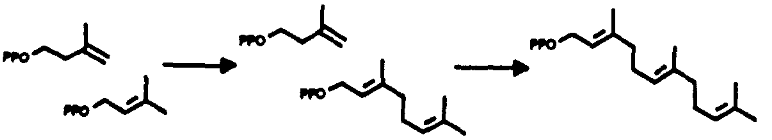


Yeast hexokinase (EC 2.7.1.1) catalyzes the phosphorylation of D-glucal and methyl α and β-D-glucopyranosides at 1-5% of the rates of phosphorylation of D-glucose and 2-deoxy-D-glucose. Maltose, cellobiose, D-galactal, and tetrahydropyran-2-methanol are not substrates of hexokinase. Enzymatically synthesized D-glucal-6-phosphate inhibits rabbbit muscle phosphoglucose isomerase competitively (K_I = 1.94 mM) and phosphoglucomutase noncompetitively (K_I = 0.122 mM).

BioMed. Chem. 1994, *2*, 631

ENZYMATIC SYNTHESIS OF ISOTOPICALLY LABELED ISOPRENOID DIPHOSPHATES

D. J. Christensen and C. D. Poulter*, *Department of Chemistry, University of Utah, Salt Lake City, UT 84103*

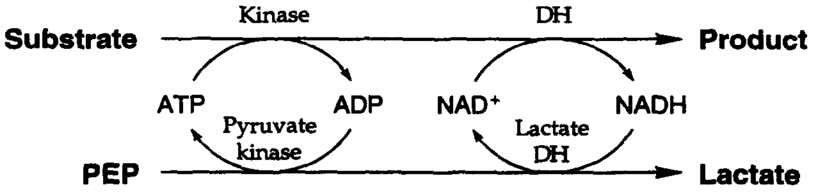


Recombinant isopentenyl diphosphate (IPP) isomerase and farnesyl diphosphate (FPP) synthase were used to synthesize FPP from ^{13}C-labeled IPP and dimethylallyl diphosphate (DMAPP). By judicious combination of substrates and enzymes, it was possible to selectively label the first and last isoprene residues in FPP.

BioMed. Chem. 1994, *2*, 639

PHOSPHOENOLPYRUVATE AS A DUAL PURPOSE REAGENT FOR INTEGRATED NUCLEOTIDE/NICOTINAMIDE COFACTOR RECYCLING.

Wolf-Dieter Fessner* and Gudrun Sinerius
Department of Organic Chemistry and Biochemistry, University of Freiburg, D-79104 Freiburg i.Br., Germany

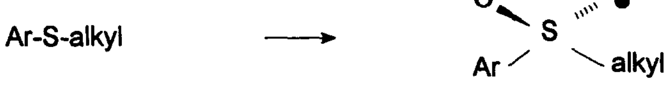


BioMed. Chem. 1994, *2*, 647

BIOTRANSFORMATION OF ORGANIC SULFIDES. PART 4 FORMATION OF CHIRAL BENZYL ALKYL AND PHENYL ALKYL SULFOXIDES BY *HELMINTHOSPORIUM* SPECIES NRRL 4671,

H.L. Holland, F.M. Brown, and B.G. Larsen, *Department of Chemistry, Brock University, St. Catharines, Ontario, L2S 3A1, Canada*

Abstract: biotransformation of phenyl alkyl and benzyl alkyl sulfides by *Helminthosporium* species NRRL 4671 gives predominantly (*S*) sulfoxides.

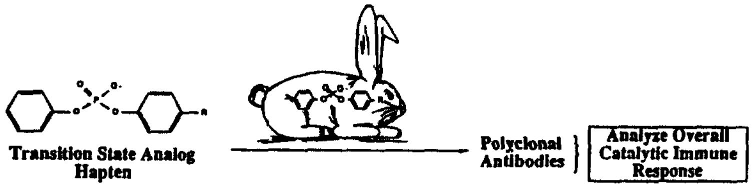


BioMed. Chem. **1994,** *2,* 653

POLYCLONAL ANTIBODIES AND CATALYSIS

David B. Stephens, Britta H. Wilmore, and Brent L. Iverson*,
Department of Chemistry and Biochemistry, The University of Texas at Austin, Austin, Texas, 78712

Some recent results involving catalytic poly-clonal antibodies are described. Polyclonal antibodies isolated directly from serum can be used to characterize the *overall* catalytic activity produced in an animal in response to immunization.



BioMed. Chem. **1994,** *2,* 659

THERMOSTABILITY AND THERMOACTIVITY OF ENZYMES FROM HYPERTHERMOPHILIC ARCHAEA,

M.W.W. Adams and R.M. Kelly, *Department of Biochemistry, University of Georgia, Athens, Georgia 30602 and Department of Chemical Engineering, North Carolina University, Raleigh, North Carolina 27695-7905*

Abstract: Enzymes from hyperthermophilic microorganisms are characteristically thermostable and thermoactive at extremely high temperatures. Information about the basis for the structure and function of these novel proteins is beginning to emerge. However, there are very few generalizations that can be drawn at this point that can be derived from the limited number of studies that have focused on biocatalysis and thermostability at extremely high temperatures.

BioMed. Chem. **1994,** *2,* 669

COMBINED CHEMICAL AND ENZYMATIC SYNTHESIS OF THE SIALYLATED NON REDUCING TERMINAL SEQUENCE OF GM$_{1b}$ GLYCOLYLATED GANGLIOSIDE, A POTENTIAL HUMAN TUMOR MARKER,

A. Lubineau, C. Augé*, C. Gautheron-Le Narvor and J.C.Ginet, *Institut de Chimie Moléculaire d'Orsay, URA CNRS 462, Université Paris-Sud, Bât. 420, 91405 ORSAY Cédex FRANCE*

$$\beta\text{-D-Gal-(1-3)-}\beta\text{-D-GalNAc-OBn} \xrightarrow{\text{Sialyl transferase}} \alpha\text{-Neu5Gc-(2-3)-}\beta\text{-D-Gal-(1-3)-}\beta\text{-D-GalNAc-OBn}$$

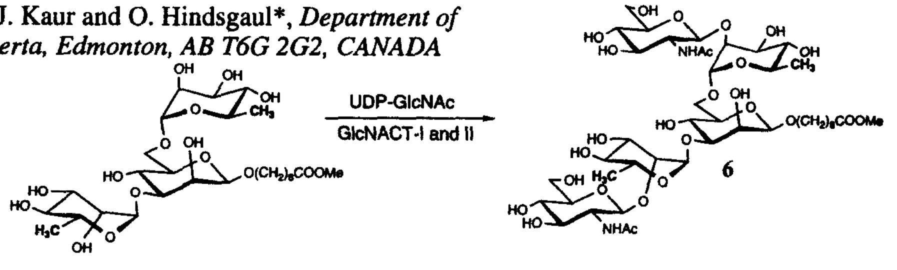
$$\text{GlcNH}_2 \rightarrow \text{ManNGc} \rightarrow \text{Neu5Gc} \rightarrow \text{CMP-NeuGc}$$

BioMed. Chem. **1994,** *2,* 675

USE OF N-ACETYLGLUCOSAMINYLTRANSFERASES I AND II IN THE SYNTHESIS OF A DIDEOXYPENTASACCHARIDE,

G. Alton, G. Srivastava, K. J. Kaur and O. Hindsgaul*, *Department of Chemistry, University of Alberta, Edmonton, AB T6G 2G2, CANADA*

Abstract: A combined chemical-enzymatic synthesis of **6** is reported.

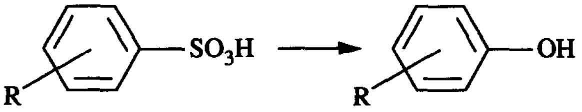


BIOCATALYTIC DESULFURIZATION OF ARYLSULFONATES,

BioMed. Chem. **1994,** *2,* 681

Matthew W. Dudley and John W. Frost,
Department of Chemistry, Purdue University, West Lafayette, IN 47907

Abstract: Conversion of arylsulfonates into phenols under mild conditions in a reaction catalyzed by *Klebsiella oxytoca KS3D* is discussed.

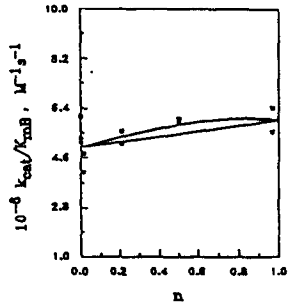


SOLVENT ISOTOPE EFFECTS AND THE NATURE OF ELECTROPHILIC CATALYSIS IN THE ACTION OF THE LACTATE DEHYDROGENASE OF *Bacillus stearothermophilus*,

BioMed. Chem. **1994,** *2,* 691

M. Xie, J. Seravalli, W.P. Huskey, K.B. Schowen and R.L. Schowen,
Departments of Chemistry and Biochemistry, and Higuchi Biosciences Center, University of Kansas, Lawrence, Kansas 66045 USA

Abstract: The solvent isotope effect is near unity on a kinetic term that displays the transition state for hydride transfer. Electrophilic catalysis of hydride transfer, producing 7-8 orders of magnitude in catalytic acceleration, is unlikely to involve protonic bridging.

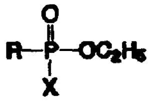


INHIBITION OF LIPASES BY PHOSPHONATES

BioMed. Chem. **1994,** *2,* 697

F. BJÖRKLING,* A. DAHL, S. PATKAR and M. ZUNDEL
Novo Nordisk A/S, Novo Allé, 2880 Bagsvaerd, Denmark

Ethyl hexylchlorophosphonate and analogues irreversibly inhibited both microbial and mammalian lipases. Enantioselective inhibition was found for the lipases derived from *Candida antarctica* and *Rhizomucor miehei* using pure enantiomers of ethyl p–nitrophenyl hexylphosphonate as inhibitors. Using the same inhibitor, reversed enantioselectivity was found for the protease α–chymotrypsin as compared to the two lipases.


$R-P(=O)(X)-OC_2H_5$

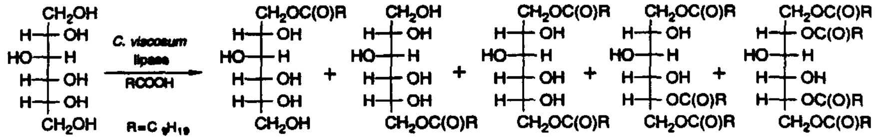
R = hexyl; X = Cl, p–nitrophenyl

Regioselectivity and fatty acid specificity of *Chromobacterium viscosum* lipase.

BioMed. Chem. **1994,** *2,* 707

R. J. Barros, P. G. V. Moura-Pinto, M. C. R. Franssen, A. E. M. Janssen and A. de Groot
Departments of Organic Chem. and Food Science, Wageningen Agricultural University, Wageningen, The Netherlands

The fatty acid specificity of the lipase from *Chromobacterium viscosum* was determined by monitoring the pseudo-first-order rate constant of the transesterification of fatty acid methyl ester with 1-propanol. The highest reaction rate was obtained with long-chain fatty acids; the enzyme prefers saturated fatty acids to unsaturated ones. *C. viscosum* lipase is regioselective in the esterification of sorbitol:

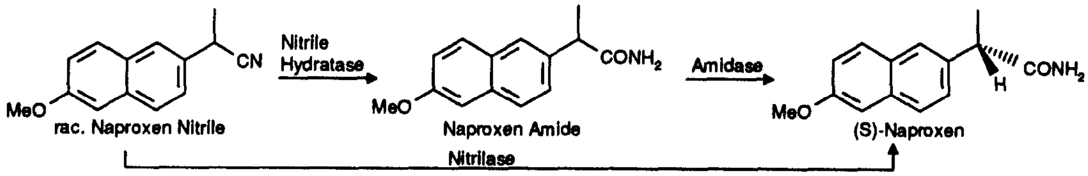


BioMed. Chem. **1994**, *2*, 715

ENZYME-CATALYSED ENANTIOSELECTIVE HYDROLYSIS OF RACEMIC NAPROXEN NITRILE, F. Effenberger*, J. Böhme,

Institut für Organische Chemie, Universität Stuttgart, Pfaffenwaldring 55, D-70569 Stuttgart, Germany

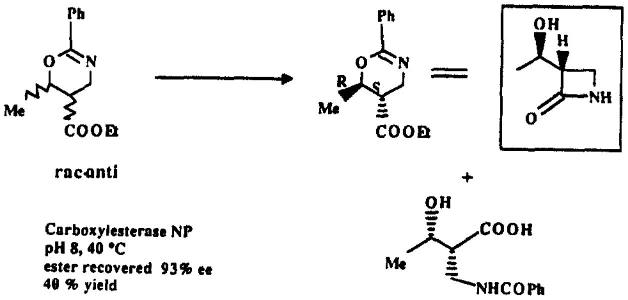
Abstract: Rac. naproxen nitrile was selectively hydrolysed to (*S*)-naproxen catalysed by Rhodococcus butanica or by Rhodococcus sp. C3II.



BioMed. Chem. **1994**, *2*, 723

Kinetic Resolution of Substituted 1,3-4H-5,6-Dihydrooxazines with Carboxylesterase NP: Synthesis of (3S,1'R)-3-(1'-Hydroxyethyl)-Azetidin-2-one

Claudio Fuganti, Simonetta Lanati and Stefano Servi
CNR, Centro per lo Studio delle Sostanze Organiche Naturali, Dipartimento di Chimica. Politecnico di Milano, Via Mancinelli 7, 20131 Milano, Italy

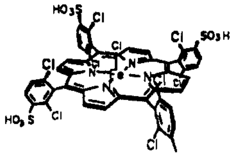


BioMed. Chem. **1994**, *2*, 735

THE BIOMIMETIC OXIDATION OF β-1, β-O-4, β-5, AND BIPHENYL LIGNIN MODEL COMPOUNDS BY SYNTHETIC IRON PORPHYRINS,

Futong Cui and David Dolphin,* *The University of British Columbia, Department of Chemistry, 2036 Main Mall, Vancouver, B.C., Canada, V6T 1Y6*

Abstract: The iron porphyrin (2) mimics lignin peroxidase in degrading a number of lignin model compounds. β-O-4 (3) and β-1 (6) lignin model compounds were cleaved at their C_α-C_β bonds.



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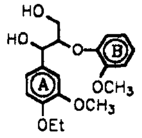

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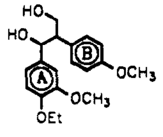

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