

## The Chemistry of 3-Hydroxy-alkanoates Poly- and Oligo-(3hydroxybutanoates (PHB, OHB)

\* = Review articles

Dieter Seebach, Max Züger

**Über die Depolymerisierung von Poly-(R)-3-hydroxy-buttersäureester (PHB)**

Helv. Chim. Acta 65, 495-503 (1982)

Dieter Seebach, Max F. Züger

**On the Preparation of Methyl and Ethyl (R)-(-)-3-Hydroxy-Valerate by  
Depolymerization of a Mixed PHB/PHV Biopolymer**

Tetrahedron Lett. 25, 2747-2750 (1984)

\*Dieter Seebach, Silvio Roggo, Jürg Zimmermann

**Biological-Chemical Preparation of 3-Hydroxycarboxylic Acids and their Use in  
EPC-Syntheses**

in "Stereochemistry of Organic and Bioorganic Transformations" Workshop  
Conferences Hoechst, Vol. 17, Wilhelm Bartmann and K. Barry Sharpless, Editors,  
Verlag Chemie, Weinheim, 1987, 85-126

Dieter Seebach, Urs Brändli, Peter Schnurrenberger, Michael Przybylski

**High-Yield Synthesis of 20-, 24-, and 28-Membered Macropentolide, -hexolide, and  
-heptolide, Respectively, from (R)- or (S)-3-Hydroxybutanoic Acid under  
Yamaguchi's Macrolactonization Conditions**

Helv. Chim. Acta 71, 155-167 (1988)

Dieter Seebach, Urs Brändli, Hans-Martin Müller, Max Dobler, Martin Egli, Michael  
Przybylski, Klaus Schneider

**On the Macrolactonization of  $\beta$ -Hydroxy Acids. Crystal Structure of the Pentolide  
and the Hexolide from (R)-3-Hydroxybutanoic Acid. Molecular Modeling Studies  
of the Tetrolide**

Helv. Chim. Acta 72, 1704-1717 (1989)

Dieter Seebach, Albert K. Beck, Urs Brändli, Dieter Müller, Michael Przybylski,  
Klaus Schneider

**Partial Depolymerization and Solubilization of Poly[(R)-3-hydroxy-butanoate]  
(PHB) and Its Copolymer with (R)-3-Hydroxyvalerate (BIOPOL<sup>®</sup>) by Treatment  
with Li-Amides/LiCl in Tetrahydrofuran at Low Temperature**

Chimia 44, 112-116 (1990)

\*Dieter Seebach

**(R)-Polyhydroxybutyrate in the Hands of a Synthetic Organic Chemist**

Thirty-Second National Organic Chemistry Symposium, The Division of Organic Chemistry of the American Chemical Society, June 16-20, 1991, Program and Abstracts, The University of Minnesota, Minneapolis, Minnesota, USA, 181-195 (1991)

Hans-Martin Müller, Max Dobler, Peter Zbinden, Dieter Seebach

**Bildung 12- bis 40-gliedriger Oligolide aus enantiomerenreinen**

**3-Hydroxybuttersäure-Derivaten - Bausteine für eine  $\alpha_1$ - und eine**

**$\beta_1$ -Helix**

Chimia 45, 376-378 (1991)

Dieter Seebach, Hans-Martin Müller, H. Michael Bürger, Dietmar A. Plattner

**Das Triolid von (R)-3-Hydroxybuttersäure - direkte Herstellung aus**

**Polyhydroxybutyrat und Bildung eines Kronen-Estercarbonyl-Komplexes mit Na-Ionen**

Angew. Chem. 104, 443-444 (1992)

Angew. Chem. Int. Ed. Engl. 31, 434-435 (1992)

Dieter Seebach, Albert K. Beck, Richard Breitschuh, Kurt Job

**Direct Degradation of the Biopolymer Poly[(R)-3-Hydroxybutyric Acid] to (R)-3-**

**Hydroxybutanoic Acid and its Methyl Ester**

Organic Syntheses 71, 39-47 (1993)

Dieter Seebach

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FEMS Microbiology Reviews 103, 215 (1992)

Frank G. Riddell, Dieter Seebach, Hans-Martin Müller

**Solid State CP/MAS  $^{13}\text{C}$ -NMR Spectra of Oligolides Derived from 3-**

**Hydroxybutanoic Acid**

Helv. Chim. Acta 76, 915-923 (1993)

\*Hans-Martin Müller, Dieter Seebach

**Poly(hydroxyfettsäureester), eine fünfte Klasse von physiologisch bedeutsamen organischen Biopolymeren?**

Angew. Chem. 105, 483-509 (1993)

Angew. Chem. Int. Ed. 32, 477-502 (1993)

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**Poly[(R)-3-hydroxyalkanoates] - The Fourth Family of Biopolymers: Contributions of an Organic Chemist**

International Bioorganic Symposium, Interlaken, April 14-16, 1993, Abstracts 38-39 and Chimia 47, 102-103 (1993)

Dietmar A. Plattner, Andreas Brunner, Max Dobler, Hans-Martin Müller, Walter Petter, Peter Zbinden, Dieter Seebach

**Cyclische Oligomere von (R)-3-Hydroxybuttersäure: Herstellung und strukturelle Aspekte**

Helv. Chim. Acta **76**, 2004-2033 (1993)

H. Michael Bürger, Hans-Martin Müller, Dieter Seebach, K. Olaf Börnsen, Martin Schär, H. Michael Widmer

**Matrix-Assisted Laser Desorption and Ionization as a Mass Spectrometric Tool for the Analysis of Poly[(R)-3-hydroxybutanoates]. Comparison with Gel Permeation Chromatography**

Macromolecules **26**, 4783-4790 (1993)

H. Michael Bürger, Dieter Seebach

**Cation Transport across Bulk Liquid Organic Membranes with Oligomers of (R)-3-Hydroxybutanoic Acid**

Helv. Chim. Acta **76**, 2570-2580 (1993)

Dieter Seebach, H. Michael Bürger, Dietmar A. Plattner, Reinhard Nesper, Thomas Fässler

**Complexes of the Triolide from (R)-3-Hydroxybutanoic Acid with Sodium, Potassium, and Barium Salts: Crystal Structures, Ester Chelates and Ester Crowns, Crystal Packing, Bonding, and Electron-Localization Functions**

Helv. Chim. Acta **76**, 2581-2601 (1993)

Frank G. Riddell, Janice Bramham, H. Michael Bürger, Zhe Zhou

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Dieter Seebach, H. Michael Bürger, Hans-Martin Müller, Urs D. Lengweiler, Albert K. Beck, Kathy E. Sykes, Phil A. Barker, Peter J. Barham

**Synthesis of Linear Oligomers of (R)-3-hydroxybutyrate and Solid-State Structural Investigations by Electron Microscopy and X-Ray Scattering**

Helv. Chim. Acta **77**, 1099-1123 (1994)

Dieter Seebach, Andreas Brunner, H. Michael Bürger, Jakob Schneider, Rosetta N. Reusch

**Isolation and  $^1\text{H}$ -NMR-Spectroscopic Identification of Poly-(3-hydroxybutanoate), c-P(3-HB), from Prokaryotic and Eukaryotic Organisms. Determination of the Absolute Configuration (R) of the Monomeric Unit 3-Hydroxy-butanoic Acid from *E. coli* and Spinach.**

Eur. J. Biochem. **224**, 317-328 (1994)

Dieter Seebach, Torsten Hoffmann, Florian N. M. Kühnle, Urs D. Lengweiler  
**Preparation and Structure of Oligolides from (R)-3-Hydroxypentanoic Acid and Comparison with the Hydroxybutanoic Acid Derivatives. A small Change with large Consequences**  
*Helv. Chim. Acta* **77**, 2007-2034 (1994)

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*J. Mater. Sci.* **30**, 623-627 (1995)

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*Helv. Chim. Acta* **78**, 1525-1540 (1995)

\*Dieter Seebach, Andreas Brunner, Beat M. Bachmann, Torsten Hoffmann, Florian N.M. Kühnle, Urs D. Lengweiler  
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Schering Lecture, Vol. 28, (1995)

Urs D. Lengweiler, Monica G. Fritz, Dieter Seebach  
**Synthese monodisperser linearer und cyclischer Oligomere der (R)-3-Hydroxybuttersäure mit bis zu 128 Einheiten**  
*Helv. Chim. Acta* **79**, 670-701 (1996)

Dieter Seebach, Andreas Brunner, H. Michael Bürger, Rosetta N. Reusch, Linda L. Bramble  
**Channel-Forming Activity of 3-Hydroxybutanoic-Acid Oligomers in Planar Lipid Bilayers**  
*Helv. Chim. Acta* **79**, 507-517 (1996)

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*Helv. Chim. Acta* **79**, 319-345 (1996)

Torsten Hoffmann, Dieter Seebach

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Liebigs Ann. 1996, 1277 - 1282

Dieter Seebach, Guido F. Herrmann, Urs D. Lengweiler, Beat M. Bachmann, Walter Amrein

**Synthese und enzymatischer Abbau von Dendrimeren aus (R)-3-Hydroxybuttersäure und Trimesinsäure**

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**Synthesis of Monodisperse Macromolecular Bicyclic and Dendritic Compounds from (R)-3-Hydroxybutanoic Acid and Benzene-1,3,5-tricarboxylic Acid and Analysis by Fragmenting MALDI-TOF Mass Spectroscopy**

Helv. Chim. Acta 80, 989 - 1026 (1997)

Sudipto Das, Urs D. Lengweiler, Dieter Seebach, Rosetta N. Reusch

**Proof for a nonproteinaceous calcium-selective channel in *Escherichia coli* by total synthesis from (R)-3-hydroxybutanoic acid and inorganic polyphosphate**

Proc. Natl. Acad. Sci. USA 94, 9075 - 9079 (1997)

Dieter Seebach, Sorana Poenaru, Gerd Folkers, Didier Rognan

**Synthesis of Oligo(3-hydroxybutanoate)(OHB)-Containing Peptides with High Binding Affinity to a Class-I-MHC Protein**

Helv. Chim. Acta 81, 1181 - 1200 (1998)

Stefan Krebs, José Lamas, Sorana Poenaru, Gerd Folkers, José A. López de Castro, Dieter Seebach, Didier Rognan

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J. Biol. Chem. 273, 19072 - 19079 (1998)

Monica G. Fritz, Dieter Seebach

**Synthesis of Amino-Acid-, Carbohydrate-, Coumarin-, and Biotin-Labelled Oligo [(R)-3-Hydroxybutanoic Acids] (OHB)**

Helv. Chim. Acta 81, 2414 – 2429 (1998)

Beat M. Bachmann, Dieter Seebach

**Synthesis and Structure of Linear and Cyclic Oligomers of 3-Hydroxybutanoic Acid with Specific Sequences of (R)- and (S)-Configurations**

Helv. Chim. Acta 81, 2430 – 2461 (1998)

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**Oligoesters of (R)-3-Hydroxybutanoic Acid: Transmembrane Transport of Ca<sup>2+</sup> across Vesicle Bilayers**

Macromolecules 32, 574 - 580 (1999)

Beat M. Bachmann, Dieter Seebach

**Investigation of the Enzymatic Cleavage of Diastereomeric Oligo(3-hydroxybutanoates) Containing Two to Eight HB Units. A Model for the Stereoselectivity of PHB Depolymerase from *Alcaligenes faecalis* T<sub>1</sub>**  
*Macromolecules* **32**, 1777 - 1784 (1999)

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*Int. J. Biol. Macromol.* **25**, 217 - 236 (1999)

Sorana Poenaru, José R. Lamas, Gerd Folkers, José A. López de Castro, Dieter Seebach, Didier Rognan

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*J. Med. Chem.* **42**, 22318 - 2331 (1999)

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*J. Receptor & Signal Transduction Research* **19**, 645 - 657 JAN-JUL (1999)

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*Chimia* **55**, 345-353 (2001)

Peter Waser, Magnus Rueping, Dieter Seebach, Elke Duchardt, Harald Schwalbe

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*Helv. Chim. Acta* **84**, 1821-1845 (2001)

Peter J. Gee, Fred A. Hamprecht, Lukas D. Schuler, Wilfred F. van Gunsteren,

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