

## Dr. Oliver Hofstetter

Associate Professor

Department of Chemistry and Biochemistry

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### Education

January 1999

Dr. rer. nat., Major: Organic Chemistry

University of Tübingen, Germany

Dissertation title: "Stereoselective Antibodies to Amino Acids"

April 1995

Diploma in Biochemistry

University of Tübingen, Germany

Thesis title: "Stereoselective Interactions of Chiral Compounds with Bovine Serum Albumin and Antibodies"

### Honors and Awards

2001 Research Innovation Award, Research Corporation

1999 The Sir Charles Clore Postdoctoral Fellowship

1999 Hoffmann-La Roche Young Investigators Award "Affinity 99"

1995 Boehringer-Ingelheim Fonds Short-term Fellowship

### Professional Experience

August 2006 to present

Associate Professor of Biological Chemistry at the Department of Chemistry and Biochemistry at Northern Illinois University, DeKalb, IL. Teaching of graduate and undergraduate courses in general chemistry and biochemistry. Research in the field of analytical biochemistry and immunochemistry. Supervision of graduate and undergraduate research students.

October 2008 to December 2008

Visiting Professor, Technical University Berlin, Institute of Chemistry, Division of Technical Chemistry; Berlin, Germany.

August 2000 to August 2006

Assistant Professor of Biological Chemistry at the Department of Chemistry and Biochemistry at Northern Illinois University, DeKalb, IL.

January 1999 to July 2000

Postdoctoral fellow with Meir Wilchek at the Weizmann Institute of Science, Rehovot, Israel. Research in the field of immunoaffinity chromatography. Purification, fragmentation, and derivatization of antibodies; chemical activation and derivatization of support materials; development of immunoassays for the determination of enantiopurity.

May 1995 to January 1999

Research and Teaching Assistant with Volker Schurig, University of Tübingen, Germany. Development of analytical techniques for the determination of antibody stereoselectivity.

September 1997 to December 1998, November/December 1996, and October 1995 to February 1996

Visiting scientist with Meir Wilchek at the Weizmann Institute of Science, and with Bernard S. Green at the Hebrew University of Jerusalem, Israel. Design and synthesis of immunogens;

production and characterization of monoclonal and polyclonal antibodies; development of a chiral immunosensor using surface plasmon resonance detection.

#### Membership in Professional Organizations

Sigma Xi - the Scientific Research Society (member since 2002)

American Chemical Society (2000)

International Society for Molecular Recognition (1999)

Gesellschaft Deutscher Chemiker - German Chemical Society (1994)

#### Publications

(\* indicates publications resulting from research since appointment to faculty position; all works refereed unless otherwise noted)

\*Eleniste, P.; Hofstetter, H.; Hofstetter, O. Expression and Characterization of an Enantioselective Antigen-Binding Fragment Directed Against  $\alpha$ -Amino Acids, **2013**, *91*, 20-29.

\*Kassa, T.; Undesser, L. P.; Hofstetter, H.; Hofstetter, O. Antibody-based Multiplex Analysis of Structurally Closely Related Chiral Molecules. *Analyst* **2011**, *136*, 1113-1115.

\*Spindler, X.; Hofstetter, O.; McDonagh, A.; Roux, C.; C. Lennard, C. Enhancement of Latent Fingermarks on Non-porous Surfaces Using Anti-L-amino Acid Antibodies Conjugated to Gold Nanoparticles. *Chem. Commun.* **2011**, *47*, 6602-5604.

\*Spindler, X.; Hofstetter, O.; Wuhrer, R.; McDonagh, A.; Roux, C.; C. Lennard, C. Targeting Amino Acids in Latent Fingermarks Using Bioconjugated Gold-citrate Self-assembled Monolayer Nanoparticles. *Sci. Justice* **2010**, *50*, 42-43 (Conference Proceedings).

\*Franco, E. J.; Sonneson, G. J.; DeLegge, T. J.; Hofstetter, H.; Horn, J. R.; Hofstetter, O. Production and Characterization of a Genetically Engineered Anti-caffeine Camelid Antibody and Its Use in Immunoaffinity Chromatography. *J. Chromatogr. B* **2010**, *878*, 177-186.

\*Ranieri, D. I.; Hofstetter, H.; Hofstetter, O. Computational Structural Analysis of an Anti-L-amino Acid Antibody and Inversion of Its Stereoselectivity. *J. Sep. Sci.*, **2009**, *32*, 1686-1695.

\*Franco, E. J.; Hofstetter, H.; Hofstetter, O. Determination of lactic acid enantiomers in human urine by high-performance immunoaffinity LC-MS. *J. Pharm. Biomed. Anal.* **2009**, *49*, 1088-1091.

\*Ranieri, D. I.; Corgliano, D. M.; Franco, E. J.; Hofstetter, H.; Hofstetter, O. Investigation of the Stereoselectivity of an Anti-amino Acid Antibody Using Molecular Modeling and Ligand Docking. *Chirality* **2008**, *20*, 559-570.

\*Franco, E. J.; Hofstetter, H.; Hofstetter, O. Enantiomer Separation of  $\alpha$ -Hydroxy Acids in High-performance Immunoaffinity Chromatography. *J. Pharm. Biomed. Anal.* **2008**, *46*, 907-913.

\*Zheng, C.; Hofstetter, H.; Hofstetter, O. Charge Density and Computational Study of Benzhydrol and Benzhydrol-d10. *J. Mol. Struct.* **2008**, *875*, 173-182.

\*Corgliano, D. M.; Hofstetter, H.; Hofstetter, O. Investigation of the Stereoselectivity of an Anti-amino Acid Antibody Using Tryptophan Fluorescence. BMG LABTECH, Applications Note 162; **2007**, published online: <http://www.bmglabtech.com/application-notes/fluorescence-intensity/tryptophan-trp-fluorescence-162.cfm> (not peer-reviewed).

\* Zhang, S.; Ding, J.; Liu, Y.; Kong, J.; Hofstetter, O. Development of a Highly Enantioselective Capacitive Immunosensor for the Detection of  $\alpha$ -Amino Acids. *Anal. Chem.* **2006**, *78*, 7592-7596.

\*Zelege, J. M.; Smith, G. B.; Hofstetter, H.; Hofstetter, O. Enantiomer Separation of Amino Acids in Immunoaffinity Micro LC-MS. *Chirality* **2006**, *18*, 544-550.

\*Franco, E. J.; Hofstetter, H.; Hofstetter, O. A Comparative Evaluation of Random and Site-specific Immobilization Techniques for the Preparation of Antibody-based Chiral Stationary Phases. *J. Sep. Sci.* **2006**, *29*, 1458-1469.

\*Hofstetter, H.; Cary, J. R.; Eleniste, P. P.; Hertweck, J. K.; Lindstrom, H. J.; Ranieri, D. I.; Smith, G. B.; Undesser, L. P.; Zelege, J. M.; Zelege, T. K.; Hofstetter, O. New Developments in the Production and Use of Stereoselective Antibodies. *Chirality* **2005**, *17*, S9-S17.

\*Hofstetter, O.; Hertweck, J. K.; Hofstetter, H. Detection of Enantiomeric Impurities in a Simple Membrane-Based Optical Immunosensor. *J. Biochem. Biophys. Methods* **2005**, *63*, 91-99.

\*Zelege, T. K.; Zelege, J. M.; Hofstetter, H.; Hofstetter, O. Stereoselective Antibodies to Free  $\alpha$ -Hydroxy Acids. *J. Mol. Recognit.* **2005**, *18*, 334-340.

\*Hofstetter, H.; Hofstetter, O. Antibodies as Tailor-Made Chiral Selectors for Detection and Separation of Stereoisomers. *TrAC - Trends Anal. Chem.* **2005**, *24*, 869-879.

\*Hofstetter, H.; Hofstetter, O. Antibodies as Tailor-Made Chiral Selectors: An Interdisciplinary Approach to Enantiomer Separation and Detection. *Chin. J. Chromatogr./SePu* **2005**, *23*, 508-519.

\*Hofstetter, O.; Lindstrom, H.; Hofstetter, H. The Effect of the Mobile Phase on Antibody-based Enantiomer Separations of Amino Acids in Perfusion Chromatography. *J. Chromatogr. A* **2004**, *1049*, 85-95.

\*Tsourkas, A.; Hofstetter, O.; Hofstetter, H.; Weissleder, R.; Josephson, L. Magnetic Relaxation Switch Immunosensors Detect Enantiomeric Impurities. *Angew. Chem. Int. Ed. Engl.* **2004**, *43*, 2395 – 2399.

\*Dutta, P.; Tipple, C.A.; Lavrik, N.V.; Datskos, P.G.; Hofstetter, H.; Hofstetter, O.; Sepaniak, M.J. Enantioselective Sensors Based on Antibody-Mediated Nanomechanics. *Anal. Chem.* **2003**, *75*, 2342-2348.

\*Hofstetter, O.; Lindstrom, H.; Hofstetter, H. Direct Resolution of Enantiomers in High-Performance Immunoaffinity Chromatography under Isocratic Conditions. *Anal. Chem.* **2002**, *74*, 2119-2125.

\*Silvaieh, H.; Wintersteiger, R.; Schmid, M.G.; Hofstetter, O.; Schurig, V.; Gübitz, G. Enantioselective Sequential-injection Chemiluminescence Immunoassays for 3, 3', 5-Triiodothyronine (T<sub>3</sub>) and Thyroxine (T<sub>4</sub>). *Anal. Chim. Acta* **2002**, *463*, 5-14.

\*Silvaieh, H.; Schmid, M.G.; Hofstetter, O.; Schurig, V.; Gübitz, G. Development of Enantioselective Chemiluminescence Flow-injection and Sequential-injection Immunoassays for  $\alpha$ -Amino Acids. *J. Biochem. Biophys. Methods* **2002**, *53*, 1-14.

\*Hofstetter, O.; Hofstetter, H. Antibodies as Chiral Selectors for the Determination of Enantioenrichment. *Enantiomer* **2001**, *6*, 153-158.

Wilchek, M.; Hofstetter, H.; Hofstetter, O. The Application of Biorecognition. In *Novel Approaches in Biosensors and Rapid Diagnostic Assays*; Liron, Z.; Bromberg, A.; Fisher, M.; Eds. Kluwer Academic/Plenum Publishers: New York, 2001; pp. 173-191.

Hofstetter, O.; Hofstetter, H.; Wilchek, M.; Schurig, V.; Green, B.S. An Immunochemical Approach for the Determination of Trace Amounts of Enantiomeric Impurity. *Chem. Commun.* **2000**, *17*, 1581-1582.

Hofstetter, O.; Hofstetter, H.; Wilchek, M.; Schurig, V.; Green, B.S. Production and Applications of Antibodies Directed Against the Chiral Center of  $\alpha$ -Amino Acids. *Int. J. Bio-Chromatogr.* **2000**, *5*, 165-174.

Hofstetter, H.; Morpurgo, M.; Hofstetter, O.; Bayer, E.A.; Wilchek, M. A Labeling, Detection and Purification System Based on 4-Hydroxyazobenzene-2-carboxylic Acid: An Extension of the Avidin-Biotin System. *Anal. Biochem.* **2000**, *284*, 354-366.

Hofstetter, O.; Hofstetter, H.; Wilchek, M.; Schurig, V.; Green, B.S. Chiral Discrimination Using an Immunosensor. *Nat. Biotechnol.* **1999**, *17*, 371-374.

Hofstetter, O.; Hofstetter, H.; Schurig, V.; Wilchek, M.; Green, B.S. Antibodies Can Recognize the Chiral Center of Free  $\alpha$ -Amino Acids. *J. Am. Chem. Soc.* **1998**, *120*, 3251-3252.

Hofstetter, H.; Hofstetter, O.; Schurig, V. Enantiomer Separation Using BSA as Chiral Stationary Phase in Affinity OTEC and OTLC. *J. Microcol. Sep.* **1998**, *10*, 287-291.

Hofstetter, O.; Hofstetter, H.; Then, D.; Schurig, V.; Green, B.S. Direct Binding of Low Molecular Weight Haptens to ELISA Plates. *J. Immunol. Methods* **1997**, *210*, 89-92.

Hofstetter, H.; Hofstetter, O.; Schurig, V. Perfusion Chromatography for the Rapid Separation of Chiral Compounds. *Biochemica* **1997**, *101*, 29 (not peer-reviewed).

Hofstetter, H.; Hofstetter, O.; Schurig, V. Rapid Separation of Enantiomers in Perfusion Chromatography Using a Protein Chiral Stationary Phase. *J. Chromatogr. A* **1997**, *764*, 35-41.

Hofstetter, H.; Hofstetter, O.; Schurig, V. High Speed Separation of Enantiomers by Perfusion Chromatography. *GIT Special Edition April* **1997**, 46-47.

Jung, G.; Hofstetter, H.; Feiertag, S.; Stoll, D.; Hofstetter, O.; Wiesmueller, K.-H.; Schurig, V. Cyclopeptide Libraries are New Chiral Selectors in Capillary Electrophoresis. *Angew. Chem. Int. Ed. Engl.* **1996**, *35*, 2148-2150.

Hofstetter, H.; Hofstetter, O.; Wistuba, D. Chiral Interaction of a Polyclonal Anti-Dinitrophenyl Antibody with Dinitrophenyl-Amino Acids Determined by an Enantioselective Enzyme-Linked Immunosorbent Assay. *Anal. Chim. Acta* **1996**, 332, 285-290.