

## Mechanistic Studies of Chiral Discrimination on Macrocyclic Antibiotics

Nelu Grinberg<sup>3</sup>, Ling Wu<sup>1</sup>, Shengli Ma<sup>1</sup>, Sherry Shen<sup>1</sup>, Nina Gonella<sup>1</sup>, Heewon Lee<sup>1</sup>,  
Chris Senanayake<sup>1</sup>, David Bell<sup>2</sup>

<sup>1</sup>Boehringer Ingelheim Pharmaceuticals, Inc.  
Chemical Development Department  
Ridgefield, CT USA

<sup>2</sup>Supelco, Analytical Research and Services  
595 North Harrison Rd./ Bellefonte, PA, 16823 USA

<sup>3</sup>Grinberg Consulting  
274 Aspetuck Ridge Road, New Milford, CT 06776, CT USA

### Abstract

The chiral separation of propranolol was studied on two macrocyclic antibiotic phases, Teicoplanin (T2) and Teicoplanin Aglycone (Tag) columns. It was found that the retention order of the two enantiomers was reversed on T2 compared to TAG when using methanol/water as a mobile phase. A conformational change of T2 was observed and it was studied using vibrational circular dichroism (VCD). To understand the chiral recognition mechanism, the thermodynamic parameters of the separation were also studied for the two stationary phases. VCD was further applied to assess the interaction of these enantiomers with the T2 and TAG columns.

### Short Biography

**Dr. Nelu Grinberg** recently retired following an eminent career in research chemistry in the pharmaceutical industry. An internationally known expert in analytical chemistry, with an emphasis on chromatography, spectroscopy, and chiral separations, he was a Distinguished Research Fellow in the Chemical Development Department at Boehringer Ingelheim Pharmaceuticals in Ridgefield, CT until January, 2017. Prior to this, he worked for sixteen years in the Analytical Department at Merck Research Laboratories in Rahway, NJ, where he was a Senior Research Fellow. Dr. Grinberg has authored and co-authored over 150 publications, including articles and book chapters, and has lectured and conducted courses worldwide. He is currently Editor-in-Chief of the Journal of Liquid Chromatography and Related Techniques, Editor of the Chromatographic Science book series, and Co-editor of the Advances in Chromatography series. He is also a member of the Board of the Connecticut Separation Science Council and was a recipient of a Koltoff Fellowship of the Hebrew University of Jerusalem. Dr. Grinberg obtained his Ph.D. in Chemistry from the Technical University of Iasi in Romania. He conducted postdoctoral research with Professor Barry Karger at Northeastern University in Boston, Massachusetts, and with Professor Emanuel Gil-Av at The Weizmann Institute of Science in Rehovot, Israel.