

## Article

# Chiral Separation of Vildagliptin by Capillary Electrophoresis—The Study of Enantiomeric Complexation

Lajos Attila Papp <sup>1</sup>, Gabriel Hancu <sup>1,\*</sup>, Zoltán István Szabó <sup>2,3</sup>, Blanka Székely-Szentmiklósi <sup>1</sup>, Tamás Gáti <sup>4</sup>, Béla Fiser <sup>5,6,7</sup>, Márta Kraszni <sup>8</sup> and Gergő Tóth <sup>8</sup>

<sup>1</sup> Department of Pharmaceutical Chemistry, Faculty of Pharmacy, “George Emil Palade” University of Medicine, Pharmacy, Science and Technology Târgu Mureș, 540120 Târgu Mureș, Romania; lajos.papp@umfst.ro (L.A.P.); blanka.szekely-szentmiklosi@umfst.ro (B.S.-S.)

<sup>2</sup> Department of Drugs Industry and Pharmaceutical Management, Faculty of Pharmacy, “George Emil Palade” University of Medicine, Pharmacy, Science and Technology Târgu Mureș, 540120 Târgu Mureș, Romania; zoltan.szabo@umfst.ro

<sup>3</sup> Sz-Imfidum, Ltd., Str. Lunga nr. 504, 525401 Târgu Mureș, Romania

<sup>4</sup> Servier Research Institute of Medicinal Chemistry (SRIMC), H-1031 Budapest, Hungary; tamas.gati@servier.com

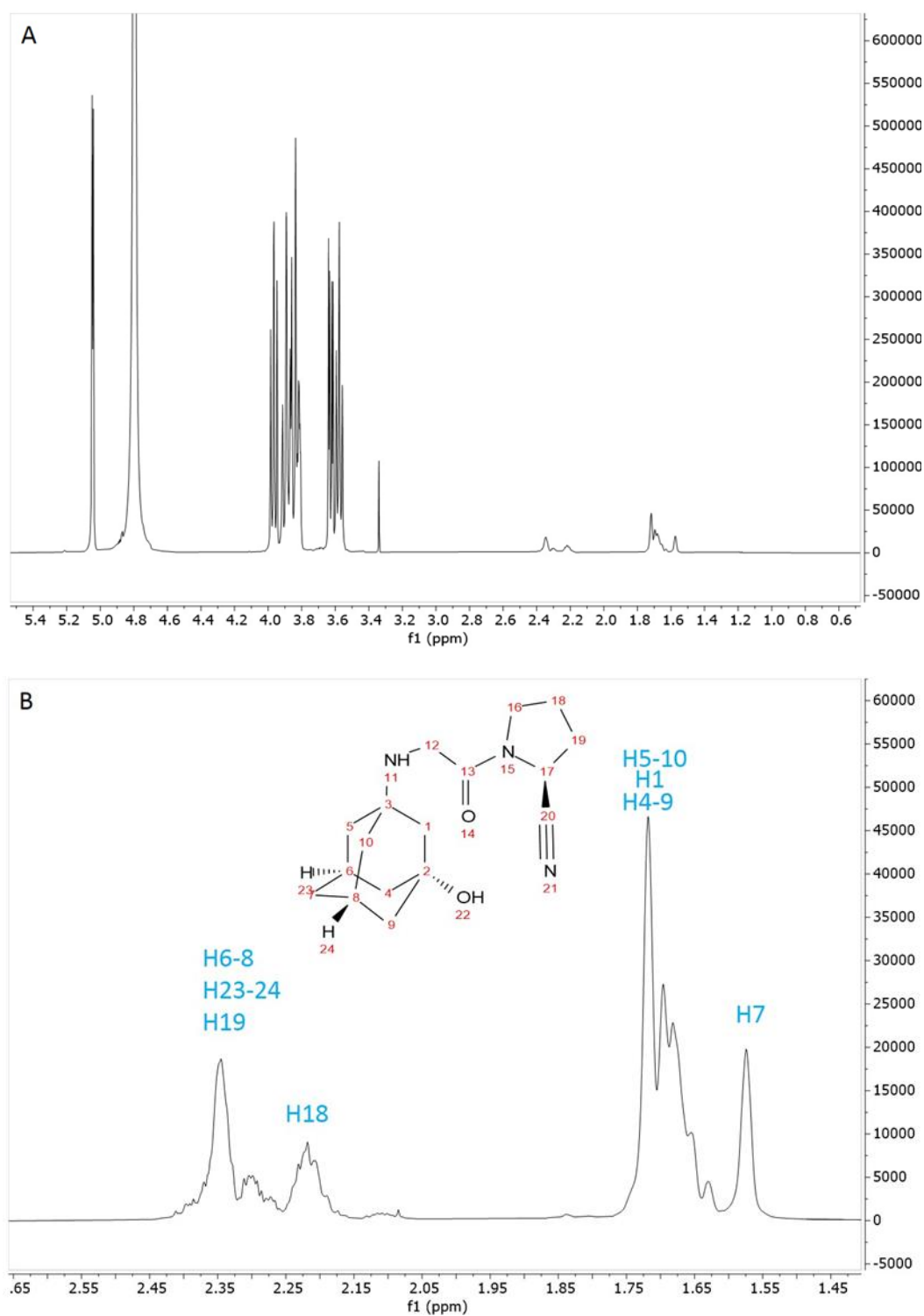
<sup>5</sup> Higher Education and Industrial Cooperation Centre, University of Miskolc, H-3515 Miskolc, Hungary; bela.fiser@uni-miskolc.hu

<sup>6</sup> Department of Biology and Chemistry, Ferenc Rakoczi II Transcarpathian Hungarian College of Higher Education, Transcarpathia, 90200 Beregszász, Ukraine

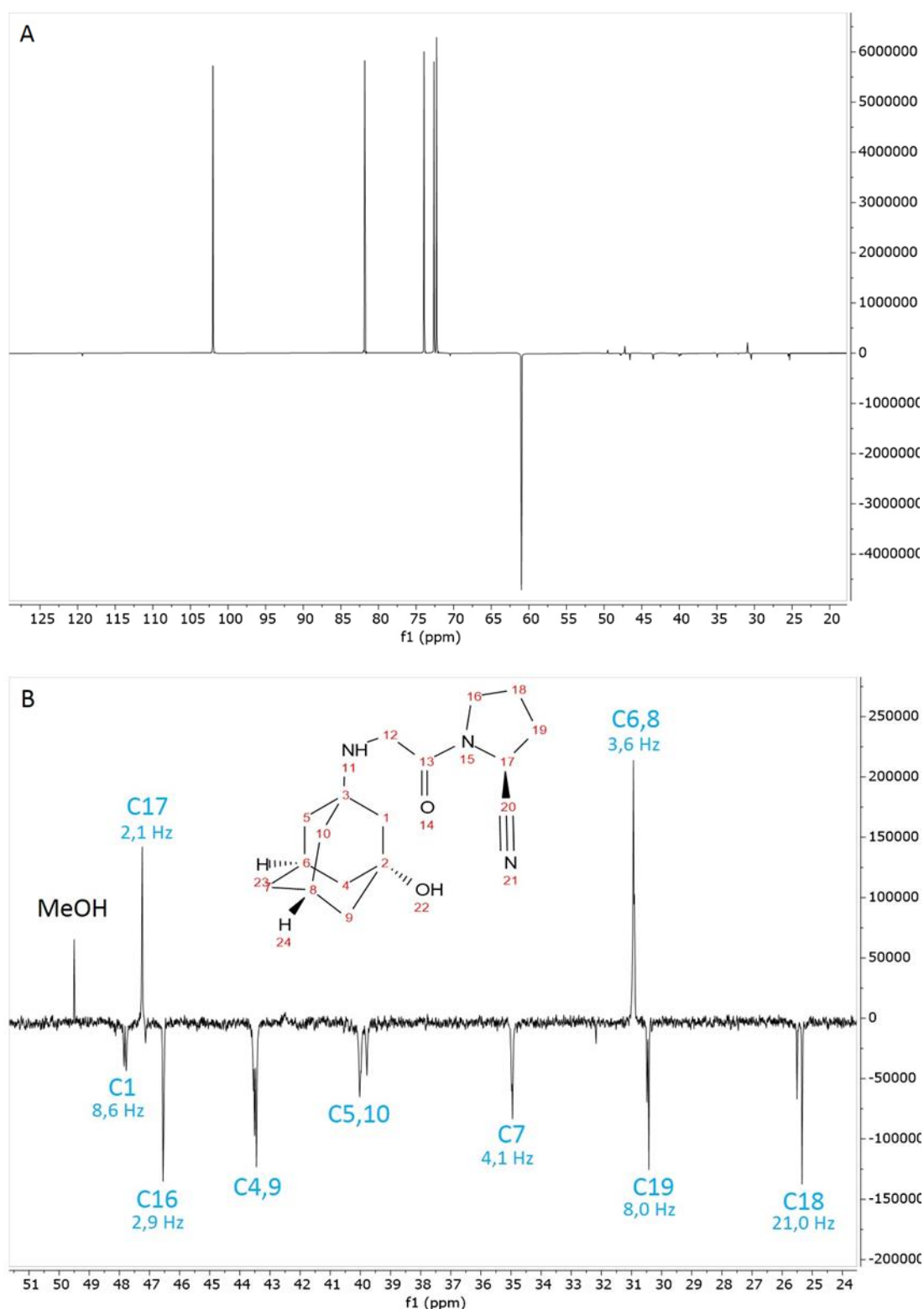
<sup>7</sup> Department of Physical Chemistry, Faculty of Chemistry, University of Lodz, 90-149 Łódź, Poland

<sup>8</sup> Department of Pharmaceutical Chemistry, Semmelweis University, 1092 Budapest, Hungary; kraszni.marta@semmelweis.hu (M.K.); toth.gergo@pharma.semmelweis-univ.hu (G.T.)

\* Correspondence: gabriel.hancu@umfst.ro



**Figure S1.**  $^1\text{H}$  NMR (500 MHz) spectrum of *S,R*-VIL 2:1 mixture with  $\alpha$ -CD in 1:3 ratio in  $\text{D}_2\text{O}$ . **A**, whole spectrum **B**, enlarged part of the aliphatic region showing several VIL signals



**Figure S2.**  $^{13}\text{C}$  NMR (125 MHz, deptqsp) spectrum of S,R-VIL 2:1 mixture with  $\alpha$ -CD in 1:3 ratio in  $\text{D}_2\text{O}$ . A, whole spectrum B, enlarged part of the aliphatic region showing several VIL signals with frequency differences between S and R enantiomers' signals.

**Table S1.** Experimental plan and results obtained for the 2<sup>5-2</sup> type fractional factorial design

Standard order	Run order	Factors					Responses	
		BGE pH	BGE conc. (mM)	CD conc. (mM)	Temp. (°C)	Voltage (kV)	<i>R</i>	<i>t</i>
6	1	5.5	25	50	15	25	0.79	3.4
9	2	5	50	40	20	20	0.78	3.78
5	3	4.5	25	50	25	15	0.68	4.35
7	4	4.5	75	50	15	15	2.23	13.84
1	5	4.5	25	30	25	25	0.39	2.25
10	6	5	50	40	20	20	0.82	3.73
4	7	5.5	75	30	25	15	1.14	8.78
2	8	5.5	25	30	15	15	0.56	4.94
8	9	5.5	75	50	25	25	0.87	2.37
3	10	4.5	75	30	15	25	1.00	3.53
11	11	5	50	40	20	20	0.81	3.78

**Table S2.** Experimental plan and results obtained for the FCCD

Standard order	Run order	Factors			Responses	
		BGE conc. (mM)	Temp. (°C)	Voltage (kV)	<i>R</i>	<i>t</i>
16	1	75	20	20	1.57	5.60
20	2	75	20	20	1.51	5.50
15	3	75	20	20	1.48	5.44
17	4	75	20	20	1.52	5.38
11	5	75	15	20	1.82	5.77
13	6	75	20	15	1.62	8.29
19	7	75	20	20	1.42	5.29
1	8	60	15	15	2.05	9.19
14	9	75	20	25	0.90	3.32
5	10	60	15	25	1.56	4.20
8	11	90	25	25	0.71	2.76
6	12	90	15	25	1.02	3.18
10	13	90	20	20	1.41	5.14
12	14	75	25	20	1.12	4.35
3	15	60	25	15	1.23	6.50
9	16	60	20	20	1.37	5.04
2	17	90	15	15	1.95	10.08
18	18	75	20	20	1.44	5.09
4	19	90	25	15	1.35	7.12
7	20	60	25	25	0.91	2.79