

Supplementary Information

Efficient Synthesis of Glycosylated Phenazine Natural Products and Analogues with DISAL Glycosyl Donors

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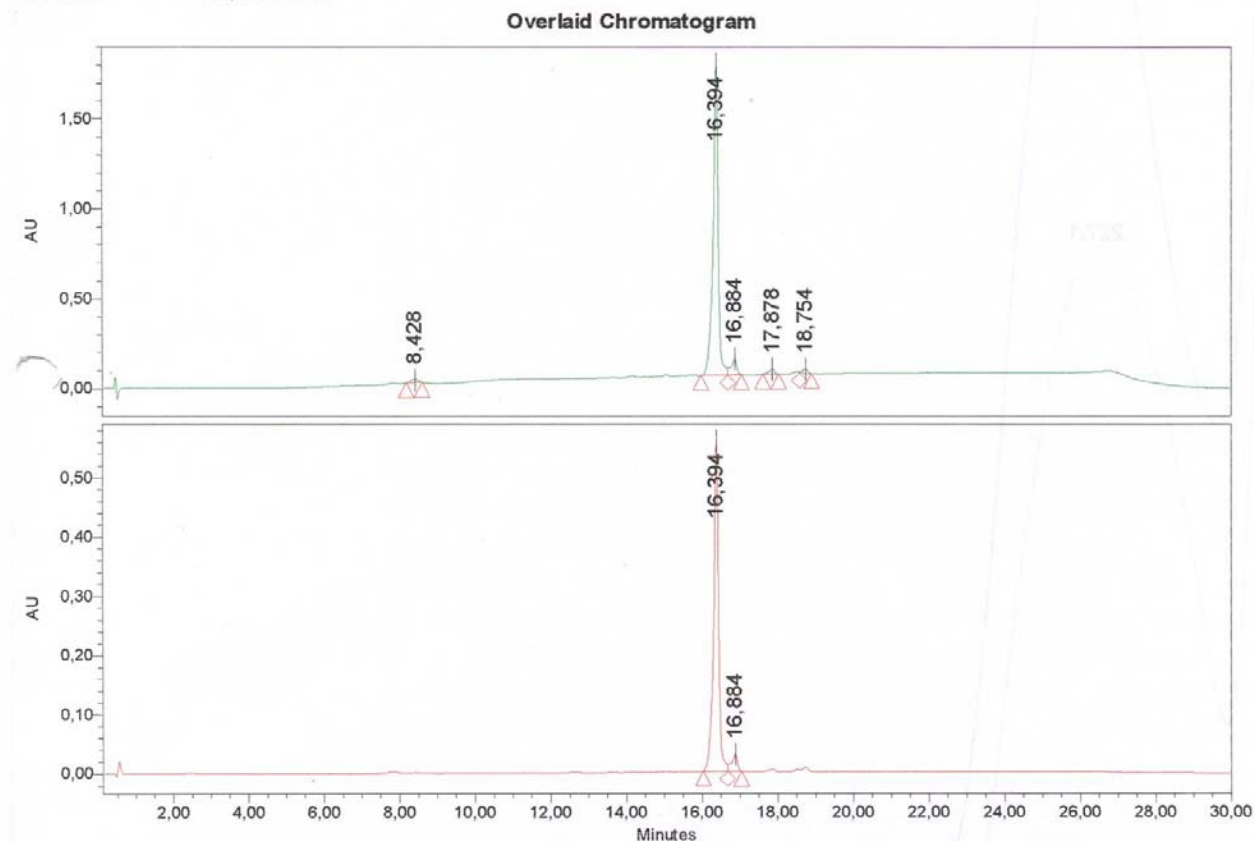
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The purity of compounds **2-3** and **6-20** was verified by analytical HPLC analysis using Waters system (600 control unit, 996 photodiode array (PDA) detector, 717 Plus autosampler) with a Waters X-Terra C18 column (3.0 x 50 mm; 3.8 μ m particle size) using linear gradients of water (A) or 0.1% aq. TFA (C) and CH₃CN (B) or 0.1% TFA in CH₃CN (D). 15 min gradient: 0 min: 5% B or D; 1 min: 5% B or D; 7 min: 95% B or D; 8.5 min: 95% B or D; 9 min: 5% B or D; 15 min: 5% B or D. 30 min gradient: 0 min: 5% B or D; 1 min: 5% B or D; 18 min: 95% B or D; 22 min: 95% B or D; 24 min: 5% B or D; 30 min: 5% B or D.

2,4-Dinitro-6-(methoxycarbonyl)phenyl 2,3,4,6-tetra-*O*-benzoyl- β -D-galactopyranoside (**2 β**)

SampleName	LP6-020123-13B	Sample Type	Unknown
Vial	31	Date Acquired	23-01-2002 12:21:03
Injection	1	Acq Method Set	Sample with TFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		



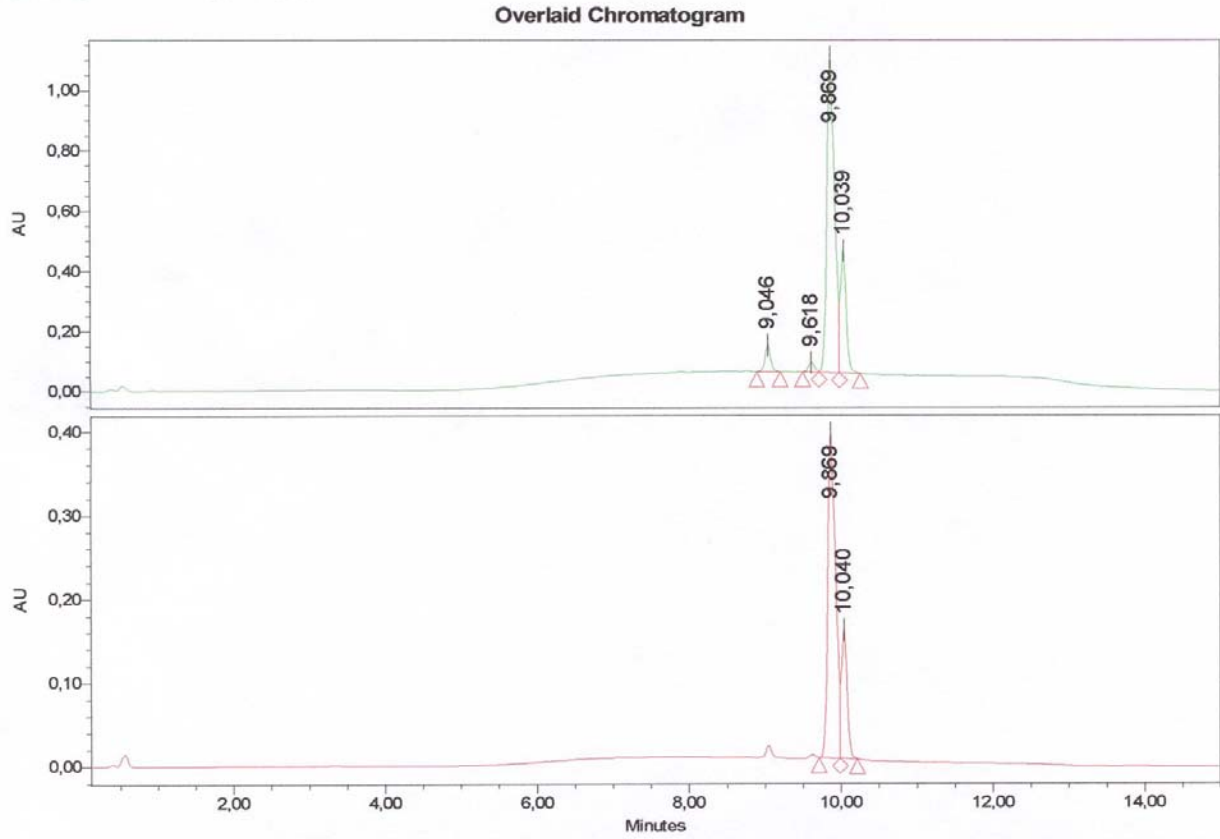
— SampleName: LP6-020123-13B from vial 31 , Channel name: 215 Date Processed 23-01-2002 12:51:14
 — SampleName: LP6-020123-13B from vial 31 , Channel name: 265 Date Processed 23-01-2002 12:51:15

Component Summary Table

Chn.	RT	Area	% Area
1	8,428	244621	1,36
2	16,394	16198581	90,23
3	265	5147157	94,21
4	16,884	933647	5,20
5	265	316209	5,79
6	17,878	322878	1,80
7	18,754	252891	1,41
Mean		3345141	
Std. Dev.		5940780	
% RSD		177,6	

2,4-Dinitro-6-(methoxycarbonyl)phenyl 2,3,4-tri-*O*-benzoyl-6-deoxy- α/β -L-glucoopyranoside
(3 α/β)

SampleName	JBL-030425-QiuDISAL prep.	Sample Type	Unknown
Vial	41	Date Acquired	25-04-2003 09:09:20
Injection	1	Acq Method Set	Sample noTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		



— SampleName: JBL-030425-QiuDISAL prep. from vial 41 , Channel name: 215 Date Processed 25-04-2003 09:24:31
 — SampleName: JBL-030425-QiuDISAL prep. from vial 41 , Channel name: 265 Date Processed 25-04-2003 09:24:31

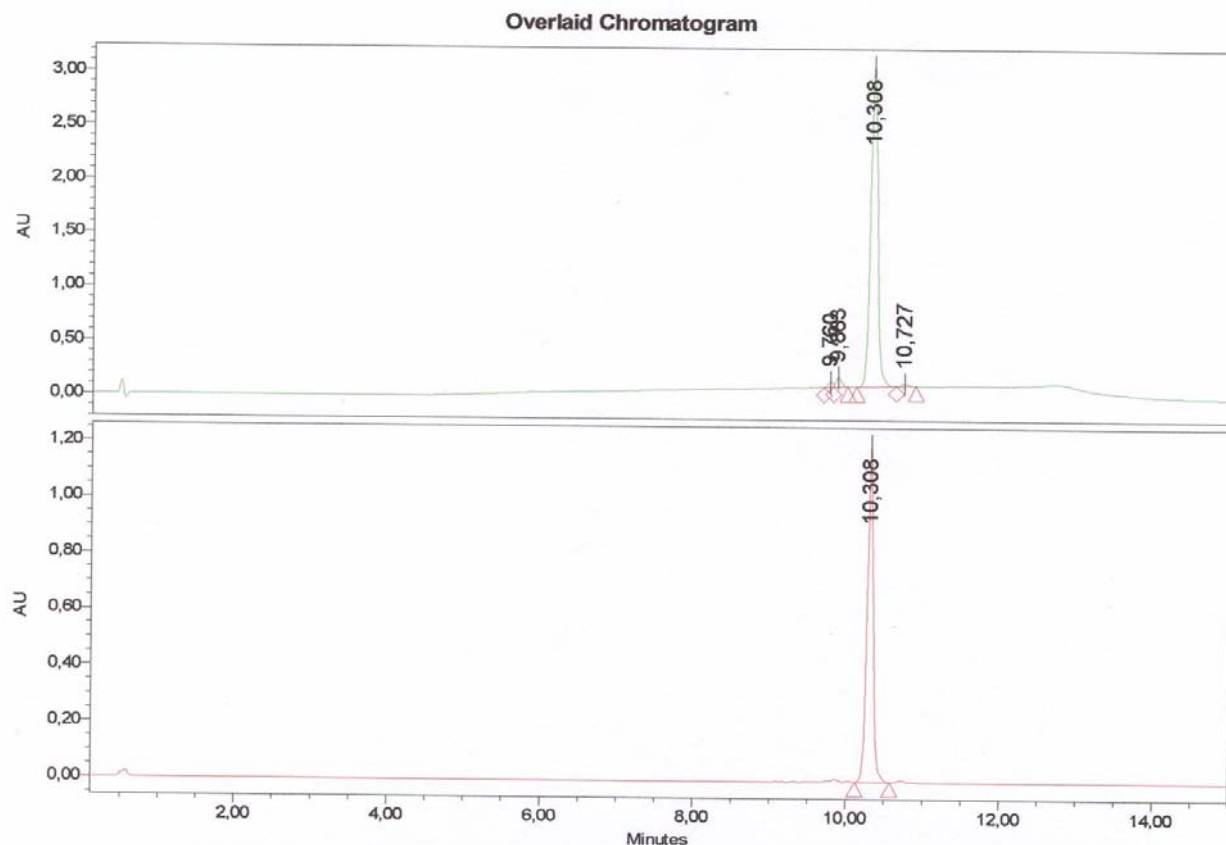
Component Summary Table

Chn.	RT	Area	% Area	
1	215	9,046	451166	4,41
2	215	9,618	181393	1,77
3	215	9,869	7398210	72,25
4	265	9,869	2772222	77,04
5	215	10,039	2209516	21,58
6	265	10,040	826211	22,96
Mean			2306453	
Std. Dev.			2694491	
% RSD			116,8	

Methyl 6-[(*R/S*)-1-(2,3,4,6-tetra-*O*-benzoyl- β -D-glucopyranosyl)-ethyl]-phenazine-1-carboxylic ester (**6**)

SampleName JBL-030423-JOC6
 Vial 43
 Injection 1
 Injection Volume 10,00 ul
 Channel 996
 Run Time 15,0 Minutes

Sample Type Unknown
 Date Acquired 23-04-2003 12:50:32
 Acq Method Set Sample with TFA 15 min
 Processing Method Default



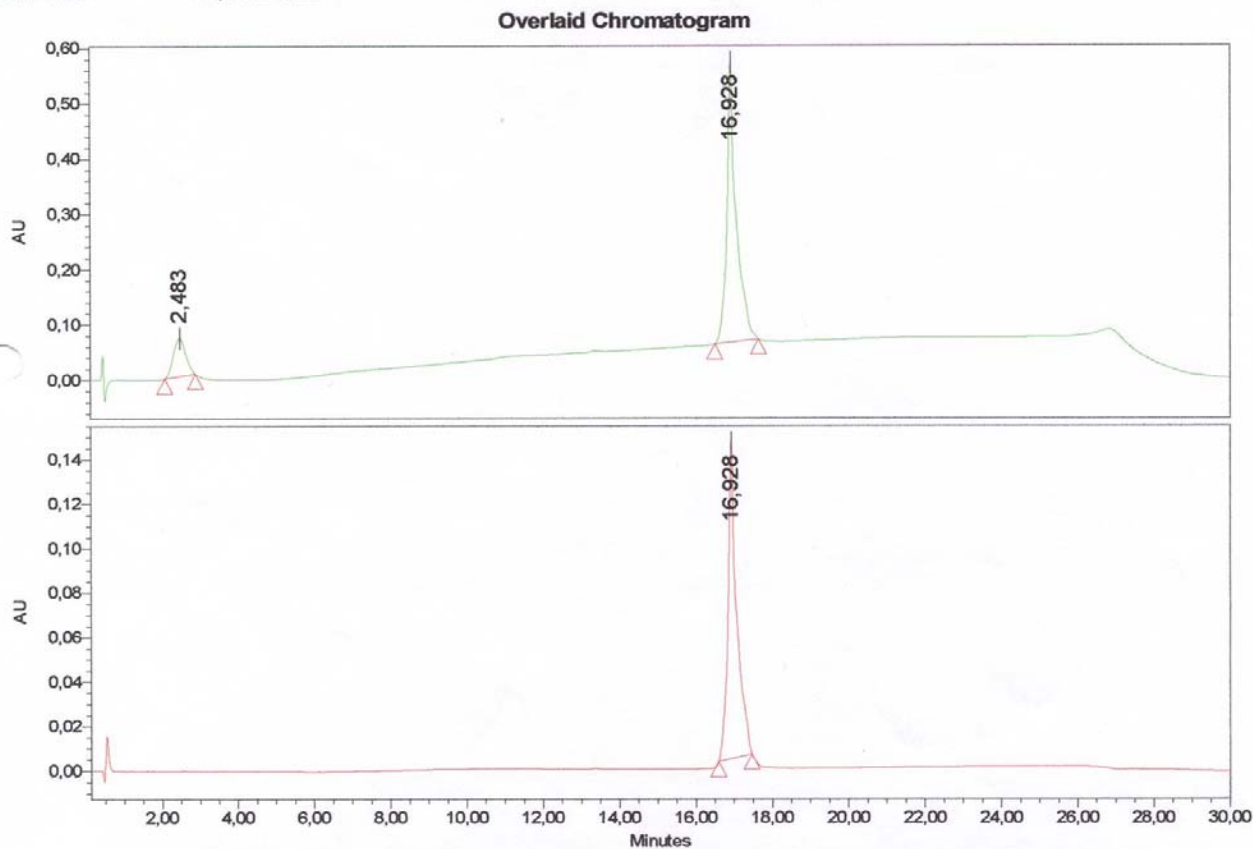
— SampleName: JBL-030423-JOC6 from vial 43 , Channel name: 215 Date Processed 23-04-2003 13:05:45
 — SampleName: JBL-030423-JOC6 from vial 43 , Channel name: 265 Date Processed 23-04-2003 13:05:45

Component Summary Table

Chn.	RT	Area	% Area	
1	215	9,760	223737	1,07
2	215	9,863	475377	2,27
3	215	10,308	20092776	95,92
4	265	10,308	6879675	100,00
5	215	10,727	154936	0,74
Mean			5565300	
Std. Dev.			8609396	
% RSD			154,7	

Methyl 6-[(*R/S*)-1-(2,3,4,6-tetra-*O*-benzoyl- β -D-galactopyranosyl)-ethyl]-phenazine-1-carboxylic ester (7)

SampleName	JBL-020718-123A	Sample Type	Unknown
Vial	68	Date Acquired	18-07-2002 14:40:07
Injection	1	Acq Method Set	Sample withTFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		



— SampleName: JBL-020718-123A from vial 68 , Channel name: 215 Date Processed 18-07-2002 15:10:20
 — SampleName: JBL-020718-123A from vial 68 , Channel name: 265 Date Processed 18-07-2002 15:10:20

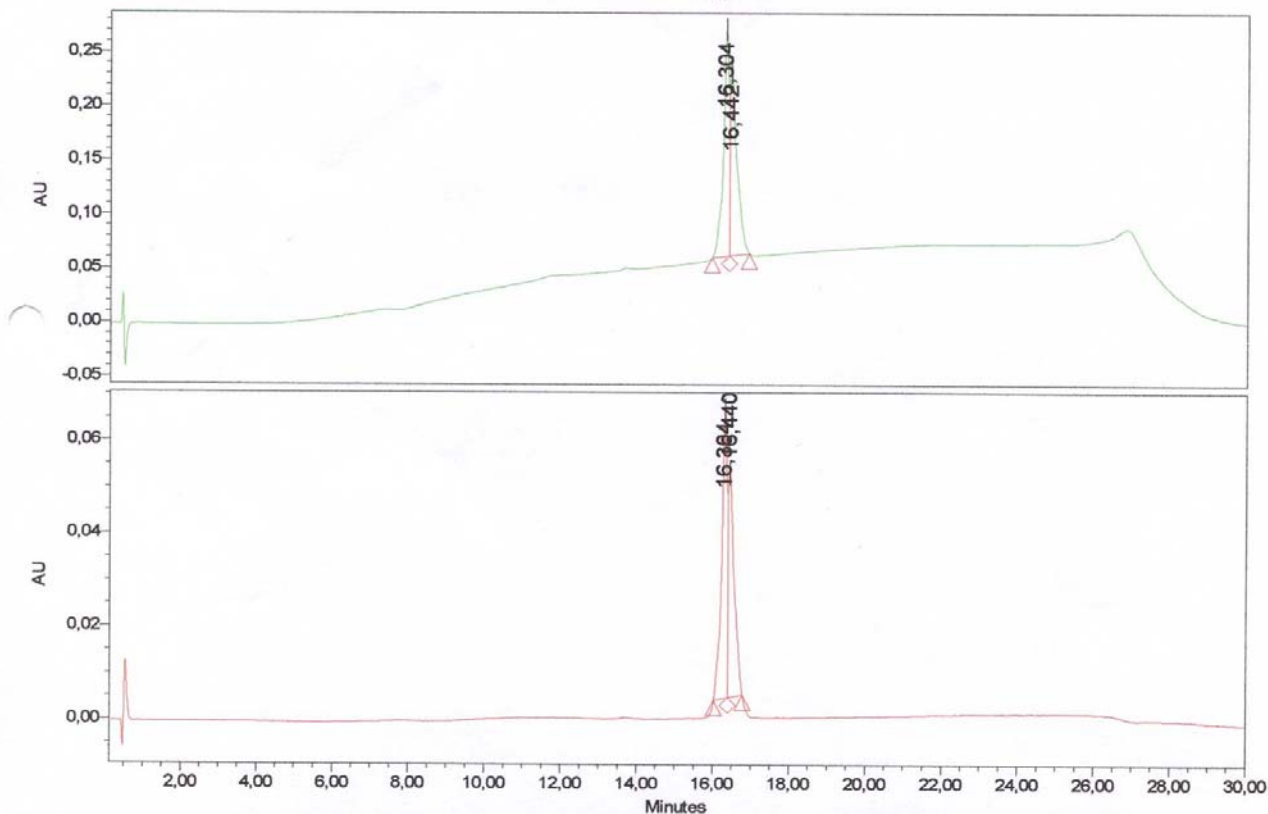
Component Summary Table

Chn.	RT	Area	% Area
1	2,483	1563524	15,37
2	16,928	3609323	84,63
3	265	2279323	100,00
Mean		1150723	
Std. Dev.		3877812	
% RSD		93,4	

Methyl 6-[(*R/S*)-1-(2,3,4-tri-*O*-benzoyl-6-deoxy- β -L-glucofuranosyl)-ethyl]-phenazine-1-carboxylic ester (**8**)

SampleName	JBL-020718-124 fr. 154	Sample Type	Unknown
Vial	68	Date Acquired	18-07-2002 13:23:28
Injection	1	Acq Method Set	Sample withTFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		

Overlaid Chromatogram



— SampleName: JBL-020718-124 fr. 154 from vial 68 , Channel name: 215 Date Processed 18-07-2002 13:53:40
— SampleName: JBL-020718-124 fr. 154 from vial 68 , Channel name: 265 Date Processed 18-07-2002 13:53:43

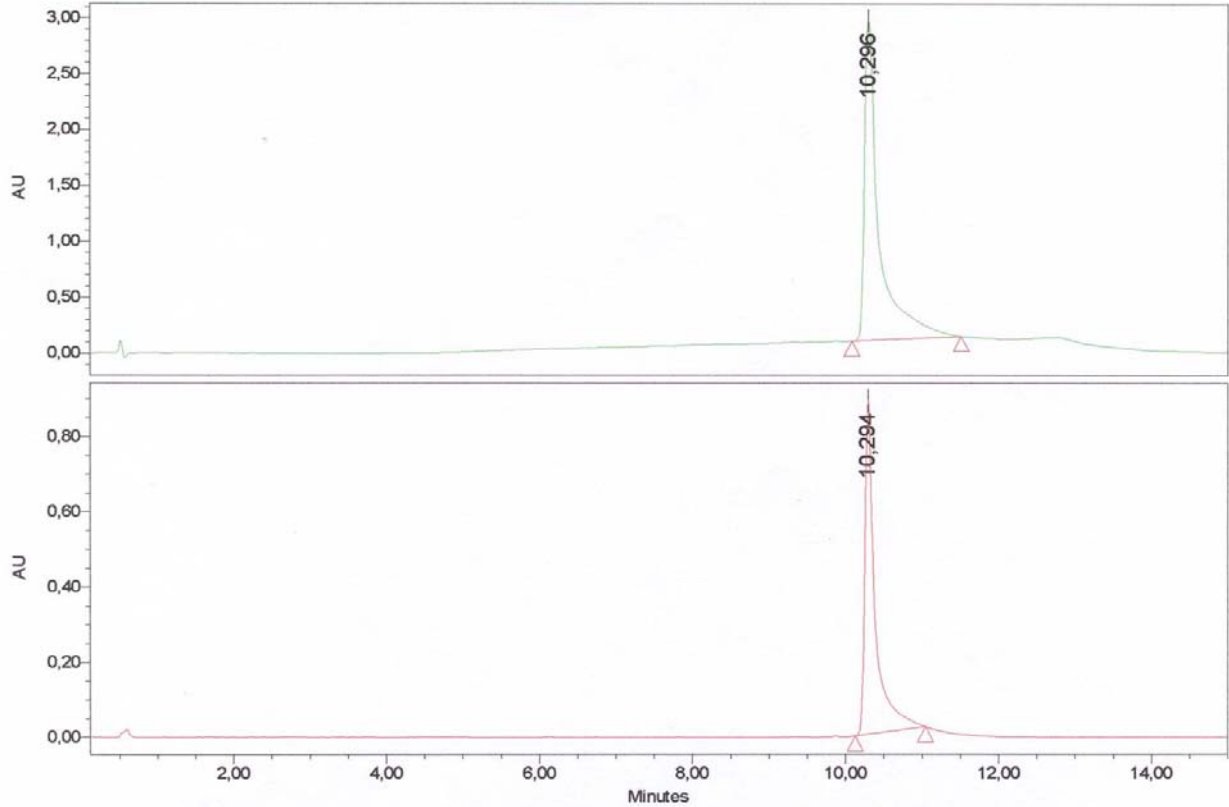
Component Summary Table

Chn.	RT	Area	% Area	
1	265	16,304	614123	52,89
2	215	16,304	2192105	50,70
3	265	16,440	546904	47,11
4	215	16,442	2131294	49,30
Mean			1371106	
Std. Dev.			913648	
% RSD			66,6	

2-Oxy-(2,3,4,6-tetra-O-benzoyl-β-D-glucoopyranosyl)-phenazine (9)

SampleName	JBL-030423-JOC9	Sample Type	Unknown
Vial	44	Date Acquired	23-04-2003 16:06:51
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		

Overlaid Chromatogram



— SampleName: JBL-030423-JOC9 from vial 44 , Channel name: 215 Date Processed 23-04-2003 16:22:03
 — SampleName: JBL-030423-JOC9 from vial 44 , Channel name: 265 Date Processed 23-04-2003 16:22:03

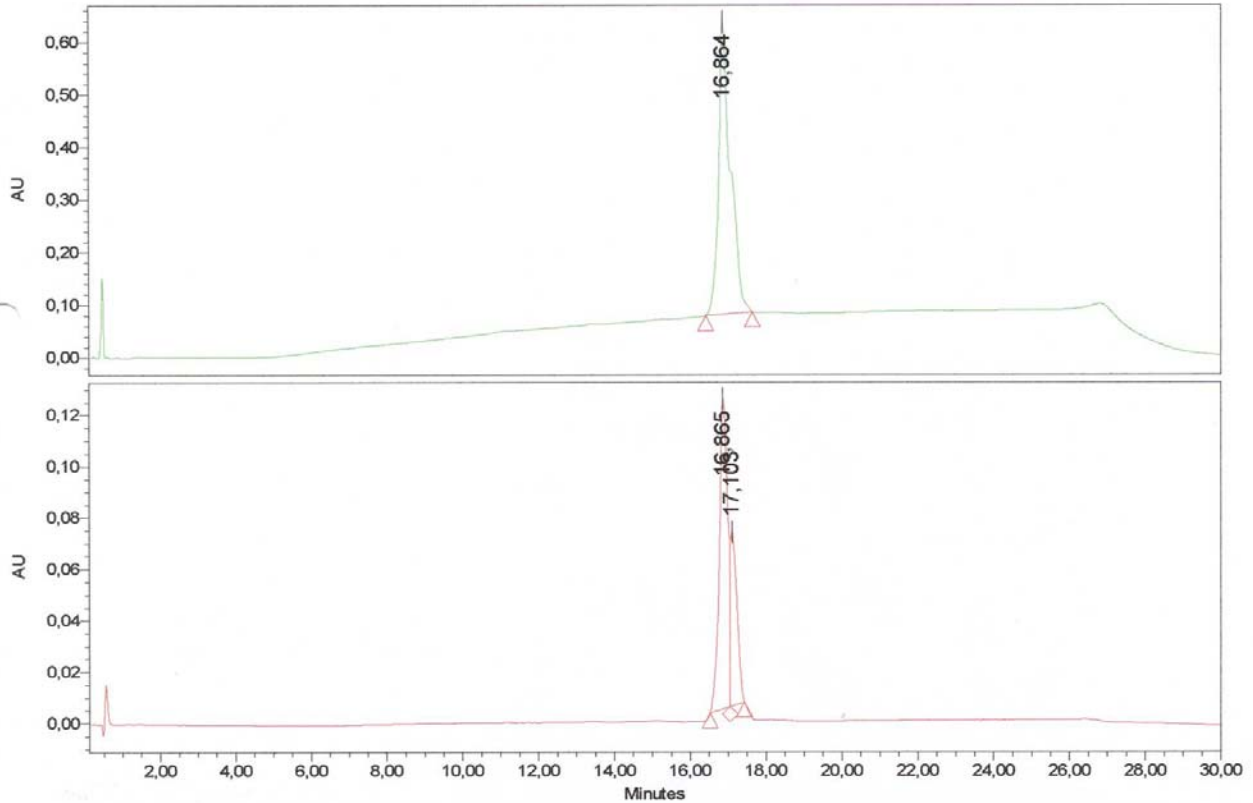
Component Summary Table

Chn.	RT	Area	% Area	
1	265	10,294	8482263	100,00
2	215	10,296	38275713	100,00
Mean			23378988	
Std. Dev.			21067150	
% RSD			90,1	

2-Oxy-(2,3,4,6-tetra-O-benzoyl-β-D-galactopyranosyl)-phenazine (10)

SampleName	JBL-020805-128A	Sample Type	Unknown
Vial	76	Date Acquired	05-08-2002 13:28:56
Injection	1	Acq Method Set	Sample with TFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		

Overlaid Chromatogram



— SampleName: JBL-020805-128A from vial 76 , Channel name: 215 Date Processed 05-08-2002 13:59:08
 — SampleName: JBL-020805-128A from vial 76 , Channel name: 265 Date Processed 05-08-2002 13:59:09

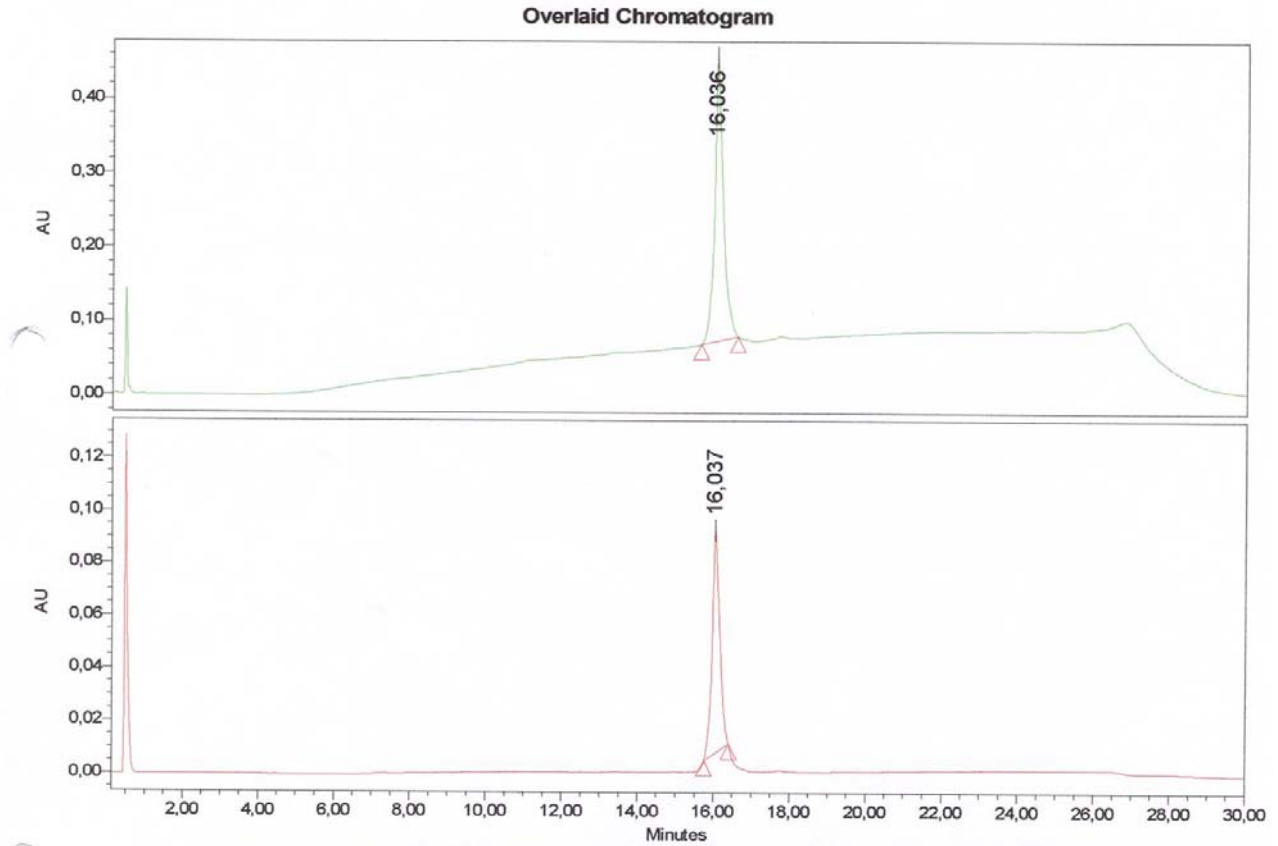
Component Summary Table

Chn.	RT	Area	% Area
1	215	12169751	100,00
2	265	1866752	69,92
3	265	802934	30,08
Mean		4946479	
Std. Dev.		6278110	
% RSD		126,9	

2-Oxy-(2,3,4,6-tri-O-benzoyl-6-deoxy-β-L-glucoopyranosyl)-phenazine (11)

SampleName JBL-020805-129A
 Vial 77
 Injection 1
 Injection Volume 10,00 ul
 Channel 996
 Run Time 30,0 Minutes

Sample Type Unknown
 Date Acquired 05-08-2002 14:39:19
 Acq Method Set Sample withTFA 30 min
 Processing Method Default



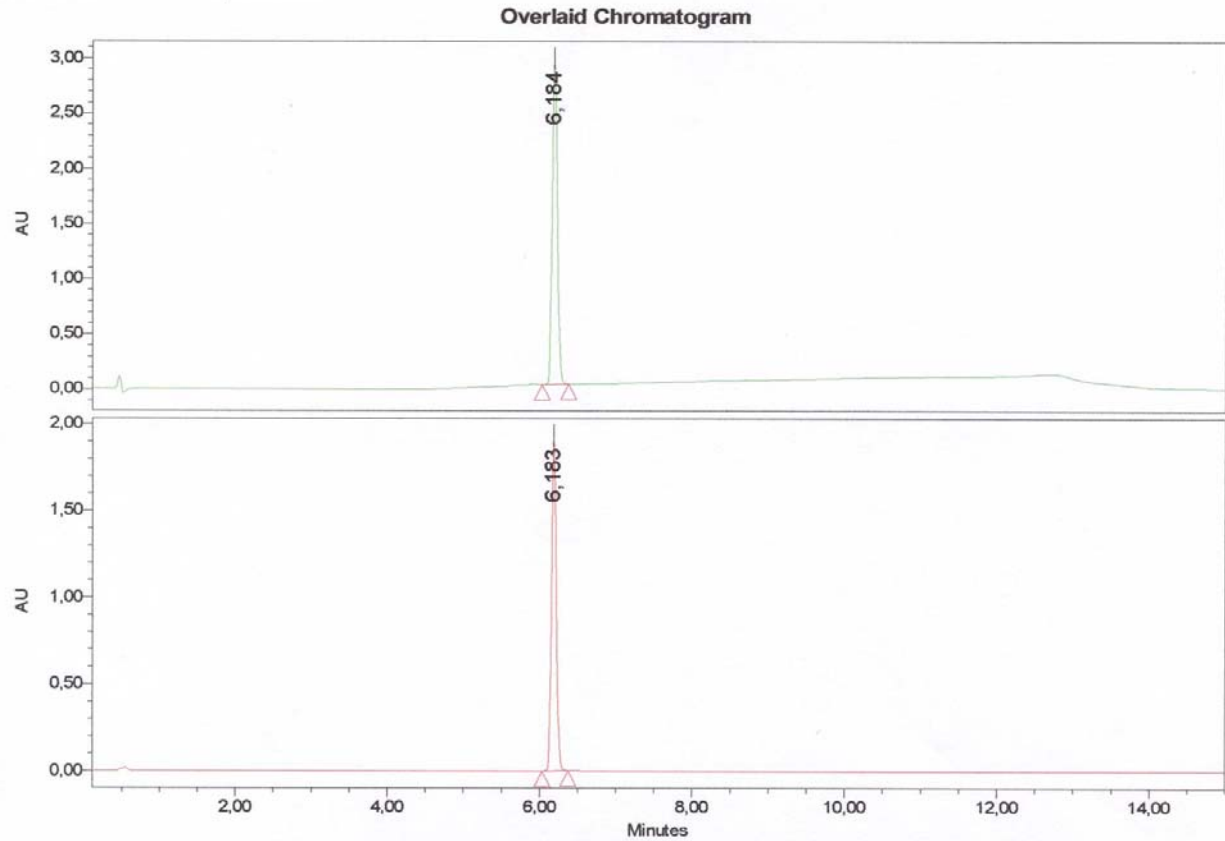
— SampleName: JBL-020805-129A from vial 77 , Channel name: 215 Date Processed 05-08-2002 15:09:32
 — SampleName: JBL-020805-129A from vial 77 , Channel name: 265 Date Processed 05-08-2002 15:09:32

Component Summary Table

Chn.	RT	Area	% Area	
1	215	16,036	3110693	100,00
2	265	16,037	1190561	100,00
Mean			3650627	
Std. Dev.			3479059	
% RSD			95,3	

Methyl 6-[(*R/S*)-1-(β -D-glucopyranosyl)-ethyl]-phenazine-1-carboxylic ester (**12**)

SampleName	JBL-030423-JOC12	Sample Type	Unknown
Vial	45	Date Acquired	23-04-2003 13:57:24
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		



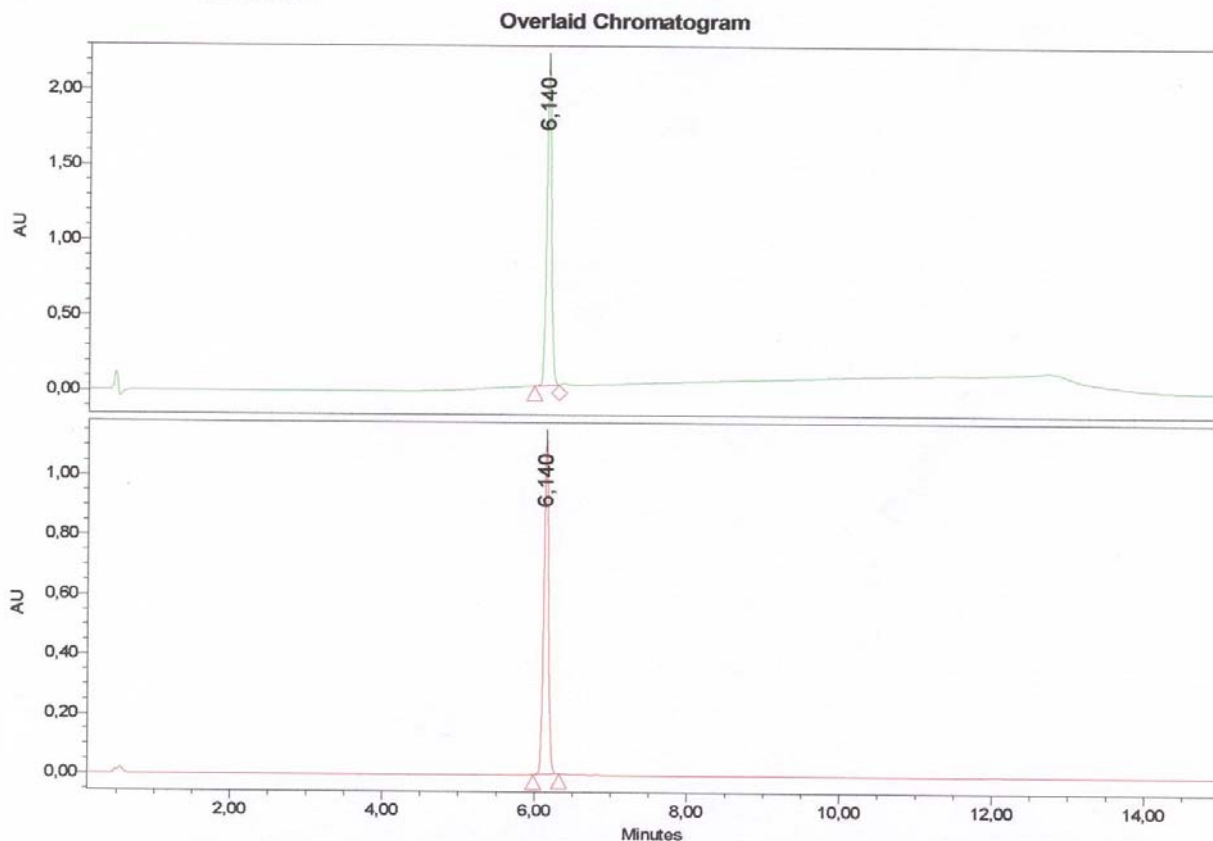
— SampleName: JBL-030423-JOC12 from vial 45 , Channel name: 215 Date Processed 23-04-2003 14:12:37
 — SampleName: JBL-030423-JOC12 from vial 45 , Channel name: 265 Date Processed 23-04-2003 14:12:37

Component Summary Table

Chn.	RT	Area	% Area
1	265	8472738	100,00
2	215	14056701	100,00
Mean		11264720	
Std. Dev.		3948458	
% RSD		35,1	

Methyl 6-[(*R/S*)-1-(β -D-galactopyranosyl)-ethyl]-phenazine-1-carboxylic ester (**13**)

SampleName	JBL-030423-JOC13	Sample Type	Unknown
Vial	46	Date Acquired	23-04-2003 14:13:32
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		



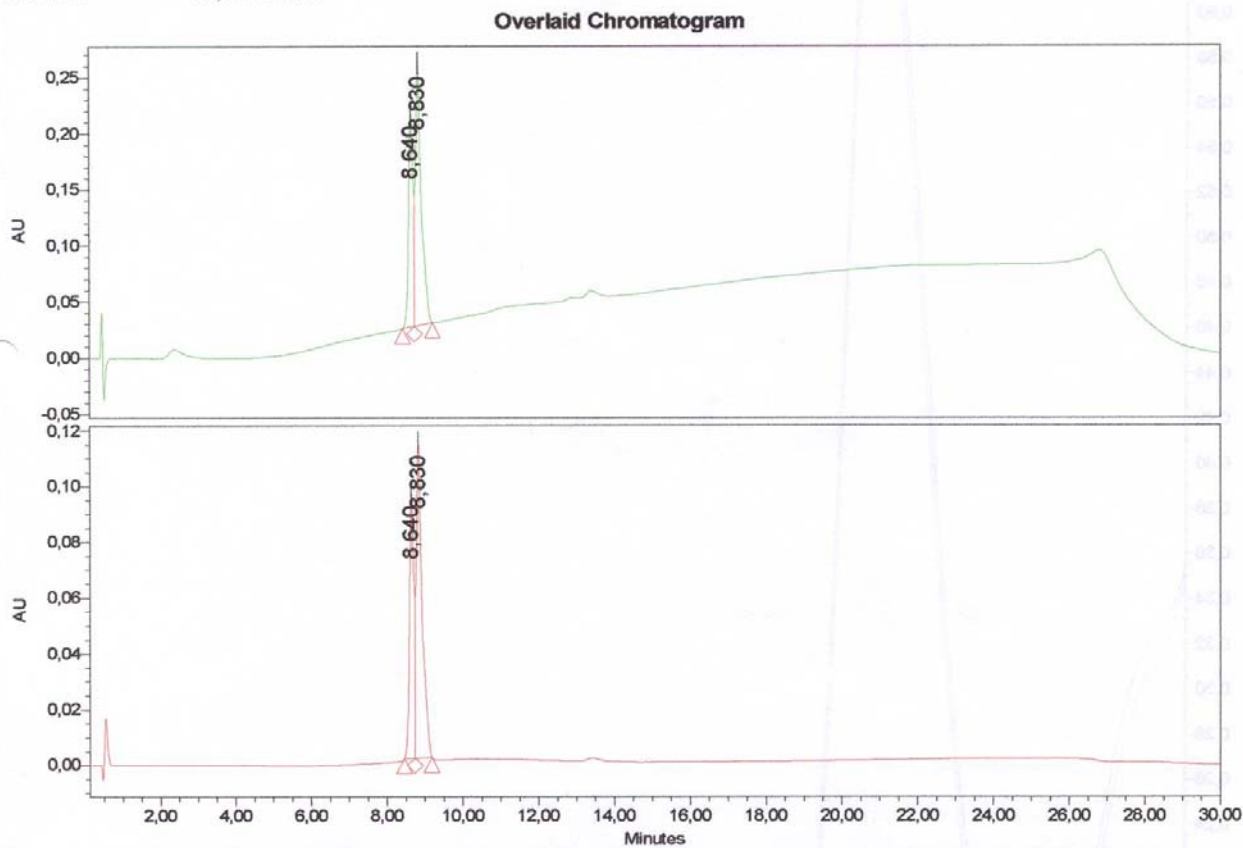
— SampleName: JBL-030423-JOC13 from vial 46 , Channel name: 215 Date Processed 23-04-2003 14:28:44
 — SampleName: JBL-030423-JOC13 from vial 46 , Channel name: 265 Date Processed 23-04-2003 14:28:44

Component Summary Table

Chn.	RT	Area	% Area	
1	215	5,140	3476872	100,00
2	265	5,140	1926214	100,00
Mean			7201543	
Std. Dev.			3217801	
% RSD			44,7	

Methyl 6-[(R/S)-1-(6-deoxy-β-L-glucopyranosyl)-ethyl]-phenazine-1-carboxylic ester (14)

SampleName	JBL-020723-126A	Sample Type	Unknown
Vial	50	Date Acquired	23-07-2002 17:24:35
Injection	1	Acq Method Set	Sample with TFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		



— SampleName: JBL-020723-126A from vial 50 , Channel name: 215 Date Processed 23-07-2002 17:54:47
 — SampleName: JBL-020723-126A from vial 50 , Channel name: 265 Date Processed 23-07-2002 17:54:47

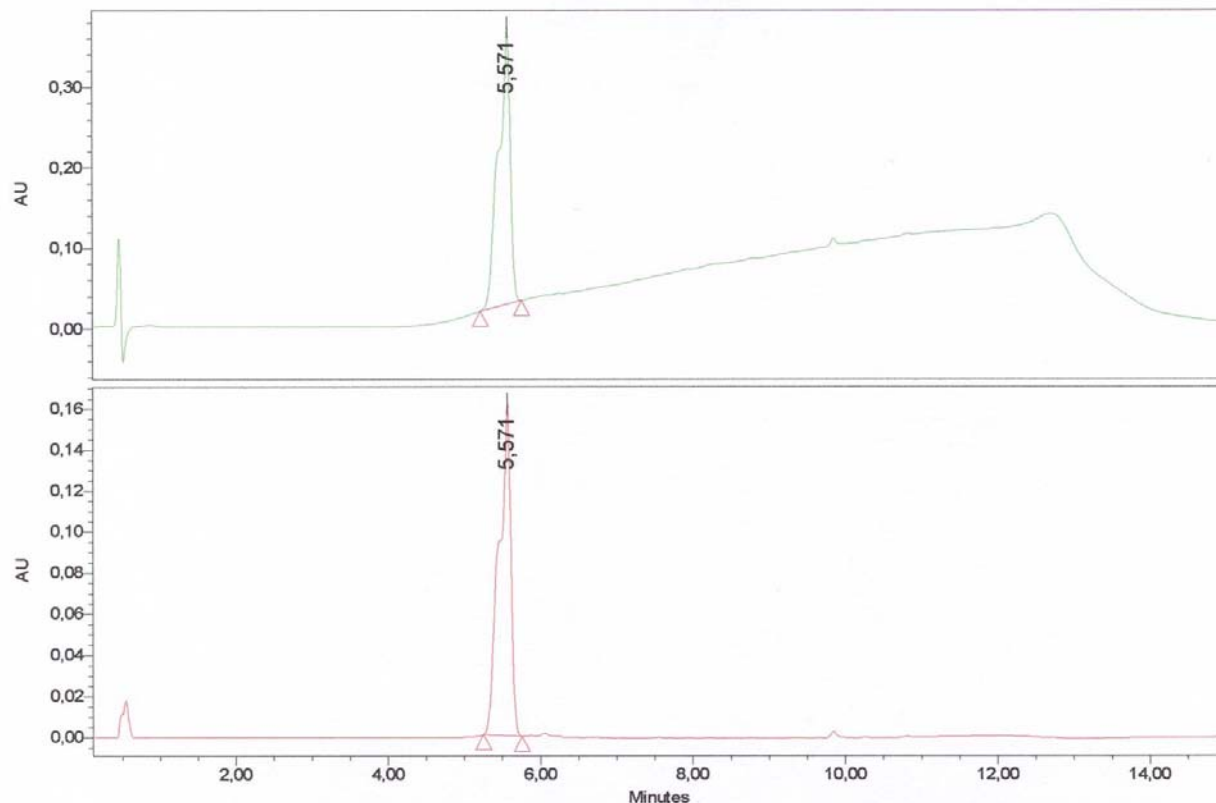
Component Summary Table

Chn.	RT	Area	% Area	
1	265	8,640	771299	38,50
2	215	8,640	1559732	37,93
3	265	8,830	1231935	61,50
4	215	8,830	2552298	62,07
Mean			1528816	
Std. Dev.			755081	
% RSD			49,4	

2-Oxy-(β -D-glucopyranosyl)-phenazine (15)

SampleName	JBL-030423-JOC15	Sample Type	Unknown
Vial	47	Date Acquired	23-04-2003 14:29:35
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		

Overlaid Chromatogram



— SampleName: JBL-030423-JOC15 from vial 47 , Channel name: 215 Date Processed 23-04-2003 14:44:48
 — SampleName: JBL-030423-JOC15 from vial 47 , Channel name: 265 Date Processed 23-04-2003 14:44:48

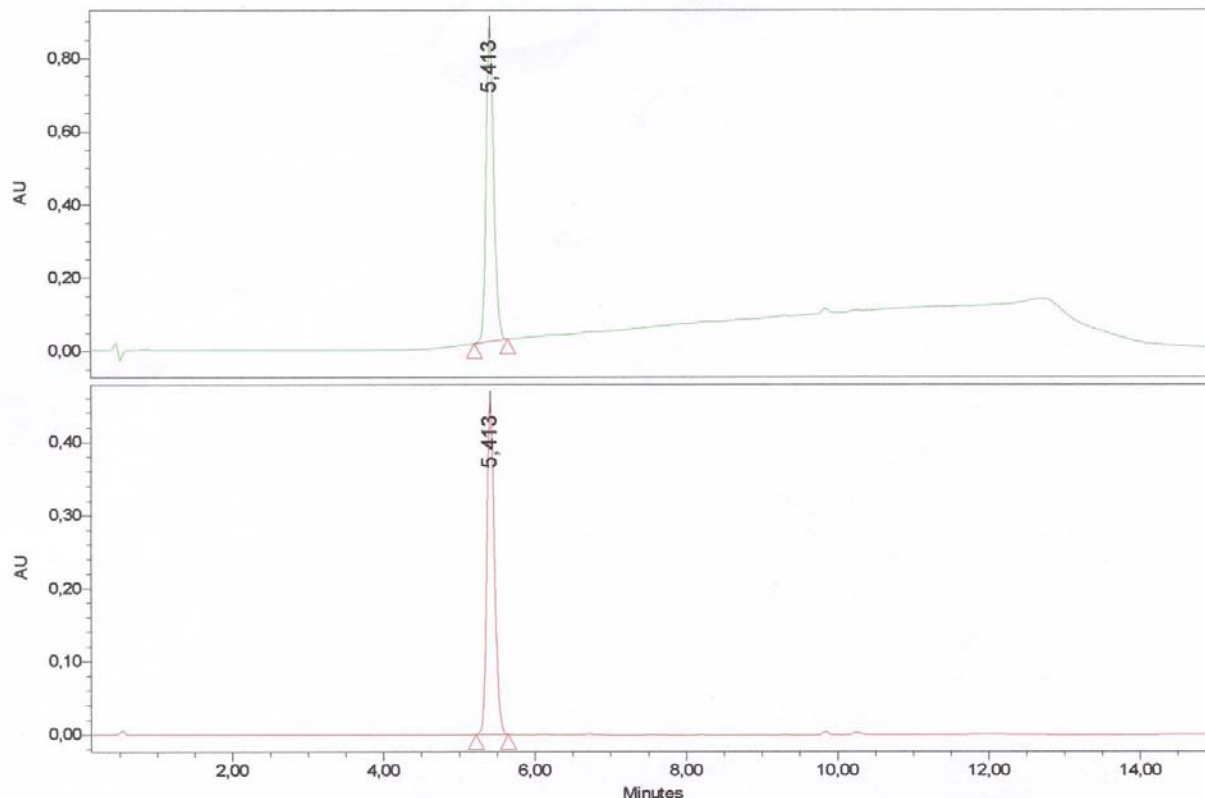
Component Summary Table

Chn.	RT	Area	% Area	
1	265	5,571	1770010	100,00
2	215	5,571	3705078	100,00
Mean			2737544	
Std. Dev.			1368300	
% RSD			50,0	

2-Oxy-(β-D-galactopyranosyl)-phenazine (16)

SampleName	JBL-030423-JOC16	Sample Type	Unknown
Vial	48	Date Acquired	23-04-2003 16:22:57
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		

Overlaid Chromatogram



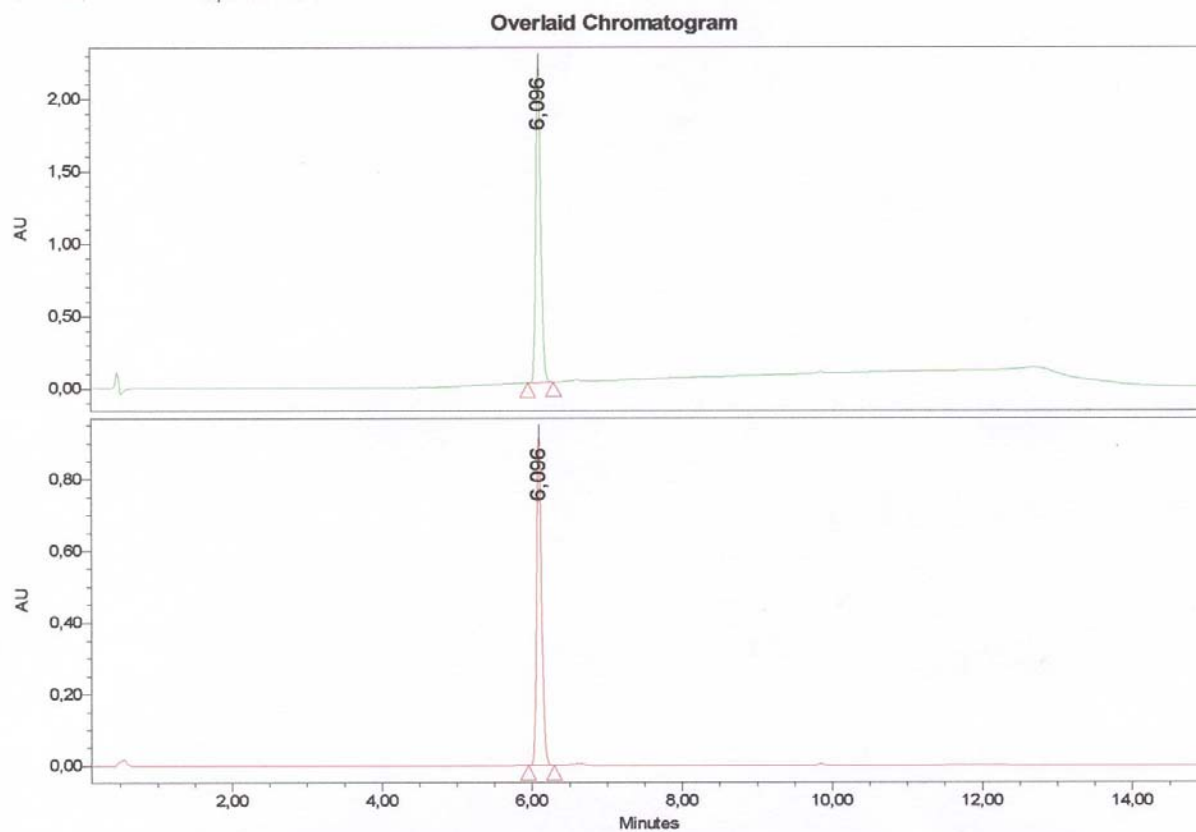
— SampleName: JBL-030423-JOC16 from vial 48 , Channel name: 215 Date Processed 23-04-2003 16:38:08
 — SampleName: JBL-030423-JOC16 from vial 48 , Channel name: 265 Date Processed 23-04-2003 16:38:08

Component Summary Table

Chn.	RT	Area	% Area	
1	265	5,413	3198539	100,00
2	215	5,413	3000998	100,00
Mean			1599768	
Std. Dev.			1981638	
% RSD			43,1	

2-Oxy-(β -L-6-deoxy-galactopyranosyl)-phenazine (17)

SampleName	JBL-030423-JOC17	Sample Type	Unknown
Vial	49	Date Acquired	23-04-2003 15:01:48
Injection	1	Acq Method Set	Sample with TFA 15 min
Injection Volume	10,00 μ l	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		



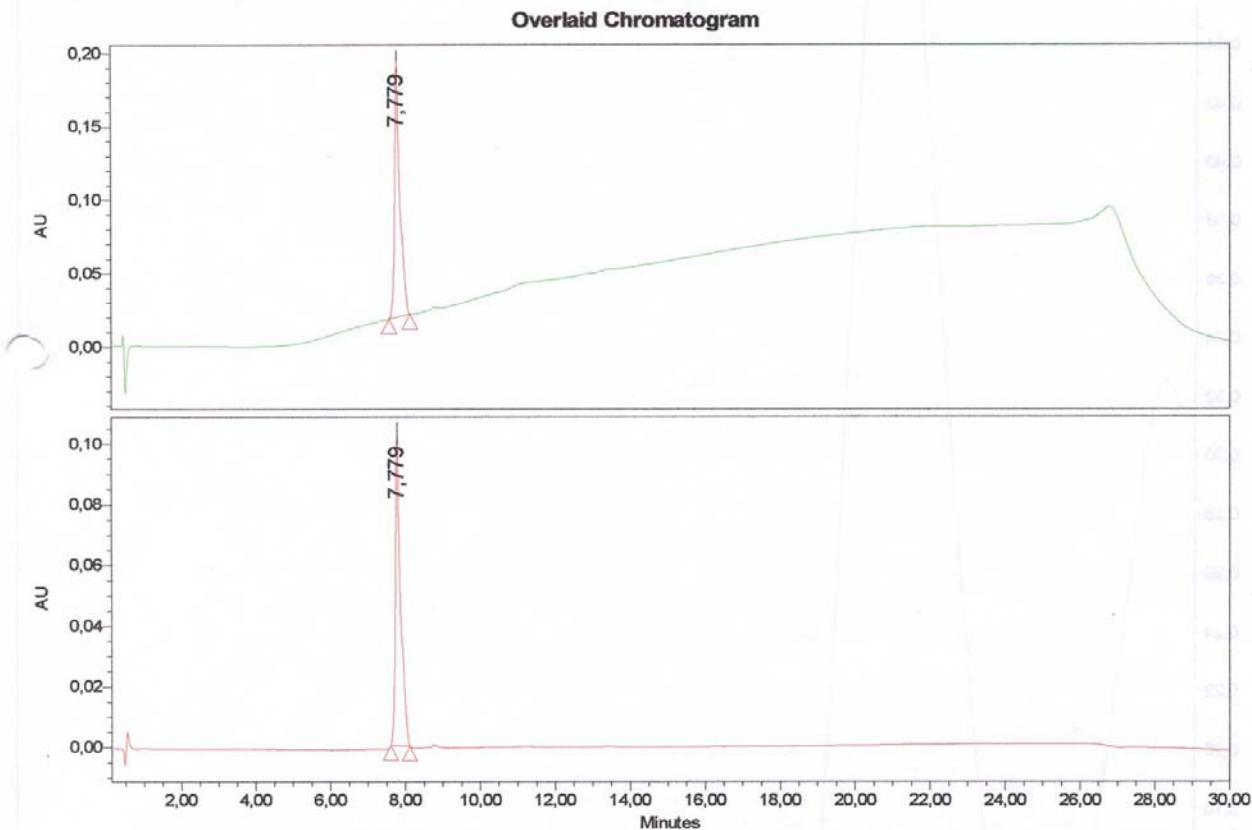
— SampleName: JBL-030423-JOC17 from vial 49 , Channel name: 215 Date Processed 23-04-2003 15:16:59
 — SampleName: JBL-030423-JOC17 from vial 49 , Channel name: 265 Date Processed 23-04-2003 15:16:59

Component Summary Table

	Chn.	RT	Area	% Area
1	265	6,096	4249864	100,00
2	215	6,096	10052688	100,00
Mean			7151276	
Std. Dev.			4103216	
% RSD			57,4	

6-[(R/S)-1-(β-D-Glucopyranosyl)-ethyl]-phenazine-1-carboxylic acid (18)

SampleName	JBL-020723-131A	Sample Type	Unknown
Vial	52	Date Acquired	23-07-2002 18:26:46
Injection	1	Acq Method Set	Sample withTFA 30 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	30,0 Minutes		



— SampleName: JBL-020723-131A from vial 52 , Channel name: 215 Date Processed 23-07-2002 18:56:58
 — SampleName: JBL-020723-131A from vial 52 , Channel name: 265 Date Processed 23-07-2002 18:56:59

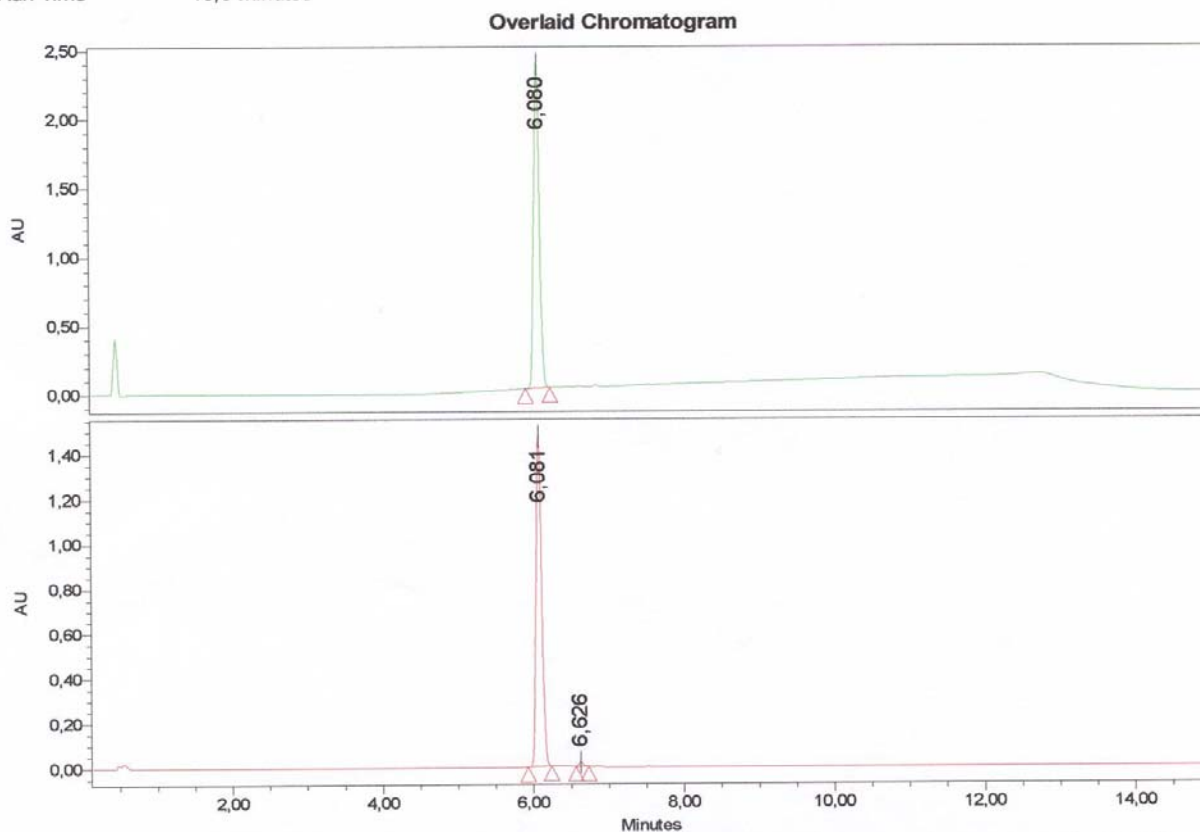
Component Summary Table

Chn.	RT	Area	% Area
1	7,779	1698030	100,00
2	7,779	996083	100,00
Mean		1347057	
Std. Dev.		496352	
% RSD		36,8	

6-[(R/S)-1-(β-D-Galactopyranosyl)-ethyl]-phenazine-1-carboxylic acid (19)

SampleName JBL-030423-JOC19
 Vial 50
 Injection 1
 Injection Volume 20,00 ul
 Channel 996
 Run Time 15,0 Minutes

Sample Type Unknown
 Date Acquired 23-04-2003 16:56:16
 Acq Method Set Sample withTFA 15 min
 Processing Method Default



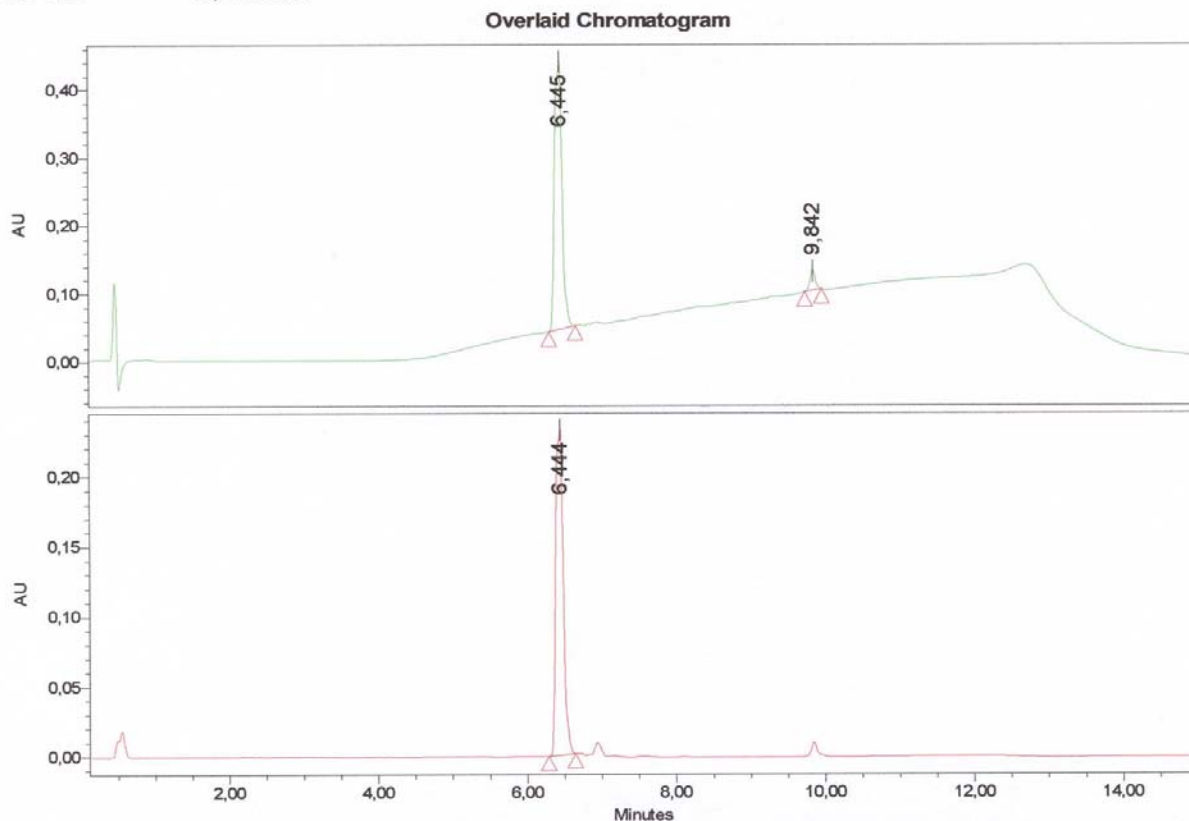
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 — SampleName: JBL-030423-JOC19 from vial 50 , Channel name: 265 Date Processed 23-04-2003 17:11:28

Component Summary Table

Chn.	RT	Area	% Area	
1	215	6,080	12525989	100,00
2	265	6,081	7760561	99,07
3	265	6,626	72932	0,93
Mean			6786494	
Std. Dev.			6283412	
% RSD			92,6	

6-[(R/S)-1-(6-Deoxy-β-D-glucoopyranosyl)-ethyl]-phenazine-1-carboxylic acid (**20**)

SampleName	JBL-030423-JOC20	Sample Type	Unknown
Vial	51	Date Acquired	23-04-2003 15:34:06
Injection	1	Acq Method Set	Sample withTFA 15 min
Injection Volume	10,00 ul	Processing Method	Default
Channel	996		
Run Time	15,0 Minutes		



— SampleName: JBL-030423-JOC20 from vial 51 , Channel name: 215 Date Processed 23-04-2003 15:49:17
 — SampleName: JBL-030423-JOC20 from vial 51 , Channel name: 265 Date Processed 23-04-2003 15:49:17

Component Summary Table

	Chn.	RT	Area	% Area
1	265	6,444	1684526	100,00
2	215	6,445	2833256	95,35
3	215	9,842	138028	4,65
Mean			1551936	
Std. Dev.			1352497	
% RSD			87,1	