

Supplementary information

Design, synthesis and biological evaluation of novel triazole-core reversal agents against P- glycoprotein-mediated multidrug resistance

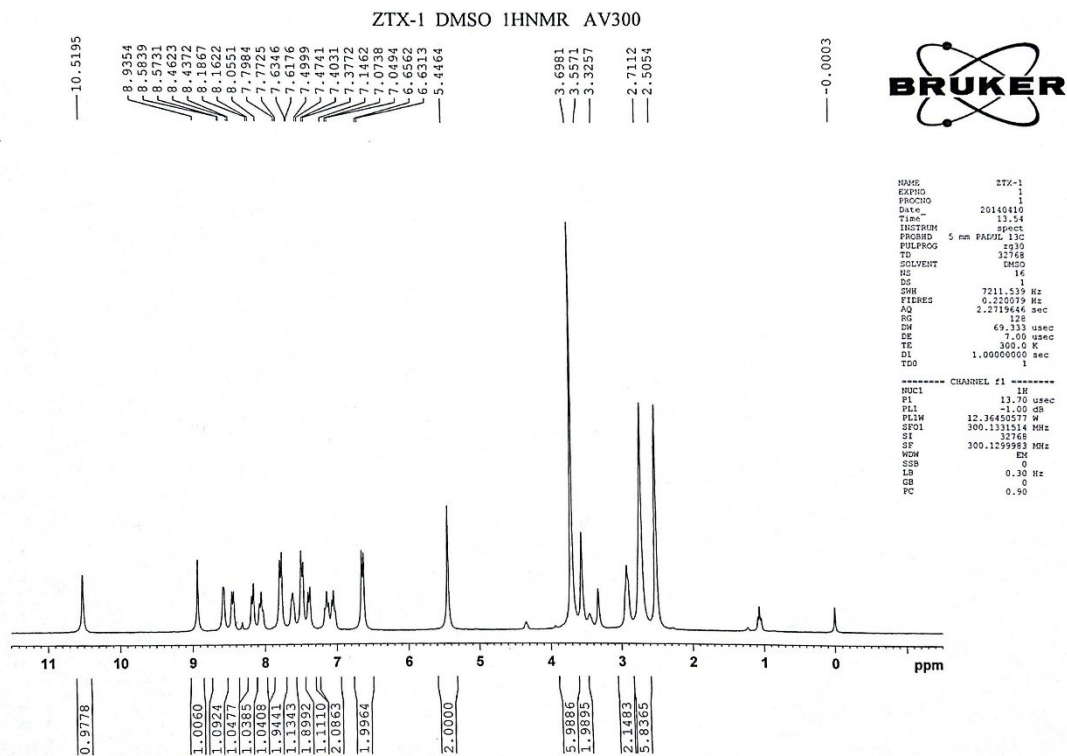
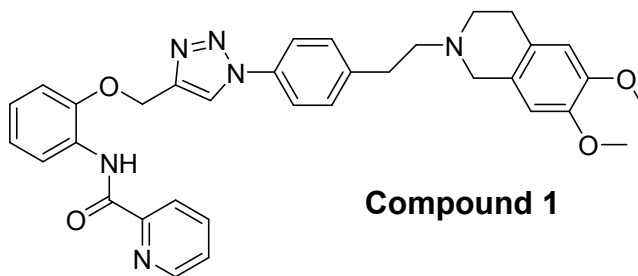
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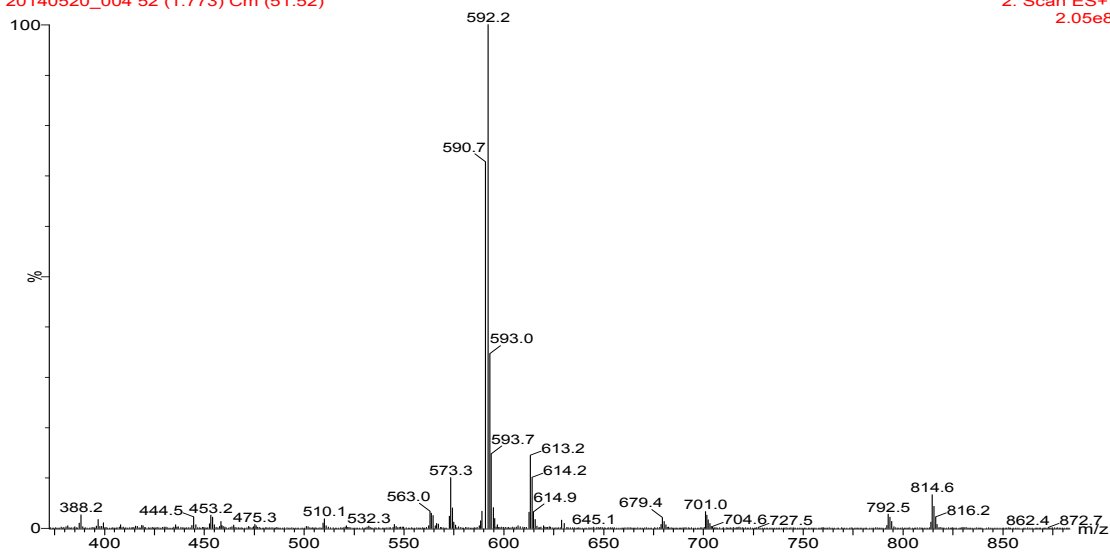
NMR and MS spectra of compounds 1-12

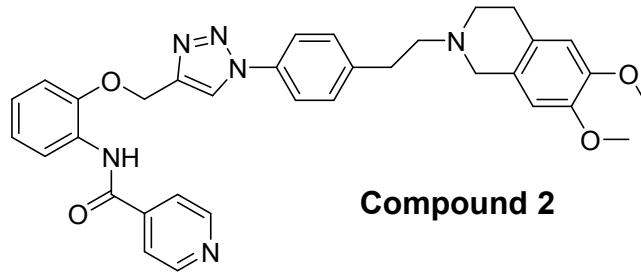


ZTX-1a23-May-2014

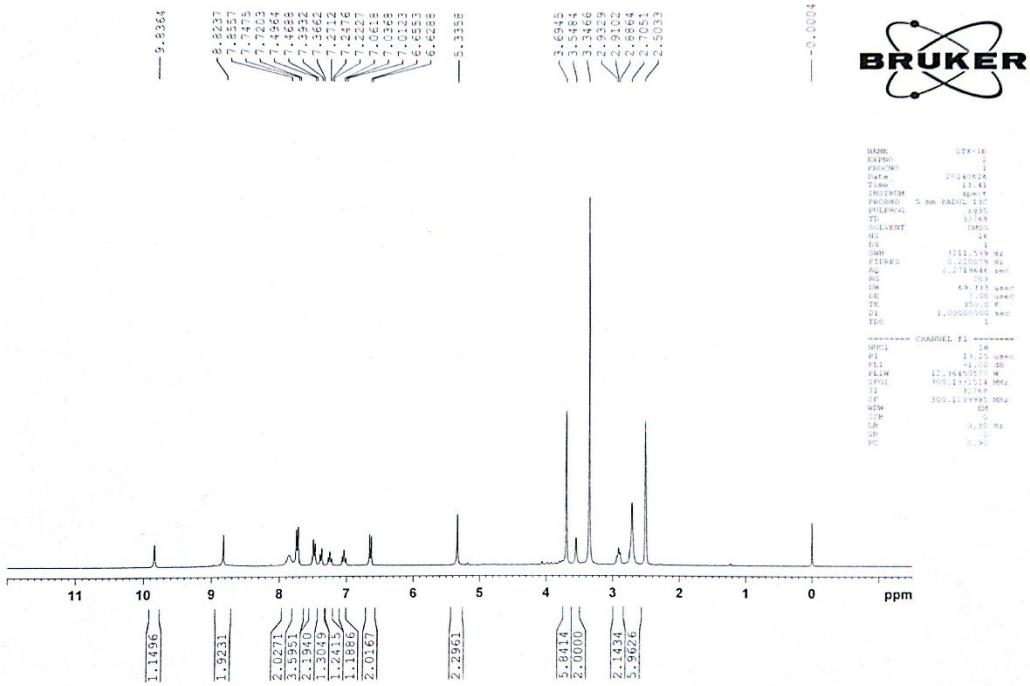
20140520_004 52 (1.773) Cm (51:52)

2: Scan ES+
2.05e8





ZTX-2 DMSO 1H1NMR AV300

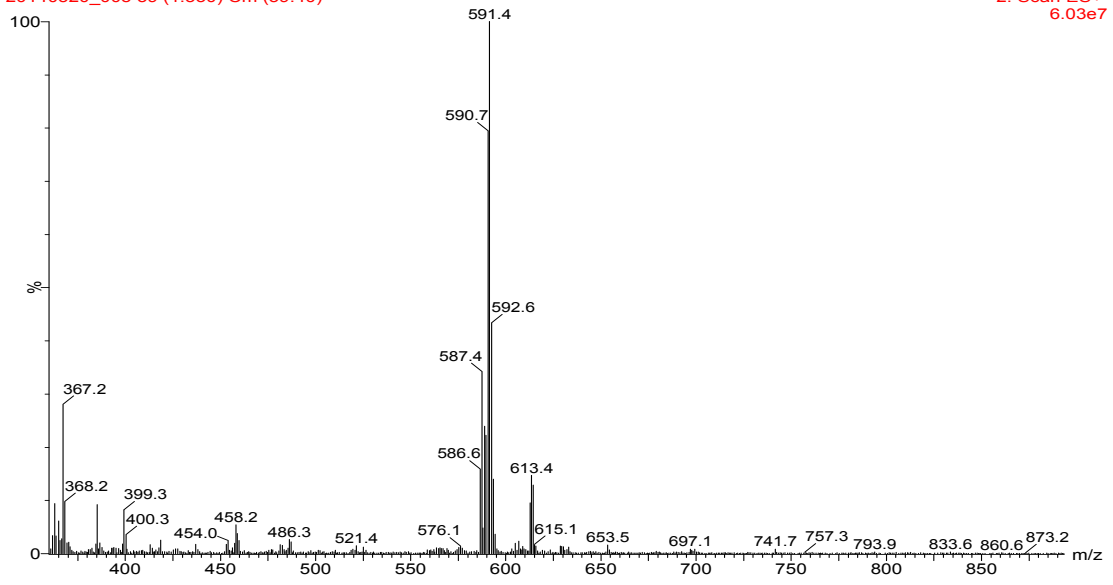


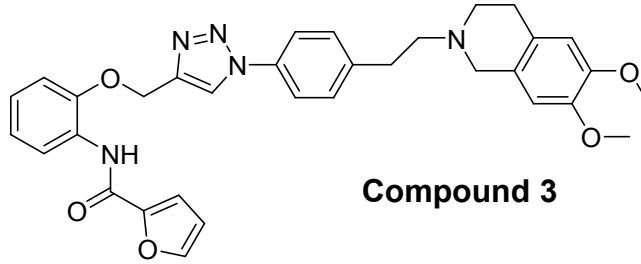
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PROCNO   1
Date_    20140524
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INSTRUM  spect
PROBHD   5 mm EASY 13C
PULPROG  zgpg30
SOLVENT  DMSO
NS       64
DS       4
SWH      3211.579 Hz
FIDRES   0.220076 Hz
AQ       0.2271944 sec
RG        321
SQ        49.733 uV
WDW       EM
SSB       0.00 uV
LB        0.30 Hz
GB        0.00 Hz
PC        1.00000000 sec
TE        300.2 K
D1        1.00000000 sec
TD        1
----- CHANNEL f1 -----
NUC1      13C
P1        12.00 nsec
PL1       0.00 dB
PL12      12.00 dB
PL13      12.00 dB
PL14      12.00 dB
PL15      12.00 dB
PL16      12.00 dB
PL17      12.00 dB
PL18      12.00 dB
PL19      12.00 dB
PL20      12.00 dB
PL21      12.00 dB
PL22      12.00 dB
PL23      12.00 dB
PL24      12.00 dB
PL25      12.00 dB
PL26      12.00 dB
PL27      12.00 dB
PL28      12.00 dB
PL29      12.00 dB
PL30      12.00 dB
PL31      12.00 dB
PL32      12.00 dB
PL33      12.00 dB
PL34      12.00 dB
PL35      12.00 dB
PL36      12.00 dB
PL37      12.00 dB
PL38      12.00 dB
PL39      12.00 dB
PL40      12.00 dB
PL41      12.00 dB
PL42      12.00 dB
PL43      12.00 dB
PL44      12.00 dB
PL45      12.00 dB
PL46      12.00 dB
PL47      12.00 dB
PL48      12.00 dB
PL49      12.00 dB
PL50      12.00 dB
PL51      12.00 dB
PL52      12.00 dB
PL53      12.00 dB
PL54      12.00 dB
PL55      12.00 dB
PL56      12.00 dB
PL57      12.00 dB
PL58      12.00 dB
PL59      12.00 dB
PL60      12.00 dB
PL61      12.00 dB
PL62      12.00 dB
PL63      12.00 dB
PL64      12.00 dB
PL65      12.00 dB
PL66      12.00 dB
PL67      12.00 dB
PL68      12.00 dB
PL69      12.00 dB
PL70      12.00 dB
PL71      12.00 dB
PL72      12.00 dB
PL73      12.00 dB
PL74      12.00 dB
PL75      12.00 dB
PL76      12.00 dB
PL77      12.00 dB
PL78      12.00 dB
PL79      12.00 dB
PL80      12.00 dB
PL81      12.00 dB
PL82      12.00 dB
PL83      12.00 dB
PL84      12.00 dB
PL85      12.00 dB
PL86      12.00 dB
PL87      12.00 dB
PL88      12.00 dB
PL89      12.00 dB
PL90      12.00 dB
PL91      12.00 dB
PL92      12.00 dB
PL93      12.00 dB
PL94      12.00 dB
PL95      12.00 dB
PL96      12.00 dB
PL97      12.00 dB
PL98      12.00 dB
PL99      12.00 dB
PL100     12.00 dB
  
```

ZTX-1b23-May-2014
20140520_005 39 (1.330) Cm (39:40)

2: Scan ES+
6.03e7





ZTX-3 DMSO 1H NMR AV300

9.1658
8.9013
7.9851
7.9587
7.8851
7.8305
7.8030
7.5304
7.5027
7.3785
7.3516
7.2963
7.2852
7.1857
7.1728
7.1472
7.0392
7.0135
6.9886
6.7374
6.6987
6.6868
6.6814
5.3874

4.0505
3.9805
3.7157
3.3292
3.0640
2.8901
2.7320
2.5028

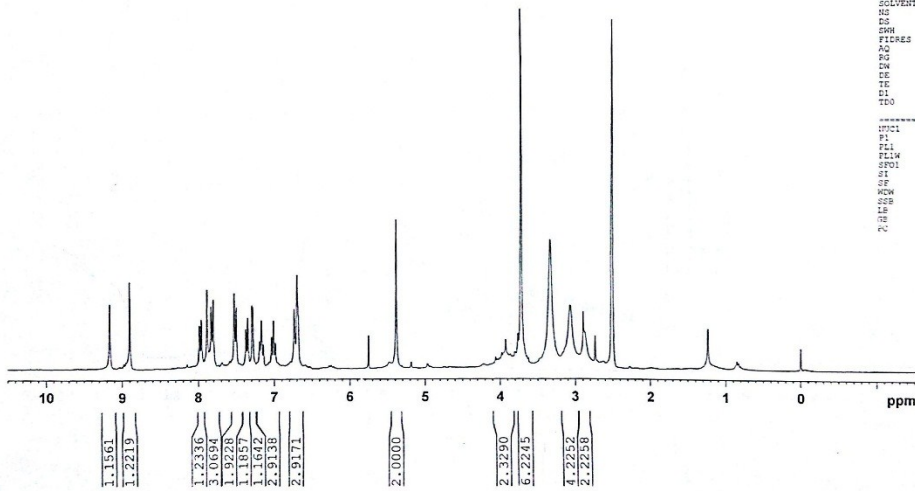
1.2328

-0.0003



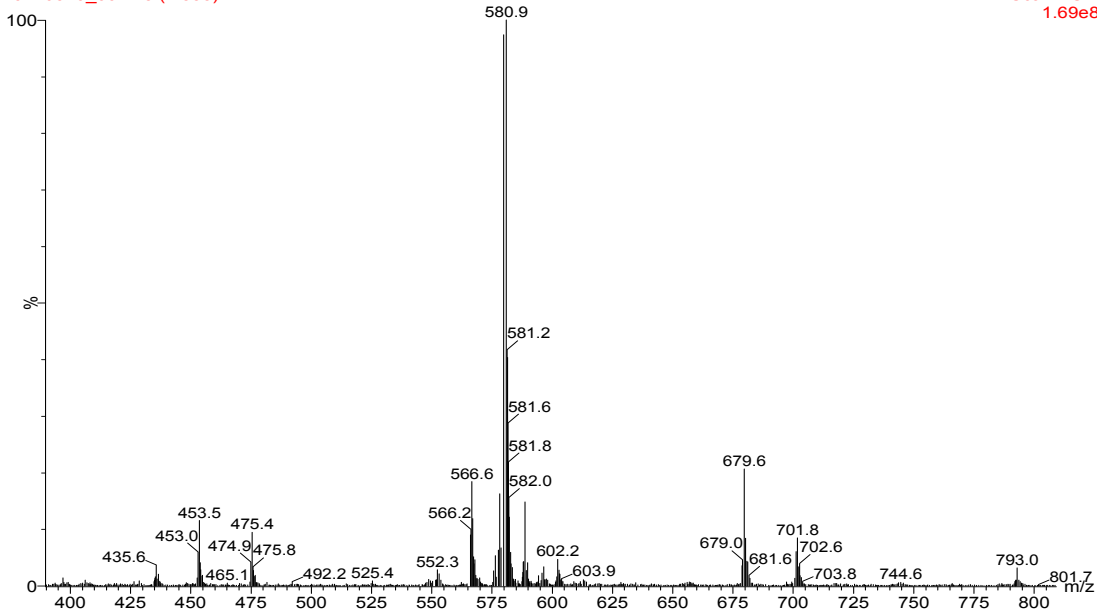
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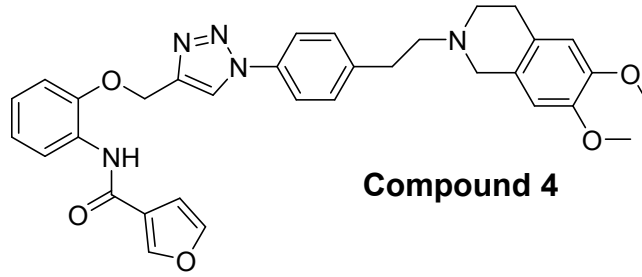
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EXPNO         1
PROCNO        1
Date_         20140507
Time          13.51
INSTRUM       spect
PROBHD        5 mm PACT-13C
PULPROG       zgpg30
TD            32768
SOLVENT       DMSO
NS            14
DS            1
SWH           7111.539 Hz
FIDRES        0.220079 Hz
AQ            2.2719646 sec
RG            258
DW            69.393 usec
DE            1.00 usec
TE            300.0 K
D1            1.00000000 sec
TD0           1
----- CHANNEL f1 -----
NUC1          13C
P1            13.00 usec
PL1           0.00 dB
PL12          12.3644000 dB
SFO1          300.1331514 MHz
SI            32768
SF            300.1339933 MHz
MAG          10.00
SFO2          125.7611535 MHz
SI2           65536
SF2           125.7611535 MHz
RG2           65536
AQ2           0.330 usec
PC            0.50
  
```



ZTX-3a23-May-2014
20140520_007 45 (1.535)

2: Scan ES+
1.69e8





Compound 4

ZTX-4 DMSO 1HNMR AV300

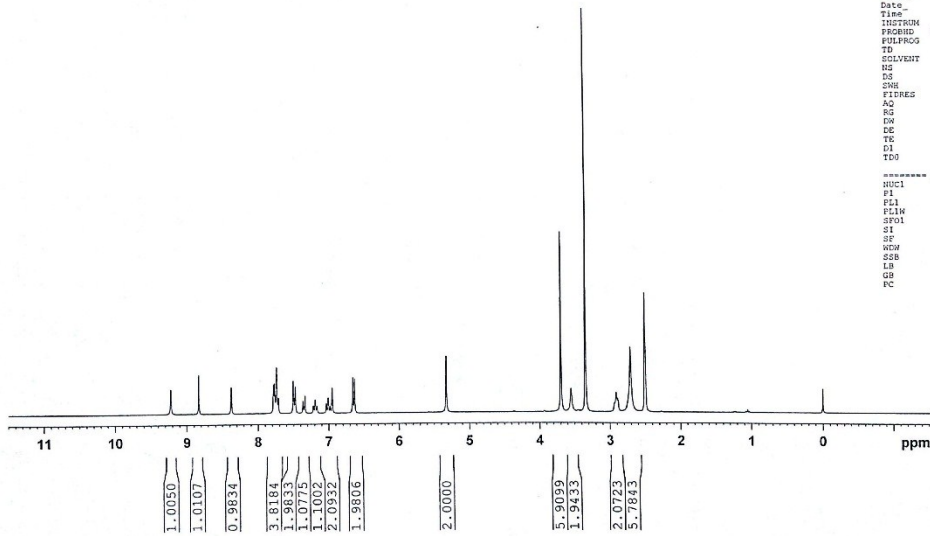
9.2205
8.9205
8.3758
7.7801
7.7637
7.7362
7.7157
7.5010
7.4731
7.3646
7.3380
7.2152
7.1911
7.1812
7.0919
7.0070
6.9814
6.9506
6.6298
5.3257
3.6537
3.5502
3.5336
3.5170
2.9111
2.8873
2.7070
2.5029

-0.0004



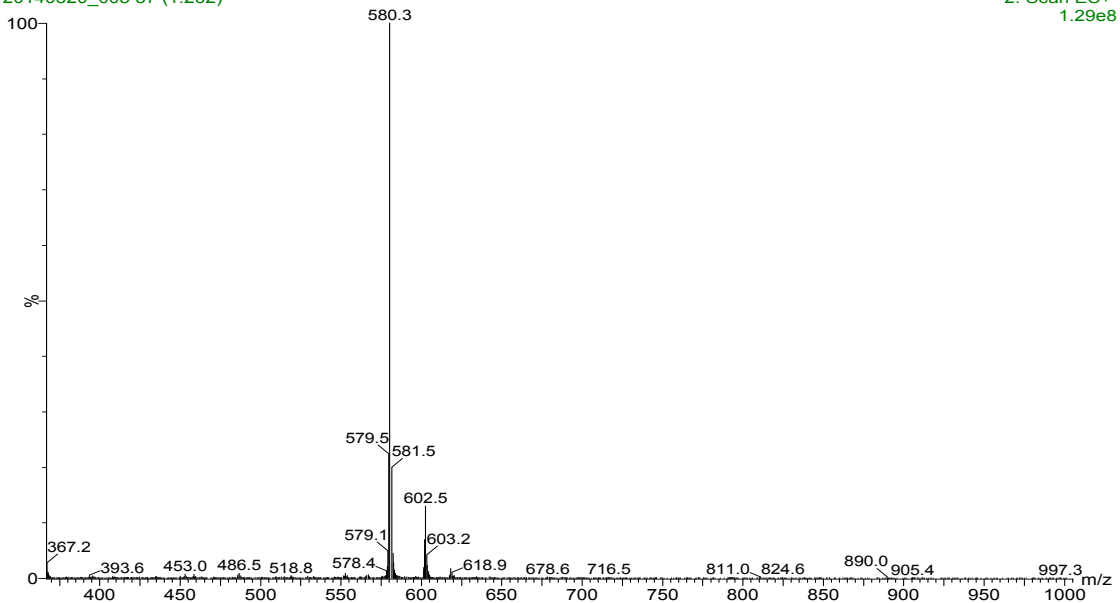
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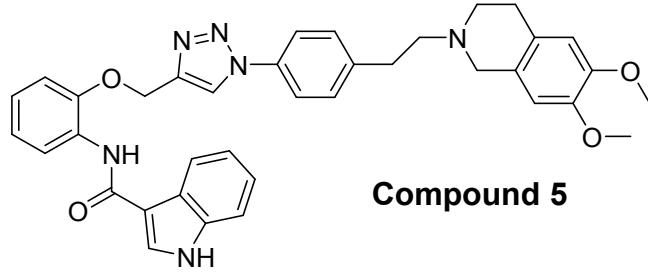
NAME      ZTX-3b
EXPNO     2
PROCNO    1
Date_     20140624
Time      13.44
INSTRUM   spect
PROBHD    5 mm PABUL1
PULPROG   zgpg30
TD         32768
SOLVENT   DMSO
NS         16
DS         1
SWH        7211.535 Hz
FIDRES     0.228039 Hz
AQ         2.2719646 sec
RG         203
FW         69.323 usec
DE         7.00 usec
TE         300.2 K
D1         1.00000000 sec
TD0        1
===== CHANNEL f1 =====
NUC1       1H
P1         13.25 usec
PL1        -1.00 dB
PL1W       12.36450577 W
SFO1       300.1331514 MHz
SI         32768
SF         300.1299996 MHz
WDW         EM
SSB         0
LB         0.30 Hz
GB         0
PC         0.90
  
```



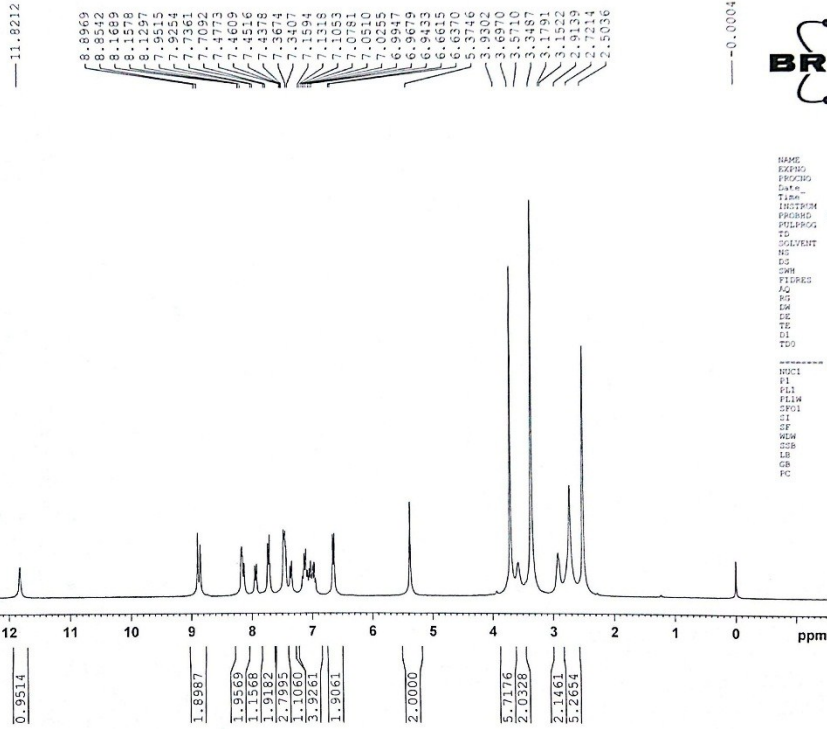
ZTX-3b23-May-2014
20140520_008 37 (1.262)

2: Scan ES+
1.29e8





ZTX-5 DMSO 1HNMR AV300



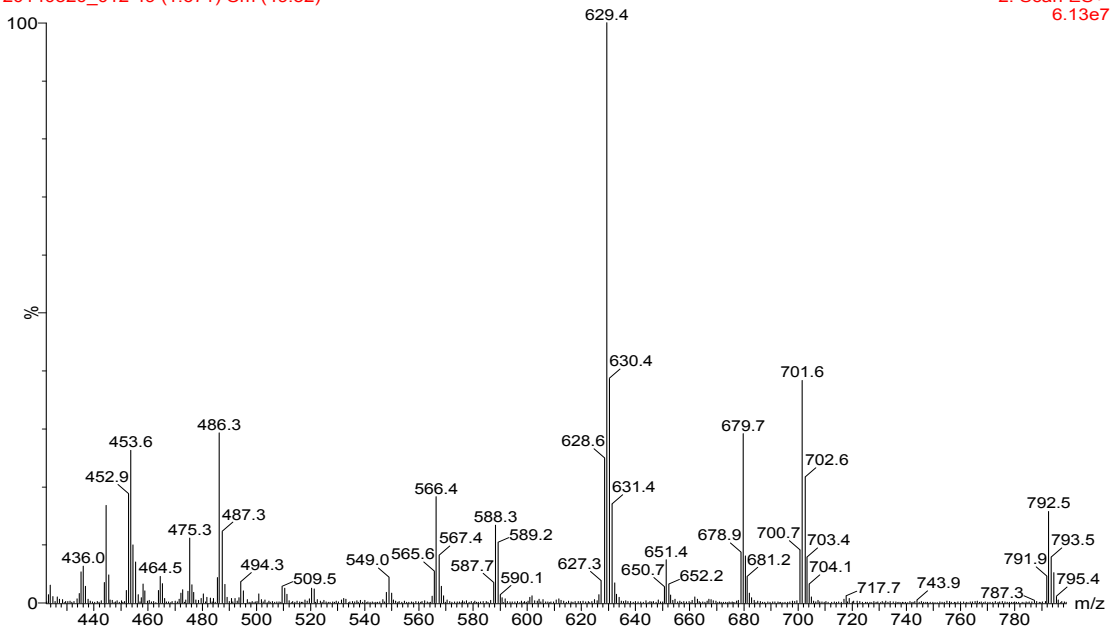
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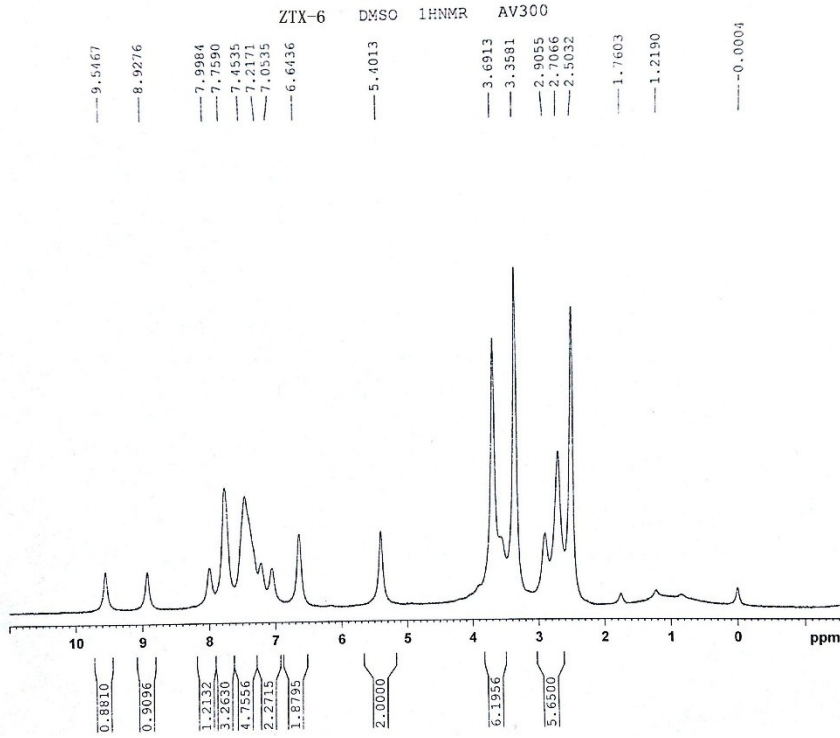
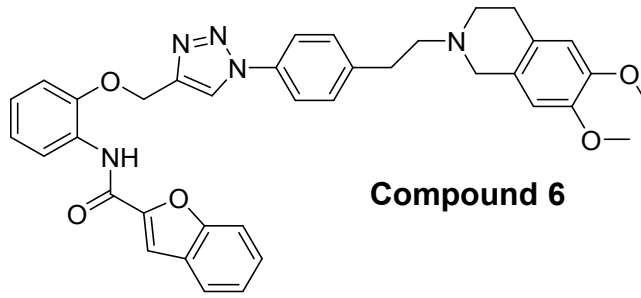
NAME      ZTX-4
EXPNO    2
PROCNO   1
Date_    20140626
Time     13.49
INSTRUM  spect
PROBHD   5 mm PAMUL 13C
PULPROG  zgpg30
TD       32768
SOLVENT  DMSO
NS       14
DS       1
SWH      7211.539 Hz
FIDRES   0.220079 Hz
AQ       2.2719644 sec
RG       203
EW       63.333 umen
IS       3.00 usec
TE       300.0 K
D1       1.00000000 sec
TD0      1
----- CHANNEL f1 -----
NUC1     1H
P1       13.00 usec
PL1      -1.00 dB
FLW      12.36450579 Hz
SFO1     300.1351214 MHz
SI       32768
SF       300.1299991 MHz
WDW      EM
SSB      0
LB       0.30 Hz
GB       0
PC       0.93
  
```

ZTX-423-May-2014

20140520_012 49 (1.671) Cm (49:52)

2: Scan ES+
6.13e7

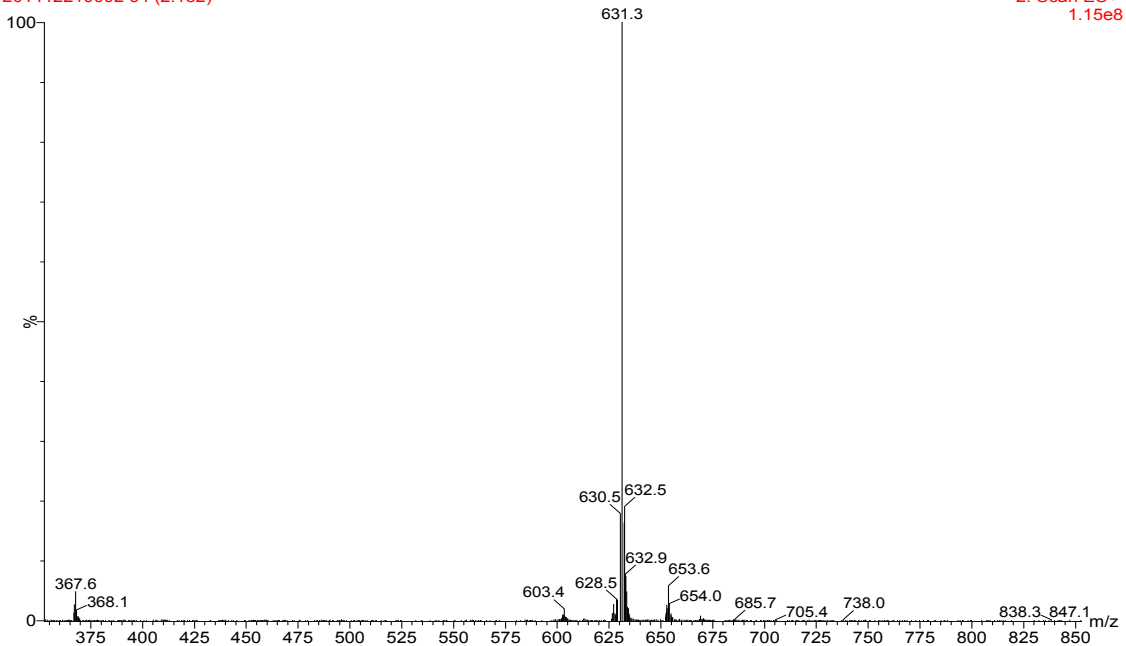


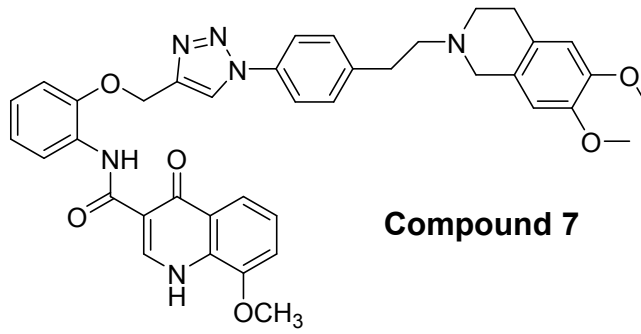


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NAME          ZTX-6
EXPNO         1
PROCNO        1
Date_         20141106
Time          11:13
INSTRUM       spect
PROBHD        5 mm PABOL13C
PULPROG       zgpg30
TD            32768
SOLVENT       DMSO
NS            16
DS            1
SWH           7211.539 Hz
FIDRES        0.122079 Hz
AQ           0.1719456 sec
RG            114
SQ           69.313 usec
DE           1.00 usec
TE            300.2 K
SI            1.074
SF            300.125470 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            0.90
  
```

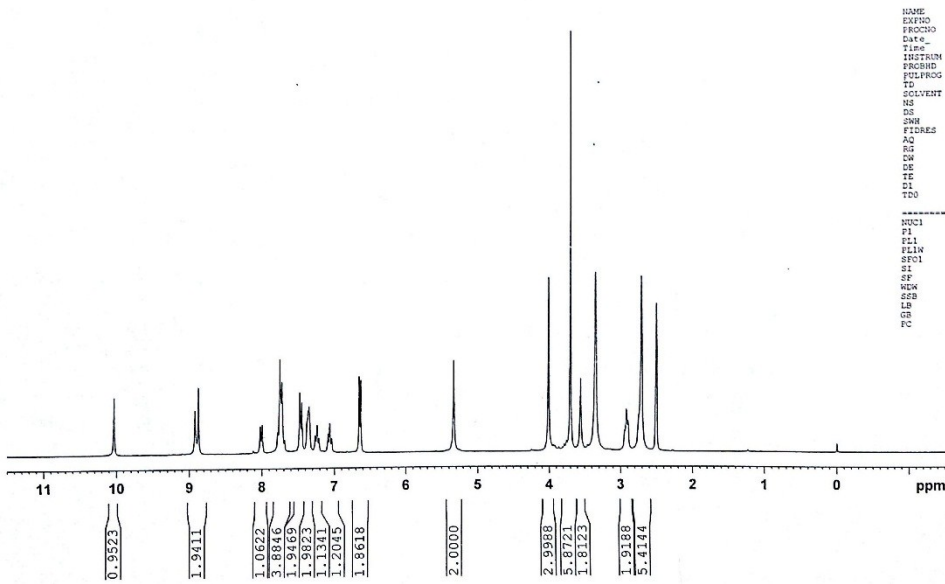
ZTX-621-Dec-2014
201412210002 64 (2.182)





ZTX-7 DMSO 1HNMR AV300

10.0292
 8.9156
 8.8715
 8.0215
 7.9362
 7.7818
 7.7538
 7.7258
 7.6876
 7.4771
 7.5476
 7.5226
 7.5226
 7.2640
 7.2289
 7.2138
 7.0870
 7.0617
 7.0366
 6.6638
 6.6329
 5.3327
 4.0075
 3.9362
 3.9161
 3.7873
 3.7531
 3.6986
 3.5560
 3.4953
 3.3486
 2.8390
 2.8150
 2.7854
 2.7059
 2.5036
 -0.0004

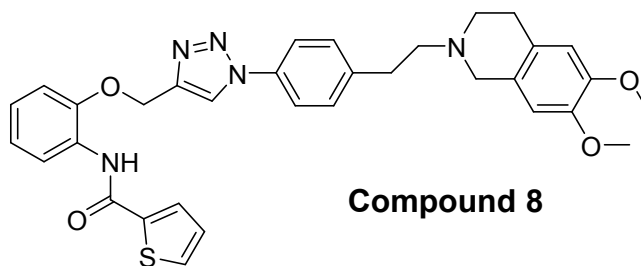
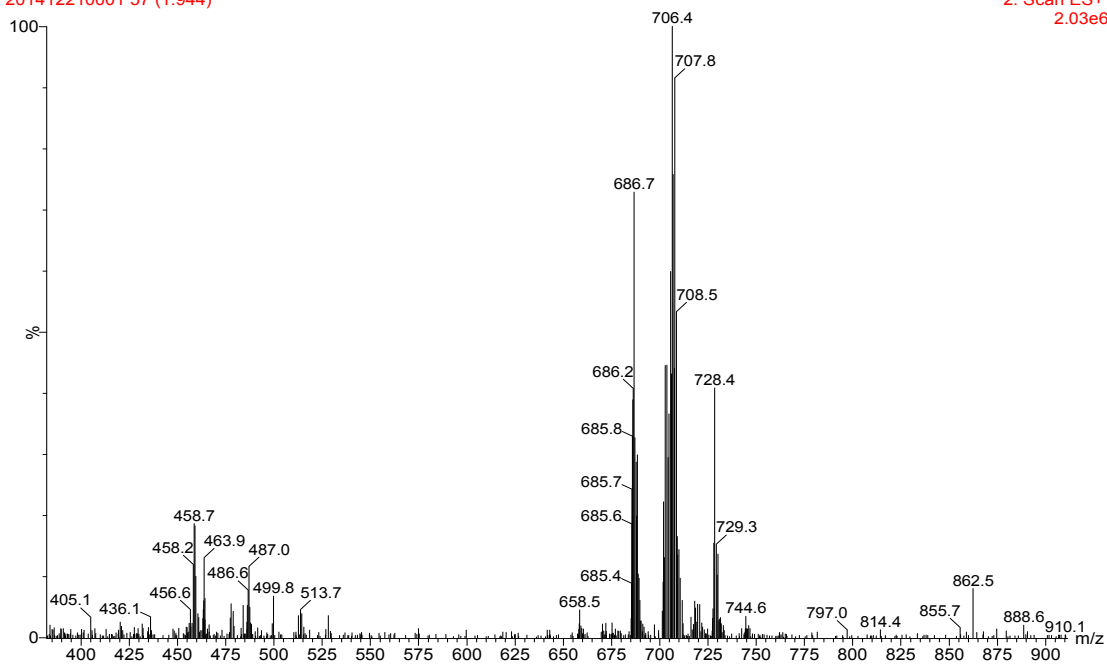


```

NAME          CTP-2
EXPNO         1
PROCNO        1
Date_         20140606
Time          15:25
INSTRUM       spect
PROBHD        5 mm PACTH 1H2
PULPROG       zgpg30
TD            32768
SOLVENT       DMSO
NS            16
DS            1
SWH           7211.539 Hz
FIDRES        0.122079 Hz
AQ            2.3719646 sec
RG            114
KW           69.333 usec
DE            7.00 usec
TE            300.2 K
D1            1.0000000 sec
TD0           1
----- CHANNEL f1 -----
NUC1          1H
P1            19.20 usec
PL1           -1.00 dB
PLIN         12.36455377 W
SFO1          300.1293814 MHz
SI            32768
SF            300.1293814 MHz
MER           0
SFB           0
LB            0.10 Hz
GB            0
PC            0.90
  
```


ZTX-521-Dec-2014
201412210001 57 (1.944)

2: Scan ES+
2.03e6



ZTX-8 DMSO 1HNMR AV300

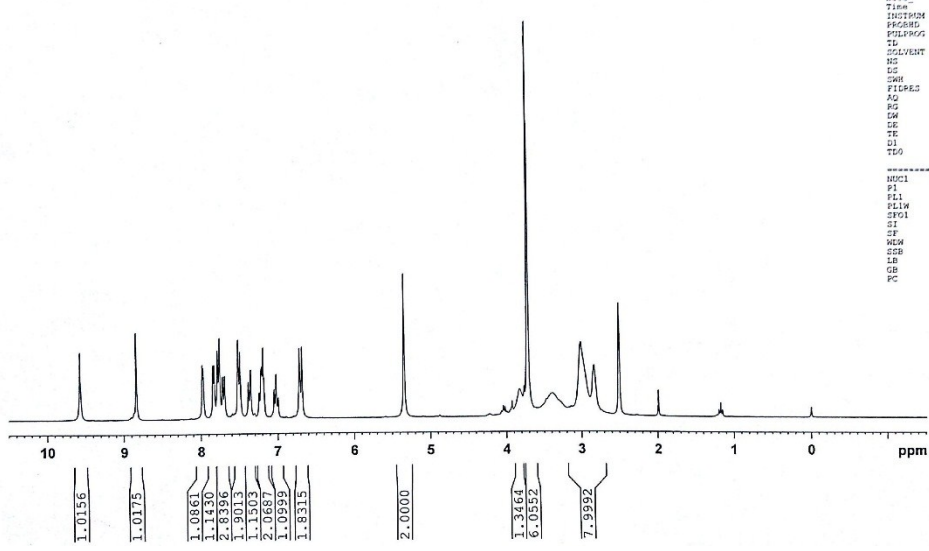
9.4661
8.6371
7.9770
7.9674
7.8389
7.8227
7.7809
7.7535
7.7132
7.6876
7.6818
7.6258
7.5768
7.5519
7.5399
7.5146
7.4052
7.1892
7.1765
7.0199
6.7155
6.6842
5.3456

3.8264
3.8236
3.3866
3.0063
2.8221
2.8056
1.9912
1.8926
1.1729
1.1213
-0.0003



```

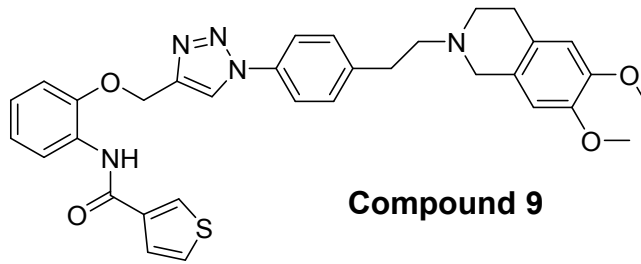
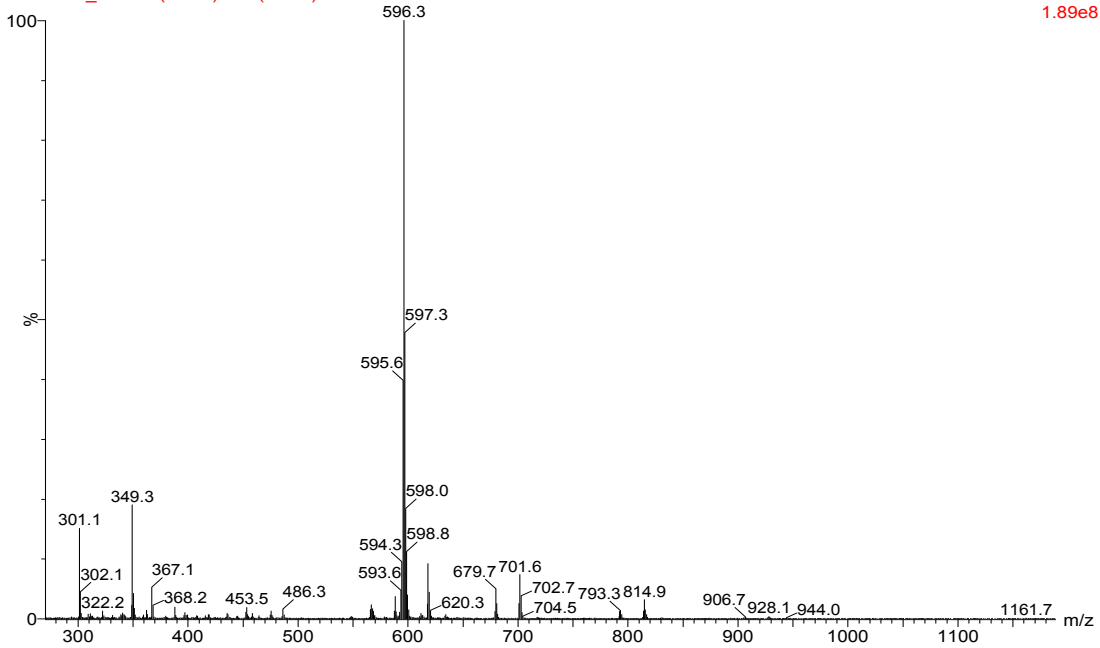
NAME      ZTX-2
EXPNO    1
PROCNO   1
DATE_    20140424
Time     12.30
INSTRUM  spect
PROBHD   5 mm PABUL 13C
PULPROG  zgpg30
TD        65536
SOLVENT  DMSO
NS        16
DS        1
SWH       7011.539 Hz
FIDRES   0.220079 Hz
AQ        2.2719666 sec
RG        114
DM        69.333 usec
DE        1.00 usec
TE        300.0 K
SI        1.00000000 sec
TDO       1
----- CHANNEL f1 -----
NUC1      1H
P1        13.70 usec
PL1       -1.00 dB
SFO1      12.36400000 MHz
WDW        EM
SF        300.1331514 MHz
WDW        EM
SSB        0
LB        0.30 Hz
GB        0
PC        0.90
  
```



ZTX-223-May-2014

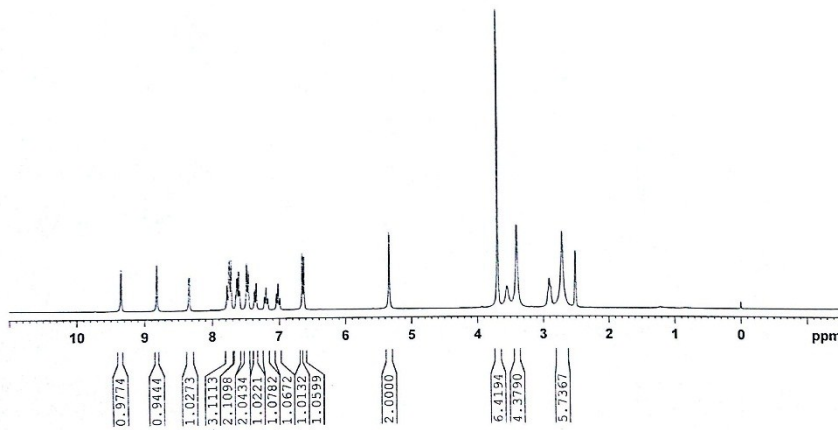
20140520_011 49 (1.671) Cm (46:49)

2: Scan ES+
1.89e8



Chemical Shift (ppm)	Integration
9.3592	
8.8207	
8.3386	
7.9909	
7.7485	
7.7202	
7.6328	
7.6270	
7.6082	
7.5926	
7.4910	
7.4637	
7.3731	
7.3462	
7.2237	
7.2001	
7.1756	
7.0444	
7.0193	
6.9944	
6.4649	
5.9515	
5.5403	
3.9344	
3.6970	
3.5523	
3.4639	
2.9057	
2.7099	
2.5074	

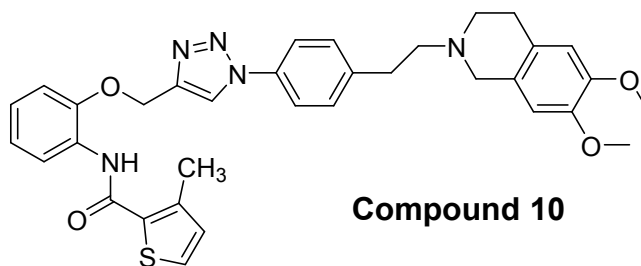
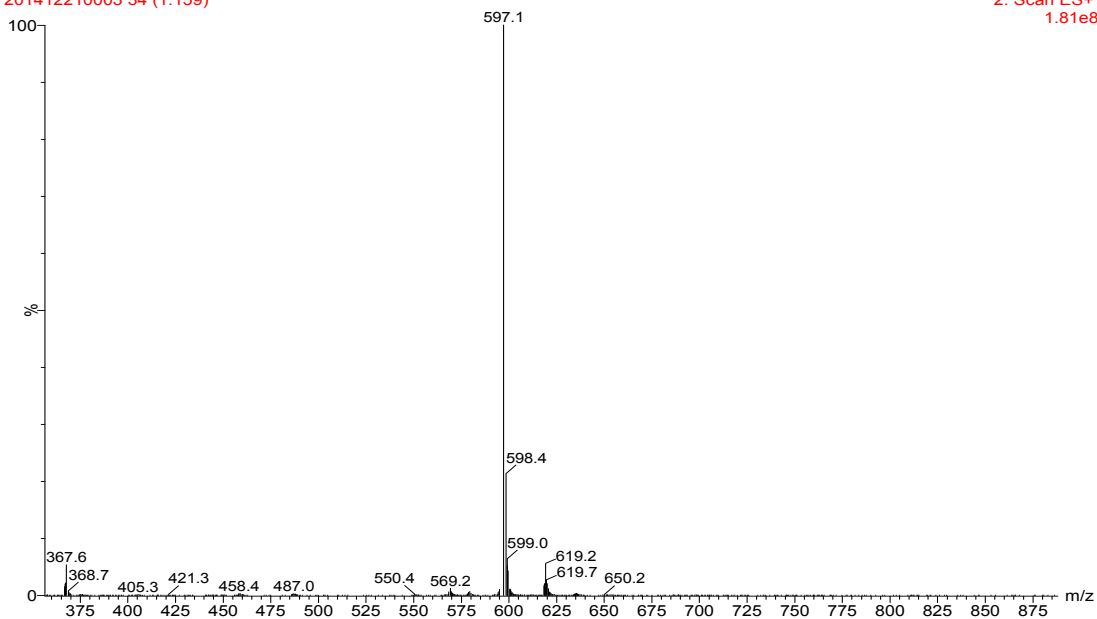
-0.0004



```
NAME          ZTX-7
EXPNO         1
PROCNO        1
Date_         20141106
Time          14.07
INSTRUM       spect
PROBHD        5 mm PABBO 13C
PULPROG       zgpg30
PC            32768
SOLVENT       DMSO
NS            16
DS            1
SWH           7111.539 Hz
FIDRES       0.200079 Hz
AQ           2.2719646 sec
RG            40.5
IW           69.333 usec
TE            300.0 K
D1            1.0000000 sec
TD            1
----- CHANNEL f1 -----
NUC1          1H
P1            13.00 usec
PL1           0.00 dB
PL12         12.3645077 dB
SFO1         300.135134 MHz
SI            32768
SF           300.129991 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0.0
PC            0.0
```

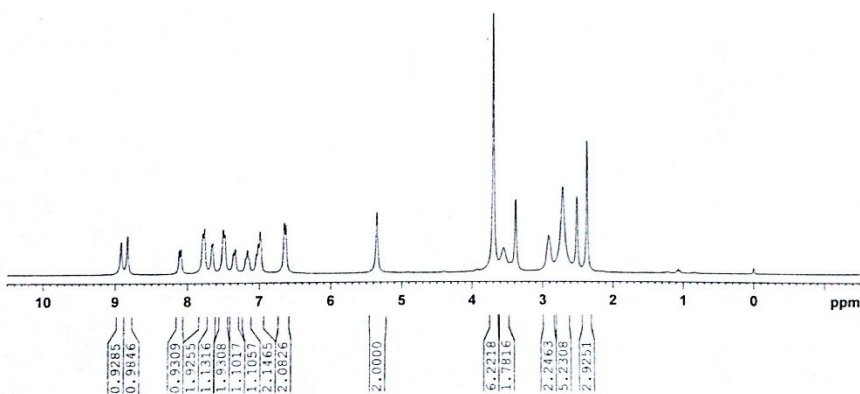
ZTX-721-Dec-2014
201412210003 34 (1.159)

2: Scan ES+
1.81e8



Compound 10

ZTX-10	DMSO	1HNMR	AV300
8.470	3.35	7.40	7.40
8.330	3.35	7.30	7.30
8.230	3.35	7.20	7.20
8.130	3.35	7.10	7.10
8.030	3.35	7.00	7.00
7.930	3.35	6.90	6.90
7.830	3.35	6.80	6.80
7.730	3.35	6.70	6.70
7.630	3.35	6.60	6.60
7.530	3.35	6.50	6.50
7.430	3.35	6.40	6.40
7.330	3.35	6.30	6.30
7.230	3.35	6.20	6.20
7.130	3.35	6.10	6.10
7.030	3.35	6.00	6.00
6.930	3.35	5.90	5.90
6.830	3.35	5.80	5.80
6.730	3.35	5.70	5.70
6.630	3.35	5.60	5.60
6.530	3.35	5.50	5.50
6.430	3.35	5.40	5.40
6.330	3.35	5.30	5.30
6.230	3.35	5.20	5.20
6.130	3.35	5.10	5.10
6.030	3.35	5.00	5.00
5.930	3.35	4.90	4.90
5.830	3.35	4.80	4.80
5.730	3.35	4.70	4.70
5.630	3.35	4.60	4.60
5.530	3.35	4.50	4.50
5.430	3.35	4.40	4.40
5.330	3.35	4.30	4.30
5.230	3.35	4.20	4.20
5.130	3.35	4.10	4.10
5.030	3.35	4.00	4.00
4.930	3.35	3.90	3.90
4.830	3.35	3.80	3.80
4.730	3.35	3.70	3.70
4.630	3.35	3.60	3.60
4.530	3.35	3.50	3.50
4.430	3.35	3.40	3.40
4.330	3.35	3.30	3.30
4.230	3.35	3.20	3.20
4.130	3.35	3.10	3.10
4.030	3.35	3.00	3.00
3.930	3.35	2.90	2.90
3.830	3.35	2.80	2.80
3.730	3.35	2.70	2.70
3.630	3.35	2.60	2.60
3.530	3.35	2.50	2.50
3.430	3.35	2.40	2.40
3.330	3.35	2.30	2.30
3.230	3.35	2.20	2.20
3.130	3.35	2.10	2.10
3.030	3.35	2.00	2.00
2.930	3.35	1.90	1.90
2.830	3.35	1.80	1.80
2.730	3.35	1.70	1.70
2.630	3.35	1.60	1.60
2.530	3.35	1.50	1.50
2.430	3.35	1.40	1.40
2.330	3.35	1.30	1.30
2.230	3.35	1.20	1.20
2.130	3.35	1.10	1.10
2.030	3.35	1.00	1.00
1.930	3.35	0.90	0.90
1.830	3.35	0.80	0.80
1.730	3.35	0.70	0.70
1.630	3.35	0.60	0.60
1.530	3.35	0.50	0.50
1.430	3.35	0.40	0.40
1.330	3.35	0.30	0.30
1.230	3.35	0.20	0.20
1.130	3.35	0.10	0.10
1.030	3.35	0.00	0.00

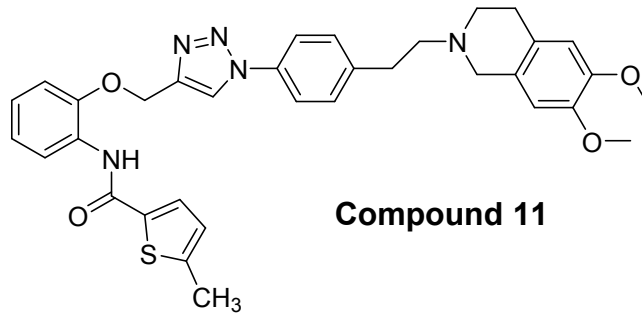
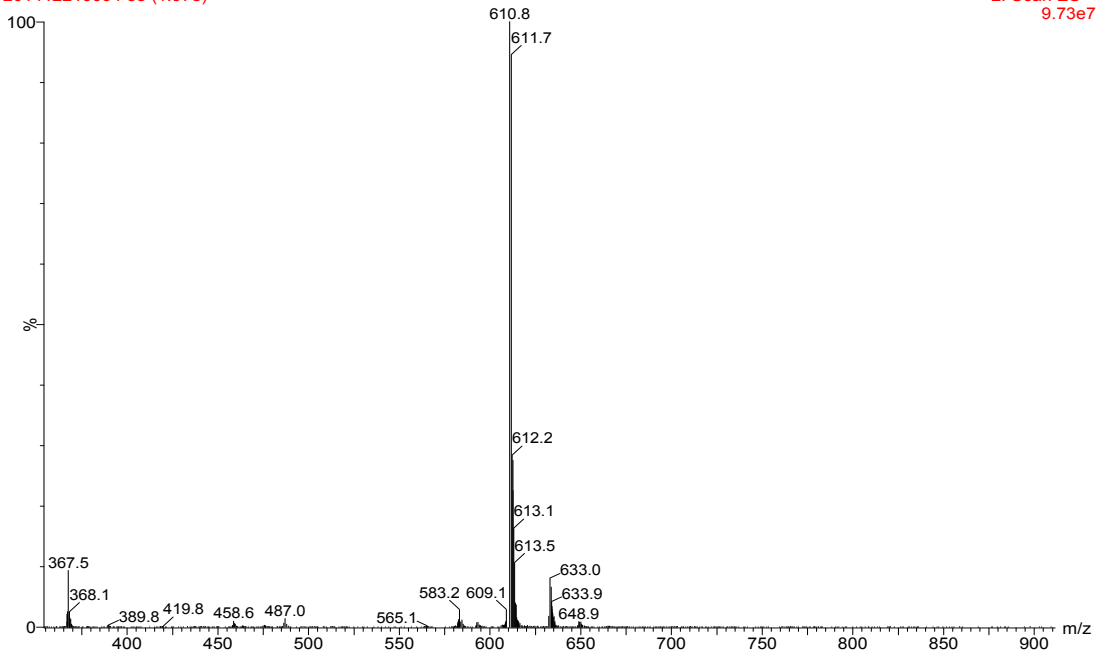


NAME: ZTX-8
EXPNO: 1
PROCNO: 1
Date_: 20141104
Time: 18.42
INSTRUM: spect
PROBHD: 5 mm PABOL 1 H
PULPROG: zgpg30
TD: 65536
SOLVENT: DMSO
NS: 14
DS: 1
SWH: 7011.819 Hz
F2REQ: 600000000 Hz
AQ: 2.2719446 sec
RG: 601
SQ: 64.1933 usec
RG: 1.00 usec
JE: 100.0 K
Q1: 1.00000000 sec
TDR: 1

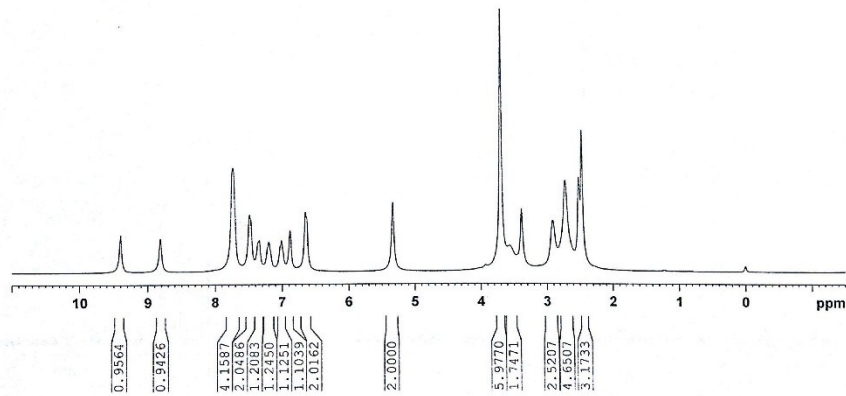
----- CHANNEL f1 -----
NUC1: 1H
P1: 13.00 usec
PL1: 0.00 dB
FREQ1: 12.16450274 MHz
SFO1: 500.1315114 MHz
Z1: 0.700
SF: 500.1315114 MHz
WDW: EM
SSB: 0
LB: 0.30 Hz
GB: 0
PC: 0.90

ZTX-821-Dec-2014
 201412210004 58 (1.978)

2: Scan ES+
 9.73e7



ZTX-11	DMSO	1HNMR	AV300
9.3998	5.3357	3.6983	1.2187
8.8124		3.5655	-0.0004
7.7454		3.3830	
7.4913		2.9053	
7.3447		2.7137	
7.2001		2.5082	
7.0122		2.4597	
6.8831			
6.6537			

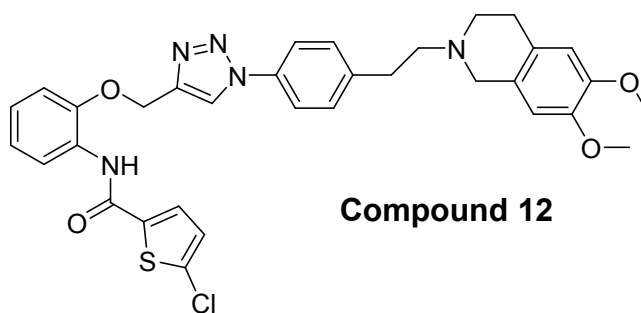
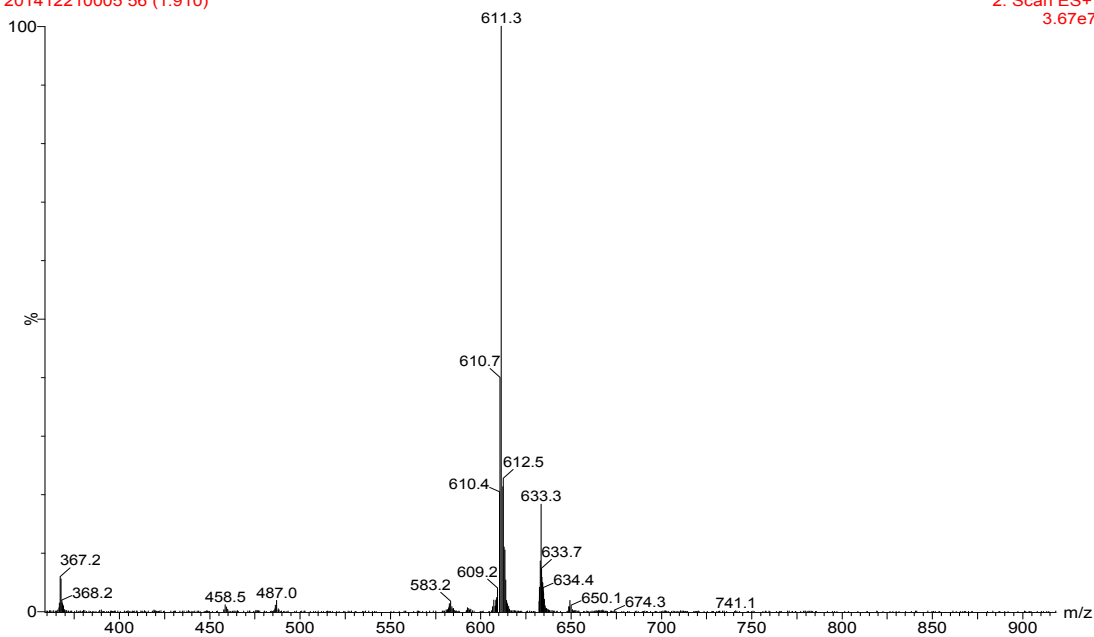


```

NAME          ZTX-9
EXPNO         1
PROCNO        1
Date_         20141106
Time          14.33
INSTRUM       spect
PROBHD        5 mm PABBO-13C
PULPROG       zgpg30
TD            32768
SOLVENT       DMSO
NS            16
DS            4
SWH           7211.529 Hz
FIDRES        0.220076 Hz
AQ            2.2719616 sec
RG            62.6
CW            69.213 usec
DE            7.00 usec
TE            300.2 K
D1            1.00000000 sec
TD0           1
===== CHANNEL f1 =====
NUC1          13C
P1            13.00 usec
PL1          -1.00 dB
PL12         12.3445077 dB
SFO1         100.6281154 MHz
SI           32768
SF           300.1259840 MHz
WDW           EM
SSB           0
LB            0.30 Hz
GB            0
PC            0.50
  
```

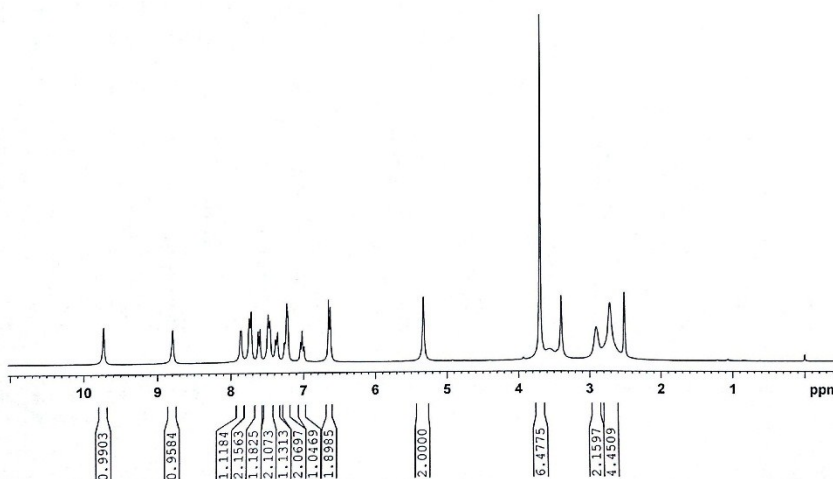
ZTX-921-Dec-2014
 201412210005 56 (1.910)

2: Scan ES+
 3.67e7



ZTX-12 DMSO 1HNMR AV300

9.7332
 8.7969
 7.8684
 7.8532
 7.7487
 7.7222
 7.6012
 7.4909
 7.4656
 7.3882
 7.3618
 7.2637
 7.2336
 7.2201
 7.0454
 7.0204
 6.9957
 6.6544
 6.6302
 5.3281
 4.9204
 3.9354
 3.6982
 3.5607
 3.3968
 2.9030
 2.7132
 2.5039
 1.2128
 1.0903
 1.0668
 1.0410
 -0.0004



```

NAME          ZTX-10
EXPNO         1
PROCNO        1
Date_         20141113
Time          14.56
INSTRUM       spect
PROBHD        5 mm PABUL 13C
PULPROG       zgpg30
TD            32768
SOLVENT       DMSO
NS            16
DS            1
SWH           7011.539 Hz
FIDRES        0.2220079 Hz
AQ            2.2719646 sec
RG            101
DW            49.333 usec
DE            7.00 usec
TE            300.0 K
D1            1.00000000 sec
TDO           1
----- CHANNEL f1 -----
NUC1           1H
P1            13.25 usec
PL1           -1.00 dB
F1            12.36450374 MHz
SFO1          300.131514 MHz
SI            32768
SF            300.1259971 MHz
WDW           EM
SSB           0
GB            0.30 Hz
PC            0.50
  
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201412210006 66 (2.251)

2: Scan ES+
4.78e7

