S1: Supplementary material

Structural elucidation and fragmentation of ACP-105 and tentatively identified metabolites

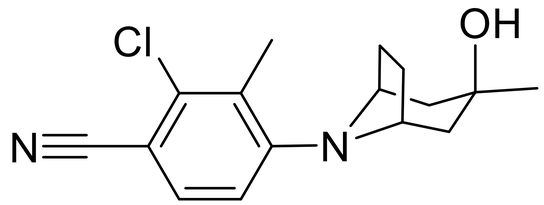
Metabolite	Metabolic transformation	Elemental composition $[M+H]^+$	Theoretical m/z
ACP-105	Administered substance	$C_{16}H_{20}ClN_2O^+$	291.1259
M1a-c	Monohydroxylation	$C_{16}H_{20}ClN_2O_2^+$	307.1208
M2a-b	Dihydroxylation	$C_{16}H_{20}ClN_2O_3^+$	323.1157
M3a-b	Loss of 2H	$C_{16}H_{18}ClN_2O^+$	289.1102
M4a-b	Monohydroxylation + Loss of 2H	$C_{16}H_{18}ClN_2O_2^+$	305.1051
M5a-b	Dihydroxylation + Loss of 2H	$C_{16}H_{18}ClN_2O_3^+$	321.1000
M6a-c	Trihydroxylation + Loss of 2H	$C_{16}H_{18}ClN_2O_4^+$	337.0950
M7	Glucuronidation	$C_{22}H_{28}ClN_2O_7^+$	467.1580
M8a-d	Monohydroxylation + Glucuronidation	$C_{22}H_{28}ClN_2O_8^+$	483.1529
M9a-b	Dihydroxylation + Glucuronidation	$C_{22}H_{28}ClN_2O_9^+$	499.1478

ACP-105

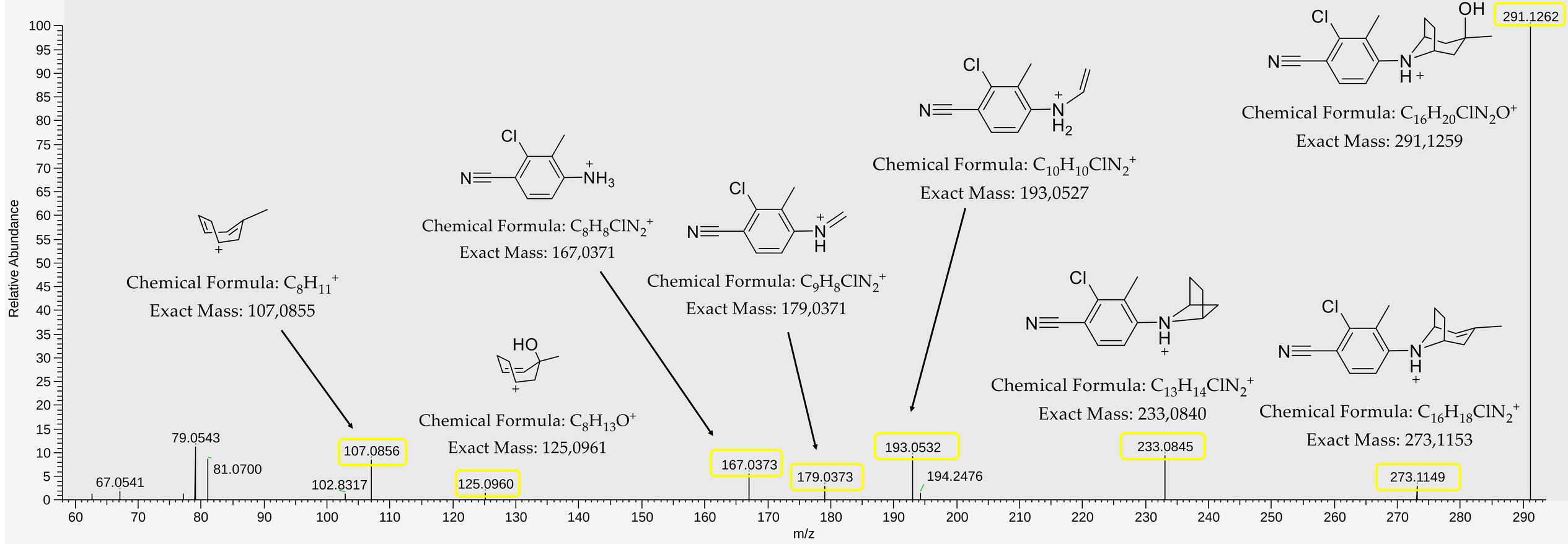
Administrated substance

Retention time: 11.59 min

m/z: 291.1262

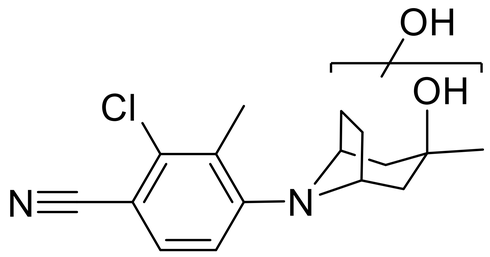


MNB_20200429_03 #4841 RT: 11.62 AV: 1 NL: 2.65E+006
T: FTMS + p ESI d Full ms2 291.1261@hcd35.00 [50.0000-315.0000]



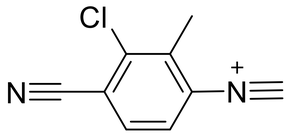
M1a

Monohydroxylation
Retention time: 8.65 min
m/z: 307.1209



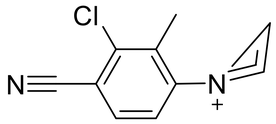
Chemical Formula: $C_8H_{11}^+$

Exact Mass: 107,0855



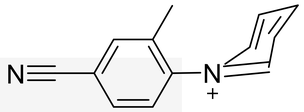
Chemical Formula: $C_9H_6ClN_2^+$

Exact Mass: 177,0214



Chemical Formula: $C_{10}H_6ClN_2^+$

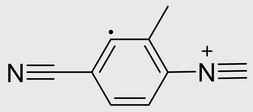
Exact Mass: 189,0214



Chemical Formula: $C_{13}H_{11}N_2^+$

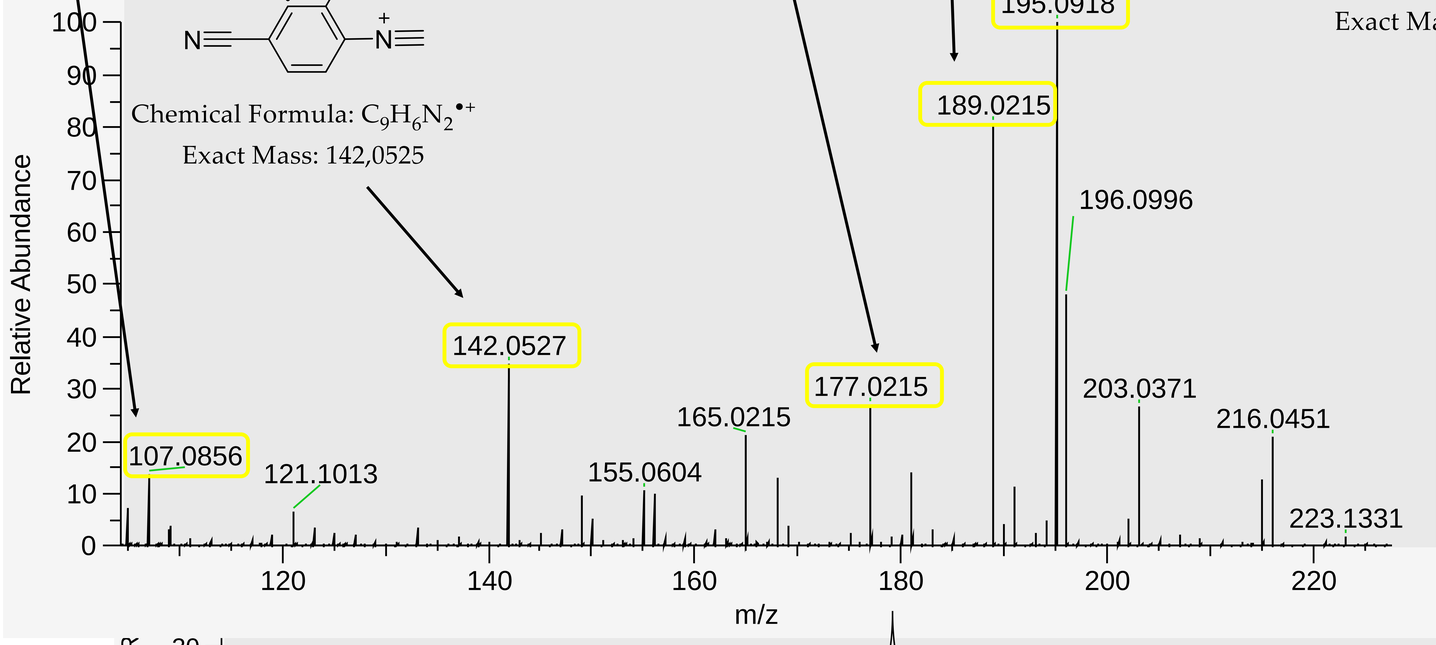
Exact Mass: 195,0917

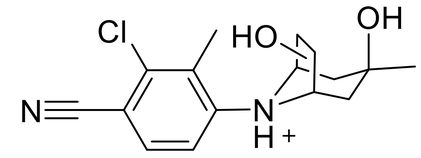
MNB_20200730_014 #1810-1826 RT: 8.62-8.69 AV: 17 SB: 15 8.59-8.62 , 8.69-8.72 NL: 5.20E+005
T: FTMS + p ESI Full ms2 307.1208@hcd38.33 [50.0000-330.0000]



Chemical Formula: $C_9H_6N_2^{\bullet+}$

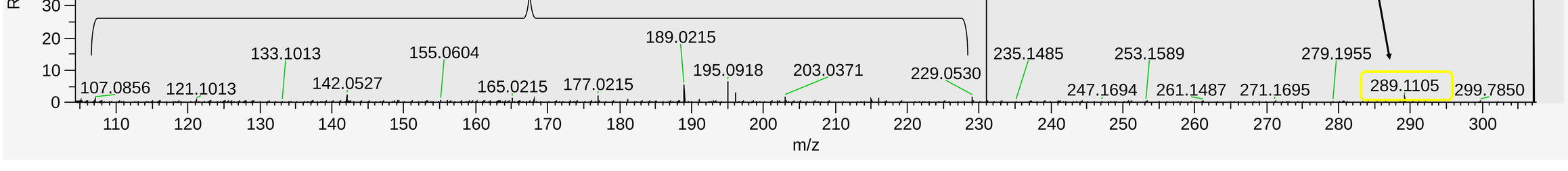
Exact Mass: 142,0525

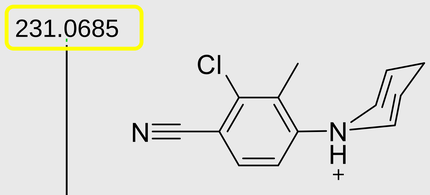




Chemical Formula: $C_{16}H_{20}ClN_2O_2^+$

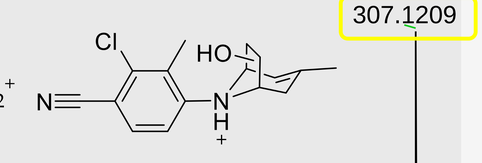
Exact Mass: 307,1208





Chemical Formula: $C_{13}H_{12}ClN_2^+$

Exact Mass: 231,0684

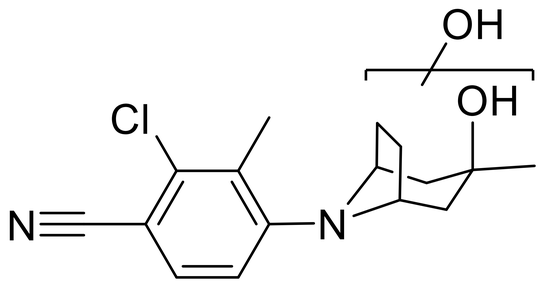


Chemical Formula: $C_{16}H_{18}ClN_2O^+$

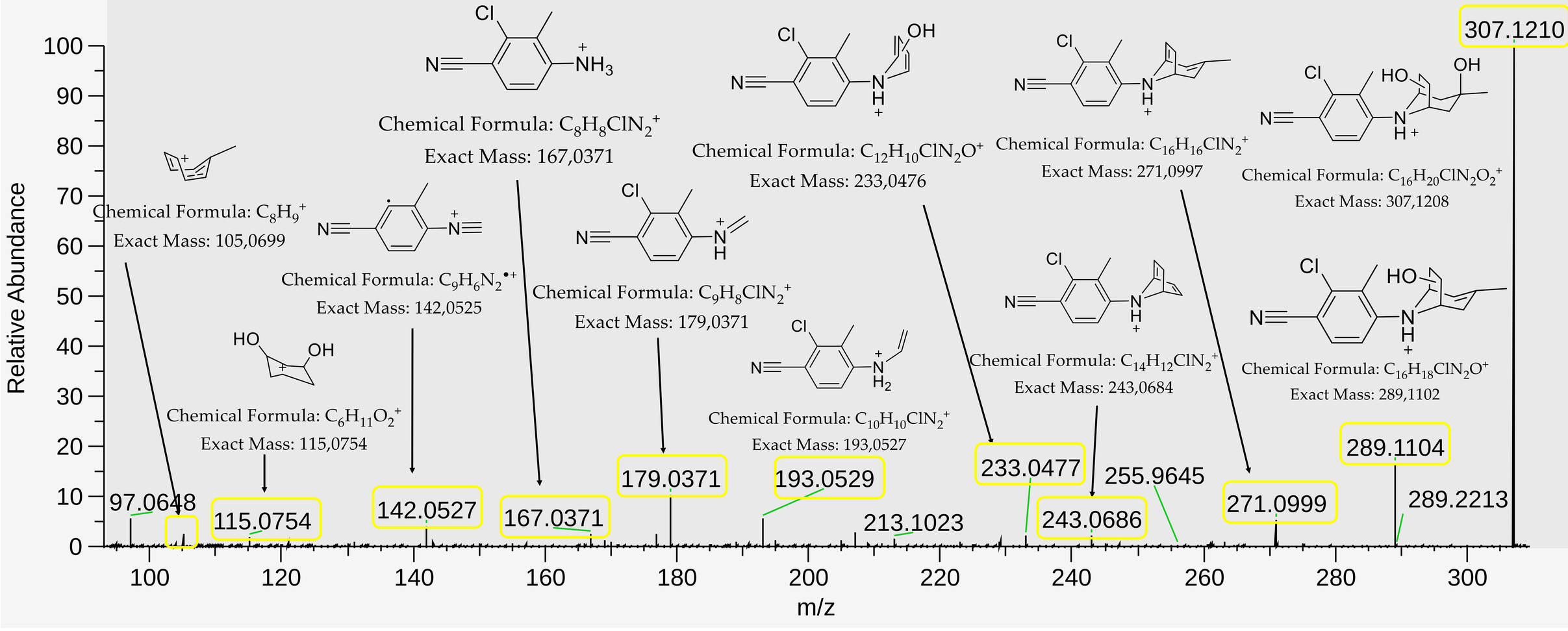
Exact Mass: 289,1102

M1b

Monohydroxylation
Retention time: 9.00 min
m/z: 307.1210

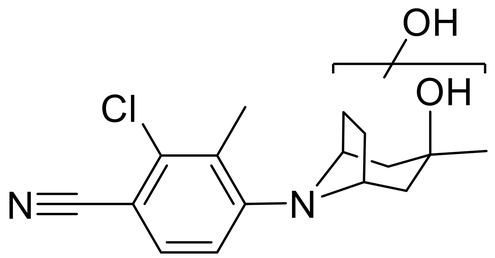


MNB_20200730_014 #1894-1908 RT: 9-9.06 AV: 15 SB: 26 8.93-9.00 , 9.06-9.10 NL: 3.51E+005
T: FTMS + p ESI Full ms2 307.1208@hcd38.33 [50.0000-330.0000]



M1c

Monohydroxylation
Retention time: 9.14 min
m/z: 307.1209



MNB_20200730_014 #1921-1937 RT: 9.12-9.19 AV: 17 SB: 24 9.07-9.12 , 9.19-9.24 NL: 8.09E+005
T: FTMS + p ESI Full ms2 307.1208@hcd38.33 [50.0000-330.0000]

Relative Abundance

m/z

105.0700
Chemical Formula: $C_8H_9^+$
Exact Mass: 105,0699

167.0372
Chemical Formula: $C_8H_8ClN_2^+$
Exact Mass: 167,0371

193.0529
Chemical Formula: $C_9H_8ClN_2^+$
Exact Mass: 179,0371

Chemical Formula: $C_{10}H_{10}ClN_2^+$
Exact Mass: 193,0527

307.1209
Chemical Formula: $C_{16}H_{20}ClN_2O_2^+$
Exact Mass: 307,1208

Chemical Formula: $C_9H_6N_2^{\bullet+}$
Exact Mass: 142,0525

Chemical Formula: $C_8H_{11}O^+$
Exact Mass: 123,0804

179.0371
Chemical Formula: $C_{13}H_{14}ClN_2^+$
Exact Mass: 233,0840

Chemical Formula: $C_{14}H_{12}ClN_2^+$
Exact Mass: 243,0684

233.0842
Chemical Formula: $C_{11}H_{10}ClN_2^+$
Exact Mass: 205,0527

Chemical Formula: $C_{16}H_{18}ClN_2O^+$
Exact Mass: 289,1102

289.1104
Chemical Formula: $C_{16}H_{16}ClN_2^+$
Exact Mass: 271,0997

271.0999

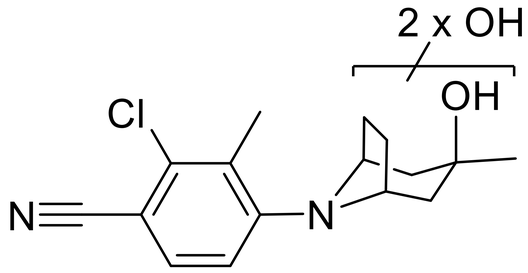
142.0527
123.0805
177.0215
205.0529
143.0605
203.0372
229.0529
115.0754
131.0605
189.0214
156.0682
217.0528
243.0685
266.1834
255.0687
284.1250

M2a

Dihydroxylation

Retention time: 7.03 min

m/z: 323.1159



MNB_20200730_013 #1449-1465 RT: 7.01-7.08 AV: 17 SB: 24 6.96-7.01 , 7.08-7.13 NL: 1.18E+006
T: FTMS + p ESI Full ms2 323.1157@hcd38.33 [50.0000-345.0000]

Relative Abundance

m/z

Chemical Formula: $C_{10}H_6ClN_2^+$
Exact Mass: 189,0214

Chemical Formula: $C_8H_6ClN_2^+$
Exact Mass: 165,0214

Chemical Formula: $C_{13}H_{11}N_2^+$
Exact Mass: 195,0917

Chemical Formula: $C_9H_6ClN_2^+$
Exact Mass: 177,0214

Chemical Formula: $C_9H_6N_2^{\bullet+}$
Exact Mass: 142,0525

Chemical Formula: $C_{11}H_8ClN_2^+$
Exact Mass: 203,0371

Chemical Formula: $C_{13}H_{12}ClN_2^+$
Exact Mass: 231,0684

Chemical Formula: $C_{16}H_{20}ClN_2O_3^+$
Exact Mass: 323,1157

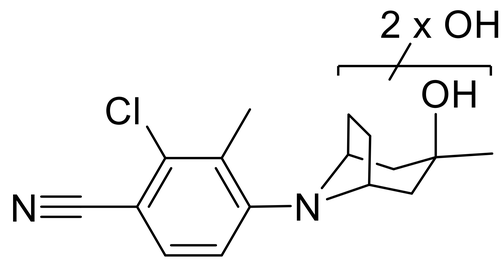
Chemical Formula: $C_{16}H_{16}ClN_2O^+$
Exact Mass: 287,0946

Chemical Formula: $C_{16}H_{18}ClN_2O_2^+$
Exact Mass: 305,1051

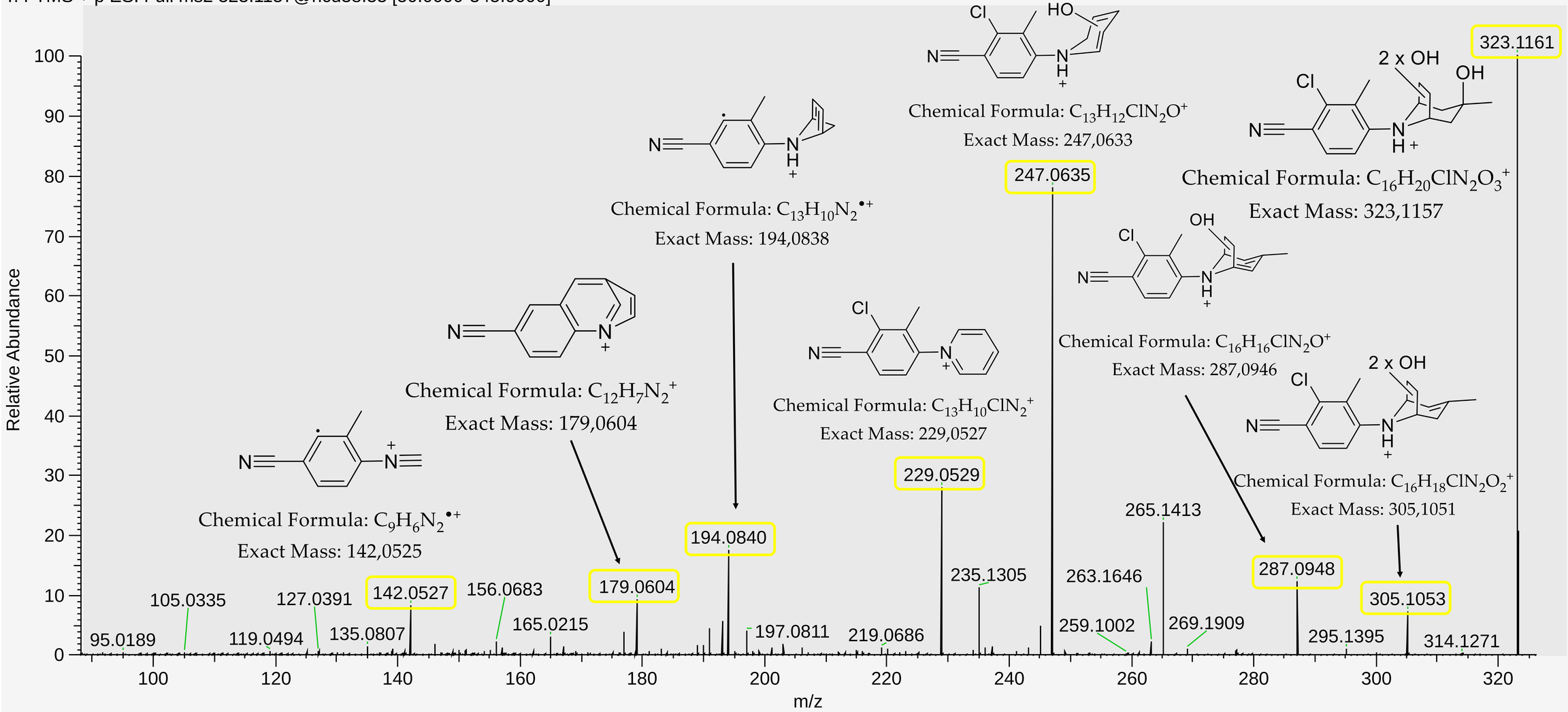
115.0754
108.0808
126.0915
142.0527
147.0805
165.0215
168.0683
177.0215
189.0215
195.0918
203.0371
216.0451
231.0685
231.1377
245.1541
259.1304
269.0842
287.0951
305.1053
323.1159

M2b

Dihydroxylation
Retention time: 7.63 min
m/z: 323.1161



MNB_20200730_013 #1583-1595 RT: 7.61-7.66 AV: 13 SB: 14 7.58-7.61 , 7.66-7.69 NL: 2.28E+005
T: FTMS + p ESI Full ms2 323.1157@hcd38.33 [50.0000-345.0000]

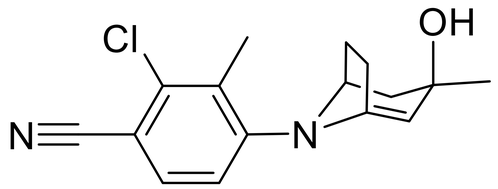


M3a

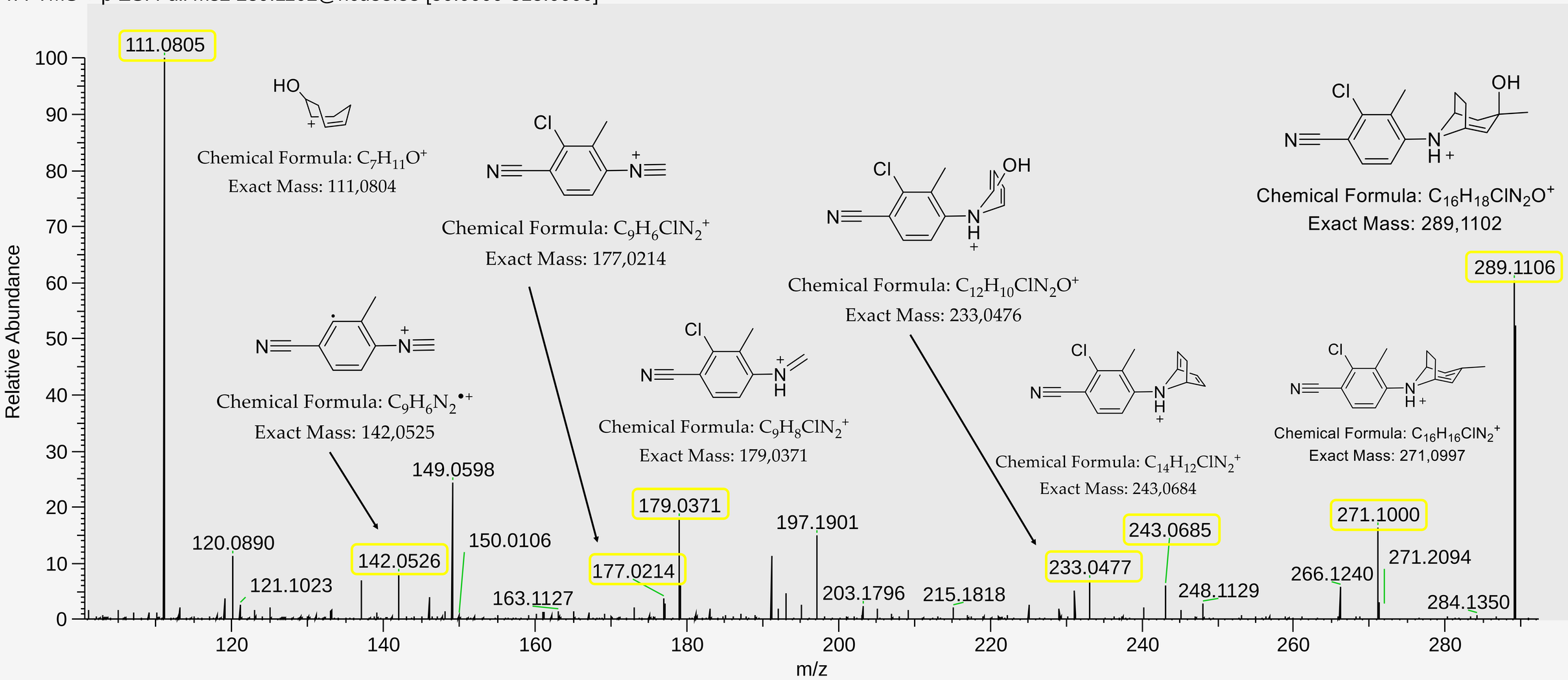
Loss of 2H

Retention time: 10.11 min

m/z: 289.1106

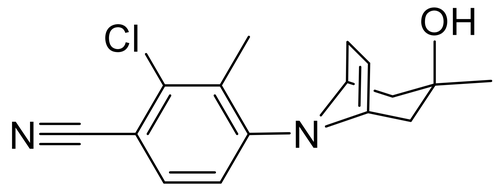


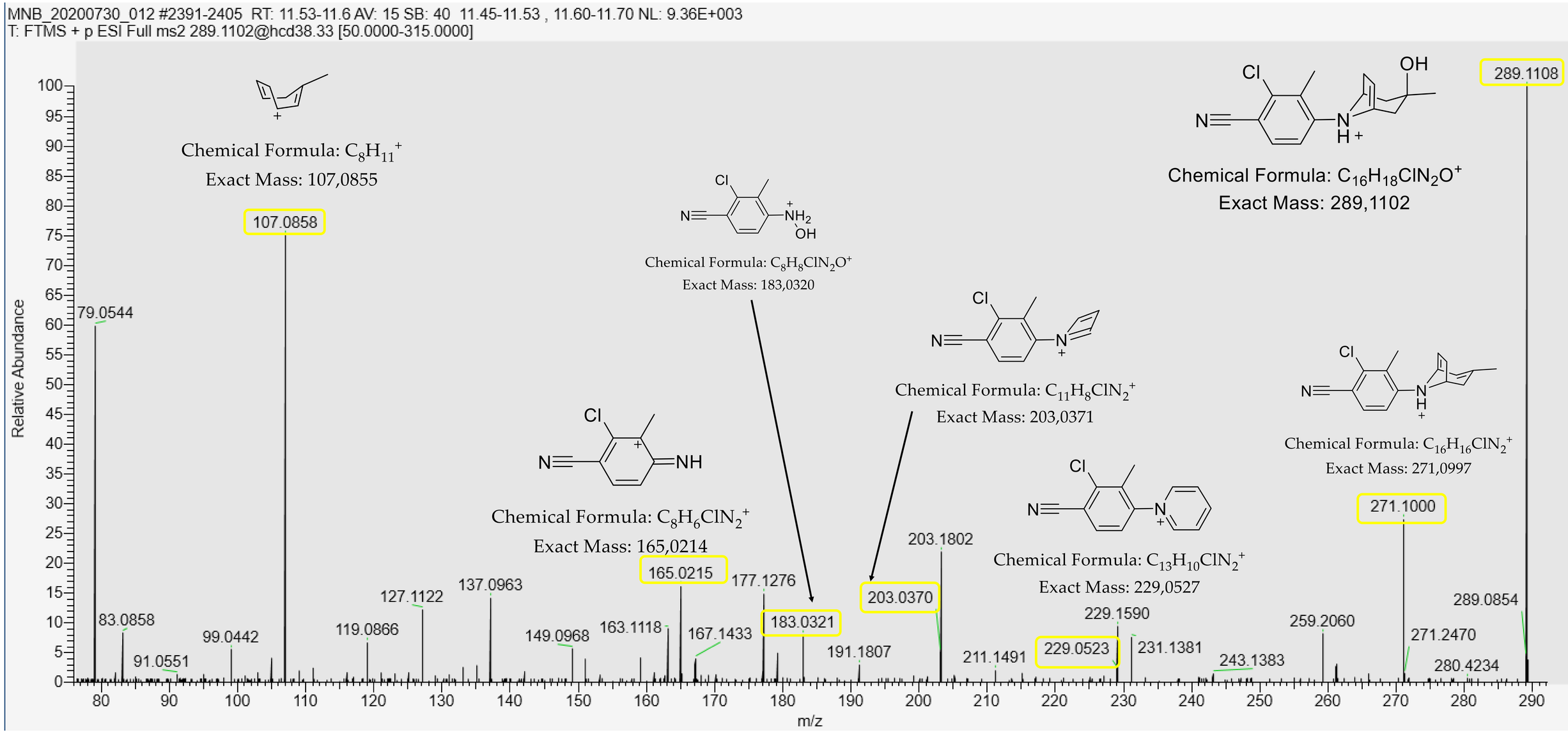
MNB_20200730_012 #2097-2108 RT: 10.11-10.16 AV: 12 SB: 74 9.90-10.11 , 10.16-10.30 NL: 3.57E+004
T: FTMS + p ESI Full ms2 289.1102@hcd38.33 [50.0000-315.0000]



M3b

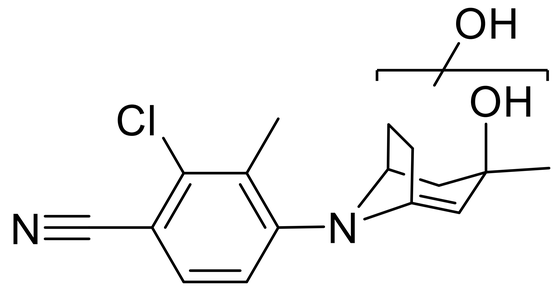
Loss of 2H
Retention time: 11.56 min
m/z: 289.1108



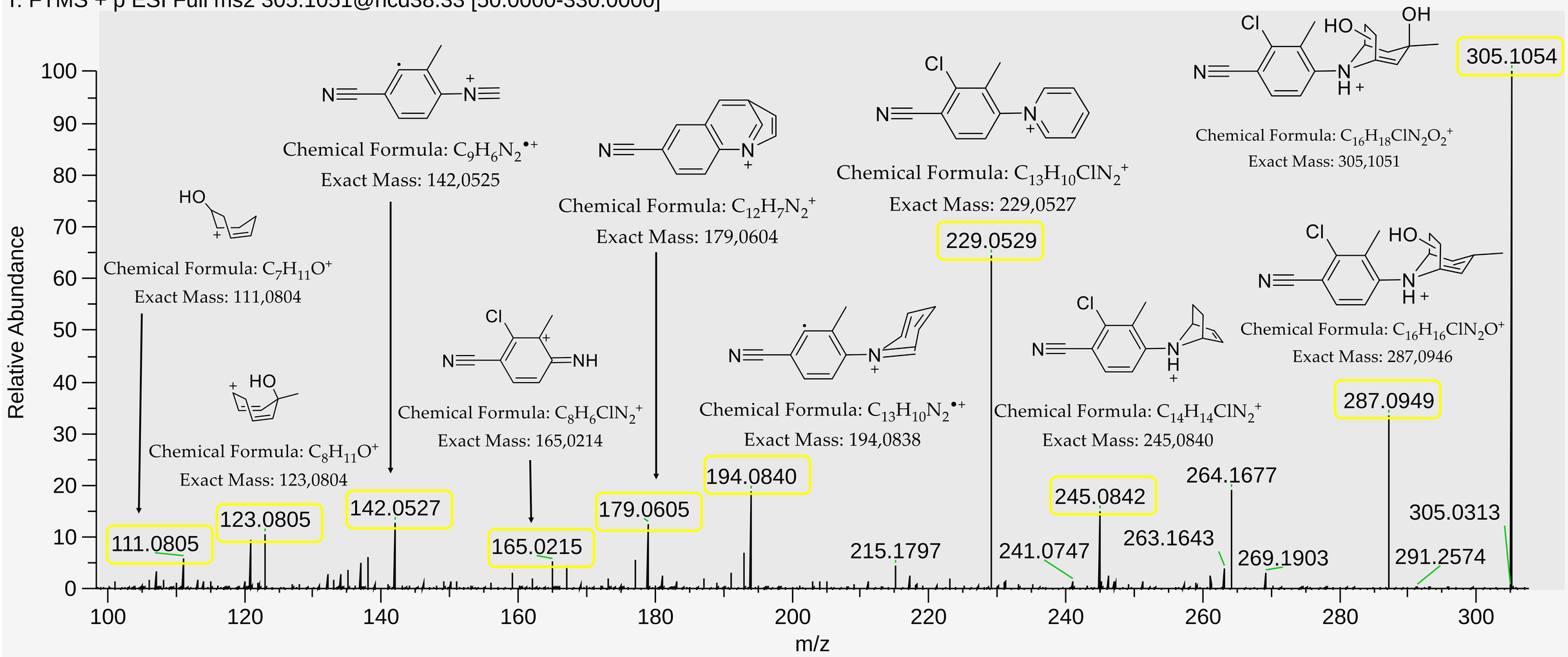


M4a

Monohydroxylation + loss of 2H
Retention time: 8.88 min
m/z: 305.1054

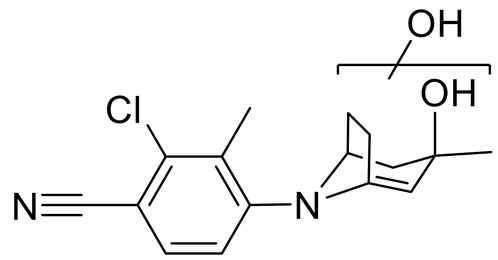


MNB_20200730_009 #1855-1871 RT: 8.86-8.93 AV: 17 SB: 28 8.80-8.86 , 8.93-8.99 NL: 9.49E+004
T: FTMS + p ESI Full ms2 305.1051@hcd38.33 [50.0000-330.0000]

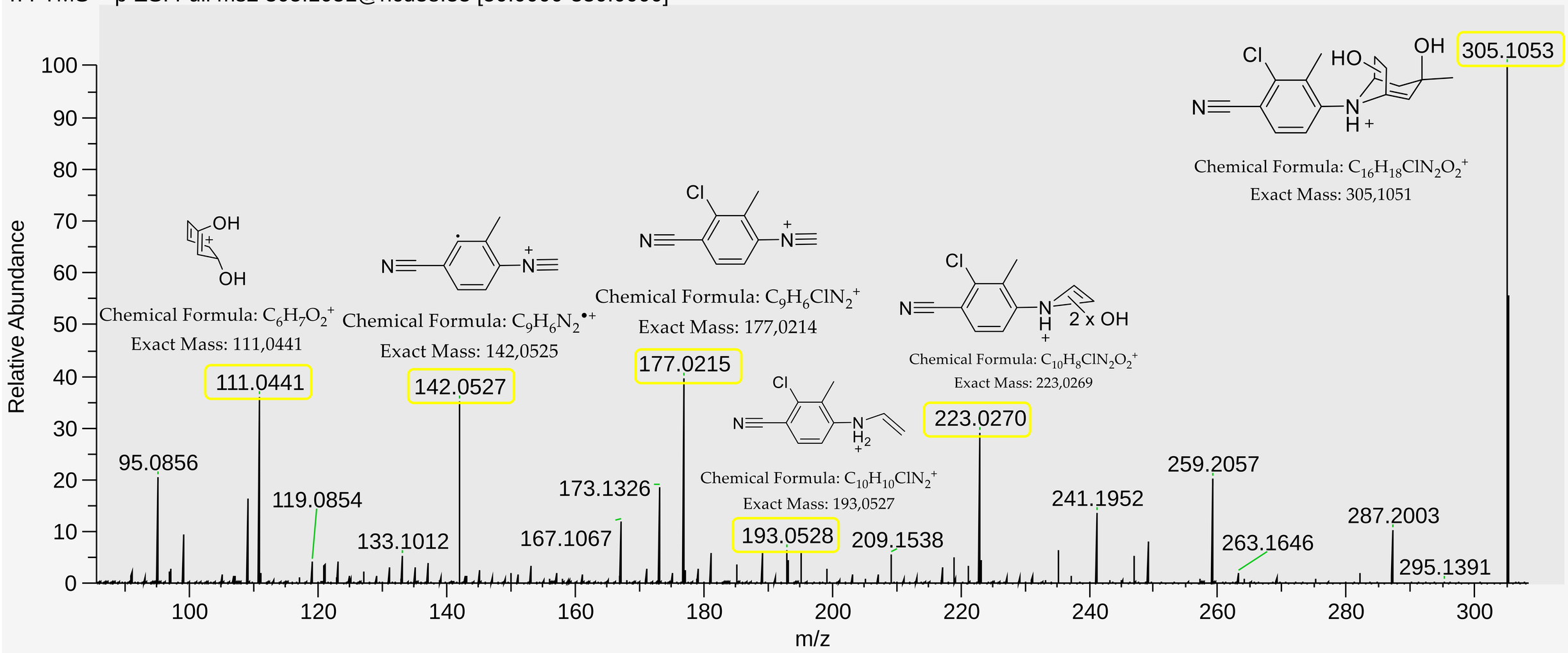


M4b

Monohydroxylation + loss of 2H
Retention time: 9.83 min
m/z: 305.1053

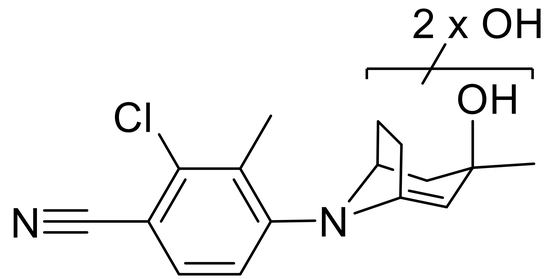


MNB_20200730_009 #2067-2080 RT: 9.82-9.88 AV: 14 SB: 28 9.75-9.82 , 9.88-9.93 NL: 1.65E+005
T: FTMS + p ESI Full ms2 305.1051@hcd38.33 [50.0000-330.0000]



M5a

Dihydroxylation + loss of 2H
Retention time: 9.17 min
m/z: 321.1005



MNB_20200730_011 #1922-1933 RT: 9.15-9.2 AV: 12 SB: 78 9.00-9.15 , 9.20-9.39 NL: 1.61E+005
T: FTMS + p ESI Full ms2 321.1000@hcd38.33 [50.0000-345.0000]

Chemical Formula: $C_9H_8ClN_2^+$
Exact Mass: 179,0371

Chemical Formula: $C_{13}H_{10}ClN_2^+$
Exact Mass: 229,0527

Chemical Formula: $C_{16}H_{14}ClN_2O^+$
Exact Mass: 285,0789

Chemical Formula: $C_{16}H_{18}ClN_2O_3^+$
Exact Mass: 321,1000

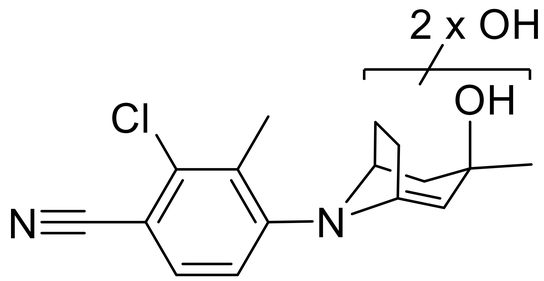
Chemical Formula: $C_{16}H_{16}ClN_2O_2^+$
Exact Mass: 303,0895

Relative Abundance

m/z

M5b

Dihydroxylation + loss of 2H
Retention time: 9.57 min
m/z: 321.1003



MNB_20200730_011 #2010-2030 RT: 9.54-9.63 AV: 21 SB: 34 9.47-9.54 , 9.63-9.70 NL: 1.27E+006
T: FTMS + p ESI Full ms2 321.1000@hcd38.33 [50.0000-345.0000]

Chemical Formula: $C_9H_6ClN_2^+$
Exact Mass: 177,0214

Chemical Formula: $C_{13}H_{10}ClN_2^+$
Exact Mass: 229,0527

Chemical Formula: $C_{16}H_{18}ClN_2O_3^+$
Exact Mass: 321,1000

Chemical Formula: $C_{10}H_{10}ClN_2^+$
Exact Mass: 193,0527

Chemical Formula: $C_{15}H_{14}ClN_2^+$
Exact Mass: 257,0840

Chemical Formula: $C_{16}H_{14}ClN_2O^+$
Exact Mass: 285,0789

Chemical Formula: $C_9H_6N_2^{\bullet+}$
Exact Mass: 142,0525

Chemical Formula: $C_8H_8ClN_2^+$
Exact Mass: 167,0371

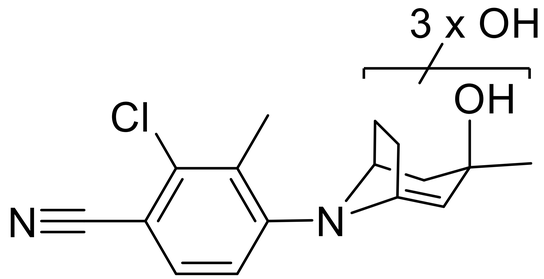
Chemical Formula: $C_{12}H_{10}ClN_2^+$
Exact Mass: 217,0527

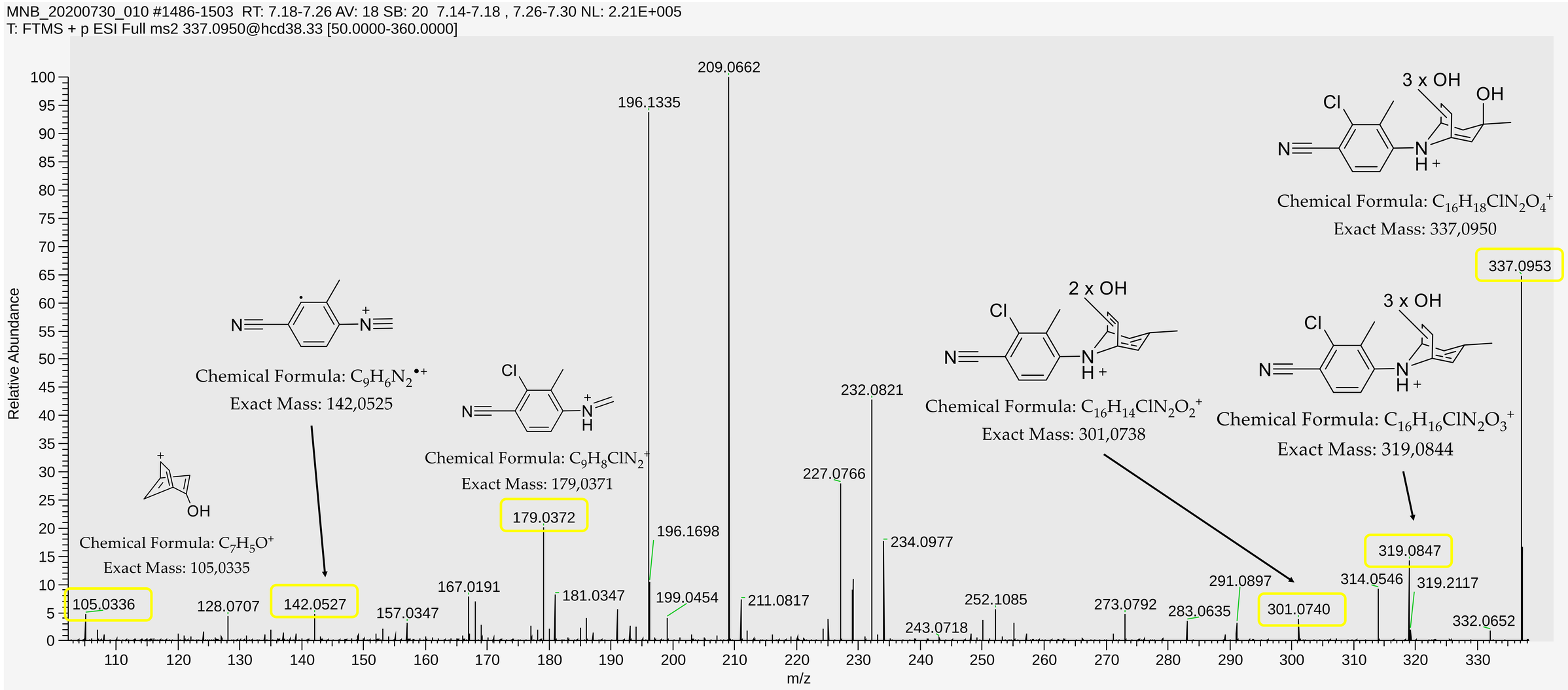
Chemical Formula: $C_{15}H_{16}ClN_2O^+$
Exact Mass: 275,0946

Chemical Formula: $C_{16}H_{16}ClN_2O_2^+$
Exact Mass: 303,0895

M6a

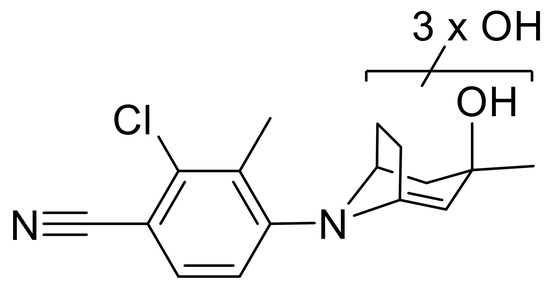
Trihydroxylation + loss of 2H
Retention time: 7.21 min
m/z: 337.0953



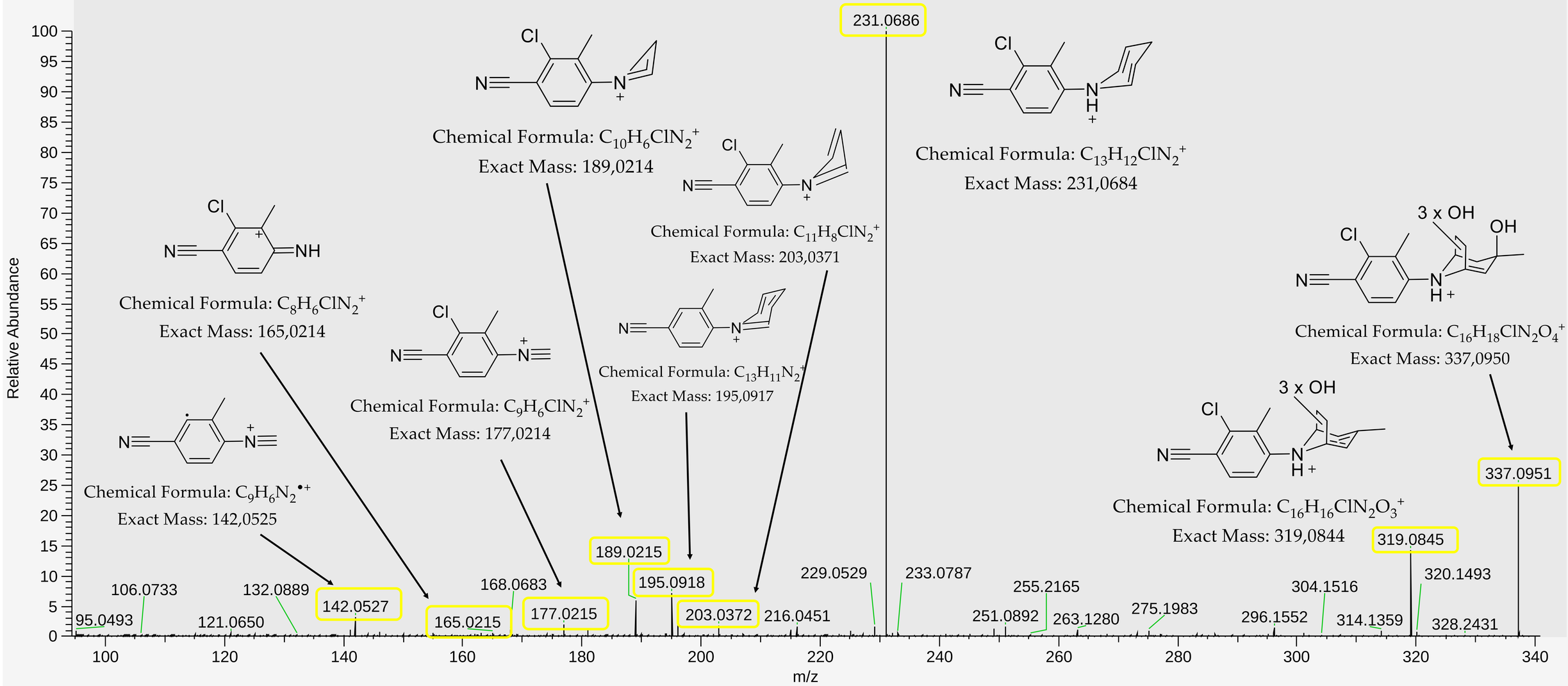


M6b

Trihydroxylation + loss of 2H
Retention time: 7.47 min
m/z: 337.0951

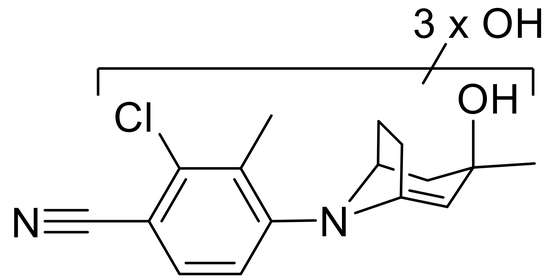


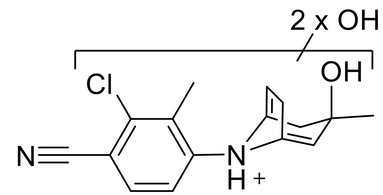
MNB_20200730_010 #1548-1562 RT: 7.46-7.52 AV: 15 SB: 17 7.42-7.45 , 7.52-7.56 NL: 8.85E+005
T: FTMS + p ESI Full ms2 337.0950@hcd38.33 [50.0000-360.0000]



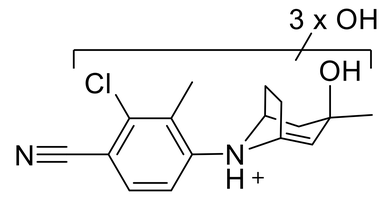
M6c

Trihydroxylation + loss of 2H
Retention time: 9.04 min
m/z: 337.0955

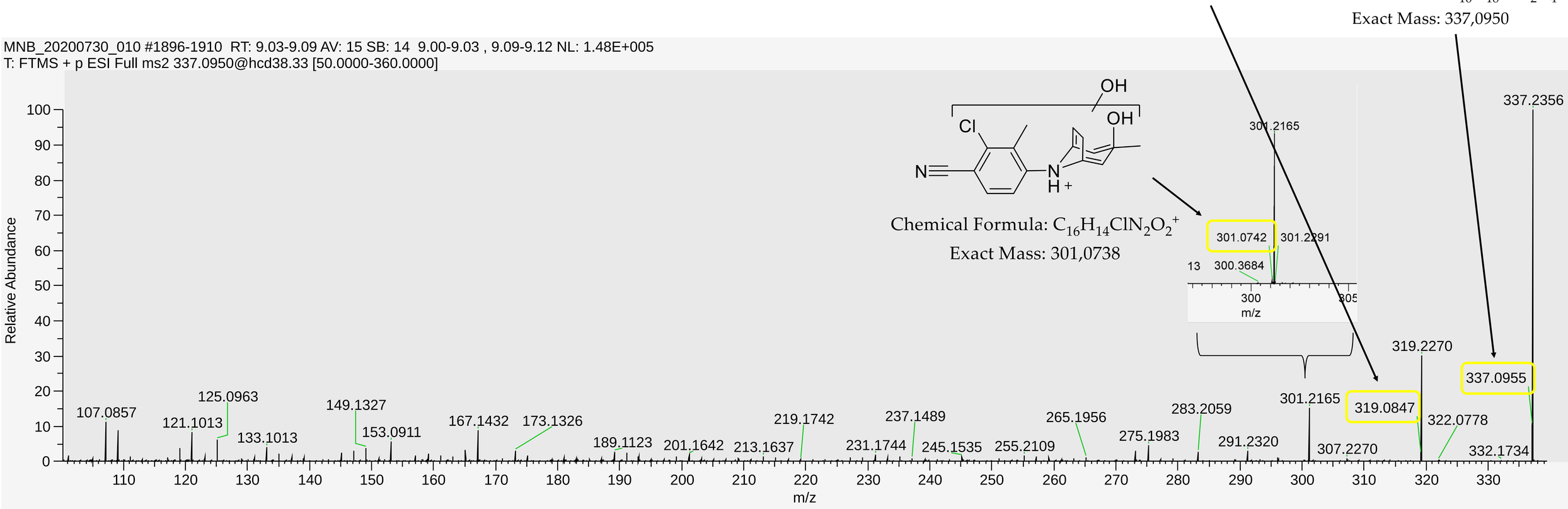




Chemical Formula: $C_{16}H_{16}ClN_2O_3^+$
Exact Mass: 319,0844

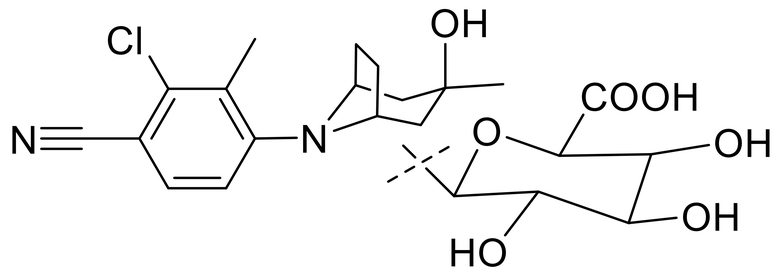


Chemical Formula: $C_{16}H_{18}ClN_2O_4^+$
Exact Mass: 337,0950

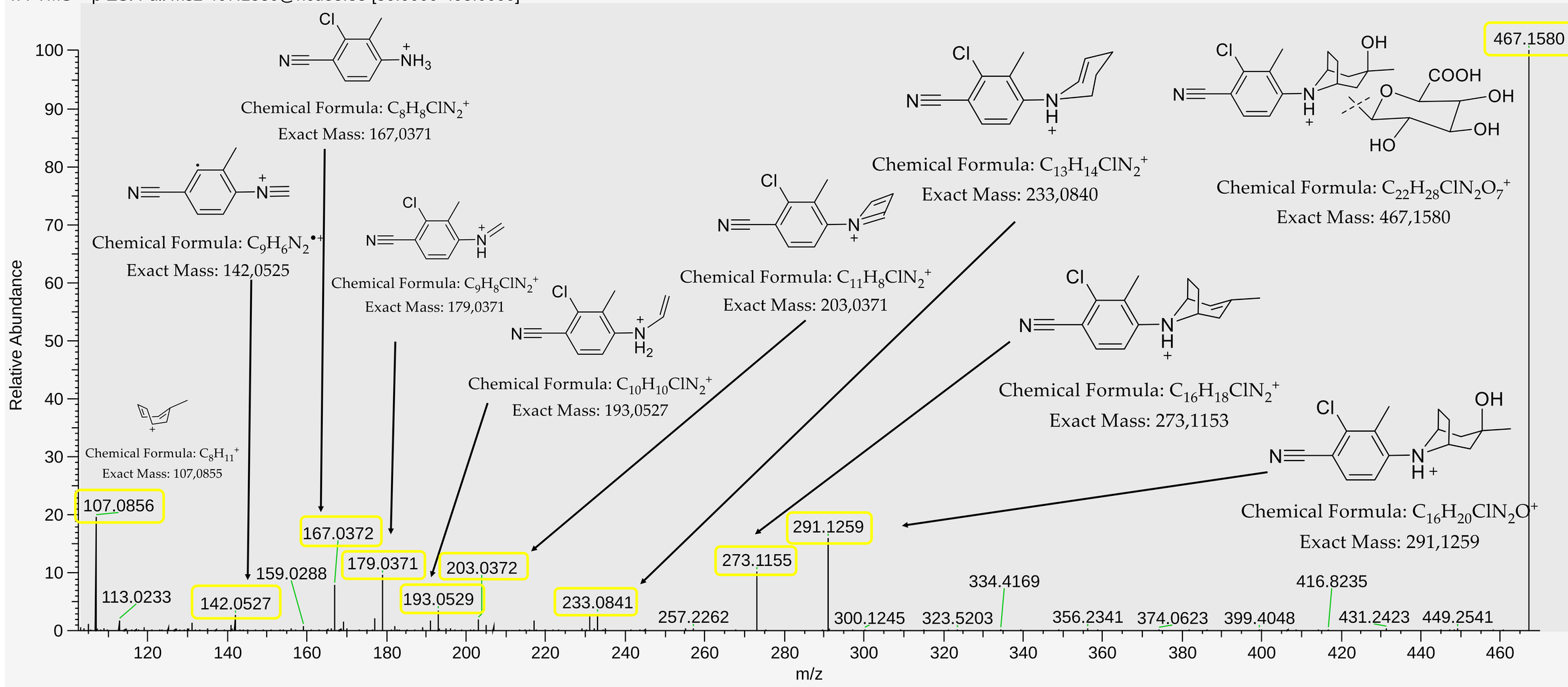


M7

Glucuronidation
Retention time: 8.95 min
m/z: 467.1580



MNB_20200429_05 #1704-1713 RT: 8.93-8.99 AV: 4 SB: 7 8.88-8.93 , 8.99-9.03 NL: 2.73E+005
T: FTMS + p ESI Full ms2 467.1580@hcd38.33 [50.0000-495.0000]

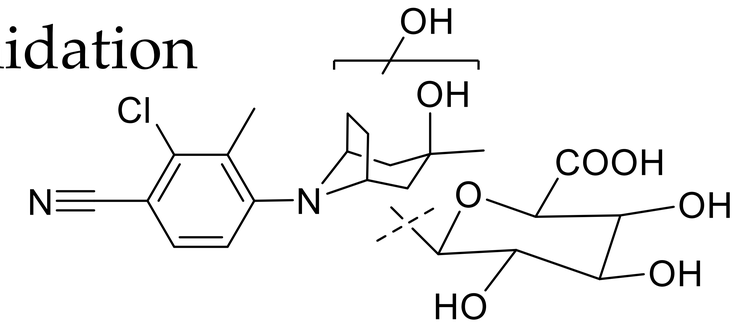


M8a

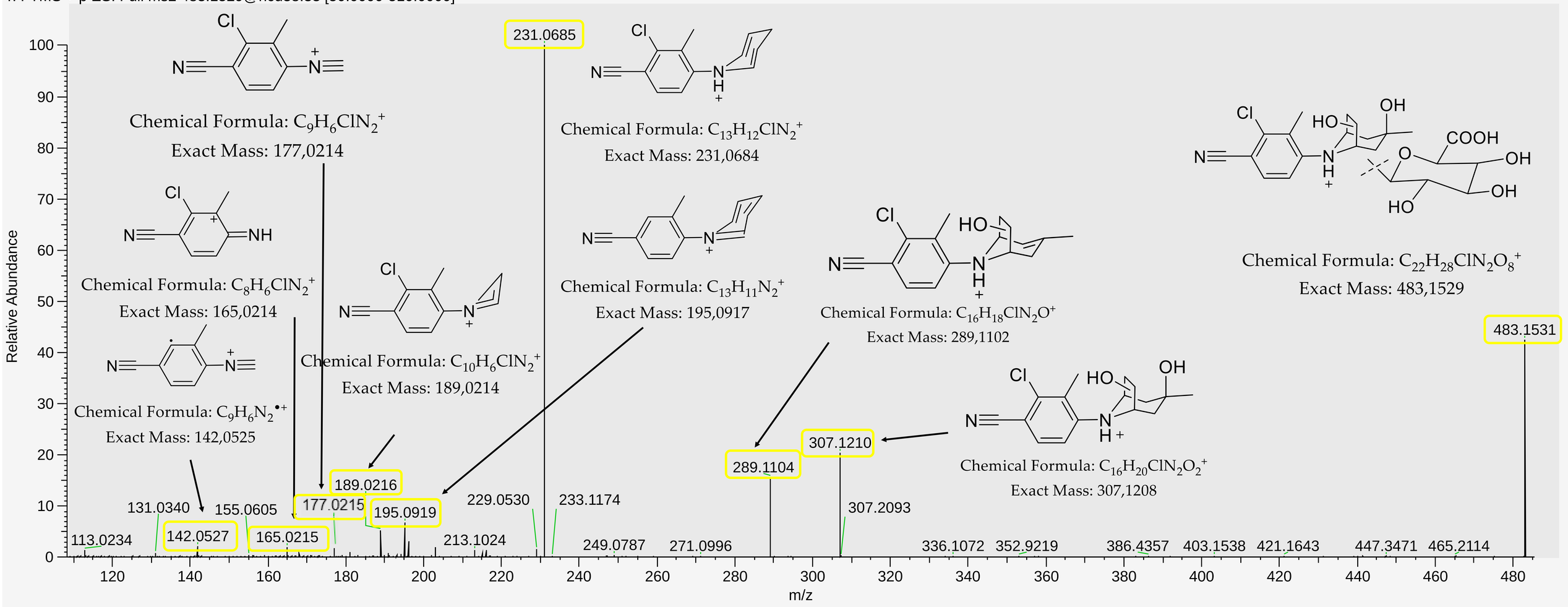
Monohydroxylation + glucuronidation

Retention time: 7.13 min

m/z: 483.1531

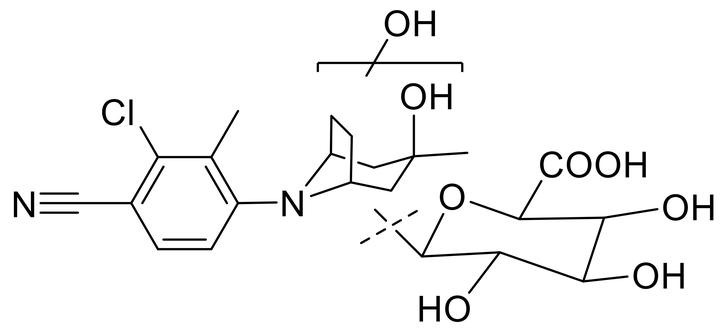


MNB_20200429_05 #1408-1421 RT: 7.1-7.18 AV: 3 SB: 5 7.03-7.10 , 7.18-7.22 NL: 7.53E+006
T: FTMS + p ESI Full ms2 483.1529@hcd38.33 [50.0000-510.0000]



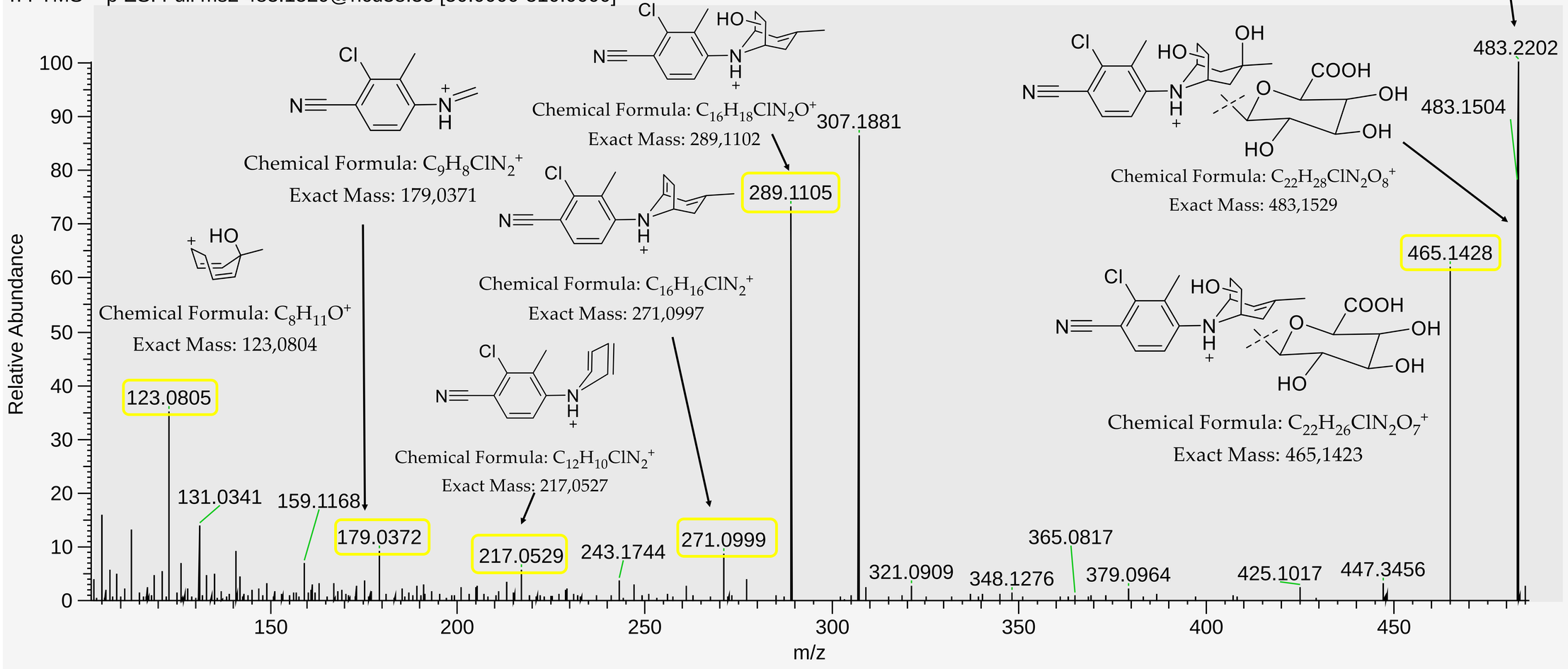
M8b

Monohydroxylation + glucuronidation
Retention time: 7.61 min
m/z: 483.1527



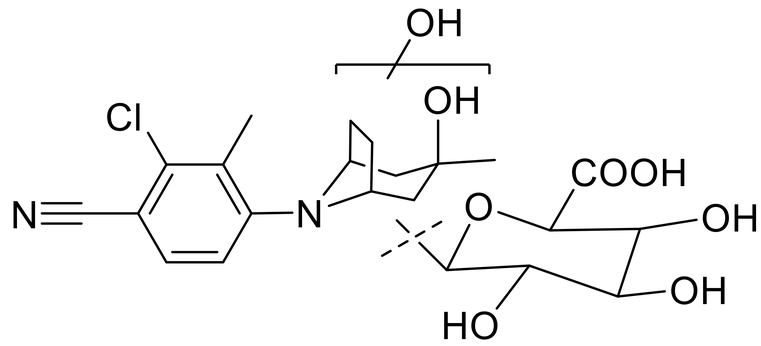
Very low intensity of remaining m/z 483.1527 and co-eluting with other ions and thereby not visible in spectrum

MNB_20200429_05 #1487-1494 RT: 7.6-7.64 AV: 2 SB: 5 7.53-7.60 , 7.64-7.69 NL: 8.46E+004
T: FTMS + p ESI Full ms2 483.1529@hcd38.33 [50.0000-510.0000]



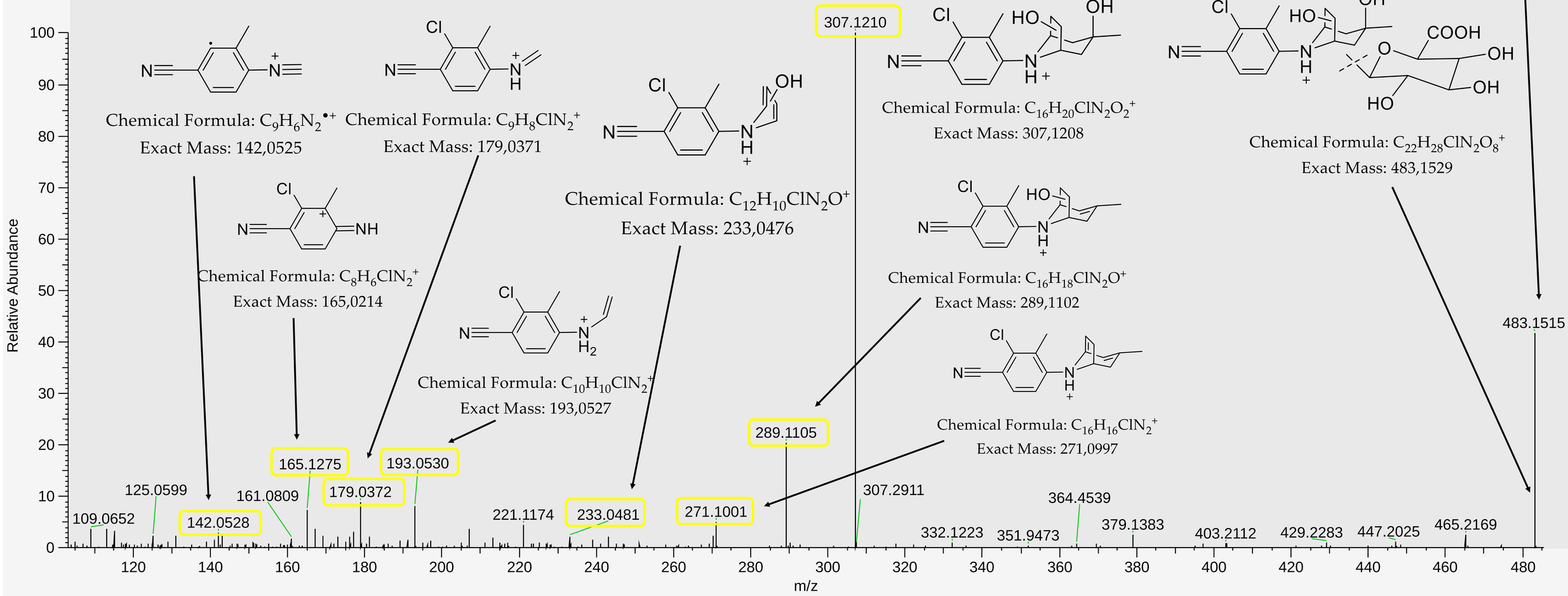
M8c

Monohydroxylation + glucuronidation
Retention time: 7.85 min
m/z: 483.1524



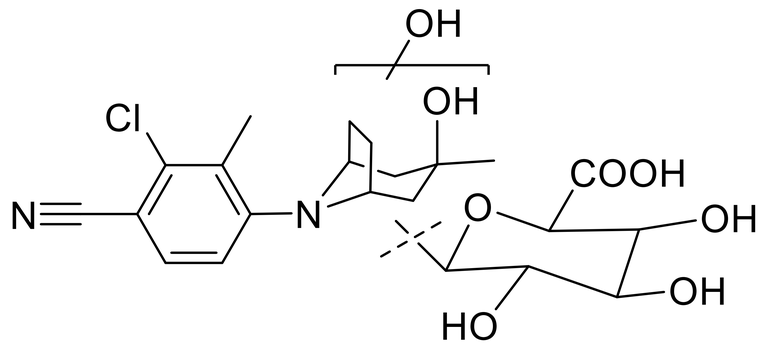
Very low intensity of remaining m/z 483.1524 and co-eluting with other ions and thereby not visible in spectrum

MNB_20200429_05 #1523-1533 RT: 7.82-7.88 AV: 3 SB: 5 7.76-7.82 , 7.88-7.93 NL: 7.59E+004
T: FTMS + p ESI Full ms2 483.1529@hcd38.33 [50.0000-510.0000]

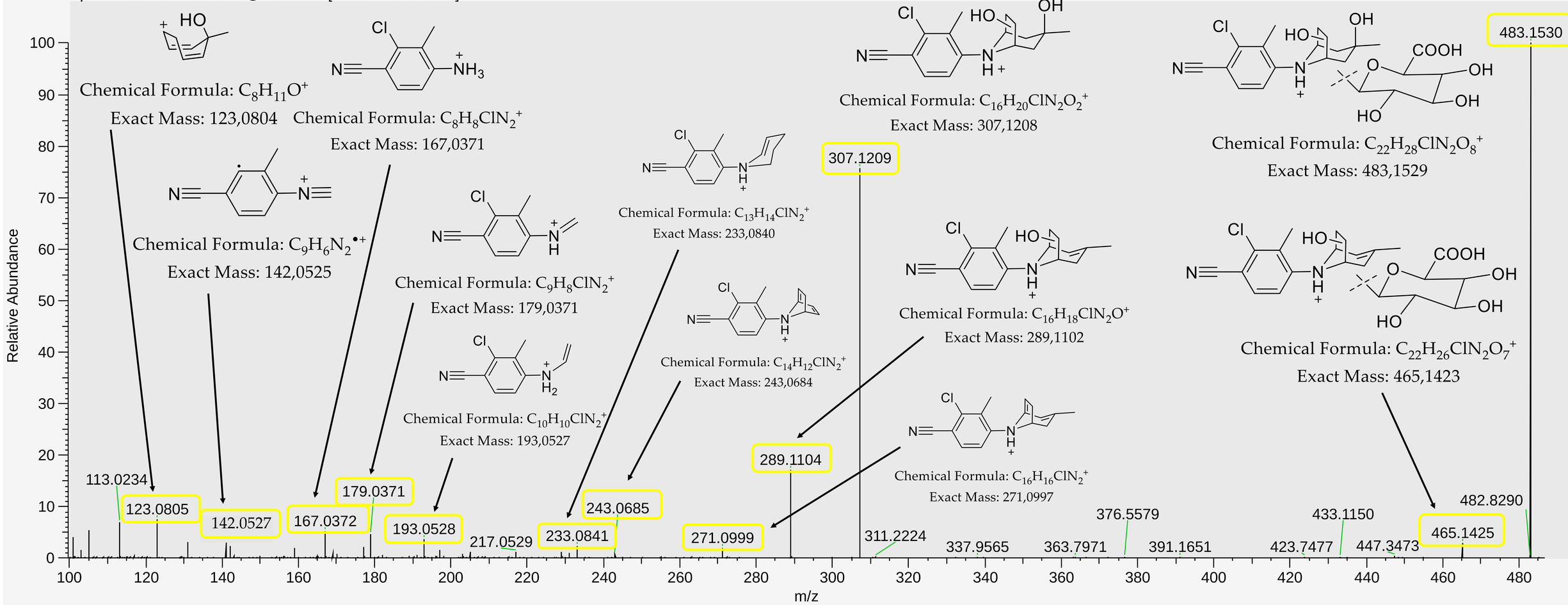


M8d

Monohydroxylation + glucuronidation
Retention time: 8.00 min
m/z: 483.1530



MNB_20200429_05 #1546-1557 RT: 7.96-8.03 AV: 4 SB: 7 7.90-7.96 , 8.03-8.10 NL: 1.02E+007
T: FTMS + p ESI Full ms2 483.1529@hcd38.33 [50.0000-510.0000]

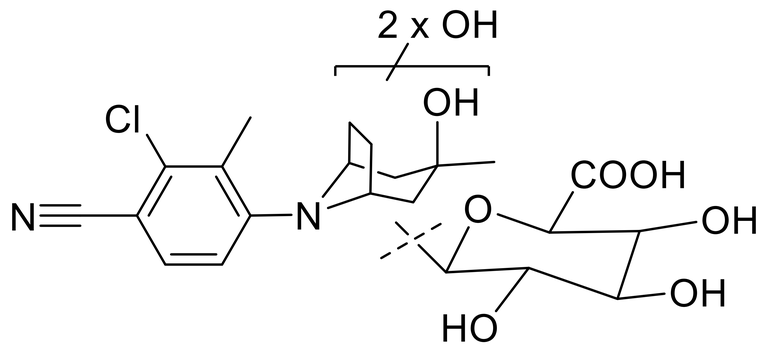


M9a

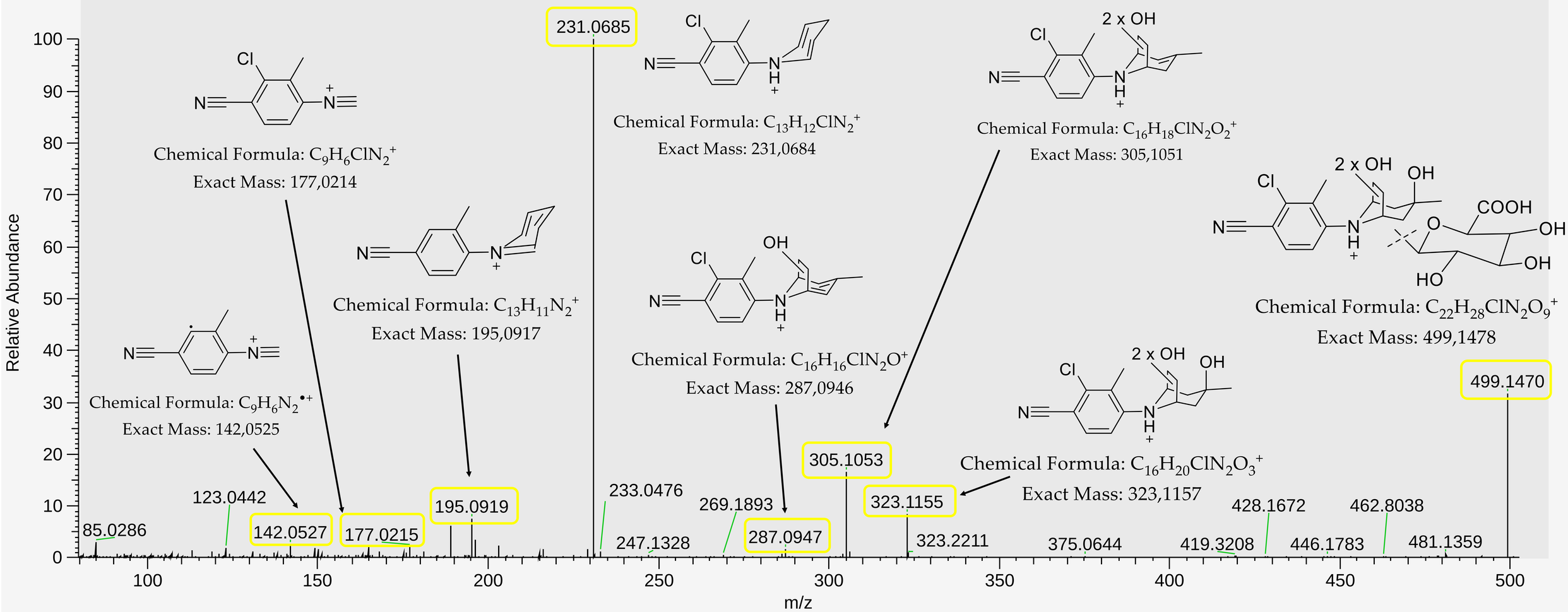
Dihydroxylation + glucuronidation

Retention time: 6.21 min

m/z: 499.1470

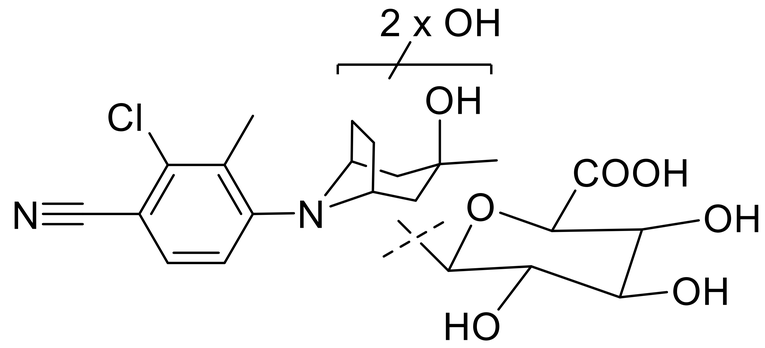


MNB_20200429_05 #1265-1275 RT: 6.19-6.25 AV: 4 SB: 7 6.13-6.19 , 6.25-6.31 NL: 4.23E+005
T: FTMS + p ESI Full ms2 499.1478@hcd38.33 [50.0000-525.0000]



M9b

Dihydroxylation + glucuronidation
Retention time: 6.52 min
m/z: 499.1478



MNB_20200429_05 #1316 RT: 6.51 AV: 1 NL: 1.21E+006
T: FTMS + p ESI Full ms2 499.1478@hcd38.33 [50.0000-525.0000]