

Supplementary Information

Synthesis and Antagonist Activity of Methyllaconitine Analogues on Human $\alpha 7$ Nicotinic Acetylcholine Receptors

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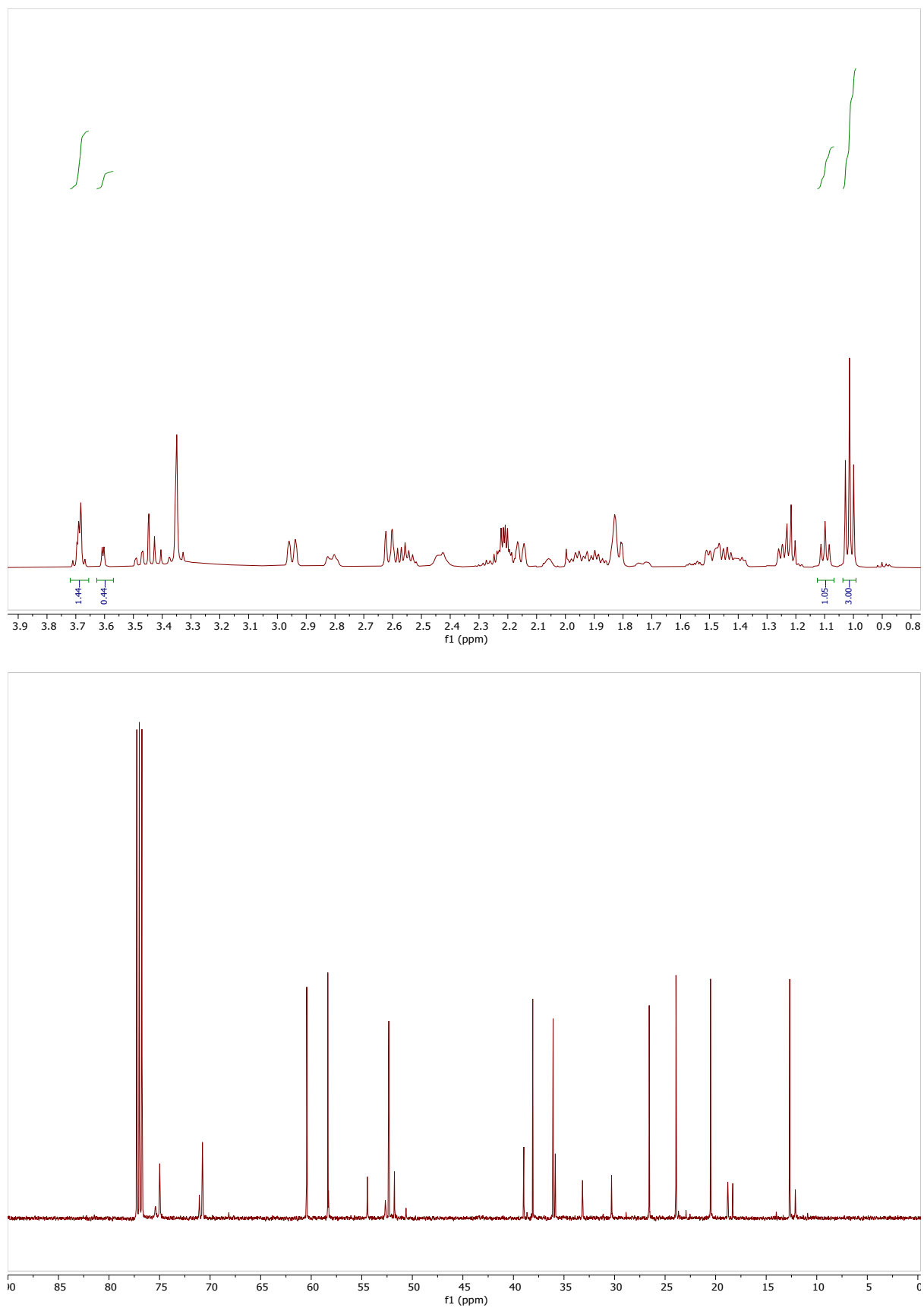


Figure S1. The ^1H NMR (500 MHz) (upper) and ^{13}C NMR (125 MHz) (lower) in CDCl_3 of the epimeric mixture after reduction of the cyclohexanone in AE-bicycle **4**.

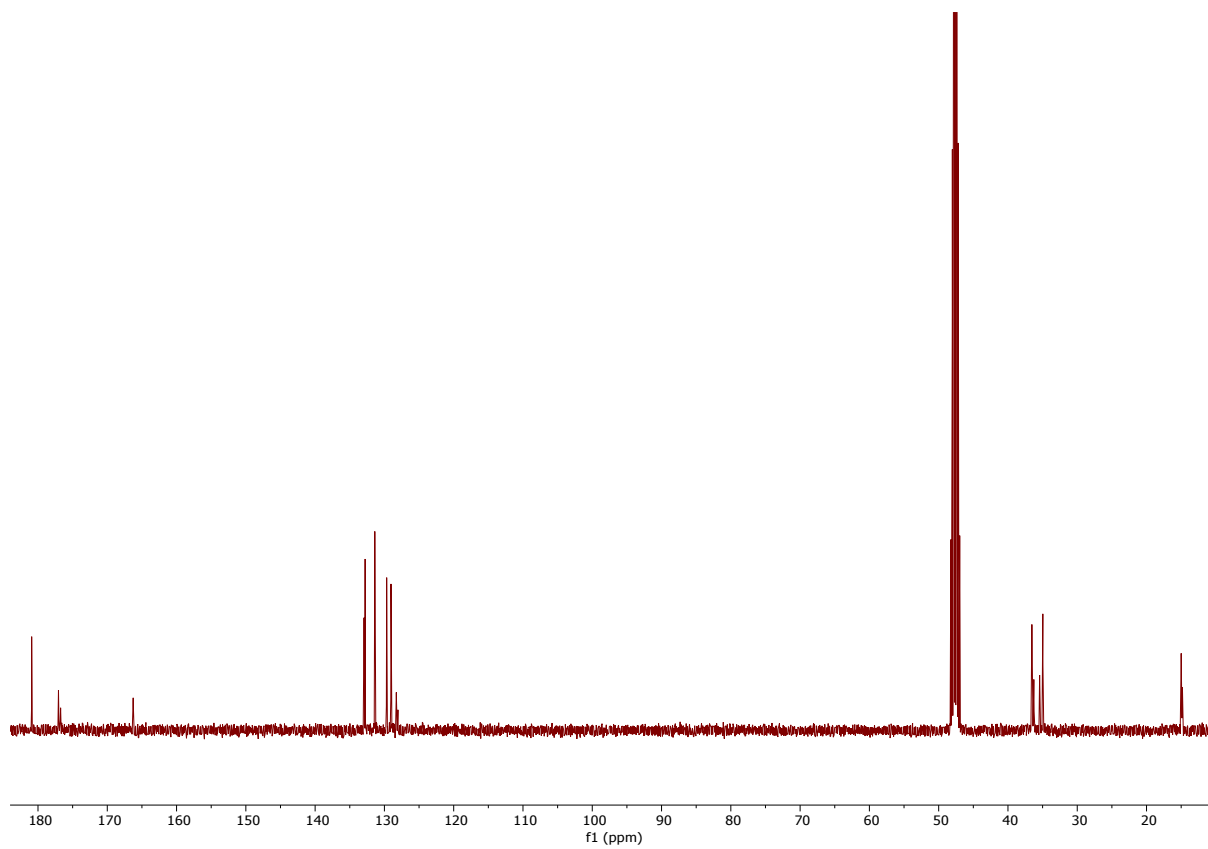


Figure S2. ^{13}C NMR (125 MHz) in CD_3OD of **13** at 25 °C (298 K).

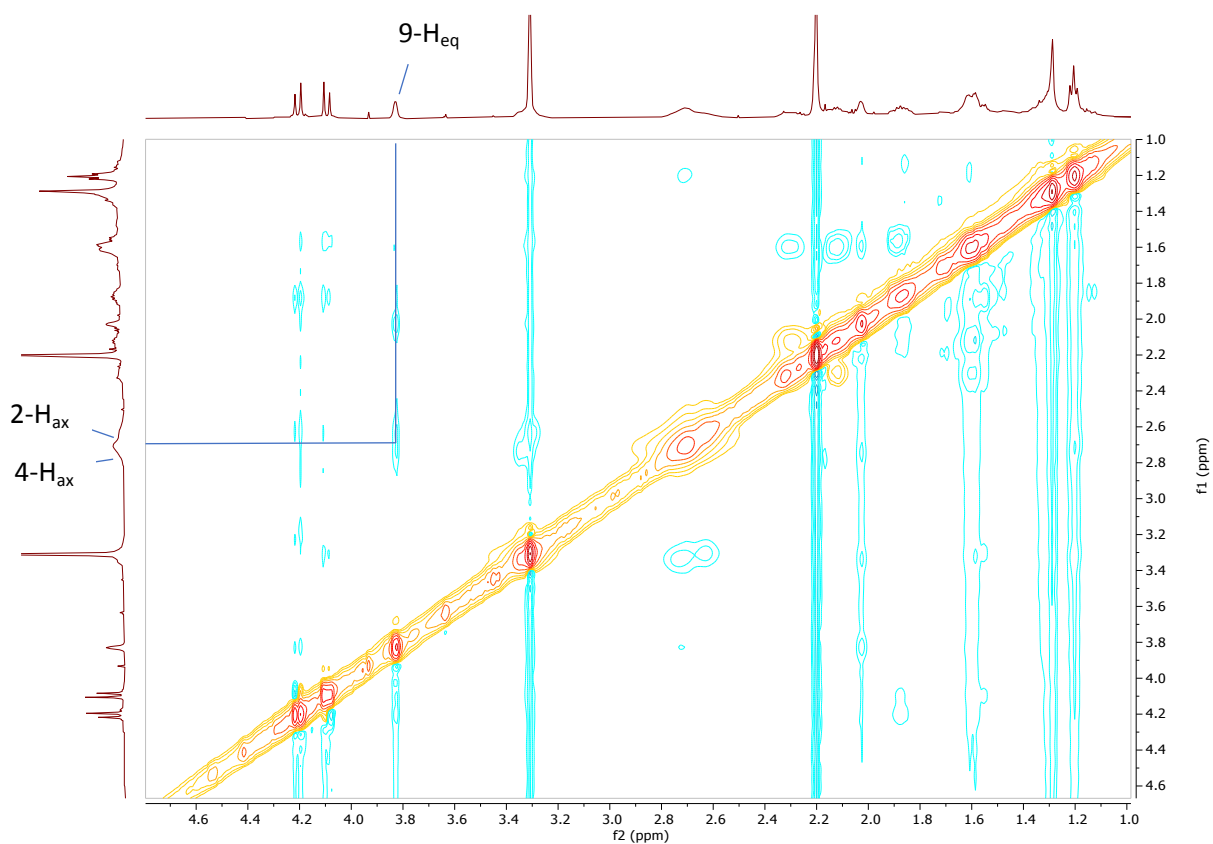
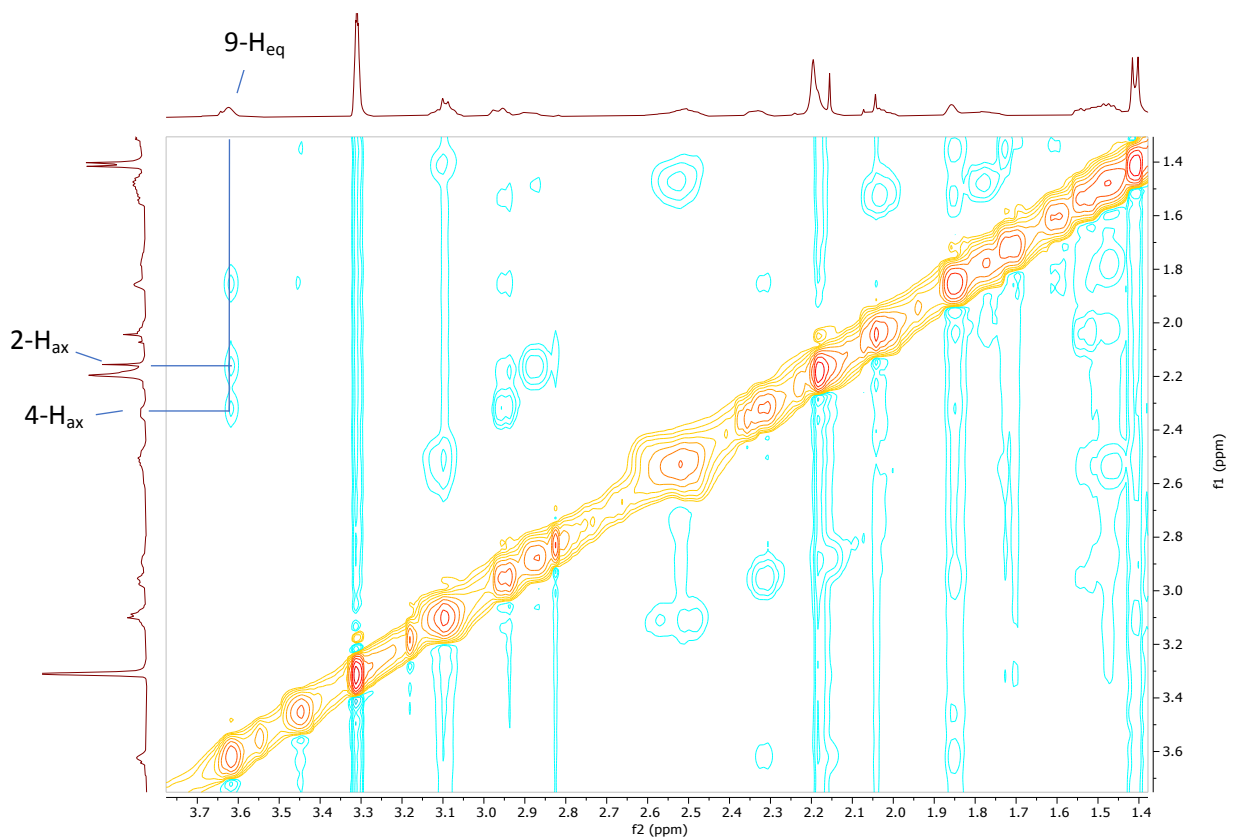


Figure S3. NOESY correlation between 9- H_{eq} and 2- H_{ax} , 4- H_{ax} in analogues **14** (upper) and **21** (lower).

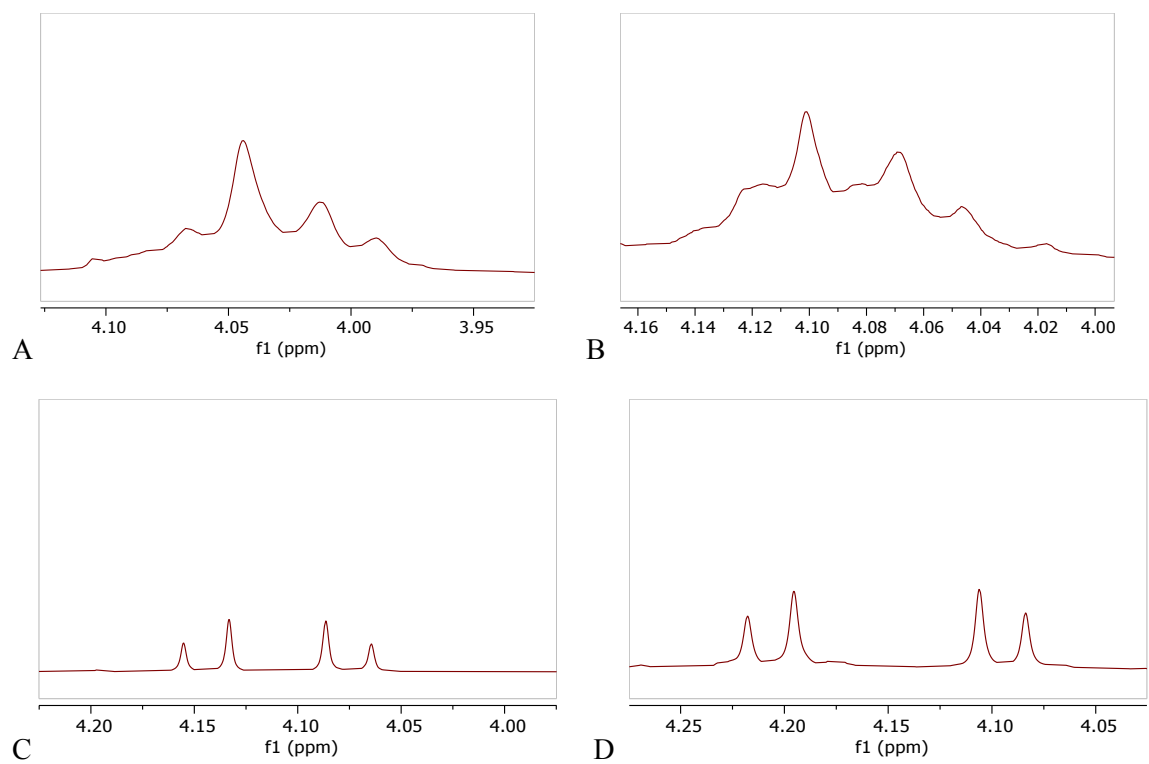
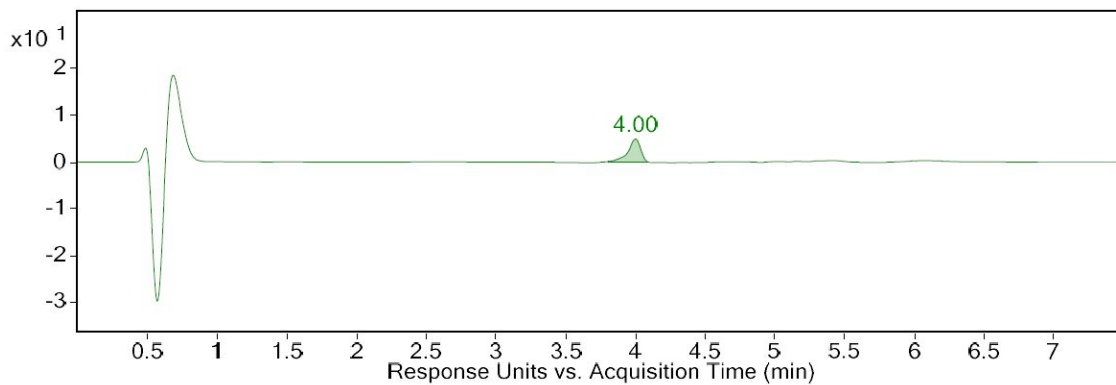


Figure S4. ^1H NMR signal at position 1' in analogues **14** and **15** (A and B respectively) and **20** and **21** (C and D respectively).

HPLC purity assays of analogues 14-21

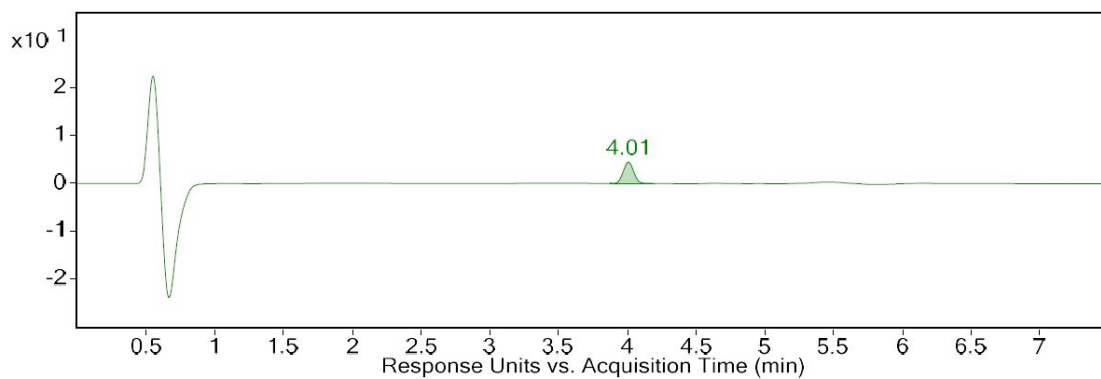
((9*R*)-9-Hydroxy-3-methyl-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**14**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|----|------|--------|-------|--------|
| 1 | 3.8 | 4 | 4.09 | 4.9 | 30.48 | 100 |

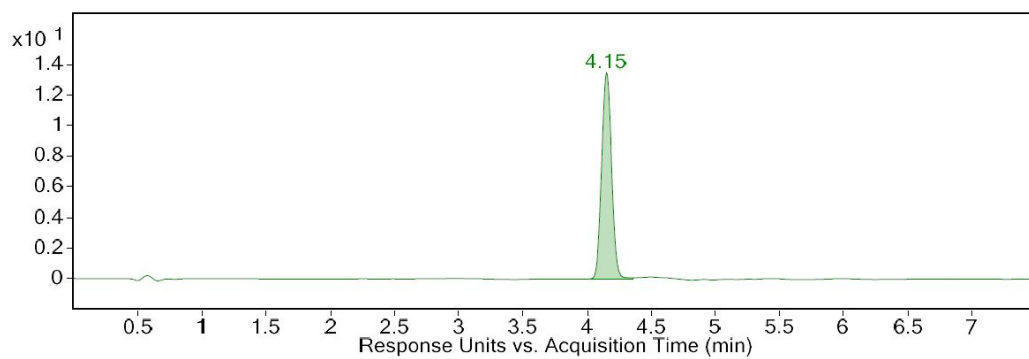
((9*R*)-3-Ethyl-9-hydroxy-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**15**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|-------|--------|
| 1 | 3.88 | 4.01 | 4.19 | 4.45 | 23.58 | 100 |

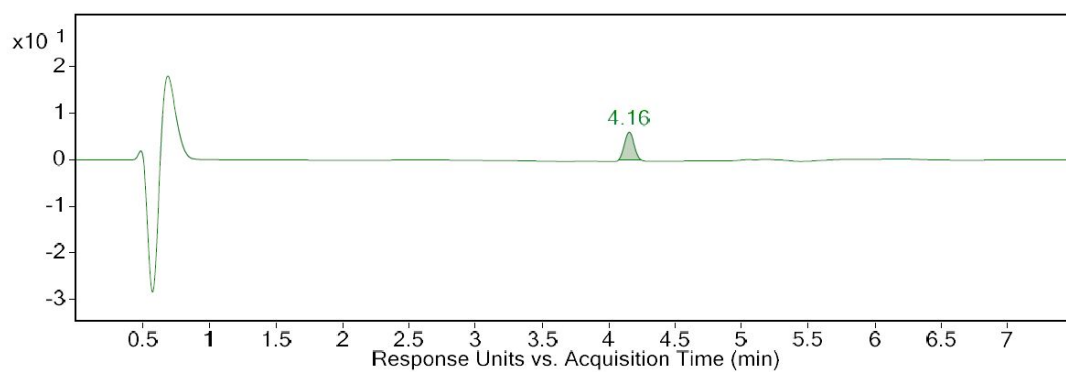
((9*R*)-3-Benzyl-9-hydroxy-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**16**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|-------|--------|
| 1 | 4.02 | 4.15 | 4.36 | 13.53 | 72.99 | 100 |

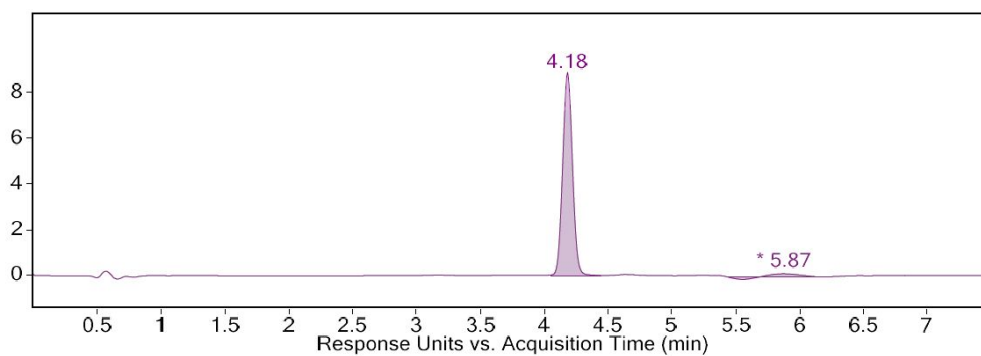
((9*R*)-9-Hydroxy-3-(2-phenethyl)-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**17**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|-------|--------|
| 1 | 4.07 | 4.16 | 4.25 | 6.03 | 29.88 | 100 |

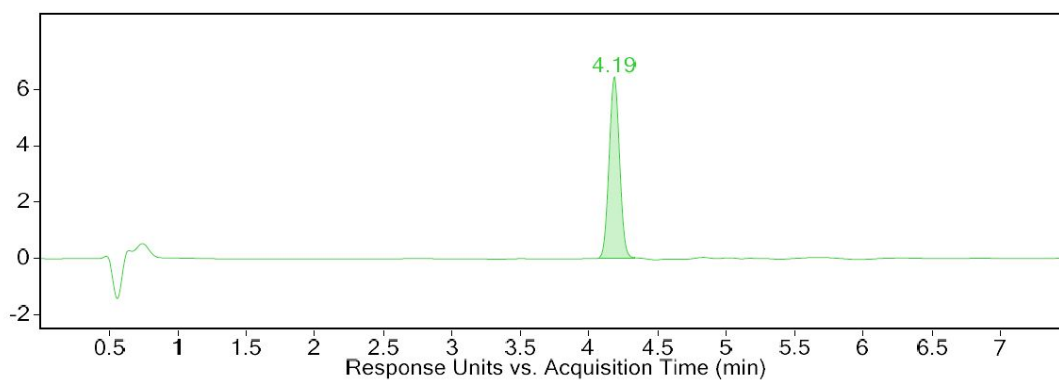
((9*R*)-9-Hydroxy-3-(3-phenylpropyl)-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**18**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|-------|--------|
| 1 | 4.05 | 4.18 | 4.44 | 8.92 | 47.68 | 100 |
| 2 | 5.43 | 5.87 | 6.17 | 0.14 | 1.17 | 2.46 |

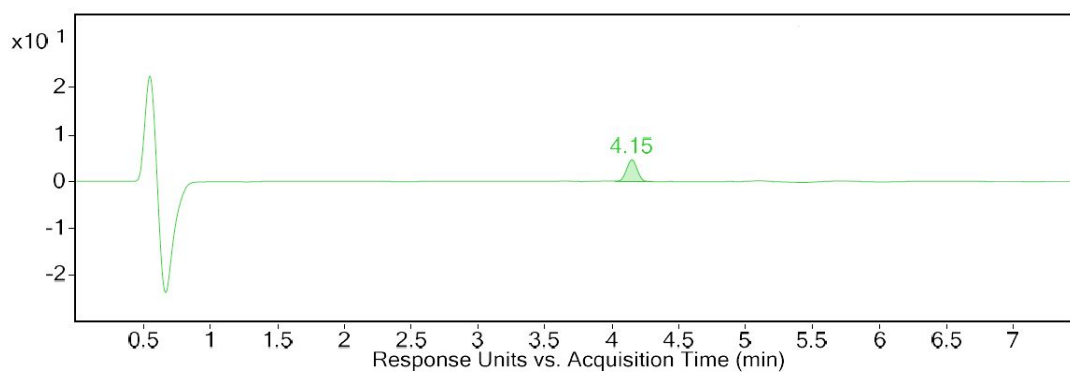
((9*R*)-9-Hydroxy-3-(4-phenylbutyl)-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-((*S*)-3-methyl-2,5-dioxopyrrolidin-1-yl)benzoate (**19**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|------|--------|
| 1 | 4.07 | 4.19 | 4.33 | 6.45 | 34.2 | 100 |

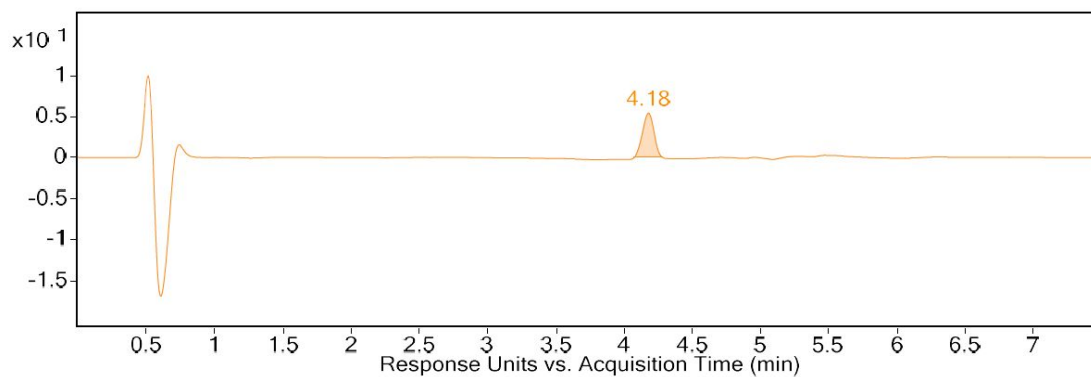
((9*R*)-9-Hydroxy-3-methyl-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-acetamidobenzoate (**20**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|-----|--------|-------|--------|
| 1 | 4.02 | 4.15 | 4.3 | 4.63 | 25.58 | 100 |

((9*R*)-3-Ethyl-9-hydroxy-3-azabicyclo[3.3.1]nonan-1-yl)methyl 2-acetamidobenzoate (**21**)



Integration Peak List

| Peak | Start | RT | End | Height | Area | Area % |
|------|-------|------|------|--------|-------|--------|
| 1 | 4.07 | 4.18 | 4.28 | 5.4 | 31.07 | 100 |