

# Task 0: Classification of an unknown substance

Assign the general name to displayed substances:

CARBOHYDRATE

PEPTIDE

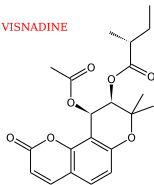
STEROID

TERPENE

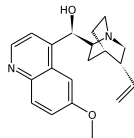
ALKALOID

COUMARINE

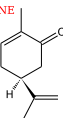
VISNADINE



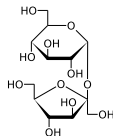
QUININE



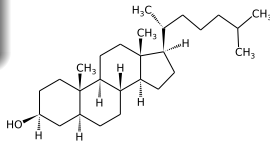
CARVONE



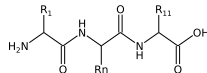
SACHAROSA



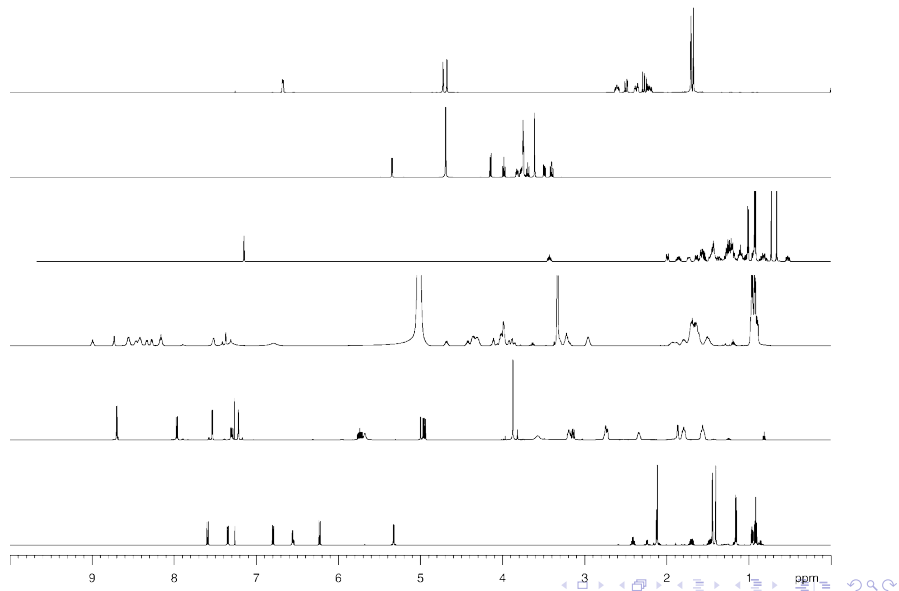
DIHYDROCHOLESTEROL



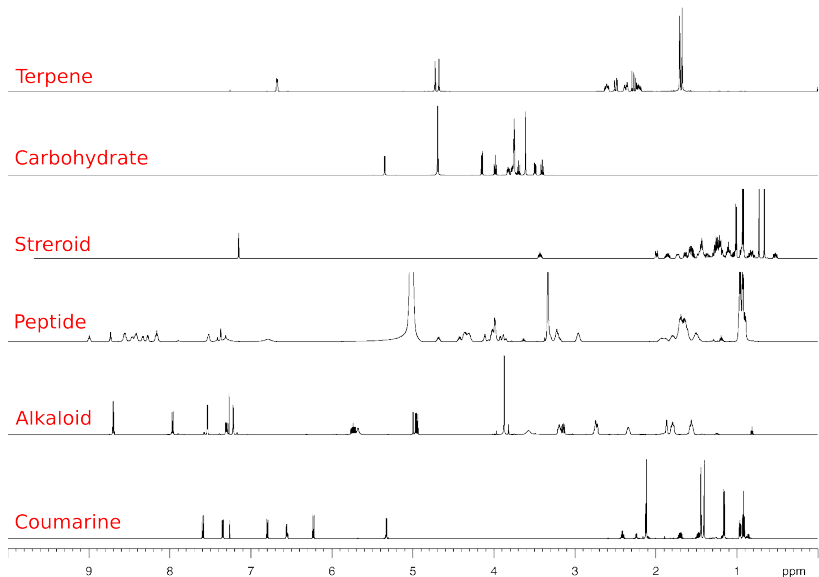
SGGLRLHLGLS



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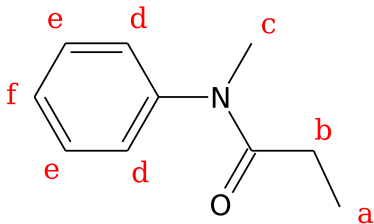


# Task 1: C<sub>10</sub>H<sub>13</sub>NO

$\delta$ [ppm]	Multiplicity	Integral
1.05	triplet	3
1.75	singlet	3
3.70	quartet	2
7-7.60	complex multiplet	5

# Task 1: C<sub>10</sub>H<sub>13</sub>NO

$\delta$ [ppm]	Multiplicity	Integral
1.05 <b>a</b>	triplet	3
1.75 <b>c</b>	singlet	3
3.70 <b>b</b>	quartet	2
7-7.60 <b>d-f</b>	complex multiplet	5

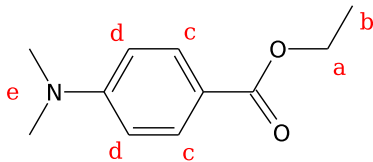


## Task 2: $C_{11}H_{15}NO_2$

$\delta$ [ppm]	Multiplicity	$J$ (Hz)	Integral
1.30	triplet	7	3
3.00	singlet	-	6
4.25	quartet	7	2
6.65	dublet	8	2
7.80	dublet	8	2

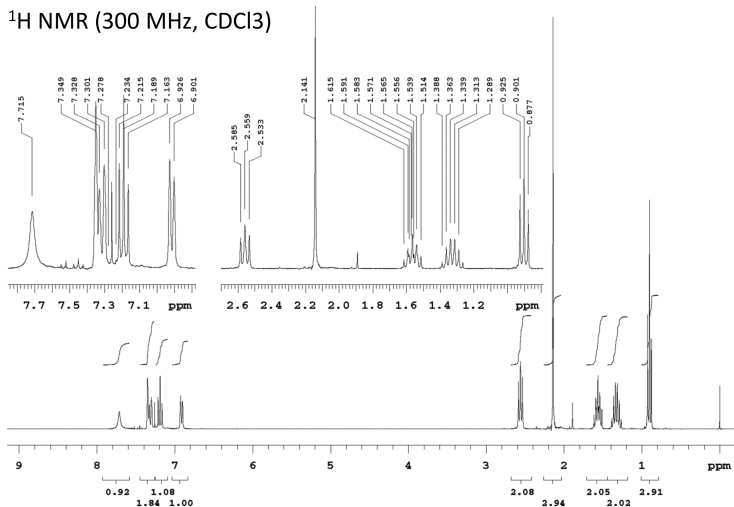
## Task 2: $C_{11}H_{15}NO_2$

$\delta$ [ppm]	Multiplicity	$J$ (Hz)	Integral
1.30 <b>b</b>	triplet	7	3
3.00 <b>e</b>	singlet	-	6
4.25 <b>a</b>	quartet	7	2
6.65 <b>d</b>	dublet	8	2
7.80 <b>c</b>	dublet	8	2



# Task 3: $C_{12}H_{17}NO_2$ - $^1H/COSY$

$^1H$  NMR (300 MHz,  $CDCl_3$ )

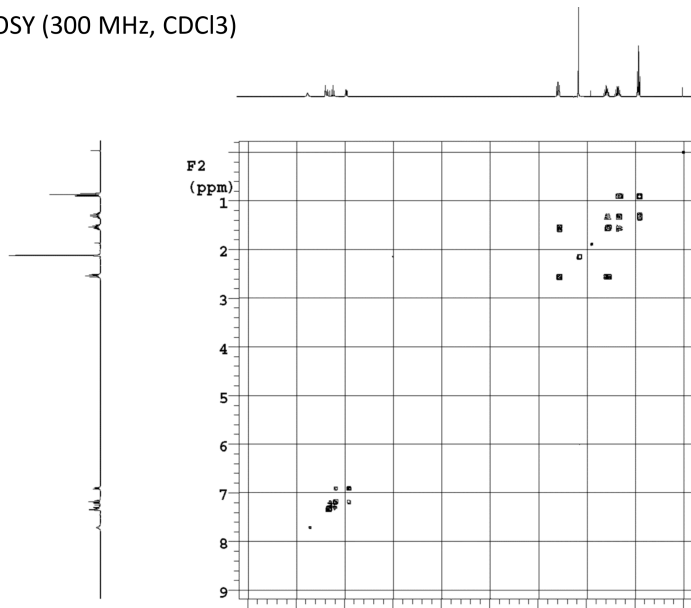


SOLUTION



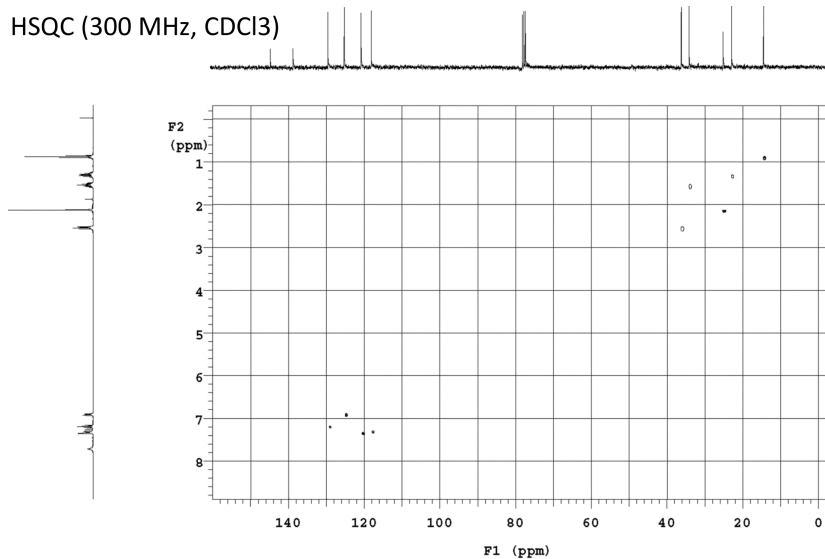
# Task 3: $C_{12}H_{17}NO_2$ - $^1H/COSY$

COSY (300 MHz,  $CDCl_3$ )



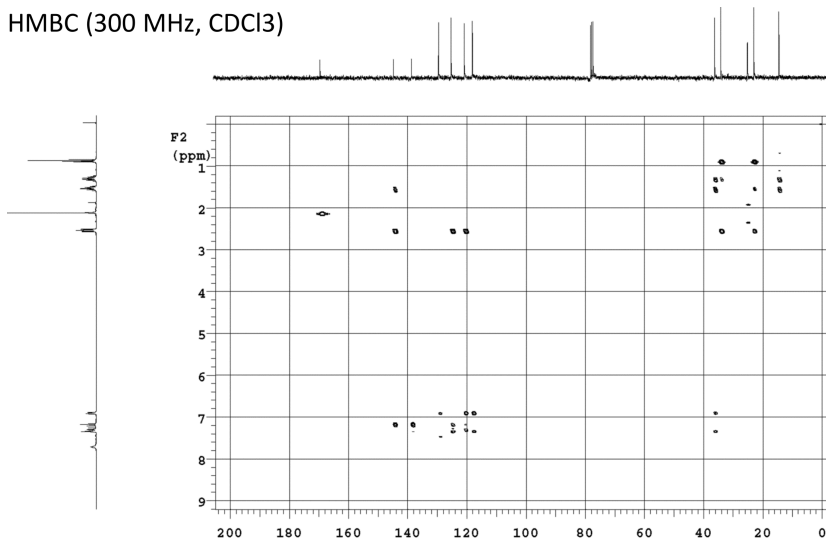
# Task 3: $C_{12}H_{17}NO_2$ - $^{13}C$ /HSQC, HMBC

HSQC (300 MHz,  $CDCl_3$ )

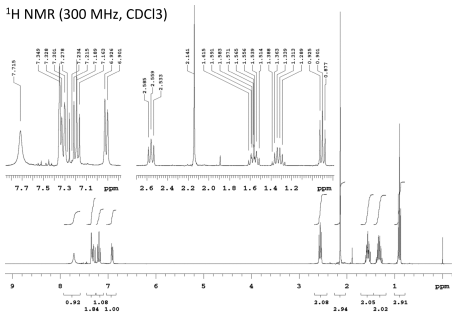


# Task 3: $C_{12}H_{17}NO_2$ - $^{13}C$ /HSQC, HMBC

HMBC (300 MHz,  $CDCl_3$ )



$^1\text{H}$  NMR (300 MHz,  $\text{CDCl}_3$ )



COSY (300 MHz,  $\text{CDCl}_3$ )

