References

1) 1610 cm-1 (aromatic rings),
2) 1630 cm-1 (β-sheets),
3) 1645 cm-1 (random coils),
4) 1661 cm-1 (α-helix),
5) 1678 cm-1 (β-sheets)
6) 1692 cm-1 (turns)

e-PS, 2009, 6, 129-137

1) 1,690 cm−1 (parallel β-sheets)
2) 1,680 cm−1(anti-parallel β-sheets),
3) 1,668 cm−1 (β-turns),
4) 1,658 cm−1 (α-helix),
5) 1,647 cm−1 (unordered),
6) 1,638 cm−1 (triple helix)
7) 1625 cm−1 (parallel β-sheets)
8) 1,612 cm−1 (β-turns).

Anal Bioanal. Chem. (2006) 386:1961–1966

(1) esters, 1715 cm-1;
(2) anti-parallel b-strand, 1690 cm-1;
(3) parallel b-strand, 1679 cm-1;
(4) b-turn, 1668 cm-1;
(5) a-helix, 1656 cm-1;
(6) unordered structure, 1647 cm-1;
(7) triple helix, 1638 cm-1;
(8) parallel b-strand, 1628 cm-1;
(9) b-turn, 1617 cm-1. d(NH2):
(10) amine, 1592 cm-1. (N–H):

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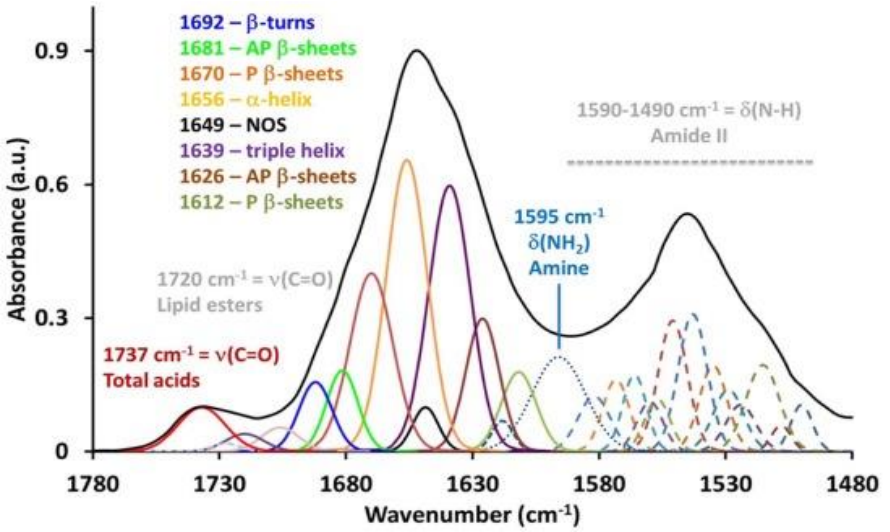
TABLE 1 | Deconvoluted amide I band frequencies and assignments to secondary structure for protein in D_2O and H_2O media.

H_2O[a]		D_2O[b]	
Mean frequencies	Assignment	Mean frequencies	Assignment
1,624 ± 1.0	β-sheet	1,624 ± 4.0	β-sheet
1,627 ± 2.0	β-sheet	1,631 ± 3.0	β-sheet
1,633 ± 2.0	β-sheet	1,637 ± 3.0	β-sheet
1,638 ± 2.0	β-sheet	1,641 ± 2.0	3_{10}-helix
1,642 ± 1.0	β-sheet	1,645 ± 4.0	Random
1,648 ± 2.0	Random	1,653 ± 4.0	α-helix
1,656 ± 2.0	α-helix	1,663 ± 4.0	β-turn
1,663 ± 3.0	3_{10}-helix	1,671 ± 3.0	β-turn
1,667 ± 1.0	β-turn	1,675 ± 5.0	β-sheet
1,675 ± 1.0	β-turn	1,683 ± 2.0	β-turn
1,680 ± 2.0	β-turn	1,689 ± 2.0	β-turn
1,685 ± 2.0	β-turn	1,694 ± 2.0	β-turn
1,691 ± 2.0	β-sheet		
1,696 ± 2.0	β-sheet		

[a]Data are from Dong and colleagues[6,47,48,54].
[b]Data are from Susi and colleagues[4,5,13,46].



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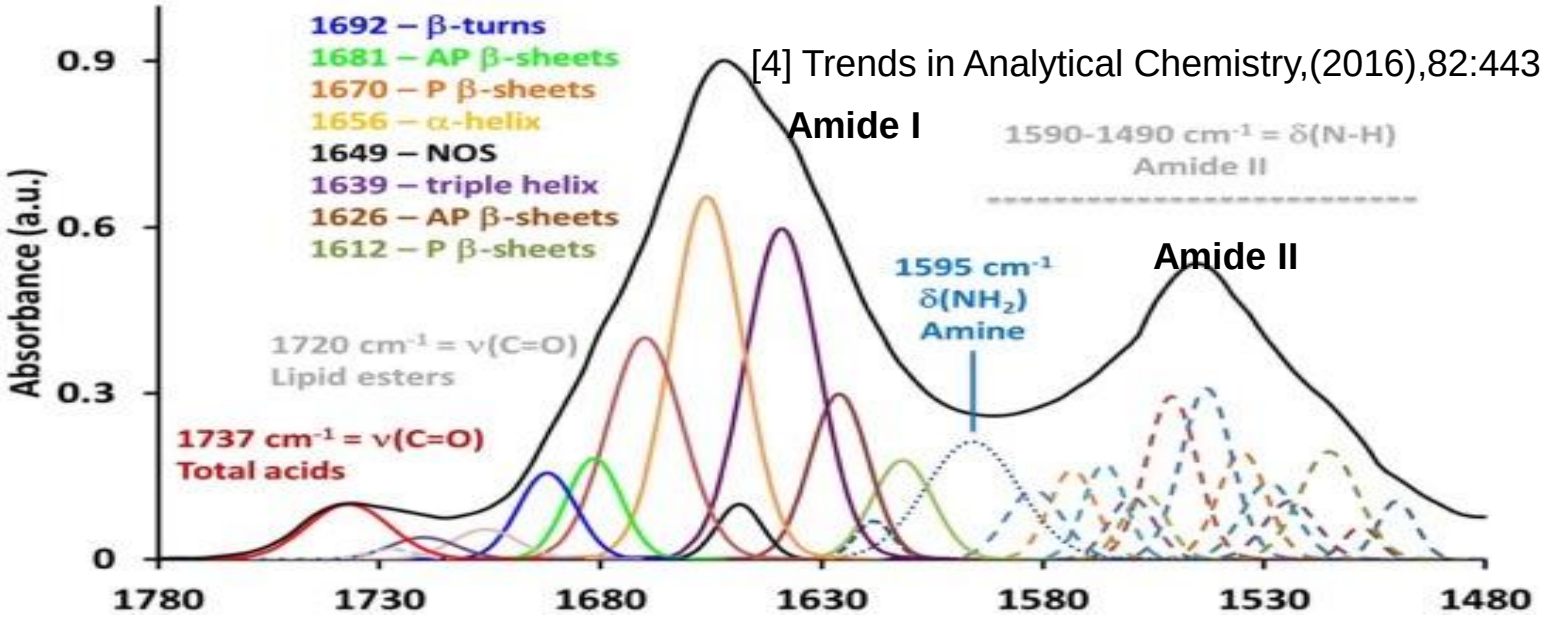
Peak assignments of amide I band

Peak (cm^{-1})	Assignment	Reference	Peak (cm^{-1})	Assignment	Reference
1610	aromatic rings	[1]	1668	β-turn	[2,3]
1612	β-turn	[2]	1678	β-sheets	[1]
1617		[3]	1679		[3]
1625	parallel β-sheets	[2]	1680	anti-parallel β-sheets	[2]
1628		[3]	1690	parallel β-sheets	[2]
1630	β-sheets	[1]			[3]
1638	triple helix	[2,3]	1692	turns	[1]
1645	random coils	[1]			
1647	unordered	[2,3]			
1656	α-helix	[3]			
1658		[2]			
1661		[1]			

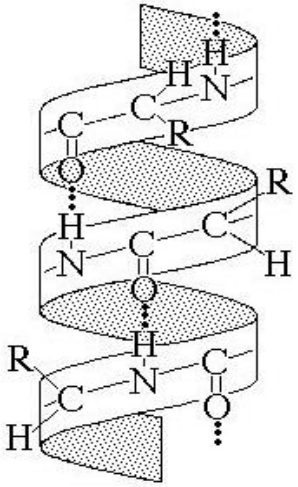
[1] e-PS, (2009), 6:129
[2] Anal Bioanal. Chem. (2008),386:1961
[3] TRENDS in Biotechnology,(2006), 24(10):455



[4] Trends in Analytical Chemistry,(2016),82:443

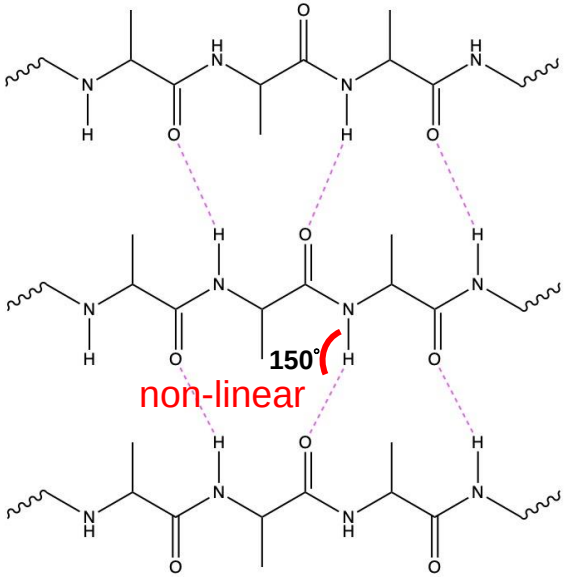
Major types of secondary structure of protein

α-Helix

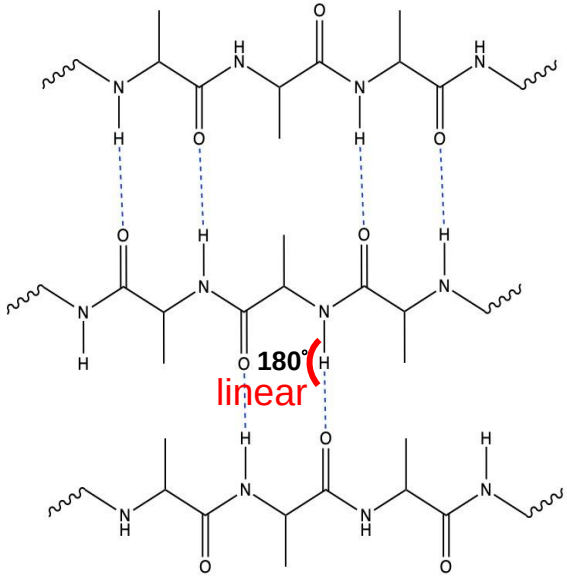


β-Sheets

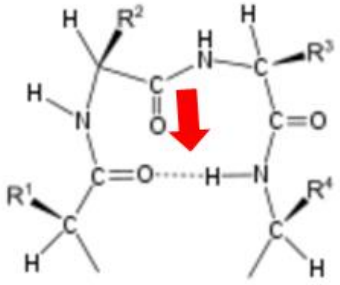
Parallel

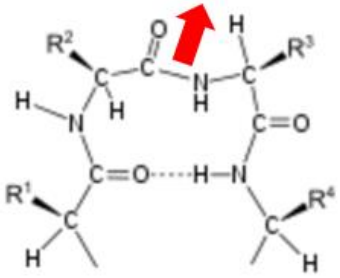


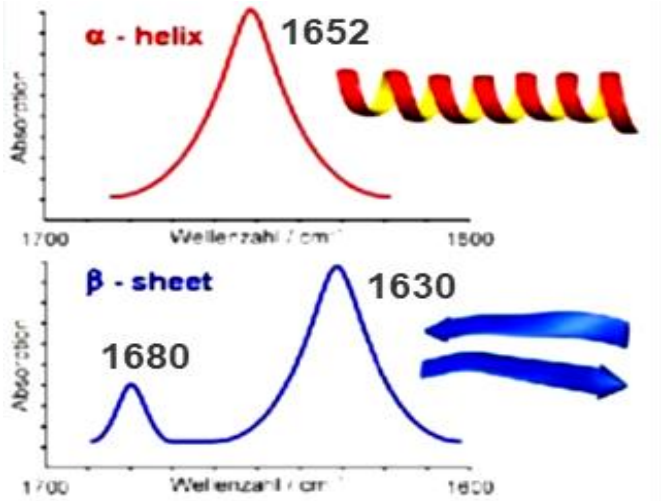
Antiparallel



β turns



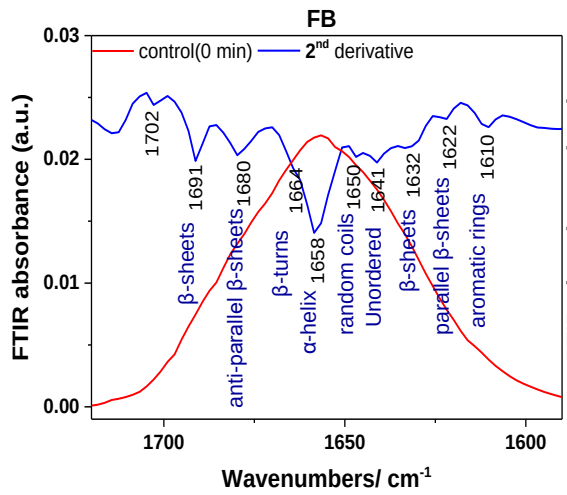


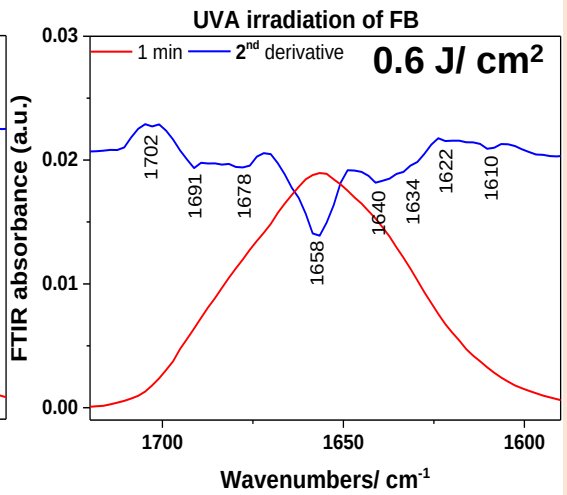


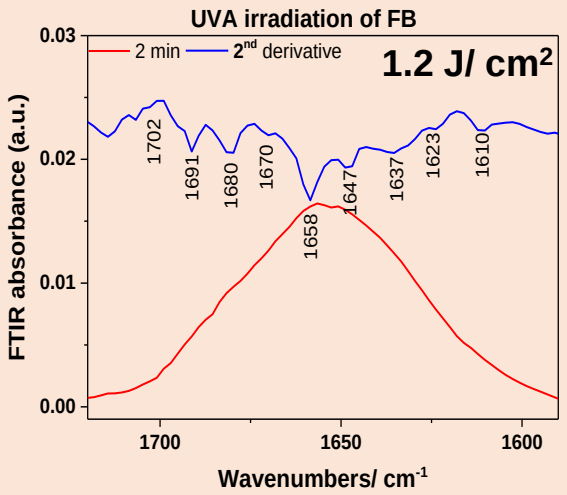
https://alevelnotes.com/notes/biology/biological-molecules/biological-molecules/protein-structure

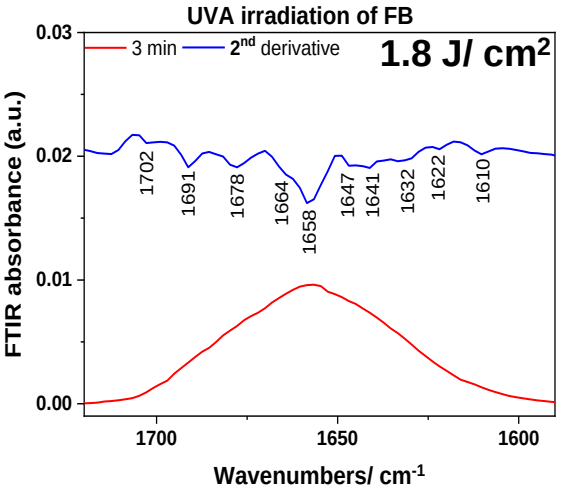
https://cbm.msoe.edu/teachingResources/proteinStructure/secondary.html

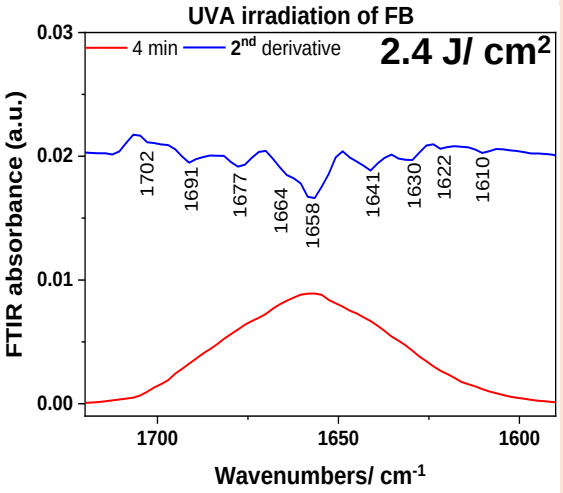
2nd derivative of Amide I band

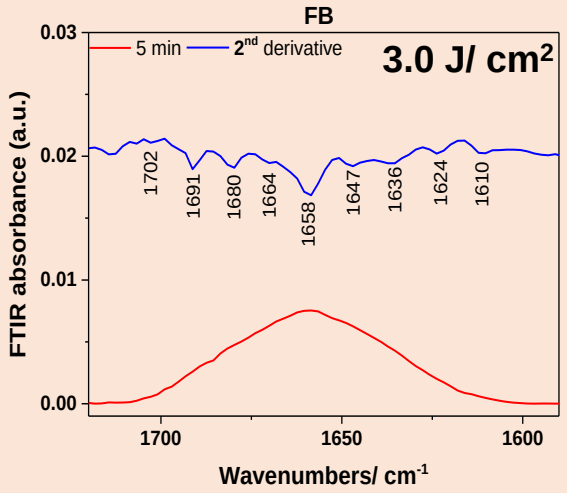


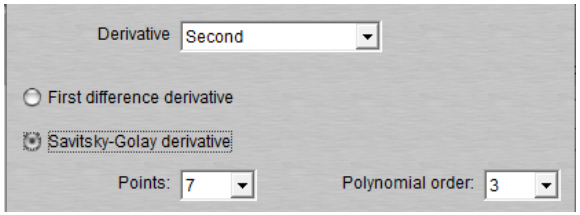












✓ FB細胞照光後僅在Amide I的吸收強度有遞減，其二級結構無明顯差異 。

2021.02佩瑜分析FB細胞光譜之Amide I的2次微分，玻片及反射大面積光譜來源:佩瑜