



Full Syllabus



Course Title

Mechanisms of Enzymatic Catalysis

Lecturer

Prof. Tsaffrir Zor

Semester

B

Course requirements

Exam

Final grade components

80% Exam, 10% Quiz, 10% Attendance

Course schedule

Class no. _ Date	Subject and Requirements (assignments, reading materials, tasks, etc.)
1 _ 30/5/2024	Introduction – enzymology; Introduction – Amino Acids and Proteins
2 _ 6/6/2024	Introduction – Michaelis-Menten, Briggs-Haldane
3 _ 13/6/2024	Introduction – Michaelis-Menten, Briggs-Haldane
4 _ 20/6/2024	Transition State
5 _ 27/6/2024	Catalysis Mechanisms
6 _ 4/7/2024	Catalysis Mechanism
7 _ 11/7/2024	Nucleophile & Leaving Group
8 _ 18/7/2024	Serine Proteases
9 _ 25/7/2024	Serine Proteases
10 _ 1/8/2024	G Proteins
11 _ 8/8/2024	G Proteins

Required course reading

Optional course reading

1) Structure and mechanism in protein science, Fersht, A. (1999), Freeman & Co.

2) Enzymatic reaction mechanisms, Walsh, C. (1979), Freeman & Co.

#	Subject\Chapter	Fersht	Walsh
1	Introduction to enzymology Lehninger	3	
2	Catalysis	2 & 12	2



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3A	Chymotrypsin (Serine proteases) Lehninger, Ref. [1]	3, 4, 7, 9, 16	3.B
3B	Subtilisin (Serine proteases) Ref. [2, 3]	15.2	-
5	Nucleophile & Leaving group	2.D	-
5B	Aminoacyl-tRNA Synthetase	2.2c, 7, 15	8.A.1
7	G proteins (GTPase) Ref. [4-6]	-	-
8A	Carboxypeptidase A (Zn proteases) Ref. [7-11]	16.3	3.C.3
8B	Pepsin (Acidic proteases) Ref. [12-13]	16.4	3.C.2

References

1. Fersht, A.R., D.M. Blow, and J. Fastrez, *Biochemistry*, 1973. **12**: 2035-41.
2. Carter, P. and J.A. Wells, *Science*, 1987. **237**: 394-9.
3. Carter, P. and J.A. Wells, *Nature*, 1988. **332**: 564-8.
4. Zor, T., et al., *FEBS Lett*, 1998. **433**: 326-30.
5. Zor, T., et al., *Eur J Biochem*, 1997. **249**: 330-6.
6. Ahmadian, M.R., et al., *Proc Natl Acad Sci U S A*, 1999. **96**: 7065-70.
7. Breslow, R. and D.L. Wernick, *Proc Natl Acad Sci U S A*, 1977. **74**: 1303-7.
8. Kilshtain-Vardi, A., et al., *Acta Crystallogr D Biol Crystallogr*, 2003. **59**: 323-33.
9. Lee, K.J. and D.H. Kim, *Bioorg Med Chem*, 1998. **6**: 1613-22.
10. Lee, M. and D.H. Kim, *Bioorg Med Chem*, 2000. **8**: 815-23.
11. Shoham, G., D.W. Christianson, and D.A. Oren, *Proc Natl Acad Sci U S A*, 1988. **85**: 684-8.
12. Cornish-Bowden, A.J. and J.R. Knowles, *Biochem J*, 1969. **113**: 353-62.
13. Whittle, P.J. and T.L. Blundell, *Annu Rev Biophys Biomol Struct*, 1994. **23**: 349-75.

Comments