



UNIVERSITÀ DI PAVIA

Anno Accademico 2016/2017

BIOCHEMISTRY

Enrollment year	2015/2016
Academic year	2016/2017
Regulations	DM270
Academic discipline	BIO/10 (BIOCHEMISTRY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	2°
Period	1st semester (01/10/2016 - 14/01/2017)
ECTS	9
Lesson hours	72 lesson hours
Language	ITALIAN
Activity type	ORAL TEST
Teacher	TORTI MAURO (titolare) - 3 ECTS BALDUINI CESARE - 6 ECTS
Prerequisites	=
Learning outcomes	=
Course contents	Part 1. Structural and chemical features of amino acids. Peptides. Methods for analysis of protein biochemistry. Three dimensional structure of proteins. Collagens and immunogloblins. Proteins in oxygen binding and transport: myoglobin and hemoglobin. Enzymes. Mechanisms of catalysis. Vitamins and coenzymes. Enzyme kinetics and mechanisms of regulation. Allosteric enzymes. Monosaccharides and polysaccharides. Proteoglycans and glycoproteins. Structural lipids and storage lipids. Lipids in the biological membranes. Membrane proteins: structure and function.

Part 2. Principles of bioenergetics. The role of ATP and phosphate group transfers. The importance of biological oxidations. The citric acid cycle. Oxidative phosphorylation and ATP synthesis. The chemiosmotic model. Regulation of mitochondrial function and ATP synthesis. Carbohydrate metabolism. Glycolysis. Gluconeogenesis. Glycogen metabolism. Shunt of pentose phosphate. Regulation of glucose metabolism in the liver and muscle under aerobic and anaerobic conditions.. Lipids metabolism. b-oxidation of fatty acids. The ketone bodies. Biosynthesis of fatty acid. Biosynthesis of fatty acid, triacilglicerols and phospholipids. Regulation of lipids metabolism. Amino acid catabolism. Transaminases. The urea cycle. General concepts on amino acids degradation. Protein synthesis. Hormonal regulation of fuel metabolism. insulin and glucagon. Molecular mechanisms of signal transduction.

Teaching methods

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Reccomended or required readings

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Assessment methods

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Further information

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Sustainable development goals - Agenda 2030

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