



University of Verona
Master degree Science in Preventive and Adapted Physical Activity
Master degree Science of Sport and Physical Performance
A.A. 2014/2015

Sport Biochemistry

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Course objectives

The course will consider the knowledge of the biochemical processes implicated in muscle cell functioning in a vision that integrates the entire organism. The student will learn to correlate the thermodynamic and kinetic features of the biochemical reactions belonging to the metabolism, including their enzymatic regulation, with the physiological responses to exercise in the absence or presence of training.

Course program

Kinetic structure of the biochemical pathways: principles of the metabolic control of enzymes involved in the production of energy during physical exercise; equilibrium reactions and non equilibrium reactions, flux generating reactions, direction of a metabolic pathway; enzymes catalyzing flux generating reactions, the lactate dehydrogenase as an example.

Metabolic activity of the skeletal muscle: aerobic metabolism, alactic and lactic metabolism during the physical exercise; phosphocreatine and lactate; Cori Cycle; the cycle of purine nucleotides; the glucose-alanine cycle.

Lactate: the revolution on lactate knowledge.

Metabolism of carbohydrates: the effects on exercise and training in skeletal muscle.

Metabolism of amino-acids and proteins: the effects on exercise and training in skeletal muscle.

Metabolism of lipids: the effects on exercise and training in skeletal muscle.

Exam Modalities

oral

Suggested Texts

Biochemistry Primer for Exercise Science by Peter Tiidus, A. Russell Tupling, Michael Houston

Lehninger Principles of Biochemistry by David L. Nelson and Michael M. Cox