

# **BIOCHEMISTRY OF SPORT AND EXERCISE (CODE: 2024087)**

## COURSE SYLLABUS:

Relationship between bioenergetic metabolic pathways with muscle fatigue in the context in which there is an increase/maintenance of the electromyographic signal with a decrease in muscle strength. Metabolic causes of peripheral fatigue associated with exercise intensity and duration. Use and interpretation of biomarkers as indicators of the predominance of energy substrates and muscle fatigue. Study of chronic fatigue and its relationship with overtraning biomarkers.

## GOALS:

- To discriminate techniques in biochemistry for detection of tissue and blood biomarkers;

- To assess the technical and financial feasibility of using blood biomarkers in research projects,

- Differentiate peripheral fatigue from modulation of motor unit recruitment by the central nervous system.

#### **BIBLIOGRAPHY:**

#### Books

- Fisiologia do exercício: bioenergética humana e suas aplicações. Brooks G.A., Fahey T.D.,

Baldwin K.M.. Phorte Ed. 2013.

- Bioquímica básica. Marzzoco, A & Torres, B.B. 4ª edição. Guanabara Koogan. 2015.

## Articles:

- MACEDO, D V ; LAZARIM, F L ; CATANHO, F O ; TESSUTI, L S ; HOHL, R. Islactateproductionrelatedto muscular fatigue? A pedagogical proposition using empirical facts. ADVANCES IN PHYSIOLOGY EDUCATION (ONLINE), v. 33, p. 302-307, 2009.

<u>HOHL, R.</u>; FERRARESSO, RLP ; BUSCARIOLLI, R ; LUCCO, R. ; <u>BRENZIKOFER</u>,
<u>R.</u>; <u>MACEDO, D V</u>. Development and Characterization of an Overtraining Animal Model.
Medicine and Science in Sports and Exercise, v. 41, p. 1155-1163, 2009.

- FERRARESSO, RLP ; BUSCARIOLLI, R ; MACEDO, DV ; NUNES,LA.S ; <u>BRENZIKOFER</u>, <u>R.</u> ; DAMAS,D ; <u>HOHL</u>, <u>R.</u> . Interaction between Overtraining and the Interindividual Variability May (Not) Trigger Muscle Oxidative Stress and Cardiomyocyte Apoptosis in Rats. OXID MED CELL LONGEV. Volume 2012, Article ID 935483, 11 pp.

- HOHL, R; NAZÁRIO DE REZENDE, FERNANDO ; MILLET, GUILLAUME Y. ; RIBEIRO DA MOTA, GUSTAVO ; MAROCOLO, MOACIR . Blood cardiac biomarkers responses are associated with 24 h ultramarathon performance. HELIYON, v. 5, p. e01913, 2019.

<u>HOHL, R</u>; BLACKHURST, DEE M. ; DONALDSON, BYRON ; VAN BOOM, KATHRYN M. ;
KOHN, TERTIUS A. . Wild antelope skeletal muscle antioxidant enzyme activities do not correlate with muscle fibre type or oxidative metabolism. COMPARATIVE BIOCHEMISTRY AND PHYSIOLOGY A-MOLECULAR & INTEGRATIVE PHYSIOLOGY, v. 242, p. 110638, 2020.
FINSTERER ,J.Biomarkers of peripheral muscle fatigue during exercise. BMC Musculoskeletal Disorders. 2012, **13**:218.

- WAN, J.J.,ET AL. Muscle fatigue: general understanding and treatment. Experimental & Molecular Medicine. 2017, 49, e384; doi:10.1038/emm.2017.194.