Short Communication

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2022.45.007215

A Brief Systematization about Proteomics in the Field of Exercise and Sports Science

Lourdes Serrano García*

University of Medical Sciences of Holguin, Cuba

***Corresponding author:** Lourdes Serrano Garcia, University of Medical Sciences of Holguin, Cuba

ARTICLE INFO

Received: July 24, 2022

Published: August 05, 2022

ABSTRACT

Citation: Lourdes Serrano García. A Brief Systematization about Proteomics in the Field of Exercise and Sports Science. Biomed J Sci & Tech Res 45(3)-2022. BJSTR. MS.ID.007215.

Introduction

The analysis of protein expression profile upon diverse conditions in health and disease, was coined as proteomics in the early 90´s. These types of studies led to myriad progress in the field of sports medicine research because the understanding of the proteome modulation in response to exercise, is a cornerstone in achieving a deeper understanding of the molecular mechanisms involved in the complex health-disease process in athletes [1]. In addition, integration of the results of proteomic data with the clinical, biochemical and sports pedagogical indicators will help in the development of personalized recommendations for the effective planning of the athlete training processes. This latter includes the choice of sports specialization, optimization of the training process and assessment of the current functional state of an athlete (such as overtraining) [2]. As is known, sports medicine is a wide medical field that deals with sports related injuries and support and also plays a major role in prevention, recovery, and pain relief [3]. In relation to this young science, it should be noted that, today, the global scientific community is actively working to identify the endogenous molecular factors and processes that can act as personalized predictors of athletic performance [2].

Among the most recent advances evidenced in the field of sports medicine, provided by the development of proteomics, the following can be mentioned:

a. Proteomic tools coupled with mass spectrometry and bioinformatic technologies used in data analysis, responsible to complement the significant number of molecular players and cell pathways included in the pathogenesis of diseases in athletes [1].

b. The influence of diet and exercise on the anthropometric profile in competitors [4].

c. The identification of the target proteins of exercise-induced stress in urine from male athletes, based on two-dimensional gel electrophoresis and mass spectrometry procedures. This provides new ideas for further exploring exercise-induced proteinuria [5].

d. The characterization of acute exercise-induced changes in salivary proteins of street runners, which provides a better understanding of the acute effects of exercise [6].

e. The study of the mechanisms of muscle adaptation, using emerging techniques for dynamic analysis of muscle proteomes [7].

f. The evaluation of the relationships of proteomics data, athlete-reported illness, athlete training distress, and coaches' ratings of distress and performance over the course of the competitive season.

In this case it was showed the importance of the immune system in the reaction to internal and external stress in athletes [8]. In Cuba, the learning of the contents related to proteomics in

the field of sports health is promoted from professional training in various careers related to the subject, although its realization in most cases is achieved in the postgraduate. In this context, the professional profile of health personnel requires the graduation of an individual who demonstrates a high level of knowledge and pertinent modes of action. In the particular case of the specialty of Medical Microbiology, proteomics is taught from the first year of internship as a subject [9]. The teaching experience of more than eight years of the author of this material in the teaching of this subject, allows ensuring that it offers sufficient theoretical-practical tools to comprehensively address health situations in which this science is involved. The multidisciplinary cathedras of genomic medicine in Cuba, created throughout the university network, have the social commission of promoting professional training in Omics technologies [10]. Numerous advances have been made in the field of biotechnology, public health and molecular biology in the country, thanks to the coordinated work of scientific and academic institutions [11]. In this sense, it is worth mentioning the production of proper drugs and vaccines, which allow the increase of the quality of life of the communities and age groups. However, in the field of sports medicine, there are few works related to the progress of proteomics in this branch. It is evident that this science requires a solid economic investment and a highly trained human resource to achieve good results, and this can become in a real limitation.

Final Considerations

The theoretical and technical development of proteomics constitutes nowadays the referential and normative framework of numerous sciences and branches of science. It can be assured that the transversality and diversification of proteomics has become in an unavoidable path in finding accurate and precise solutions. In the field of sports medicine, there are important advances aimed, regarding to the improvement of teaching-learning processes, which allows the increases in quality of life of coaches and athletes. In this sense, proteomics is considered as an essential science for the revitalization of preventive actions, treatment, and rehabilitation of athletes.

Acknowledgment

Author (Lourdes Serrano) offers sincerest acknowledges to the Financial and Editorial offices of the Biomedical Journal of Scientific & Technical Research (BJSTR) for the complete financing of this paper.

Competing Interest

The author has declared that no competing interest exists.

References

1. Petriz B (2017) Proteomics in Exercise and Sports Science: Still a Useful Tool. Austin Sports Med 2(1): 1012.
2. Malsagova KA, Butkova TV, Kopylov AT, Izotov AA, Rudnev VR, et al. (2021) Molecular Portrait of an Athlete. Diagnostics 11(6): 1095
3. Abou M (2020) The role of sports medicine in physical education. International Journal of Physical Education, Sports and Health 7(6): 76-83.
4. Toro R, Mangas A, Quezada M, Rodriguez-Rosety M, Fournielles G, et al. (2014) Diet and exercise influence on the proteomic profile of an athlete population. Nutr Hosp 30(5): 1110-1117.
5. Lin WT, Lin HQ (2018) Differential expression of proteins in urea from male athletes after 30 km running evaluated by proteomics. Exercise Biochemistry Review Proceedings of IBEC 2018, Beijing, China 1(30): 23-25.
6. Lima CM, Almeida L, de Souza G, Freire D, Barbosa A, et al. (2021) Salivary protein analysis of street runners after a real sporting event. Research, Society and Development 10(10): e114101018183
7. Hesketh SJ, Stansfield BN, Stead CA, Burniston JG (2020) The application of proteomics in muscle exercise physiology. Expert Review of Proteomics 17(11-12): 813-825.
8. Knab AM, Nieman DC, Zingaretti LM, Groen AJ, Pugachev A (2020) Proteomic Profiling and Monitoring of Training Distress and Illness in University Swimmers During a 25-Week Competitive Season. Front. Physiol 11: 373.
9. (2019) Medical Microbiology Specialty Curriculum. Ministry of Public Health and University of Medical Sciences of Havana: Havana, Cuba.
10. Website of Genomic Medicine.
11. Serrano L, Serrano L, Rodríguez AJ (2022) A Current Glance Regarding the Experience of Cuban Vaccination Advance Against COVID-19. Biomed J Sci & Tech Res 41(5): 33064-33066.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2022.45.007215

Lourdes Serrano García. Biomed J Sci & Tech Res