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## Where human speed limit goes for short and long term running? A multifactor analysis through energetic metabolic pathways, genetic variations into ethnics and statistical approaches

Speed is limited morphologically and physiologically by different factors. Among others, human dimensions and osteomuscular ratios determine speed performance at biomechanical level. The number and type of contractile fibers, favoring anaerobic or aerobic energy supply, provide another restriction for muscle power. Even all of them could be modified under certain conditions in a limited rate through exercise training; there are always restrictions by ethnic variations due to genetic heritage of such populations. Finally, molecular storage capacity and kinetic for each pathway is at first line restraining real performance instead of any other improvement at other levels. Records from race constitute a first approach for integrated and non-integrated metabolic system for power supply at muscle fibers. Without drugs influence, they represent the best net effort from the muscular and metabolic machinery of those individuals for different distances. A mathematical modeling was developed for ranges analysis for best performance at different energetic supply rates for establishing tendencies and limits in power. Equations during heterochronism phase reveal speed increase of up to  $a=4.66 \text{ m/s}^2$  ( $R^2=0.9866$ ) until reach a maximum speed of  $11.79 \text{ m/s}$  for few seconds and a global equation for overall performance of  $V=-0.646 \ln(t)+11.097$  ( $R^2=0.9104$ ). Equations by intervals are provided with statistical analysis for each determination with the metabolic interpretation and biological relevance, giving benefits for health during recovering process and evaluation derived from both physical training and fitness and a potential tool for evaluating individual's capacities and discovering of disruptions.

### Biography

Frenkel Guisado Bourzac is an Auxiliary Professor (equivalent to Associate Professor, USA) since 2015 and Assistant Professor since 2007 at Faculty of Natural and Exact Sciences, University of Oriente with more than 12 years of teaching experience. His research is focused at biochemistry and molecular biology, ecotoxicology, enzymology, physiology and sport sciences. He has received his Master of Science degree from UCCFD and PhD is in progress. He has published more than 11 papers in reputed journals with 19 international meetings and congresses participations where others 17 research reports have been published in CD-ROM memories and other scientific journals.

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