Metabolomics Related to Biomechanics

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Editorial

Metabolomics is the scientific study of chemical processes involving metabolism. Metabolism is the general term for the biological reactions to life-sustaining chemical reactions. These reactions allow organisms to grow and reproduce, maintain their structure, and respond to the environment. Metabolism is usually divided into two categories: catabolism can break down large molecules to gain energy (such as cellular respiration) and anabolism can use energy to synthesize various components in cells, such as proteins and nucleic acids. Metabolism is the constant exchange of matter and energy between organisms. Once the exchange of matter and energy ceases, the life of the organism ends.

Chemical reactions in metabolism can be summarized as metabolic pathways that convert one chemical into another by a series of enzymes. Enzymes are very important for metabolic reactions because enzymes can make it viable to react with another thermodynamically susceptible reaction. The metabolism has one kind of specific function to decide which substances are good and which are bad to organism.

For example, some prokaryotes use hydrogen sulfide as a nutrient, but this gas is fatal to animals by Friedrich [1]. The rate of metabolism, or metabolic rate, also affects the amount of food an organism needs. Metabolism has one feature: the basic metabolic pathways are similar regardless of species of any size. For example, carboxylic acids, as the most well-known intermediate in the citric acid cycle (also known as the "tricarboxylic acid cycle"), are present in all organisms, whether tiny single-cell bacteria or giant multicellular Creatures such as elephants by Smith and Morowitz [2]. Such similarities in metabolism are likely to be the result of the high efficiency of the relevant metabolic pathways and the appearance of these pathways in the early stages of evolutionary history [3,4]. According to a study by a Swedish scholar at the European Association for Fat Medicine held in Belgium in 2000, people started to exercise because fat was decomposed and burned. Therefore, the blood flow to adipose tissue increased and reached the highest point in 30 minutes. After the exercise is stopped, the blood flow will drop, but very cleverly, the blood flow will rise again, followed by 5 hours. In other words, every movement, fat will continue to burn 6 hours, the metabolic rate can rise for 6 hours. So that, the sport or biological mechanical phenomena is importance to metabolism.

It is a wide of range refer to the study of biological mechanical phenomena which are included biological limb movement, neuromuscular control, biological blood circulation, breathing, bone mechanics, muscle mechanics, organ mechanics, etc. Biomechanical development is very early in recent years with the mechanical theory and the development of experimental techniques, biomechanical studies from the human body to the body, from the organism to the organs and from tissues to the development of cells, such as tissue mechanics, cell mechanics. Biomechanics is an area of natural science.

It is investigated biology mechanics field and are included with physical body movement, velocity and some other effects by subject to forces.

The Biomechanics is towards many aspects, such as seeking to understand the mechanics of living systems, for an organism, helping to understand its normal function, predicting changes due to alteration, proposing methods of artificial intervention, etc. There are some importance biology developments for Biomechanics field.

William Harvey [5] was the first person to correctly describe blood's circulation in the body. He showed that arteries and veins form a complete circuit. The circuit starts at the heart and leads back to the heart. The heart's regular contractions drive the flow of blood around the whole body. Isaac Newton [6], the most important mechanics law was built by Newton, It is the basic law for all of physical field, and is also suit to Biomechanics and Metabolomics field development. Galileo Galilei [7] His research while at Pisa and Padua was mostly concerned with the problem of motion, in particular motion on inclined planes, of the pendulum, and of freely falling bodies. Giovanni A Borelli [8], Italian physiologist and physicist who was the first to explain muscular movement and other body functions according to the laws of statics and dynamics. Robert Boyle [9] was developed a very important theory for the relationship between volume of gas and its pressure, PV=constant, P is the gas pressure and V is gas volume.

A leading scientist and intellectual of his day, he was a great proponent of the experimental method. Robert Hooke [10], English physicist who discovered the law of elasticity, known as Hooke's law, and who did research in a remarkable variety of fields. Leonhard Euler [11] was provided many useful theories for mathematics, mechanics, optics, fluid dynamics, etc. Thomas Young [12] was presented some of importance theories for material and very known as Young's modulus. The other importance contributions were optics and eye grass for Biomechanics and Metabolomics field development.

Jean Poiseuille [13] who was formulated a mathematical expression for the flow rate for the laminar (non-turbulent) flow of fluids in circular tubes. Hermann Von Helmholtz [14], he is known for his mathematics of the eye, theories of vision, ideas on the visual perception of space, color vision research, and on the sensation of tone, perception of sound, and empiricism. In physics, he is known for his theories on the conservation of energy, work in electrodynamics, chemical thermodynamics, and on a mechanical foundation of thermodynamics. As a philosopher, he is known for his philosophy of science, ideas on the relation between the laws of perception and the laws of nature, the science of aesthetics, and ideas on the civilizing power of science. B...Van der Pole [15] who was made "The nonlinear oscillation mode for heart". In the 60's, van der Pol was already considered as "one of the most eminent radio scientists, a leader in many fields, and one of the pioneers in the theory and applications of nonlinear circuits" which can be used for heart. Marcello Malpighi [16]
was developed some useful methods for Biomechanics and Metabolomics field development, such as tracheae method which is used small holes in skin to breathe instead of lung. Stephen Hales [17] was made the major contributions to a range of scientific fields including botany, pneumatic chemistry and physiology. He was provided the ways to measure blood pressure and was the first person to do such a special job which can be help to Biomechanics and Metabolomics field development. He also invented several devices, including a ventilator, a pneumatic trough and a surgical forceps for the removal of bladder stones. Otto Frank [18] was made several important contributions to cardiac physiology and cardiology. The Frank-Starling law of the heart is named him and Ernest Starling. August Krogh [19] was obtained Nobel Prize in Physiology or Medicine who was investigated many importance phenomena for physiology or medicine, discovered the mechanism to influence metabolism for medicine effects at blood perfusion in muscle and related to arterioles and capillaries. A.V. Hill [20] was another Nobel Prize scientist in Physiology or Medicine for his elucidation of the production of heat and mechanical work in muscles. Recently, there were some of studies made by Hsiao [21-25] which were consider important contributions to cardiac physiology and cardiology. The Frank-Starling law of the heart is named after him and Ernest Starling.

At last, we obtained a conclusion that the biomechanics is an importance relation to metabolism, there are a large related technology and knowledge to solve and to help people to obtain a good living metabolism ways and improvements. Biomechanics has moved from organ level, to tissue level and to cellular level. Mechanics of gene action lies at focus of bioengineering. Metabolomics is the scientific study of chemical processes, but is very deeply influence by the biomechanics relationship. All of the sport or biomechanics from outside or inside body is important to improve the metabolism efficiency. A good sport or biomechanics ways will be helped metabolism, so that the relation with each other is very importance.

References

1. Friedrich C (1998) Physiology and genetics of sulfur-oxidizing bacteria. Adv Microb Physiol 39: 235-289.
2. Smith E, Morowitz H (2004) Universality in intermediary metabolism. Proc Natl Acad Sci 101: 13168-73.
3. Ebenhöh O, Heinrich R (2001) Evolutionary optimization of metabolic pathways. Theoretical reconstruction of the stoichiometry of ATP and NADH producing systems. Bull Math Biol 63: 21-55.
4. Meléndez-Hevia E, Waddell T, Cascante M (1996) The puzzle of the Krebs citric acid cycle: assembling the pieces of chemically warranted reactions, and opportunism in the design of metabolic pathways during evolution. J Mol Evol 43: 293-303.
5. https://en.wikipedia.org/wiki/William_Harvey
6. https://en.wikipedia.org/wiki/Isaac_Newton
7. https://en.wikipedia.org/wiki/Leonhard_Euler
8. https://en.wikipedia.org/wiki/Thomas_Young_(scientist)
9. https://en.wikipedia.org/wiki/Hermann_von_Helmholtz
10. https://en.wikipedia.org/wiki/Balthasar_van_der_Pol
11. https://en.wikipedia.org/wiki/Isaac_Newton
12. https://en.wikipedia.org/wiki/Bgalileo_Galilei
13. https://en.wikipedia.org/wiki/Robert_Hooke
14. https://en.wikipedia.org/wiki/Robert_Boyle
15. https://en.wikipedia.org/wiki/William_Harvey
16. https://en.wikipedia.org/wiki/Galileo_Galilei
17. https://en.wikipedia.org/wiki/Isaac_Newton
18. https://en.wikipedia.org/wiki/Otto_Frank_(physiologist)
19. https://en.wikipedia.org/wiki/August_Krogh
20. https://www.britannica.com/biography/A-V-Hill
21. Kai-Long Hsiao (2013) Energy conversion conjugate conduction-convection and radiation over non-linearly extrusion stretching sheet with physical multimedia effects. Energy 59: 494-502.
22. Kai-Long Hsiao (2016) Stagnation Electrical MHD Nanofluid Mixed Convection with Slip Boundary on a Stretching Sheet. Applied Thermal Engineering 98: 850-861.
23. Kai-Long Hsiao (2017) Combined Electrical MHD Heat Transfer Thermal Extrusion System Using Maxwell Fluid with Radiative and Viscous Dissipation Effects. Applied Thermal Engineering 112: 1281-1288.
24. Kai-Long Hsiao (2017) Micropolar Nanofluid Flow with MHD and Viscous Dissipation Effects towards a Stretching Sheet with Multimedia Feature. Int J Heat Mass Transf 112: 983-990.
25. Kai-Long Hsiao (2017) To Promote Radiation Electrical MHD Activation Energy Thermal Extrusion Manufacturing System Efficiency by Using Carreau-Nanofluid with Parameters Control Method. Energy 130: 486-499.