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RESEARCH ARTICLE

THE SYSTEM MODELS AND HALDEN, BOHR EFFECTS, HAPPENED IN THE MEMBRANE REDOXY POTENTIAL THREE STATE DEPENDENT 9 STEPPED FULL CYCLE OF PROTON CONDUCTANCE IN THE HUMAN BODY

*Ambaga, M., Tumen-Ulzii, A. and Buyantushig, T.

New Medicine Medical University, Ulanbator, Mongolia

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ABSTRACT

By our suggestion, the Halden, Bohr effects have implemented within Eight stage of 9 staged full closed cycle of proton conductance-located in the Respiring tissues -capillary blood which are existed around 87 trillion cells, Pulmonary circuit, where occurred oxygen unloading under effect of increased bicarbonate exit by bicarbonate/chloride ion shift mechanism, leading to increase of protons released from NADH, FADH, reduced KoQ resulting to entry of protons to erythrocyte membrane surroundings, which are inseparable parts- basic components of the System models of the Human body, including the membrane redox potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance, all these processes have been connected with that as the presence of protons from peripheral tissues favors the formation of salt bridges by protonating the terminal His residue of the beta subunits, an increase in protons causes oxygen release, while an increase in oxygen causes proton release, the hydrogen ions (protons) tend to displace the oxygen from the hemoglobin, protons promote oxygen unloading, After making such new interpretation as Ninth stage - of 9 staged close cycle of proton conductance in the location of Respiratory membrane, Pulmonary circuit have been distinguished by oxygen uptake from alveolar air -under effect of increase of bicarbonate entry by bicarbonate / chloride ion shift mechanism and Eighth stage have been functioned in the level of Pulmonary circuit, Respiring tissue characterized by oxygen unloading by bicarbonate / chloride ion shift mechanism, release of oxygen from HbO₂-under effect of exit of bicarbonate by bicarbonate / chloride ion shift mechanism, leading to increase of oxygen in a mitochondrial - 6-thstage was became easy to understand the scientific basis of relationship between Halden, Bohr effects and eighth and ninth stages of closed 9 staged cycle of proton, electron conductance, in such way relationship between Halden, Bohr effects and the System models of the Human body, including the membrane redox potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance.

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INTRODUCTION

We described at first time the System models, including the membrane redox potential three state dependent 9 stepped full cycle of proton conductance including the four compartments, the 10 main functional systems and four types of cells, distinguished by difference of proton conductance by using the new conception as that it is existed a close relationship between following two expressions as Life has become dependent from presence of protons and electrons which were formed during the events called Big Bang 15 years ago and the presence of protons from peripheral tissues favors the formation of salt bridge in histidine residue of beta subunits (Harpers Biochemistry). The buffering capacity of erythrocyte membrane surroundings in relation to free protons, formed in the full cycle of proton and electron conductance inside the Human Body

would be appeared in the 8-th stage of the full cycle as the diffusion of proton from mitochondrial matrix of all cells and metabolic water through plasma membrane of red blood cells also entry of CO₂ from all cells. Quantity of free protons inside of erythrocyte membrane surroundings at 8- stage of cycle would make the remarkable influence to the buffering capacity of erythrocyte membrane surroundings in relation to protons, formed in the full cycle of proton and electron conductance and to diffusion speed of oxygen to 14 trillion cells that is, more protons inside of erythrocyte membrane surroundings more oxygen delivery to body cells by mechanisms as an increase in protons causes oxygen release, while an increase in oxygen causes proton release.

RESULTS AND CONCLUSION

By our suggestion, the buffering capacity of erythrocyte membrane surroundings in relation to free protons, formed in the first 1-7 stages

of proton conductance have implemented within Eight stage of 9 staged full closed cycle of proton conductance -located in the Respiring tissues -capillary blood which are existed around 87 trillion cells,, Pulmonary circuit, where occurred oxygen unloading under effect of increased bicarbonate exit by bicarbonate/chloride ion shift mechanism, leading to increase of protons released from NADH, FADH, reduced KoQ resulting to entry of protons to erythrocyte membrane surroundings, all these processes described as the presence of protons from peripheral tissues favors the formation of salt bridges by protonating the terminal His residue of the beta subunits, an increase in protons causes oxygen release, while an increase in oxygen causes proton release (Harpers Biochemistry, Twenty second edition),The hydrogen ions (protons) tend to displace the oxygen from the hemoglobin (D.J.Taylor et al, Biological science),protons promote oxygen unloading, which are inseparable parts- basic components of the System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance.

The relationship between all parameters of the system models including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also 10 functional systems may be described as follows a first : In the first 1- 7 stages of closed cycle of proton conductance of mitochondrial location have been formed free proton , metabolic water, carbon dioxide and ATP, at second: following to this have been created the possibility to start the 9-th stage of closed cycle, located in the Respiratory membrane - Pulmonary circuit-increase of oxygen uptake from alveolar air -under effect of increased bicarbonate entry by HCO₃ entry and CL ion exit-(bicarbonate / chloride ion shift mechanism), Oxygen entry leading to increase of HbO₂ formation and the 8- th stage of closed cycle, located in the Respiring tissues - Pulmonary circuit -oxygen unloading by HCO₃- exit and CL entry-O₂ exit -Release of oxygen from HbO₂ under effect of exit of bicarbonate by bicarbonate exit/ chloride ion entry shift mechanism, leading to increase of oxygen in a mitochondrial - 6- thstage of proton conductance, which have been conditioned the Energy substrate -Donator entry as fatty acids from third compartment to second compartment, which have been followed by

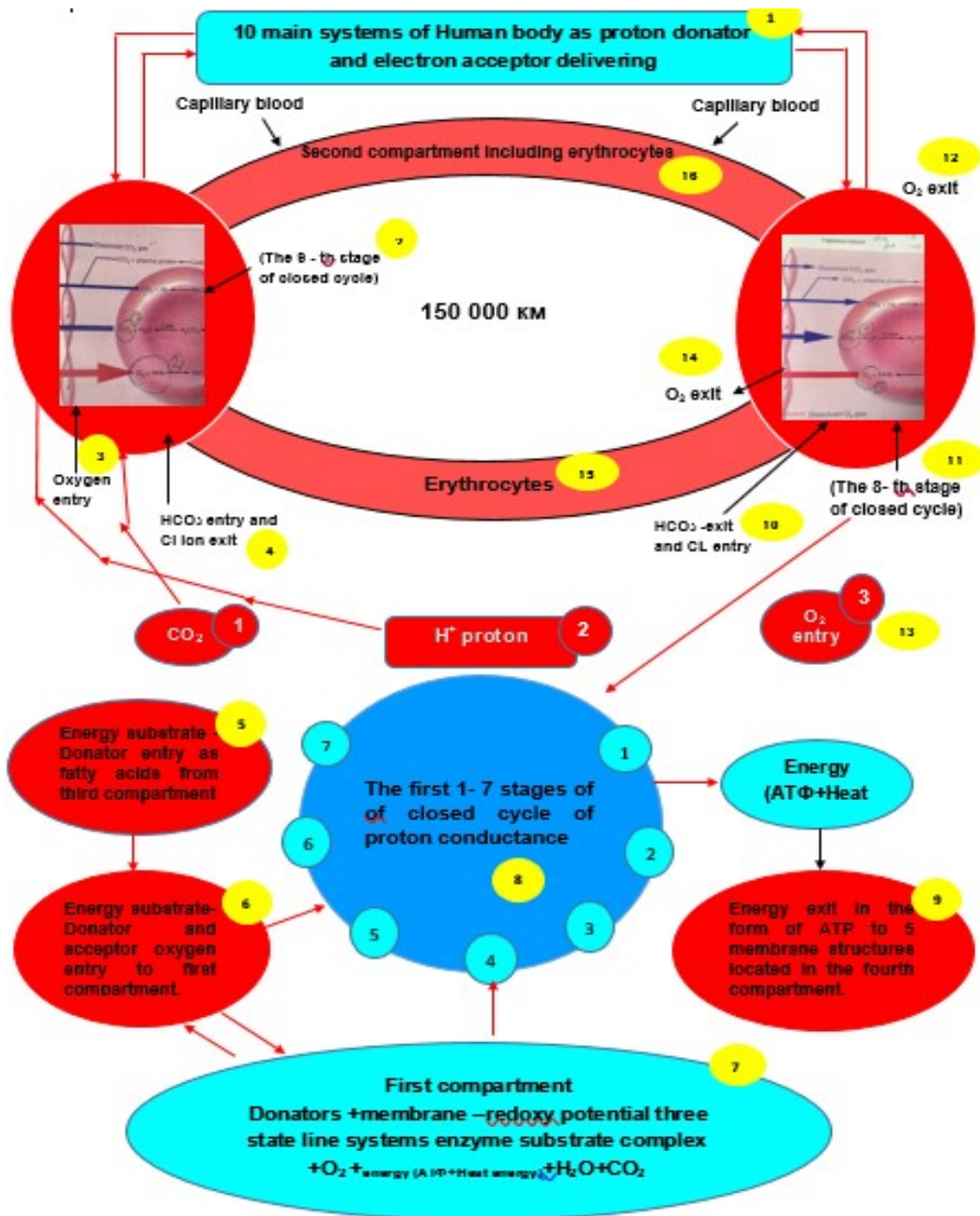


Figure 1. The system models, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, the 10 functional systems

Energy substrate-Donator and acceptor oxygen entry from second compartment to first compartment, where have been formed ATP, owing to formation of ATP in the first compartment have been created the condition to functioning of fourth compartment parameters, as 5 membrane structures-5 function systems, where conducted the normal genetic-cell division, information-response, biosynthetic, bioenergetic, biotransformation functions by using of high energy phosphate - ATP, high energy electrons NADPH, which have existed in the level of all cells of the 10 main systems of Human body as proton donator and electron acceptor delivering. In this connection that we had been established that it is existed a close relationship between following two expressions as Life has become dependent from presence of protons and electrons which were formed during the events called Big Bang 15 years ago and the presence of protons from peripheral tissues favors the formation of salt bridge in histidine residue of beta subunits (Harpers Biochemistry) we are trying to describe the system models, including the membrane redoxy potential three state dependent 9stepped full cycle of proton conductance including the four compartments, the 10 functional systems.

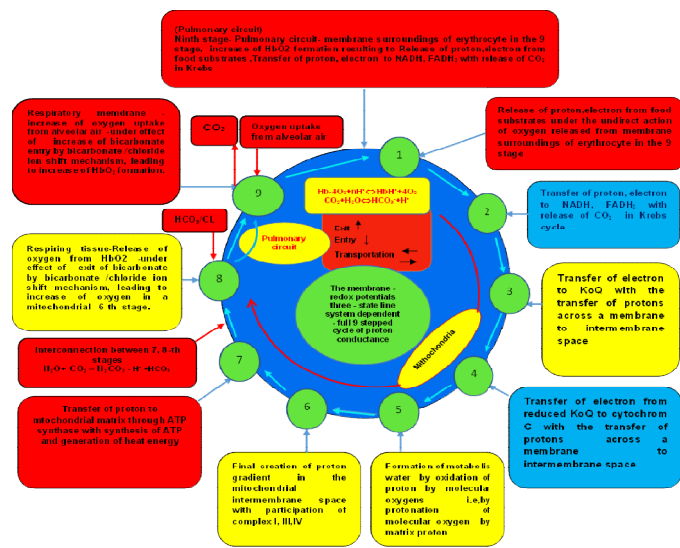


Figure 2. The membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance

1.The System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance have functioned owing to this process as the Bohr effect as hemoglobin's oxygen binding affinity is inversely related both to acidity and to the concentration of carbon dioxide, carbon dioxide reacts with water to form carbonic acid, an increase in CO₂ results in a decrease in blood pH, resulting in hemoglobin proteins releasing their load of oxygen, which should be explained by processes, conducted in the Eighth stage- Respiring tissue - Pulmonary circuit -oxygen uploading by bicarbonate / chloride ion shift mechanism Release of oxygen from HbO₂ -under effect of exit of bicarbonate by bicarbonate/ chloride ion shift mechanism, leading to increase of oxygen in a mitochondrial - 6-th stage,

2. According to the Bohr effect, conversely, a decrease in carbon dioxide provokes an increase in pH, which results in hemoglobin picking up more oxygen, which could be explained by processes, which occurred during Ninth stage of proton conductance located in the Respiratory membrane, Pulmonary circuit-increase of oxygen uptake from alveolar air-under effect of increased bicarbonate entry by bicarbonate / chloride ion shift mechanism, leading to increase of HbO₂ formation, which are inseparable parts- basic components of the System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional

systems, and four types of cells, distinguished by difference of proton conductance.

3. The System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance have been functioned owing to these processes as Deoxygenated hemoglobin is a better proton acceptor than the oxygenated form, in red blood cells, the enzyme carbonic anhydrase catalyzes the conversion of dissolved carbon dioxide to carbonic acid, which been rapidly dissociates to bicarbonate and a free proton, which have occurred during the Eighth stage- Respiring tissue - Pulmonary circuit -oxygen uploading by bicarbonate / chloride ion shift mechanism Release of oxygen from HbO₂ -under effect of exit of bicarbonate by bicarbonate/ chloride ion shift mechanism, leading to increase of oxygen in a mitochondrial - 6-thstage.

4. The Bohr effect facilitates oxygen release in the tissues, particularly those tissues in most need of oxygen, when a tissue's metabolic rate increases, so does its carbon dioxide waste production, when released into the bloodstream, carbon dioxide forms bicarbonate and protons, have occurred during Eighth stage- Respiring tissue - Pulmonary circuit -oxygen uploading by bicarbonate / chloride ion shift mechanism Release of oxygen from HbO₂ -under effect of exit of bicarbonate by bicarbonate / chloride ion shift mechanism, leading to increase of oxygen in a mitochondrial - 6-thstage, which are inseparable parts- basic components of the System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance.

5.The enzyme carbonic anhydrase, which is present in red blood cells drastically speeds up the conversion to bicarbonate and protons, this causes the pH of the blood to decrease, which promotes the dissociation of oxygen from haemoglobin, and allows the surrounding tissues to obtain enough oxygen to meet their demands have occurred during Eighth stage of proton conductance located in the Respiring tissue - Pulmonary circuit -oxygen uploading by bicarbonate / chloride ion shift mechanism, which are inseparable parts- basic components of the System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance, all these processes have been connected with that as the presence of protons from peripheral tissues favors the formation of salt bridges by protonating the terminal His residue of the beta subunits, an increase in protons causes oxygen release, while an increase in oxygen causes proton release,the hydrogen ions (protons) tend to displace the oxygen from the hemoglobin,protons promote oxygen unloading.

6.The Bohr effect enables the body to adapt to changing conditions and makes it possible to supply extra oxygen to tissues that need it the most, such as when muscles are undergoing strenuous activity, they require large amounts of oxygen to conduct cellular respiration, which generates CO₂ (and therefore HCO₃⁻ and H⁺) as byproducts, these waste products lower the pH of the blood, which increases oxygen delivery to the active muscles, if muscle cells aren't receiving enough oxygen for cellular respiration, they resort to lactic acid fermentation, which releases lactic acid as a byproduct, this increases the acidity of the blood far more than CO₂ alone, which reflects the cells' even greater need for oxygen, in fact, under anaerobic conditions, muscles generate lactic acid so quickly that pH of the blood passing through the muscles will drop to around 7.2, which causes haemoglobin to begin releasing roughly 10% more oxygen, which have been occurred in the Eighth stage- Respiring tissue - Pulmonary circuit -oxygen uploading by bicarbonate / chloride ion shift mechanism Release of oxygen from HbO₂ -under effect of exit

of bicarbonate by bicarbonate / chloride ion shift mechanism, which are inseparable parts— basic components of the System models of the Human body, including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance and the four compartments, also the 10 functional systems, and four types of cells, distinguished by difference of proton conductance, all these processes have been connected with that as the presence of protons from peripheral tissues favors the formation of salt bridges by protonating the terminal His residue of the beta subunits, an increase in protons causes oxygen release, while an increase in oxygen causes proton release, the hydrogen ions (protons) tend to displace the oxygen from the hemoglobin, protons promote oxygen unloading.

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