Available Online at http://www.journalajst.com

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN: 0976-3376

Asian Journal of Science and Technology
Vol. 11, Issue, 12, pp.11388-11391, December, 2020

RESEARCH ARTICLE

FATTY ACID OXIDATION AND 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.**

Ulanbator, New Medicine Medical University, Mongolia

ARTICLE INFO

Article History:
Received 17th September, 2020
Received in revised form
29th October, 2020
Accepted 11th November, 2020
Published online 30th December, 2020

Key words:
The full 9 stepped cycle of proton conductance, Krebs cycle Fatty acid oxidation.

ABSTRACT

It should be say that the Acetyl-coA formed during β-oxidation of fatty acids have been oxidized using the Krebs cycle, by such way the fatty acid oxidation became one of parts of Krebs cycle including - the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance having a closed loop figure. It is very interesing that fatty acid oxidation have been conducted in close relationship with membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance, described by us ,which appeared as increase of betta state with high reduction potential in the membrane redoxy potential three state system lead to decrease of fatty acid oxidation because of high level of reduced form of FADH and NADH. The β-oxidation of fatty acids have been happened by using all enzymes responsible for electron transport and oxidative phosphorylation , this is the evolution basis that why fatty acid oxidation became one of parts of Krebs cycle including closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. It should be say that during fatty acid oxidation may be appeared the less effective loss of proton gradients , some protons leak across the membrane, lowering the yield of ATP , owing to increase of unstable gamma state with low level of redoxy potential in the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance having a closed loop figure.

Citation: ***Ambaga, M. Tumen-Ulzii, A. and Buyantushig, T.*** **2020.** "Fatty acid oxidation and the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body", *Asian Journal of Science and Technology*, 11, (12), 11388-11391.

INTRODUCTION

All cells "breathe" by pumping protons (hydrogen ions) across a membrane, would burn food –donators with oxygen,these all are conditioned the generation of ATP (the universal energy currency of life) by using Fatty acid oxidation included reaction medium as "Donators + membrane - redox potentials three - state line system + O_2 + ADP + Pi + H^+ + nH + membrane space = (ATP + heat energy) + H_2O + nH + matrix + CO_2", which is belong to the the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance described by us. The flow of protons through the membrane turbines rotates the stalk of the ATP synthase, and the conformational changes induced by this rotation catalyze ATP synthesis within the reaction medium as "Donators + membrane - redox potentials three - state line system + O_2 + ADP + Pi + H^+ + nH + membrane space = (ATP + heat energy) + H_2O + nH + matrix + CO_2". This process as life hydrogenates carbon dioxide, attaches hydrogen atoms to CO_2 converting carbon dioxide into organic molecules as fatty acids was the evolution basis of forming of Fatty acid oxidation included - reaction medium as "Donators + membrane - redox potentials three - state line system + O_2 + ADP + Pi + H^+ + nH + membrane space = (ATP + heat energy) + H_2O + nH + matrix + CO_2", which is belong to the the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance described by us. *J. E. Walker (1982)* clarified the three-dimensional structure of the enzyme, which consists of one protein group (the F_0 portion) embedded in the inner membrane and connected by a sort of protein stalk or shaft to another protein group (the F_1 portion). The passage of hydrogen ions through the membrane causes the F_0 portion and the stalk to rotate, and this rotation changes the configuration of the proteins in the F_1 portion. *J. E.* Walker's results supported Boyer's "binding change mechanism," which proposed that the enzyme functions by changing the position of its protein groups in such a way as to change their chemical affinity for ATP and its precursor molecules.

RESULTS AND DISCUSSION

At first time, we revealed that the full 9 stepped cycle of proton conductance inside human body, which starts as release of proton, electron from food substrates under the undirect action of oxygen released from membrane surroundings of erythrocyte in the 9 stage by a closed loop Figure.

In the framework of biological events as "the membrane redoxy potential three state dependent 9 stepped full cycle of

proton conductance" would be conducted a following processes as:

Figure 1. The final variant of closed cycle of proton conductance inside human body

In the framework of biological events as "the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance" would be conducted a following processes as:

1. **First stage**: Release of proton, electron from food substrates under the undirect action of oxygen released from membrane surroundings of erythrocyte in the 9 stage.
2. **Second stage**. Transfer of proton, electron to NADH, $FADH_2$ with release of CO_2 in Krebs cycle.
3. **Third stage** - Transfer of electron to KoQ with the transfer of protons across a membrane to intermembrane space
4. **Fourth stage** - Transfer of electron from reduced KoQ to cytochrom C with the transfer of protons across a membrane to intermembrane space
5. **Fifth stage** - Formation of metabolic water in the mitochondrian matrix by oxidation of proton by molecular oxygens i.e, by protonation of molecular oxygen by matrix proton with participation cytochrome C oxidase within complex IV
6. **Sixth stage** - Final creation of proton gradient in the mitochondrial intermembrane space with participation of complex I, III, IV
7. **Seventh stage** - Transfer of proton to mtochondrial matrix through ATP synthase with synthesis of ATP and generation of heat energy
8. **Eighth stage** - Entry of three important factors to erythrocytes as protons are exited in the form of metabolic water from mitochondrial matrix of all cells and entered in the form of HCO_3 through plasma membrane of red blood cells, also entry of CO_2 formed in the 2-stage of closed cycle and entry of oxygen from lung.
9. **Ninth stage** - Proton combine with hemoglobin (generation of HbH) which promotes the release of oxygen from hemoglobin, oxygen diffusion to all cells conditioning the release of proton, electron from food substrates in the 1-stage also proton released from hemoglobin promotes uptake of oxygen by hemoglobin, CO_2 promotes the generation of free proton by mecchanism as H_2CO_3. = $H+HCO_3$, carbonic anhydrase catalyzes the formation of CO_2 from H_2CO_3 and CO_2 diffuse out in the alveoli.

It is more interesting that the β-oxidation of fatty acids in an intra-mitochondrial process, which have been conducted by forming the molecules of Acetyl-coA followed by completely oxidizing with participation of Krebs cycle is functioned normally with the passage of hydrogen ions through the membrane causes the F_0 portion and the stalk to rotate, and this rotation changes the configuration of the proteins in the F_1 portion confirmed by J.Walker and P. D. Boyer. It may be say that the final part of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance including Krebs cycle- mediated fatty acid oxidation should be connected with "binding change mechanism," which proposed that the enzyme functions by changing the position of its protein groups in such a way as to change their chemical affinity for ATP and its precursor molecule confirmed by J.Walker and P. D. Boyer.

Fatty acid oxidation contrary to an oxygen free metabolic pathway as glycolysis ,which are widely occurred indicating that it is an ancient metabolic pathway have been played the important role in the generation of more ATP, NADPH in the reaction medium as "Donators + membrane - redox potentials three - state line system + O_2 + ADP + Pi + H^+ + nH + membrane space = (ATP + heat energy) + H_2O + nH + matrix + CO_2" which is belong to the the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance, owing to participation of oxygen. Before they are oxidized, fatty acids must be activated requiring energy supplied by ATP, in a first step, ATP reacts with the fatty acid to form a mixed anhydride with liberation of pyrophosphate, in a second step, the acyl- AMP formed reacts with coenzyme A-SH to give a thio-ester, the acyl-coenzyme A, in such way, fatty acid oxidation became one of parts of closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. It is very interesing that fatty acid oxidation have been conducted in close relationship with membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance, described by us, which appeared as increase of betta state with high reduction potential in the membrane redoxy potential three state system lead to decrease of fatty acid oxidation because of high level of reduced form of FADH and NADH.

The Acyl-coenzyme A subjected to the pathway of β-oxidation as dehydrogenation under the action of an Acyl-coA-dehydrogenase, a FAD enzyme, with formation of a α-β double bond in trans configuration, hydration of this double bond, catalyzed by enoyl-coA hydratase, with formation of α β-hydroxylated derivative of L-configuration, dehydrogenation by L-β-hydroxyacyl-coA -dehydrogenase, a NAD^+ enzyme, with formation of a β-keto derivative, by intervention of a molecule of coenzyme A, detachment of a two carbon fragment in the form of acetyl-coA, catalyzed by β-ketothiolase. remains an acyl-coA having 2 carbon atoms less than the starting Acyl-coA, these series of reaction have

been served the connective role in order to fatty acid oxidation joined to closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. It should be say that during fatty acid oxidation may be appeared the less effective loss of proton gradients, some protons leak across the membrane, lowering the yield of ATP, owing to increase of unstable gamma state with low level of redoxy potential in the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance having a closed loop figure.

It should be say that the Acetyl-coA formed during β-oxidation of fatty acids have been oxidized using the Krebs cycle, by such way the fatty acid oxidation became one of parts of Krebs cycle including - the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance having a closed loop figure. Each turn of the helix of β-oxidation yields $FADH_2$ and $NADH + H^+$ the reoxidation of which, thanks to the electron transport chain, allows the formation respectively, of 2 and 3 molecules of ATP, in such way, fatty acid oxidation became one of parts of Krebs cycle including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body, described by us. The Acetyl-coA I, formed during fatty acid oxidation have been oxidized by the Krebs cycle with formation of 12 ATP(stearic acid has 18 carbon atoms, its complete oxidation will allow the formation of (8 x 5) + (9 x 12) i.e. 148 ATP), this is one of reason how the fatty acid oxidation became one of parts of Krebs cycle including closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. Beside, fatty acid oxidation have been conducted in close relationship with membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance, described by us ,which appeared as increase of alpha state with high oxidation potential in the membrane redoxy potential three state system lead to intensification of Fatty acid oxidation through high level of oxidized form of FAD and NAD. Fatty acids by containing more carbon atoms per unit weight (148 ATP /18 C) during their oxidation (38 ATP /6 C in case of oxidation of glucose) have been played the role of a larger energy reserves, in such way fatty acid oxidation became one of parts of Krebs cycle including the closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. The β-oxidation of fatty acids have been happened by using all enzymes responsible for electron transport and oxidative phosphorylation, this is the evolution basis that why fatty acid oxidation became one of parts of Krebs cycle including closed loop of the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body. Due to intra-mitochondrial location of β-oxidation, the citrate have been formed by reaction of acetyl-coenzyme A with the oxaloacetate, in such way fatty acid oxidation became one of parts of Krebs cycle including the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance in the human body because the citrate is first donator of Krebs cycle.

REFERENCES

Ambaga M, Tumen-Ulzii A. (2016). Integrated NCM medicine with s-NCM new knowledge, lambert Academic Publishing

Ambaga M, Tumen-Ulzii A (2015). The life become dependent from the presence of electrons and protons, which were formed during events called big bang 15 billion years ago, electrons and protons sets the stage for formation of life in the universe

Ambaga M (2016). The Full Cycle of Proton and Electron Conductance inside the Human Body, Consisting of 9 Linked Stages. Acad. J. Sci. Res. 4(6): 127-131.

Ambaga M (2016). A new suggestion about existing of membrane - redoxy potential three state line system between donators and acceptors inside the living cells, Asian Journal of Science and technology, Vol.07, Issue, 07, pp.3157-3161.

Ambaga M (2016). 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. International Journal of Development Research, Vol 06, Issue, 07, pp. 8458-8461.

Ambaga M (2016). The Full Cycle of Proton and Electron Conductance inside the Human Body and triple Rlung, Mkhris, Badgan theory of Tibetian Traditional medicine, International Journal of Current Research, Vol 8, Issue 08, p.36391-36393.

Ambaga M (2016). The possibility to drive the membrane - redox potential, a three state line system dependent - full 9 stepped cycle of proton conductance inside human body to favorable direction during pathological situations., International Journal of Current Research, Vol, Issue,11, pp 42456-42459, November.

Ambaga M (2017). The membrane - redox potentials three - state line system dependent - full 9 stepped cycle of proton conductance and the evolution based biological mechanism of oxygen utilization –ATP making bioenergy systems, World Journal of Scientific Research and Review, 2017.vol.5,№ 3,march,pp.8-13.

Ambaga M (2017). The membrane - redox potentials three - state line system dependent - full 9 stepped cycle of proton conductance and the evolution based biological mechanism of organ formation , World Journal of Scientific Research and Review, vol.5, № 3, march, pp.1-7.

Ambaga M (2017). The membrane - redox potentials three - state line system dependent - full 9 stepped cycle of proton conductance as the universal metabolic formula and the development of all medical thinking during last 3000 years , Asian Journal of Science and technology, vol.08, Issue,03,pp.4485-4488, March,

Ambaga M (2017). The full 9 stepped cycle of proton conductance and the two basic electron, proton dependent metabolic reaction system of obtaining of ATP, Applied Science and innovative Research, vol.1, No 1, pp 63-68 .

Ambaga M (2017). The bioevolution link between the two basic electron, proton dependent metabolic reaction systems of obtaining of ATP, International Journal of Current Research, vol 9,issue 06,pp.52182-52185.

Ambaga M (2017). The genome size and the two basic electron, proton dependent metabolic reaction systems of obtaining of ATP, *International Journal of Current Research,* vol 9, issue 06,pp.52771-52774.

Ambaga M,Tumen-Ulzii A, (2017). The full 9 stepped cycle of proton conductance and antispiral-like evolutionary back steps from second late evolution time equation to first early evolution time equation during some pathology,

International Journal of Current Research, vol 9,issue 07,pp.54969-54972.

Ambaga M,Tumen-Ulzii A, (2017). The full 9 stepped cycle of proton conductance and the formation of three zones with various degree of disturbances of clockwise normal flow of electrons and protons during shortage of donators and acceptors- Asian Journal of Science and technology, vol.08,Issue,08,pp.5346-5349,

Boyer, P. D. "Energy Capture and Use in Plants and Bacteria. Final Technical Report", University of California Los Angeles (UCLA), United States Department of Energy, (December 31, 1993)

Nick Lane, and William F. Martin (2012), The origin of membrane bioenergetics J.cell, http://dx.doi.org/ 10.1016/j.cell.2012.11.050.

Nick Lane, The vital question (Energy, Evolution and the origins of Complex life) https://en.wikipedia.org/ wiki/Biosphere

Víctor Sojo, Andrew Pomiankowski, Nick Lane (2014), A Bioenergetic Basis for Membrane Divergence in Archaea and Bacteria, Published: August 12, 2014, http://dx.doi.org/10.1371/journal.pbio.1001926

https://en.wikipedia.org/wiki/Glycolysis

https://www.biologydiscussion.com/biochemistry/lipids-biochemistry/oxidation-of-fatty-acids-biochemistry/72756

Walker, J. E.; Saraste, M; Runswick, M. J.; Gay, N. J. (1982). "Distantly related sequences in the alpha- and beta-subunits of ATP synthase, myosin, kinases and other ATP-requiring enzymes and a common nucleotide binding fold". *The EMBO Journal. 1(8): 945–51*. doi:10.1002/j.1460-2075.1982. tb01276.x. PMC 553140. PMID 6329717.

****