



Research Article

THERMOGENESIS AND THE MEMBRANE REDOXY POTENTIAL THREE STATE DEPENDENT 9 STEPPED FULL CYCLE OF PROTON CONDUCTANCE IN THE HUMAN BODY

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Abstract

The influx of H⁺ into the matrix of the mitochondrion and bypasses the ATP synthase channel, uncouples oxidative phosphorylation, and the energy from the proton motive force is dissipated as heat rather than producing ATP from ADP, all these processes have been conducted under influence of increase of unsaturated fatty acids –alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) within amembrane - redox potentials three - state line system reaction medium firstly described by us, which have been functioned in the framework of “Donators + membrane - redox potentials three - state line system + O₂ + ADP + Pi + H⁺ + nH⁺_{membrane space} = (ATP + heat energy) + H₂O + nH⁺_{matrix} + CO₂” which is belong to the the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance. The mitochondria in a eukaryotic cell utilize fuels to produce energy in the form of adenosine triphosphate (ATP), this process involves storing energy as a proton gradient, also known as the proton motive force (PMF), across the mitochondrial inner membrane, this energy is used to synthesize ATP when the protons flow across the membrane through the ATP synthase enzyme is known as chemiosmosis, in endotherms, body heat is maintained by signaling the mitochondria to allow protons to run back along the gradient without producing ATP (proton leak), owing to increase in unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) system within a membrane - redox potentials three - state line system reaction medium firstly described by us. Uncoupling protein in the inner membrane, facilitates the return of the protons after they have been actively pumped out of the mitochondria by the electron transport chain, this alternative route for protons uncouples oxidative phosphorylation and the energy is released as heat , owing to increase in unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three – state system (MRPTS) within amembrane - redox potentials three - state line system reaction medium firstly described by us. Brown adipose tissue or brown fat makes up the adipose organ together with white adipose tissue - beige, are metabolically active in adult humans, produces heat by non-shivering thermogenesis, is crucial for maintaining core body temperature and energy balance, contains more capillaries than white fat, these supply the tissue with oxygen and nutrients and distribute the produced heat throughout the body, all these processes have been conducted under influence of increase of unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state system (MRPTS) within amembrane - redox potentials three - state line system reaction medium firstly described by us.

Keywords: Breastfeeding, Infant, Expressed breast milk.

INTRODUCTION

Thermogenesis can produced by leakage of the sodium-potassium pump and the Ca²⁺ pump, thermogenesis is contributed to by futile cycles, such as the simultaneous occurrence of lipogenesis and lipolysis or glycolysis and gluconeogenesis, in a broader context, futile cycles can be influenced by activity/rest cycles such as the summermatter cycle. Furthermore, in ectotherms that span a wide range of latitudes, the within-species longevity is correlated with how far from the equator an individual lives suggesting that cooler environments lead to increased brown adipose tissue activation and increased lifespan across a wide range of species. The presence of brown adipose tissue was discovered in adults, the supraclavicular, paravertebral, mediastinal remains to be determined whether these deposits are 'classical' brown adipose tissue or beige/brite fat, "classical" brown fat is found in highly vascularized deposits in somewhat consistent anatomical locations, such as between the shoulder blades, surrounding the kidneys, the neck, and supraclavicular area, and along the spinal cord. Thermogenesis is the process of heat production in in all warm-blooded animals, and also in a few species of thermogenic plants such as the Eastern skunk cabbage, the Voodoo lily, and the giant water lilies of the genus Victoria.

The lodgepole pine dwarf mistletoe, *Arceuthobium americanum* disperses its seeds explosively through thermogenesis.

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:

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, FADH₂ with release of CO₂ in Krebs cycle
3. Third stage -Transfer of electron to KoQ with the transfer of protons across a membrane to intermembrane space

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Figure1. The final variant of closed cycle of proton conductance inside human body

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 mitochondrial 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 HCO₃ through plasma membrane of red blood cells, also entry of CO₂ 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, CO₂ promotes the generation of free proton by mecchanism as H₂CO₃. = H+HCO₃, carbonic anhydrase catalyzes the formation of CO₂ from H₂CO₃ and CO₂ diffuse out in the alveoli.

The influx of H⁺ into the matrix of the mitochondrion and bypasses the ATP synthase channel, uncouples oxidative phosphorylation, and the energy from the proton motive force is dissipated as heat rather than producing ATP from ADP, all these processes have been conducted under influence of increase of unsaturated fatty acids –alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) within a membrane - redox potentials three - state line system reaction medium firstly described by us, which have been functioned in the framework of “Donators + membrane - redox potentials three - state line system + O₂ + ADP + Pi + H⁺ + nH + membrane space = (ATP + heat energy) + H₂O + nH + matrix + CO₂” which is belong to the the membrane redoxy potential three state dependent 9 stepped full cycle of proton conductance. The mitochondria in a eukaryotic cell utilize fuels to produce energy in the form of adenosine triphosphate (ATP), this process involves storing energy as a proton gradient, also known as the proton motive force (PMF), across the mitochondrial inner membrane, this energy is used to synthesize ATP when the protons flow across the membrane through the ATP synthase enzyme is known as chemiosmosis, in endotherms, body heat is maintained by signaling the mitochondria to allow protons to run back along the gradient without producing ATP (proton leak), owing to increase in unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) system within a membrane - redox potentials three - state line system reaction medium firstly described by us.

Uncoupling protein in the inner membrane, facilitates the return of the protons after they have been actively pumped out of the mitochondria by the electron transport chain, this alternative route for protons uncouples oxidative phosphorylation and the energy is released as heat, owing to increase in unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three – state system (MRPTS) within a membrane - redox potentials three - state line system reaction medium firstly described by us. Brown adipose tissue or brown fat makes up the adipose organ together with white adipose tissue- 'beige', are metabolically active in adult humans, produces heat by non-shivering thermogenesis, is crucial for maintaining core body temperature and energy balance, contains more capillaries than white fat, these supply the tissue with oxygen and nutrients and distribute the produced heat throughout the body, all these processes have been conducted under influence of increase of unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state system (MRPTS) within a membrane - redox potentials three - state line system reaction medium firstly described by us. Non-shivering thermogenesis occurs in brown adipose tissue that is present in almost all eutherians, having a unique uncoupling protein that allows the uncoupling of protons (H^+) moving down their mitochondrial gradient from the synthesis of ATP, by allowing the energy to be dissipated as heat, owing to increase in unsaturated fatty acids – alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) within a membrane - redox potentials three - state line system reaction medium firstly described by us, which have been functioned by using a “Donators + membrane - redox potentials three - state line system + $O_2 + ADP + Pi + H^+ + nH + \text{membrane space} = (ATP + \text{heat energy}) + H_2O + nH + \text{matrix} + CO_2$ ” system, which is belong to the the membrane redox potential three state dependent 9 stepped full cycle of proton conductance (Ambaga, 2016). All cells of endotherms give off heat, especially when body temperature is below a regulatory threshold, brown adipose tissue is highly specialized for this non-shivering thermogenesis, each cell has a higher number of mitochondria compared to more typical cells, all these processes conducted under influence of increase of unsaturated fatty acids –alpha state as first variant of basic three membrane states of a membrane - redox potentials three - state (MRPTS) within a membrane - redox potentials three - state line system reaction medium firstly described by us, which have been functioned by using of “Donators + membrane - redox potentials three - state line system + $O_2 + ADP + Pi + H^+ + nH + \text{membrane space} = (ATP + \text{heat energy}) + H_2O + nH_{\text{matrix}} + CO_2$ ” which is belong to the the membrane redox potential three state dependent 9 stepped full cycle of proton conductance, contrary to this a increase of in saturated fatty acids – beta state as second variant of MRPTS, lead to decrease the intensity of thermogenesis (Ambaga, 2016).

REFERENCES

- 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.
- Ambaga M. 2016. The Full Cycle of Proton and Electron Conductance inside the Human Body and triple Rlung, Mkhris, Badgan theory of Tibetan 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 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. 2016. A new suggestion about existing of membrane -redox 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, Consisting of 9 Linked Stages. *Acad. J. Sci. Res.*, 4(6): 127-131.
- 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, No. 03, pp.8-13.
- 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 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 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, No. 03, 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.
- 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., Tumen-Ulzii, A. 2016. Integrated NCM medicine with s-NCM new knowledge, *lambert Academic Publishing*.
- Boyer, P. D. 1993. "Energy Capture and Use in Plants and Bacteria. Final Technical Report", University of California Los Angeles (UCLA), United States Department of Energy.
- 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>
- 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.
- <https://en.wikipedia.org/wiki/Thermogenesis>
<https://en.wikipedia.org/wiki/Glycolysis>
https://en.wikipedia.org/wiki/Brown_adipose_tissue
<https://www.biologydiscussion.com/biochemistry/lipids-biochemistry/oxidation-of-fatty-acids-biochemistry/72756>
https://en.wikipedia.org/wiki/Adenosine_triphosphate
