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Self-Study of Cancer Reoccurrence Stress and Effects of Keto Diet and Black Seed Oil

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Abstract: Humans with body health problems seek medical treatment immediately but when they have mind-related problems they are reluctant to seek medical treatment because brain has no pain sensors. When Prefrontal Cortex (PFC) of a human is under stress and it is partially/fully shutdown, Amygdala dominates stopping humans from seeking medical care. Consequently, according to scientific mind model, a Complete Mind (CM) is not available. CM is an algorithm based on EEG data from neuron firing in Microbiome-Gut-Brain-Axis (MGBA). Surprisingly, lack of CM leads to psychological & neurological problems resulting in chronic inflammation that is a leading cause of cancer and heart disease. This paper demonstrates the use of a stress-controlled LEGO robot to detect psychological & neurological problems. The EEG sensors and control electronics present in a Fabric- and/or Tattoo-embedded (or skin-patch-embedded) Micro System (FTIMS) to control the LEGO robot by a mind state (stress, anxiety, empathy, etc.). Earlier demonstrated mind's attention level control of the LEGO robot can be extended for empathy, anxiety, depression, etc., which needs EEG signals from brain parts responsible for these factors. This shows that emotional control of a robot is possible, and thereby open the door to exploring how people can indicate their need for mental health services by their ability or inability to mentally control a LEGO robot.

The research conducted in three phases, (a) multi-sensor EEG for approximate signals coming from different brain parts, (b) accurate identification of brain parts involved certain neurological phenomena using fMRI/EEG system, and (c) study role of EEG signals coming from MGBA identifying role of Microbiome communication with Amygdala, is unique in the world. Ketogenic diet and blackseed oil (Nigella Sativa) are emerging as an effective treatment for most cancers.

I. INTRODUCTION

Current healthcare approaches, for most ailments, seem to focus on treating the symptoms rather than the root cause of many diseases leading to a worldwide rise of health problems related to brain and body. Further health problems can result through prolonged use of prescription drugs. Chronic inflammation [1][2][3] is the major cause of most health problems, especially chronic inflammation in the Microbiome-Gut-Brain-Axis (MGBA). This work shows how scientific mind model [4] and knowledge of Amygdala Scripts (AS) [5] can help mitigate many health problems caused by chronic inflammation in MGBA and personality (AS). As mind can affect chronic inflammation, neurogenesis and lifestyle, a mind-controlled LEGO robot can help identify early psychological/neurological problems if the EEG sensors and control electronics are present in Fabric- and Tattoo-embedded Micro Systems (FTIMS). The technology developed for mind-controlled LEGO robot has already been tested using an attention level mind algorithm, the current research can demonstrate stress- and empathy-controlled LEGO robot using FTIMS technology followed by study of other mind conditions.

II. COMPLETE MIND AND INCOMPLETE MIND MODELS

Fig. 1 shows that Complete Mind (CM), crucial for understanding basic science of brain and body health, can help self-study psychological/neurological problems. Stress affects CM and leads to Incomplete Mind (IM) shown in Fig. 2. IM-based decisions are bad for brain and body health. In fact, if the PFC is shut down by brain due to survival reasons, unique human talent is compromised, and human behavior is comparable to that of an animal.

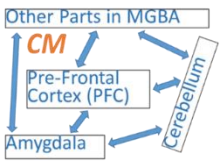

Fig. 1 Complete Mind (CM) model based on MGBA.

The Diet, Environment, Exercise, Prescription-medicine, Sleep and Amygdala Scripts (AS), in a complex manner, affect the stress and chronic inflammation levels. The fundamental personality dependent data, generated by the limbic system in general and Amygdala in particular, affects mind. Thus, the data from Amygdala [5][6], PFC and Cerebellum plays a

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fundamental role in defining the personality, differentiating one human from another. According to scientific mind model [4], the personality algorithm is the leader (decision maker) for all the parts in MGBA.

Fig. 3 shows DEEPSA (Diet, Environment, Exercise, Prescription Medicine, Sleep and Amygdala Scripts) model for Chronic Inflammation (CI) and how it affects mind and vice versa. Diet can contain chemicals, antibiotics, Genetically Modified Organism (GMO), lectins unless it is organic. The environment consists of pollution, trees, lawn, and people. Trees, in addition to supplying oxygen, are source of chemicals in polluted areas. A beautiful lawn may satisfy the ego/amygdala of a human, but it can be source of dangerous chemicals unless an organic fertilizer is used.

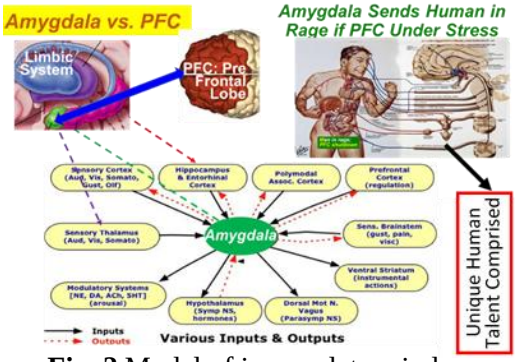

Fig. 2 Model of incomplete mind resulting from stress related shutdown of PFC.

People under extreme stress spread their stress to those who socialize with them due to the mirror neurons effect [8]. Exercise is considered 2nd best medicine for all diseases. Prescription medicine has side effects, is inflammatory and habit forming. Sleep is crucial for good health and it repairs body & brain. AS [5] determine personality and affect behavior. Consequently, the root cause of most diseases/conditions is an extremely complex problem requiring a complex study approach as shown in Fig. 3. The chronic inflammation in MGBA can be affected, positively or negatively, by factors in DEEPSA model as explained in Fig. 3. While the stress affects the chronic inflammation directly, the behavior normally affected by AS is the major factor affecting stress making the cause of health problems very complex. Pre-natal stress [9][10], causing cognitive, behavioral, and psychosocial problems, can also affect AS. This is because fetus's mental health is affected by noise in the womb, mother's mental health and food she consumes.

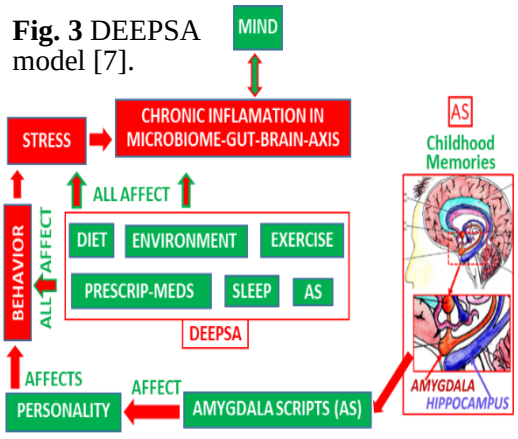

Fig. 3 DEEPSA model [7].

III. MIND AFFECTS INFLAMMATION AND NEUROGENESIS

Normal inflammation is body's self-healing response to kill damaging agents and is crucial for survival, particularly to cope with acute inflammation during our reproductive years. However, chronic exposure to a variety of antigens induces a chronic low-grade inflammatory status (so called 'inflammaging') that contributes to age-associated morbidity and mortality [1]. The key to successful aging and longevity, for all ages, is to decrease chronic inflammation without compromising an acute response when exposed to pathogens. This is because in later life, chronic inflammation can lead to a number of chronic diseases such as atherosclerosis [2][3], type 2 diabetes [11][12], Alzheimer's disease [13], multiple sclerosis [14][15], and osteoporosis [16][17]. Major depression and frailty have a major inflammatory component [18][19]. As mind is the leader of everything a human does, a CM can help decrease chronic inflammation.

The only area of brain where neurogenesis (ability to divide to make new cells) continues throughout life is the hippocampus, an area essential to memory encoding and storage. Neurogenesis increases by learning, exercise [20][21] and sex but decreases with stress, sleep deprivation and aging. Mind can affect aging through controlling stress [22]. The slowdown of biological aging by slowing shortening of DNA telomere through diet, exercise and good sleep is possible [23]. Complete Mind (CM) controls diet, exercise, and good sleep.

AS (Amygdala Scripts) [5][24][25], permanently stored in hippocampus, affect mind and personality. AS can affect neurogenesis through stress. There is some evidence that neurogenesis can also take place in midbrain and striatum [26] areas. Decision making is affected by Amygdala [27][28][29]. Thus, according to the new mind model [4], for an accurate algorithm, one must combine the Amygdala, PFC, and Enteric Nervous System (ENS) data resulting in Personality Algorithm (PA). The role of Microbiome, communicating with amygdala [25], is very important for PA and neurogenesis.

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IV. CM EXTENDS ACROSS MGBA

Recent research shows that chronic inflammation problems can occur anywhere along MGBA [30][31][32]. As the gut is the longest and complicated body part (one of the three body parts along with skin and lungs directly exposed to the outside environment), understanding the implications of its exposure to the outside world, and related chronic inflammation is a huge challenge. For example, the antibody immunoglobulin (Ig) is involved in food intolerance (IgG) and food allergy (IgE). IgG, the most common antibody in circulation in human blood (approx. 75 %) [33], causes Irritable Bowel Syndrome (IBS) and other problems because certain foods have antigens incompatible with IgG [34]. Also, the emotional problems [33], mediated by amygdala scripts [5], become dominant because PFC, being a newer part of the human brain, is more susceptible to psychological and physiological cognitive damages [35] including elderly [36] health.

V. FABRIC- AND TATTOO-EMBEDDED MICRO SYSTEMS (FTIMS)

The self-study of psychological/neural problems focuses on (a) a holistic approach for mind/body data collection using FTIMS and smartphones, (b) thousands of years old meditation and herbal therapies and remedies that tend to cure the cause of health problems without the side effects, (c) the latest research on self-healing and (d) algorithm development for anxiety, stress, and neural problems.

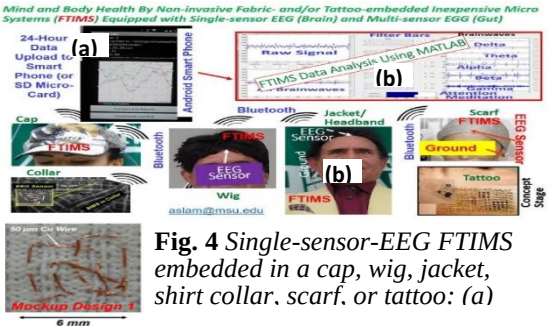

Fig. 4 *Single-sensor-EEG FTIMS embedded in a cap, wig, jacket, shirt collar, scarf, or tattoo: (a)*

In our current/prior work (Fig. 4), we have successfully tested single-sensor-EEG (electroencephalogram) FTIMS embedded in a cap, wig, jacket, or shirt collar. While FTIMS are mostly based on off-the-shelf components, the use of a sewing machine to fabricate 80-micrometer-thick Cu-wire-based EEG sensors (see collar-mounted FTIMS in Fig. 4) are one of the innovations of this work.

VI. PROTECTING PFC

The PFC is most sensitive to the detrimental effects of stress exposure [38][39][40]. This is because the PFC, the most evolved brain region with the highest-order cognitive abilities, is more susceptible to impairment in contrast to older subconscious limbic system of the brain (with amygdala being the emotional center). Even quite mild acute uncontrollable stress can cause a rapid and dramatic loss of PFC cognitive abilities while a prolonged stress exposure causes architectural changes in PFC dendrites [38]. Consequently, an amygdala-mediated or emotional behavior can dominate undermining the logical role of PFC.

Recent research has begun to reveal the intracellular signaling pathways that mediate the effects of stress on the PFC [38]. It has provided clues as to why genetic or environmental insults that disinhibit stress signaling pathways can lead to symptoms of PFC dysfunction. However, the environmental effects dominate according to “genes load the gun, the environment pulls the trigger” [41].

How can the performance of PFC be made more effective to counteract the negative influence of amygdala and amygdala scripts? It is interesting to note that in a normal breathing process only medulla is involved, and PFC plays no role. Yoga and meditation exercises with carefully designed breath-in and -out cycles involve activating PFC’s role in relaxing [41][42] and minimizing amygdala’s stressful emotional role. Without the normal function of PFC, CM is not present as Amygdala’s role will dominate leading to psychological/neurological problems.

VII. MIND-CONTROLLED LEGO ROBOT AS PRE-CURSER FOR SELF-STUDY OF PSYCHOLOGICAL/NEURAL PROBLEMS

The FTIMS led to design and testing of a mind-controlled robot [43] which uses mind’s attention algorithm (Fig. 5). If function F(n) is Fast Fourier Transform (FFT) of EEG data with N points, the Power Spectral Density (PSD), P(n) = F(n) F*(n)/N and the attention level algorithm, $R = E_\alpha/E_\beta$ [44] where E_α and E_β are density functions defined in Fig. 5.

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This technology is applicable to in-home (a) brain/body health monitoring using smartphones and (b) self-study of psychological/neurological health problems. Algorithms for the prediction of depression [45] and other health problems have also become the focus of recent research. Our future research will address most of the factors mentioned in the upper left side of Fig. 6.

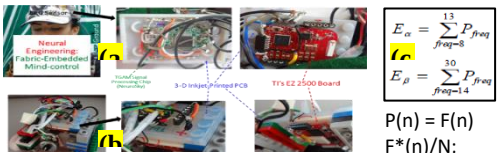

Fig. 5 Cap-mounted EEG sensor and signal processing Microsystem (a), a LEGO robot

EEG data From Specific Brain Parts

Most important aspect of this research is identifying the EEG signal coming from specific brain part/parts. For example, EEG signal coming from parts responsible for empathy for self-study of empathy related problems. Simultaneous EEG and fMRI measurement approach [46][47][48] can identify data from certain brain part or parts, to be investigated in our future work, using the following procedure:

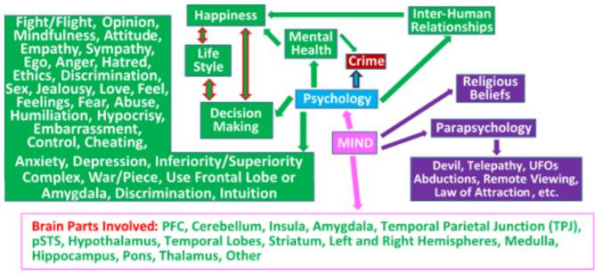

Fig. 6 Suggested model of interrelated factors controlled bv mind as MGBA-data-based

a) Identify the EEG data from brain parts using simultaneous EEG and functional Magnetic Resonance Imaging (fMRI) experiments.
b) Identify sections of data responsible for a particular algorithm (any of the factors mentioned in Fig. 6).
c) Develop algorithm by finding FFT (Fast Fourier Transform) of relevant EEG data.
d) Test these algorithms under different conditions.

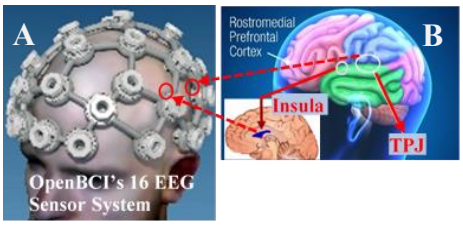

Fig. 7 EEG data collection from TPJ and insula regions 16-sensor OpenBCI [37].

Starting with empathy-controlled robot, other psychological/neural problems can be studied. The neuron firing in MGBA is also applicable to develop algorithms for factors mentioned in Fig. 6 that also shows parts of brain involved for development of algorithms for such factors. For example, empathy algorithm, involving insula and TPJ (Temporal Parietal Junction) [49][50], should be possible using EEG data from TPJ and insula. Following are specific tasks under investigation:

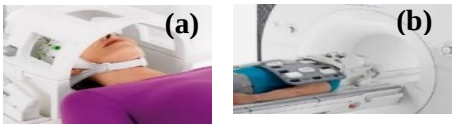

Fig. 8 EEG/fMRI systems; (a) Indiamart and (b) Siemens [37].

(a) Starting with OpenBCI's 8- or 16-sensor EEG systems, as shown in Fig. 7, EEG signal can be acquired from TPJ and insula regions.
(b) Alpha and beta waves, from these regions, can be used to develop empathy algorithm using the FFT approach.
(d) Our work will check if higher EEG signal detected by alpha and beta waves is consistent with part (b).
(e) Explore what regions of scull surface show higher EEG signal under anxiety, depression, etc.
(d) Use simultaneous EEG and fMRI measurement approach [46][47][48] to identify data from a certain brain part or parts using systems shown in Fig. 8.
(e) fMRI can be used to identify parts of the brain involved in the factors mentioned in Fig. 6.

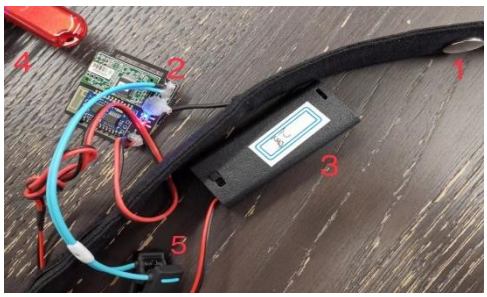

Fig. 9 TGAM brainwave headband and Bluetooth adapter; sensor (1), TGAM chip (2), bluetooth module (3), battery box (4), and bluetooth adapter (5).

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VIII. KEOGENIC DIET, BLACK SEED OIL AND CURRENT WORK

Ketogenic diet (KD) is emerging as an effective treatment for most cancers [51][52][52][54][55][56]. KD is effective as metabolic therapy for cancer treatment by supplying low energy to cells which starve tumor cells [52]. Anti-tumor clinical effects, quality of life in cancer patients and effects of keto diet have been investigated with some questions remaining [53].

KD can treat cancer [54]. Blackseed oil (Nigella Sativa) reduces the cancer growth [57][58][59]. More research continues to study further effects of KD and Nigella Sativa on cancer.

IX. ANXIETY/STRESS ALGORITHM

Figs. 9-11 show the equipment and results of measurements. The measured attention and meditation levels, as shown in Fig. 11, are used to define Anxiety/Stress algorithm; AS = Attention x Meditation.

Early results, obtained on volunteers, show that a very low value of AS leads to high anxiety/stress levels. This technique will be used on cancer survivor volunteers to check their anxiety/stress levels.

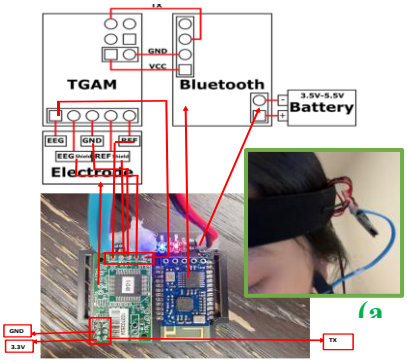

Fig. 10 Neurosky TGAM sensor ASIC module, Bluetooth

X. CONCLUSIONS

As mind can affect chronic inflammation, neurogenesis and lifestyle, a mind-controlled LEGO robot can help identify early psychological/neurological problems if the EEG sensors and control electronics are present in Fabric- and Tattoo-embedded Micro Systems (FTIMS). The early technology developed for attention-controlled LEGO robot has already been tested using an attention level mind algorithm, the current research will first demonstrate an empathy-controlled LEGO robot using FTIMS technology followed by study of other mind conditions. Our current work is focusing on a mind-controlled robot by an algorithm that defines Anxiety/Stress algorithm; AS = Attention x Meditation. Early results, obtained on volunteers, show that a very low value of AS leads to high anxiety/stress.

Recent studies show that ketogenic diet and black seed oil reduce the cancer growth.

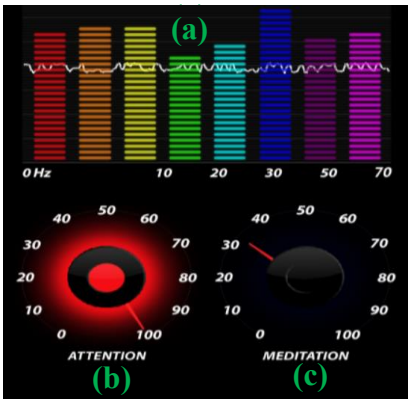

Fig. 11 (a) EEG brain waves, (b) attention level and (c) meditation level.

REFERENCES

[1] Claudio Franceschi, “Inflammaging as a Major Characteristic of Old People: Can It Be Prevented or Cured?”, Nutrition Reviews, Vol. 65, No. 12, 2007.
[2] Libby P. “Inflammation in atherosclerosis”, Nature, 420, 868 – 874, 2002.
[3] Libby P. “Inflammation and cardiovascular disease mechanisms” Am J Clin Nutr, 83(suppl), 456–460, 2006.
[4] Dean M. Aslam, “Intriguing Aspects of New Scientific Mind Model as EEG Data Based Algorithm”, Int. J. Adv. Res. Comp. & Comm. Eng., vol. 8 (12), 2019; DOI 10.17148/IJARCCE.2019.81216 79; https://ijarcce.com/wp-content/uploads/2020/01/IJARCCE.2019.81216.pdf

DOI: 10.17148/IJARCCE.2023.12426

[5] Stokes, Tim, "What Freud Did Not Know', Rutgers University Press, 2013 (Amygdala Scripts mentioned for the first time in this book); https://www.psychologytoday.com/us/blog/what-freud-didnt-know/201002/taming-your-personal-rogues

[6] Dante Cicchetti, "An Odyssey of Discovery: Lessons Learned through Three Decades of Research on Child Maltreatment", American Psychologist, 59(8), 731-741353, 2004.

[7] D. Aslam, "Self-Study and -Care of Human Health Problems Guided by New Scientific Mind Model", IJARCE, 10 (5), 2021; DOI 10.17148/IJARCCE2021.10502.

[8] L. Bonini, C. Rotunno, E. Arcuri, V. Gallese, "Mirror neurons 30 years later: implications and applications", Trends in Cognitive Sciences Review, 26 (9), 767-781, 2022.

[9] A. Charil, D. P. Laplante, C. Vaillancourt, S. King, "Prenatal stress and brain development", Brain Research Reviews, 65 (1), 56-79, 2010; https://doi.org/10.1016/j.brainresrev.2010.06.002

[10] G. Buffa, et al., "Prenatal stress and child development: A scoping review of research in low- and middle-income countries", PLoS ONE 13(12), 2018; https://doi.org/10.1371/journal.pone.0207235

[11] Festa A, D'Agostino R, Jr., Tracy RP, Haffner SM, "Elevated levels of acute-phase proteins and plas-minogen activator inhibitor-1 predict the development of type 2 diabetes: the insulin resistance atherosclerosis study" Diabetes, 51, 1131–1137, 2002.

[12] Pradhan AD, Manson JE, Rifai N, Buring JE, Ridker PM, "C-reactive protein, interleukin 6, and risk of developing type 2 diabetes mellitus" JAMA, 286:327–334, 2001.

[13] Griffin WS, "Inflammation and neurodegenerative Diseases", Am J Clin Nutr, .83(suppl), 470 – 474, 2006.

[14] Josa M. Frischer, Stephan Bramow, Assunta Dal-Bianco, Claudia F. Lucchinetti, Helmut Rauschka, Manfred Schmidbauer, Henning Laursen, Per Soelberg Sorensen and Hans Lassmann, "The relation between inflammation and neurodegeneration in multiple sclerosis brains", Brain, 132, 1175–1189, 2009.

[15] N. Melzer and S. G. Meuth, "Disease-modifying therapy in multiple sclerosis and chronic inflammatory demyelinating polyradiculoneuropathy: common and divergent current and future strategies", British Society for Immunology, Clinical and Experimental Immunology, 175: 359–372, 2013.

[16] Lorenzo JA, Naprta A, Rao Y, et al., "Mice lacking the type I interleukin-1 receptor do not lose bone mass after ovariectomy", Endocrinology, 139, 3022–3025, 1998.

[17] Kimble RB, Matayoshi AB, Vannice JL, Kung VT, Williams C, Pacifici R, "Simultaneous block of interleukin-1and tumor necrosis factor is required to completely prevent bone loss in the early postovariectomy period", Endocrinology,136, 3054 –3061, 1995.

[18] De Martinis M, Franceschi C, Monti D, Ginaldi L., "Inflammation markers predicting frailty and mortality in the elderly, Exp Mol Pathol, 80, 219 –227, 2006.

[19] Raison CL, Capuron L, Miller AH, "Cytokines sing the blues: inflammation and the pathogenesis of depression", Trends Immunol, 27, 24 –31, 2006.

[20] H. van Praag, G. Kempermann and F. H. Gagenature, "Running increases cell proliferation and neurogenesis in the adult mouse dentate gyrus", Nature Neuroscience, 2(3), 1999.

[21] H. van Praag, "Neurogenesis and Exercise: Past and Future Directions", Neuromol Med, 10, 128–140, 2008.

[22] E. S. Epel, E. H. Blackburn, J. Lin, F. S. Dhabhar, N. E. Adler, J. D. Morrow, and Richard M. Cawthon, "Accelerated telomere shortening in response to life stress", Proc Natl Acad Sci U S A, 101(49), 17312–17315, 2004.

[23] E. Blackburn (2009 Nobel Laureate) and Elissa Epel, "The Telomere Effect: A Revolutionary Approach to Living Younger, Healthier, Longer", January 3, 2017.

[24] Dante Cicchetti, "An Odyssey of Discovery: Lessons Learned through Three Decades of Research on Child Maltreatment", American Psychologist, 59(8), 731-741353, 2004

[25] Cowan CSM, Hoban AE, Ventura-Silva AP, Dinan TG, Clarke G, "Gutsy Moves: The Amygdala as a Critical Node in Microbiota to Brain Signaling", Bioessays., 40(1), 2018.

[26] P. Farzaehfar, "Comparative review of adult midbrain and striatum neurogenesis with classical neurogenesis", Neurosci. Res., 134, 1-9, 2018; doi: 10.1016/j.neures.2018.01.002. Epub 2018 Jan 12.

[27] U. Rutishauser "Decision Making: A Role for the Amygdala in Translating Goals into Choices", Current Biology, 26 (22), R1177-R1179, 2016; https://doi.org/10.1016/j.cub.2016.09.050

[28] B. De Martino, D. Kumaran, B. Seymour, and R. J. Dolan, "Frames, Biases, and Rational Decision-Making in the Human Brain", Science, 313(5787), 684–687, 2006; doi:10.1126/science.1128356.

[29] A. Bechara, H. Damasio, A. R. Damasio, and G. P. Lee, "Different Contributions of the Human Amygdala and Ventromedial Prefrontal Cortex to Decision-Making", J. Neuroscience, 19(13), 5473–548, 1999.

[30] Jane A. Foster and Karen-Anne McVey Neufeld, 'Gut–brain axis: how the microbiome influences anxiety and depression', Trends in Neurosciences, Vol. 36 (5), 2013.

[31] S.M. O'Mahony, G. Clarkea, Y.E. Borrea, T.G. Dinan, J.F. Cryana, 'Serotonin, tryptophan metabolism and the brain-gut-microbiome axis', Behavioural Brain Research, 277, 32–48, 2015.

DOI: 10.17148/IJARCCE.2023.12426

[32] Patrice D. Cani, and Claude Knauf, 'How gut microbes talk to organs: The role of endocrine and nervous routes', Mol Metab, 5(9), 743–752, 2016.
[33] https://www.sciencenews.org/article/body%E2%80%99s-bacteria-don%E2%80%99t-outnumber-human-cells-so-much-after-all
[34] Antony J. Haynes, Antoinette Savill, 'The Food Intolerance Bible: A Nutritionist's Plan to Beat Food Cravings, Fatigue, Mood Swings, Celiac Disease, Headaches, IBS, and Deal with Food Allergies', Conari Press, 2008.
[35] Amy F.T. Arnsten, Murray A. Raskind, Fletcher B. Taylor, Daniel F. Connor, "The effects of stress exposure on prefrontal cortex: Translating basic research into successful treatments for post-traumatic stress disorder", Neurobiology of Stress, 1 89-99, 2015.
[36] A. Weil, "Spontaneous Happiness", page 31 (. . "graying of our population" . . "Older people are more" . .), Little, Brown and Co., 2011.
[37] D.M. Aslam, "Neuroscience Engineering Education Using Self-learning by Mind-controlled LEGO Robots", IJARCE, 10 (7), 2021; DOI 10.17148/IJARCCE.2021.10701.
[38] Amy F. T. Arnsten, "Stress signaling pathways that impair prefrontal cortex structure and function", Nature, vol. 10, 2009.
[39] R.M. Shansky and J. Lipps, "Stress-induced cognitive dysfunction: hormone-neurotransmitter interactions in the prefrontal cortex", Front. Human Neurosci., 2013.
[40] C. W. Nordahl, C. Ranganath, A.P. Yonelinas, C. DeCarli, E. Fletcher and W.J. Jagust, "White Matter Changes Compromise Prefrontal Cortex Function in Healthy Elderly Individuals", J Cogn Neurosci., 18(3) 2006.
[41] Krishnakumar, D., Hamblin, M.R., and Lakshmanan, S, "Meditation and Yoga can Modulate Brain Mechanisms that affect Behavior and Anxiety-A Modern Scientific Perspective", Anc Sci., 2(1), pp 13–19, 2015.
[42] Tomasino, B., Chiesa A., Fabbro, F., "Disentangling the neural mechanisms involved in Hinduism- and Buddhism-related meditations", Brain and Cognition, 90, pp. 32–40, 2014. Rhee SH, Pothoulakis C, Mayer EA, 'Principles and clinical implications of the brain-gut-enteric microbiota axis' Nat. Rev Gastroenterol Hepatol, 6(5),306-14, 2009.
[43] http://www.egr.msu.edu/nsferc/40sec-Mindcontrol%20Robot.mp4
[44] Ning-Han Liu, Cheng-Yu Chiang and Hsuan-Chin Chu, "Recognizing the Degree of Human Attention Using EEG Signals from Mobile Sensors" Sensors, 13, 10273-10286, 2013.
[45] J. Wang, J. Sareen, Scott Patten, J. Bolton, N. Schmitz, A. Birney, "A prediction algorithm for first onset of major depression in the general population: development and validation", J Epidemiol Community Health, 1–7, 2014.
[46] S.D. Jackob N. Keynan, Yehudit Meir-Hasson, Gadi Gilam, Avihay Cohen, Gilan Jackont, Sivan Kinreich, Limor Ikar, Ayelet Or-Borichev, Amit Etkin, Anett Gyurak, Ilana Klovatch, Nathan Intrator, and Talma Hendlernm, "Limbic Activity Modulation Guided by Functional Magnetic Resonance Imaging–Inspired Electroencephalography Improves Implicit Emotion Regulation", Biological Psychiatry, 2016; 80:490–496 www.sobp.org/journal
[47] M.S. George, "Is Functional Magnetic Resonance Imaging-Inspired Electroencephalogram Feedback the Next New Treatment in Psychiatry?", Biological Psychiatry, 2016; 80:422–423 www.sobp.org/journal
[48] V. Zotev, R. Phillips, H. Yuan, M. Misaki, J. Bodurka, "Self-regulation of human brain activity using simultaneous real-time fMRI and EEG neurofeedback", NeuroImage, 85, 985–995, 2014.
[49] Tania Singer, Hugo D. Critchley and Kerstin Preuschoff, "A common role of insula in feelings, empathy and uncertainty", Trends in Cognitive Sciences, 13 (8), 2009.
[50] J. Zaki and K. Ochsner "The neuroscience of empathy: progress, pitfalls and promise", Nature Neuroscience, 15 (5), 2012.
[51] Daniela D. Weber, Sepideh Aminzadeh-Gohari, Julia Tulipan, Luca Catalano, René G. Feichtinger, Barbara Kofler, "Ketogenic diet in the treatment of cancer – Where do we stand?", Molecular Metabolism
Vol. 33 (102-121), 2020.
[52] Talib, W.H.; Mahmod, A.I.; Kamal, A.; Rashid, H.M.; Alashqar, A.M.D.; Khater, S.; Jamal, D.; Waly, M. "Ketogenic Diet in Cancer Prevention and Therapy: Molecular Targets and Therapeutic Opportunities", Curr. Issues Mol. Biol., 43, 558–589, 2021; https://doi.org/10.3390/cimb43020042
[53] Maximilian Römer, Jennifer Dörfer, and Jutta Huebner, "The use of ketogenic diets in cancer patients: a systematic review", Clinical and Experimental Medicine (2021) 21(501–536), 2021; https://doi.org/10.1007/s10238-021-00710-2
[54] Keto diet to treat cancer? – With Dr. Angela Poff: https://www.google.com/search?q=videos+keto+for+cancer&rlz=1C1GCEA_enUS994US994&oq=videos+keto+for+cancer&aqs=chrome..69i57.17947j0j7&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:39db196b,vid:t12BbR-7JOE
[55] Cancer and Ketones, Dr. Eric Berg; https://www.google.com/search?q=videos+keto+for+cancer&rlz=1C1GCEA_enUS994US994&oq=videos+keto+f

DOI: 10.17148/IJARCCE.2023.12426

or+cancer&aqs=chrome..69i57.17947j0j7&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:daba2156,vid:zIu7u83BSmI

[56] The ketogenic diet and cancer research | Dominic D'Agostino; https://www.google.com/search?q=videos+keto+for+cancer&rlz=1C1GCEA_enUS994US994&oq=videos+keto+for+cancer&aqs=chrome..69i57.17947j0j7&sourceid=chrome&ie=UTF-8#fpstate=ive&vld=cid:de17aff4,vid:zoKibvj8VBs

[57] M. A. Randhawa and M. S. Alghamdi, "Anticancer Activity of Nigella sativa (Black Seed) — A Review", The American Journal of Chinese Medicine, 39(6), 1075–1091, 2011; DOI: 10.1142/S0192415X1100941X ; https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=df754d1d53922e57089dc804ca6e1d101ae7d717

[58] E. S. Al-Sheddi1, N. N. Farshori1, M. M. Al-Oqail, J. Musarrat, A. A. Al-Khedhairy, M. A. Siddiqui, "Cytotoxicity of Nigella Sativa Seed Oil and Extract Against Human Lung Cancer Cell Line", Asian Pac J Cancer Prev, 15 (2), 983-987, 2014 ; DOI: http://dx.doi.org/10.7314/APJCP.2014.15.2.983

[59] Y. Khurshid, B. Syed, S. U. Simjee, O. Beg and A. Ahmed, "Antiproliferative and apoptotic effects of proteins from black seeds (Nigella sativa) on human breast MCF-7 cancer cell line", BMC Complementary Medicine and Therapies, 20:5, 2020; https://doi.org/10.1186/s12906-019-2804-1