MAGNETIC FIELDS IN HUMANS DUE TO NEURONS

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Abstract

The research study is based on the magnetic field in humans due to neurons. The discussion of "Magnetic field in humans due to neurons" emphasises developing ideas about microtubules and the way to translate information to the human brain cortex through electrophysiologic impulse. The introduction chapter involves the discussion of problem statements, aims and objectives of this research process with methodology. The literature review chapter is associated with the discussion of relevant topics with the pros and cons of the magnetic fields on cytoskeleton microtubules. The research methodology chapter has focused on the secondary qualitative data sources and thematic analysis data type to conclude accurate results for the research study. On the other hand, the research finding theme has analysed the advantages and disadvantages of the magnetic field. Further, research findings have been stated to discuss the research topic to find out the possible outcomes. There is a certain limitation that needs to be reduced to overcome the consequences in the human nervous system.

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Outline

The research introduces magnetic fields' impact on the human body and leads to death with the specification of aims and objectives. The research consists of the identification of impacts of magnetic fields on cytoskeleton microtubules, discussion of MRS and MRI, and effects of the cytotoxic and shape-based magnetic domain for analysing critically. The research methodology has discussed the secondary qualitative data analysis method. The result and discussion part include a brief description and analysis of the themes of the relevant topic. The recommendation part specifies key factors for developing a research project and limitations describes ethical considerations and problems in this research process.

Introduction

The research paper is based on the analysis of magnetic fields as the result of human death. This research project aims to elaborate on different activities of the magnetic field in the biological system, mainly the human body to identify the signs of human death by a magnetic field. The research process emphasises understanding the connection between a magnetic field and the human brain to interlink the relevant topic and reach objectives and findings. The magnetic field created by a high frequency of MRI, MRS, and other sources of the radiofrequency devices leads to increased friction of nanomagnetic particles that create mechanical friction.

Most of the external stimuli increase leaking which leads to creating high frequency and mechanical stimulation in the human brain. Through this, the human body faces a lot of problems such as brain tumours, brain cancers, and other stress-related issues. Moreover, anticancer activity such as chemotherapy increases cytotoxic effects in the human body that damage cancer cells as well as natural cells. The damage to natural cells reduces the repairing capacity of the biological system. The continuous growth of the cytotoxic effects reduces brain efficiency which contributes to the death of the human brain. MIR and Mrs increase the magnetic frequency of the human brain as well as damage ears. The loud noise of MRI increases the stress level of human that impact human brain efficiency and performance rate. The research process was conducted through the secondary data analysis process. The secondary qualitative data analysis process has followed thematic analysis of relevant topics to find out relevant factors to reach the aims and objective of this research project. The thematic analyses of the relevant topic have specified the concept of Magnetic frequency that increases the mechanical stimulation in the biological body. An increase of mechanical stimulation for magnetic frequency leads to enhancing the high rate of electric current and potential ion channel. Potassium channels and ions increase friction and mechanisation stimulation that increases the stress level of the human brain. Moreover, magnetic field and elect6ric current lead to enhance pressure that causes brain dysfunction and psychological effects. Anticancer activity creates a magnetic field that damages cells and reduces the potentiality to repair. The shape-based magnetic domain is associated with the modification of the “three-terminal magnetic tunnel junction” that helps to create artificial neurons in the human brain. The magnetic field is not involved with human death directly but it causes many diseases such as brain tumours, and cancers by impacting biological function that leads to human death.

Literature review

Impact of the magnetic field inside and its effect on the cytoskeleton microtubules

Static magnetic fields induce impact in human brains through influencing the processing of membrane channels utilising different equipment. As per the study by Wyszkowska *et al.,* (2019), the Energy magnetic is associated with the development of a magnetic field that is mainly applied for in-humongous activity. As per the perspective of Le Bihan (2020), gradients of energy magnetic create pressure that contributes to generating surface tension. As cited by Yakir-Blumkin *et al.,* (2020), the Surface tension in the human brain's magnetic fields leads to surface delimiting that makes an electrostatic magnetic field which controls the activation,

deactivation and inactivation mechanism of the human membrane. As per the opinion of Darwish and Darwish (2022), the small mechanical force is created by surface pressure within 10^{-1} to 1 mNm^{1}. As per the view of Röösli and Jalilian (2018), pressure and surface tension is the reason for creating active voltage with potassium channels in biological membranes. Stretch-activated of different kinds of ions in potassium channels due to mechanical forces' impact on biological tissues.

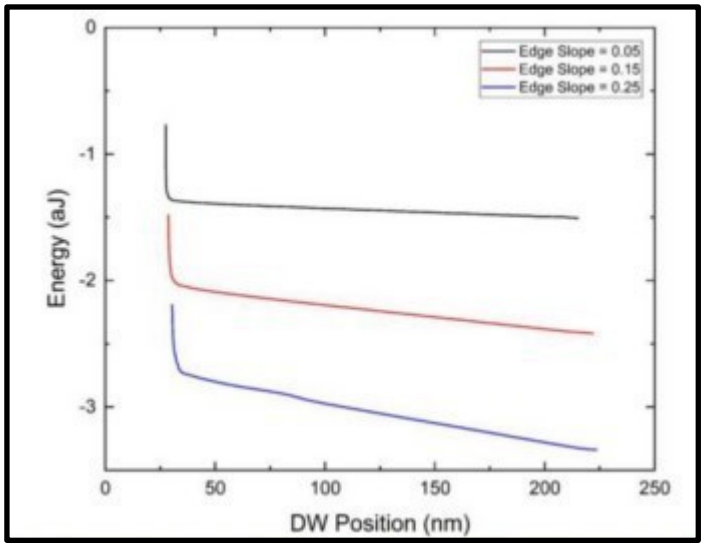

Figure 1: Projection of energy created by the mechanical stimulation process

(Source: Murphy, 2019)

Virtually, channels created by mechanical forces help to modify the activity for regulating stress levels of human brains through managing pressures in recur time. As per the viewpoint of Röösli and Jalilian (2018), the activity modification for regulating stress levels is known as a mechanical stimulation process that involves managing mechanisms of static magnetic fields. The mechanical stimulation process is associated with maintaining static magnetic fields to maintain the effects on the biological system through managing the stress level of the human brain. As per the view of Murphy (2019), brain cells include electric properties and Ionic correct presents in the cell membrane of a biological system. As per the research of Medeiros *et al.,* (2020), "Magnetoencephalography observations" aims to identify the process of magnetic field creation and its impact on human brains with the estimation of presynaptic current. As per the statement of Keliris *et al.,* (2019), magnetic movements through creating a continuous magnetic field and presynaptic current lead to "biological chemical reactions". As per the statement of Medeiros *et al.,* (2020), "biological chemical reactions" create frictions and "superparamagnetic nanoparticles". Magnetic movements make stress in membranes and gradients that increase the stress level of the human brain.

MRS and MRI of the human brain a magnetic field

MRS stands for "magnetic resonance spectroscopy" which is associated with detecting chemical composition through scanning tissues. In the context of Trifunovic (2020), MRI known as "magnetic resonance imaging" involves with measure radiofrequency for translating anatomic images. As per the research of Murphy (2019), "Magnetic resonance spectroscopy" is a non-invasive technique that is mainly used for measuring the chemical composition of tissues considering physical principles. As per the understanding of Möller *et al.,* (2019), MRI is associated with energy exchange and creating anatomic images with the help of radiofrequency through representing nemouras value regarding the emitted signal. MRS helps to produce information for displaying graphical images through different chemical detection and scanning processes. MRS works with MRI for generating images and developing insight on voxel of interest. According to the statement of Niiyama *et al.,* (2018), the voxel of interest represents the image of the human brain that is scanned by MRI equipment and the image can be modified by using the software.

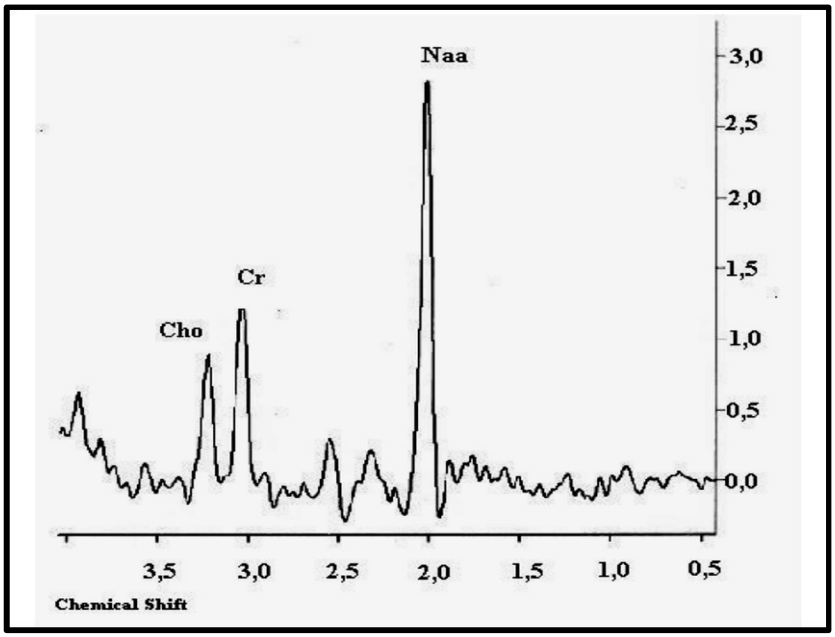

Figure 2: Statistical impacts of MRI and MRS on the human brain

(Source: Skaist, 2019)

MRS provides information about the chemical composition of tissues and the brain on a voxel of insight. As per the article of Lin *et al.,* (2021), MRI helps to identify the different condition of the human brain such as swelling, bleeding, and problems that helps the doctor to diagnose infection, damage, tumours, and inflammation and stack in blonde vessels. As per the observation of NAKAMACHI *et al.,* (2019), during the time of scanning, it makes a loud noise

creating a magnetic field that makes it difficult for hearing making issues and defects in human ears. For that proper protection of ears during MRI is needed otherwise it makes ears defects. The noise of the magnetic field during MRI leads to creating more problems by affecting the nerves of the human brain. As per the study by Skaist (2019), the magnetic field of MRI causes nerve stimulation and problems in the peripheral muscle that makes a twitching sensation. Moreover, radiofrequency in MRI contributes to a heating body that also impacts biological systems and the human body.

The rapid growth of cytotoxic effect by oscillating magnetic field in human due to neurons

Cytotoxic refers to a substance that damages biological cells and causes cells to die. Cytotoxic comes from a chemographic drug that helps to damage cancer cells. As cited by Zhao *et al.,* (2020), cytotoxic growth is associated with shrinkage of cell size and stopping the spread of cancers through damaging and killing cancer cells. As per the study by Losero *et al.,* (2022), the cytotoxic effect increased through an anticancer activity that creates magnetic nanoparticles. Cytotoxic effects create cellular dysfunction that creates static magnetic. As per the opinion of Vila (2019), cellular effects lead to the alternating potentiality of the membrane through damaging normal and cancer cells.

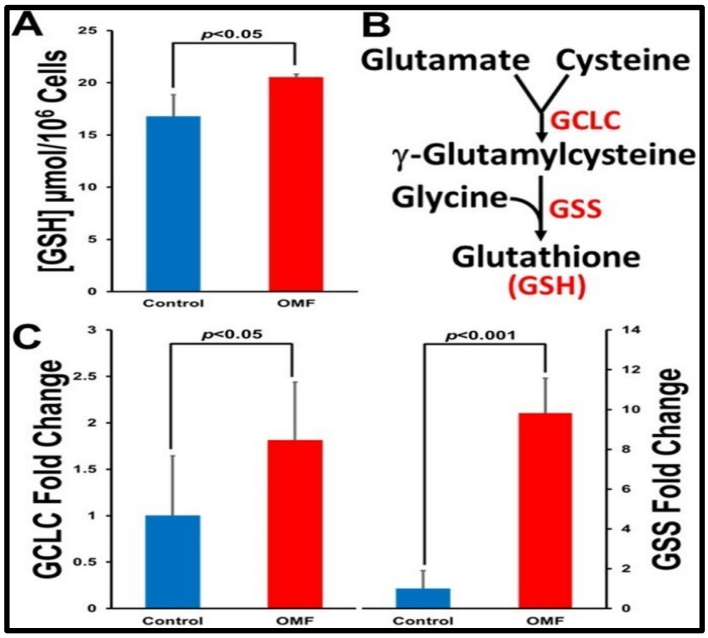

Figure 3: Project of cytotoxic effect in the human brain

(Source: Cichon *et al.,* 2020)

Damaging normal cells affects the human body through the depolarising membrane. As per the perspective of Georgiev (2021), cytotoxic include nanomagnetic particles that create a static

magnetic field in the human body. In the case of brain cancers, the static magnetic particles with anticancer activity increase the number of cytotoxic that create more stress and different chemical reactions in the brain. As per the viewpoint of Cichon *et al.,* (2020), depolarisation effects by the anticancer activity kill normal cells with cancer cells that impact the repair capacity of cells in the human biological system. Static magnetic field kills tumour cells and damages microvascular endothelial cells of the human brain that create barriers between the brain and blood.

A shape-based magnetic domain that drifts control over magnetic tunnel junction in humans due to neurons

Spintronic devices are based on shape-based domain walls of ferromagnetic wire that involve neuromorphic information processing systems. As cited by Wyszkowska *et al.,* (2019), neurons need external stimuli for stimulating functional factors of the human brain and managing leaking. In the context of Keliris *et al.,* (2019), external stimuli in the creation of neurons in the human brain are associated with creating electric current and magnetic field that takes leak ion fundamental function. As per the opinion of Yakir-Blumkin *et al.,* (2020), magnetic fields and current lead to reduced efficiency and intelligence of the human brain through the increasing complexity of fabrication.

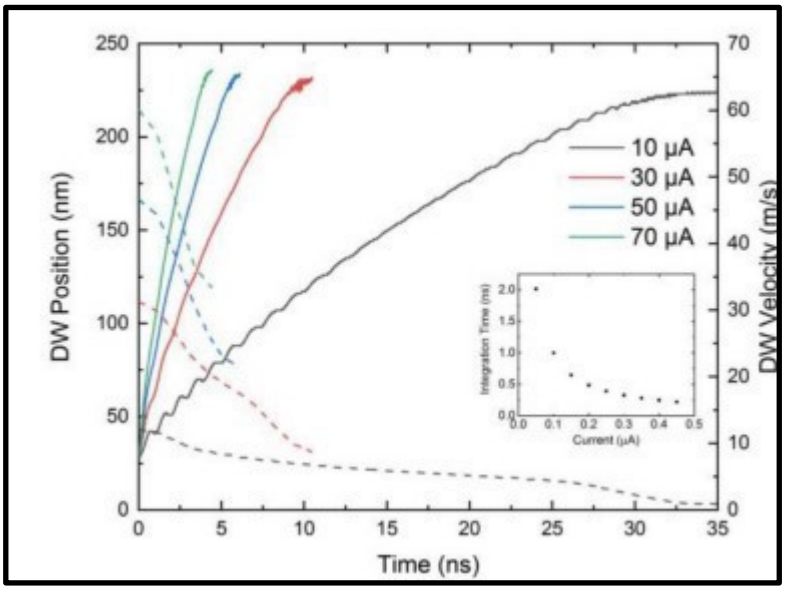

Figure 4: Impact of Shape-based magnetic domain drift

(Source: Trifunovic, 2020)

Shape-based magnetic domain modifies the "three-terminal magnetic tunnel junction" of neurons that makes difficulties in efficiency without using any external stimuli by providing leaking function in a biological system. As per the perspective of Darwish and Darwish (2022),

shape-based magnetic domain drift integrates leaking behaviour by producing a current and magnetic field that reduces the leaking of external stimuli. Friction in the magnetic field creates noise. As per the viewpoint of Le Bihan (2020), integration of leaking and creating noise increases the velocity of non-magnetic particles that improve spintronic LIF neurons. As per the understanding of Trifunovic (2020), the ferromagnetic layer and electric current induce the leaking of neurons. The improvements in neuron leaking increase the power of fabrication and decapitation that impact "neuromorphic information processing systems".

Analyse the stimulation of magnetic field in human due to neurons

The static magnetic field is associated with regulating activation, and deactivation mechanisms that create voltage and potassium channels. According to the statement of Möller *et al.,* (2019), the creation of potassium channels and voltage leads to increase mechanical stimulation by making a gradient field in the biological system. As per the article of Niiyama *et al.,* (2018), radiofrequency through using mobile phone increase the possibility of acoustic neuroma, and brain tumour. The magnetic field created by radio frequency leads to appear brain tumours and the possibility of brain cancer also. As per the observation of Lin *et al.,* (2021), "Intermediate Frequency Fields" cause health issues by making hazards in frequency rate.

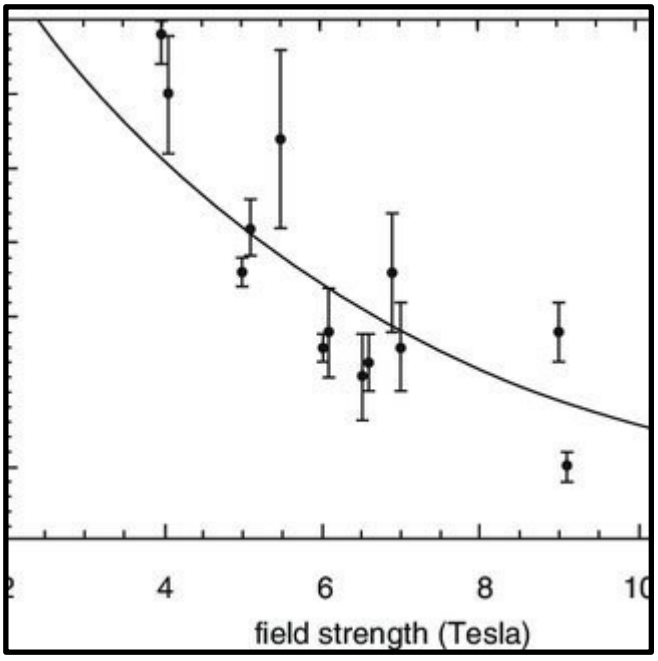

Figure 5: Projection of stimulation of magnetic field in human due to neurons

(Source: Skaist, 2019)

Intermediate Frequency Fields create high-frequency magnetic fields of more than 300 Hz that create mechanical stimulation in the brain. As per the study by NAKAMACHI *et al.,* (2019), frequency variation increases stress levels and causes brain cancer. The magnetic field of

cytotoxic effect is associated with damaging cells that contribute to making many chemical reactions which is the reason humans die. As per the opinion of Zhao *et al.,* (2020), magnetic fields and chemical reactions create stimulation and chemical reactions that increase toxicity in the human body. Radio magnetic fields created by radiation damage brain cells and DNA that are recognised as a reason for human death.

Methodology

In terms of executing the research successfully, the researchers must follow the research process systematically. In the context of Chen *et al*. (2018), a research framework and proper procedures are important for meeting research aims and objectives. This research has followed the "Explanatory research design" to predefine different factors that are based on the recent scenario of the research study. Therefore, in the case of "realism research philosophy", the explanatory research design is used to analyse the study. In the research process, several attributes need to be extracted to justify the information. Different information from articles and journals has been analysed in terms of the magnetic field in human due to neurons. On the other hand, research strategy is the process that needs to be followed while conducting the research. In terms of meeting the research aims and objectives, it is essential to select an appropriate research strategy. Proper data collection and research methods can help in developing the best direction for conducting the research study (Budinger and Bird, 2018). The research has followed secondary qualitative data to extract reliable sources of literature. The data collection process is the most critical part of the research process. Through a collection of data, any research can be identified to link with the “thematic analysis techniques”. In the case of secondary qualitative research, thematic analysis has been conducted. Hence, different secondary data sources like journals and articles have been selected to conduct the research study. The data collected from journals and articles have been selected from the relevant research topic (Chen *et al*. 2018). Therefore, authentic data and trustable sources have been considered to analyse the terms of a magnetic field in human due to neurons. Hence, assured data from all sources and provided authentic sources to perform the research study.

Results

Theme 1: Major effects of the magnetic field and its impact on the cytoskeleton microtubules

In the research study, the impact of neuronal microtubules can be translated and input can be carried out through magnetic fields entering into human brain cells. In the context of Georgiev

(2021), the investigation of the magnetic field structure in different neuronal departments has shown a major impact on the cytoskeleton microtubules. These results can be accessed through "electrophysiological measurement" in human neurons. Hence, secondary qualitative data analysis has provided authentic data related to the effects of magnetic fields and information related to microtubules. Information has shown that the magnetic field is too fragile to input information to "microtubules" and cannot sustain the "quantum hall effect".

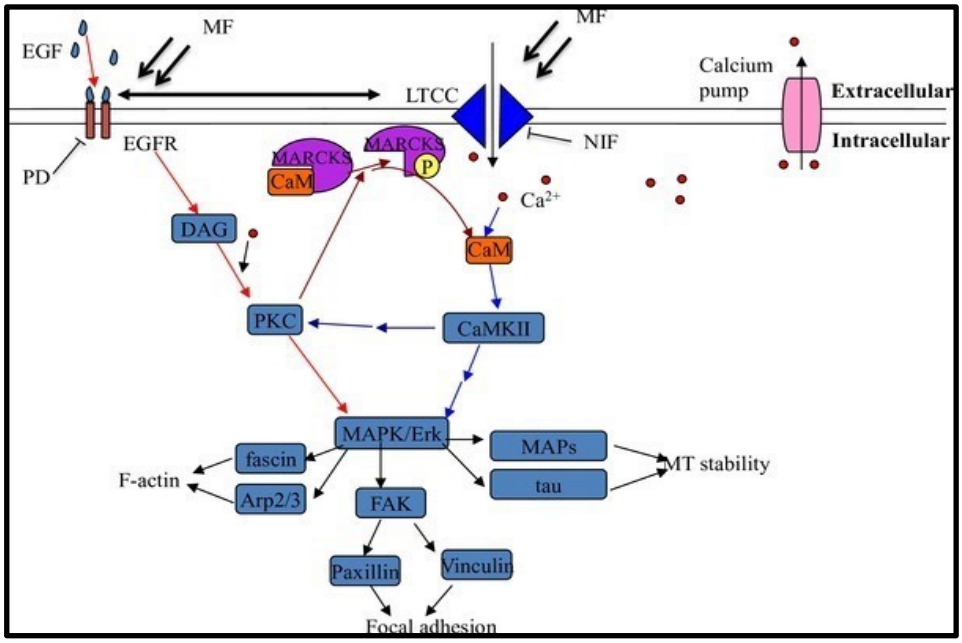

Figure 6: Weak power frequency includes microtubule cytoskeleton

(Source: Journals.plos.org, 2018)

On the other hand, the magnetic flux density of a person spikes in 3 orders of "magnitude" is weaker than the "Earth magnetic field". The magnetic field in the human brain cells carries a biological impact and acts upon "transmembrane voltage ion" channels to govern the action of the neuron (Elyasigorji *et al*. 2022). The human neuron is supported by the "sub neuronal processing" for providing information in the microtubules of the human brain and interacting with the local magnetic field.

Theme 2: Specify the portable magnetometry for detecting magnetic field in human due to neurons

The development of the magnetic field in the human brain can be detected through biomedical applications. As per the observation by Murzin *et al.* (2020), this application focused primarily on magnetic noise reduction and design improvement to limit the values of neuron detection. The usage of magnetic field sensors in detecting human neurons is magnetic tomography, magnetic neurography, Magneto cartography, and magneto myography. This research study

has focused on all the aspects that are related to the magnetic field in human due to neurons. Data sources collected from secondary qualitative data have provided a clear overview of the recent studies in this field. Hence, there are different types of magnetic field sensors that include giant Magneto impedance, spin wave interferometer, Hall Effect, and many more. Therefore, the general application of magnetic field sensors in human neurons or biomedicine is limited and requires a special environment for the process. Specific portable magnetometry is used to detect relatively low "biometric signals" from tissues and organs (Toida *et al*. 2022).

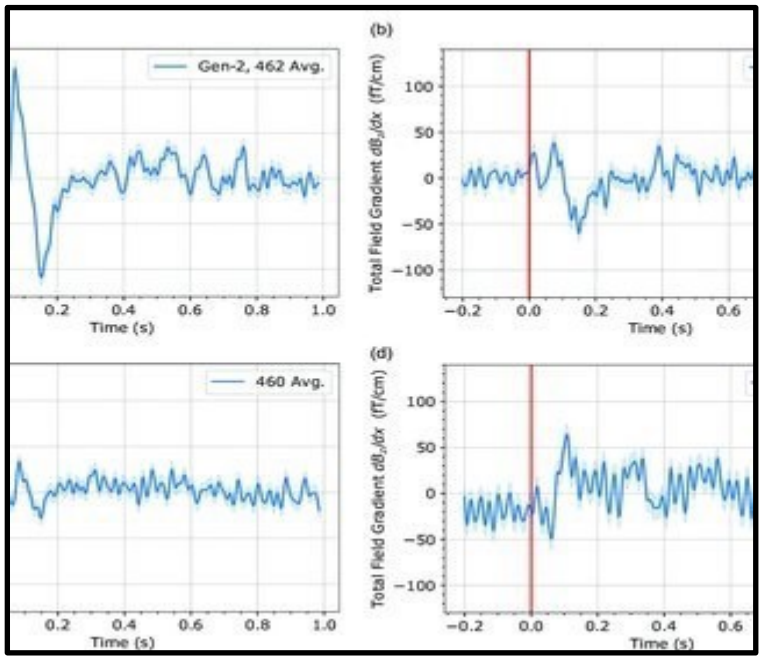

Figure 7: Portable magnetometry for detection of Biomagnetism

(Source: Researchgate.net, 2020)

"Magnetoencephalography" provide relatable information about the "time-varying" activities of human brains. Recent studies have concluded that the development of "point-of-care devices" for diagnosing human neurons is important. Certain biological and magnetic objects are generally "non-ferromagnetic" and are the latest development in the field of nanoparticle systems. In addition, the collection has been linked with thematic data analysis to focus on the development of magnetometry in magnetic field diagnostics.

Theme 3: Identity magnetically drives micro in humans and their stimulation in neurons

The research study is based on the magnetic field stimulus that is induced to change neural activities with different parameters. As per the view of Mukesh *et al*. (2019), the main goal of performing these studies is to build an appropriate result from the collected data. Previous research study has suggested that magnetic stimulation may lead to the development of the performance of "cochlear implants". Therefore, magnetic stimulation in neurons is assessed

using a “micro-scale coil”. Magnetic drives are used to detect small changes in the activities of neurons and substrate MEAs are used to measure the responses to stimulation. Initial findings of the research study have shown a magnetic stimulation that is associated with the changes in network firing rates. The collected secondary qualitative data sources have suggested that magnetic stimulation has been used to evoke neural activities in the human brain.

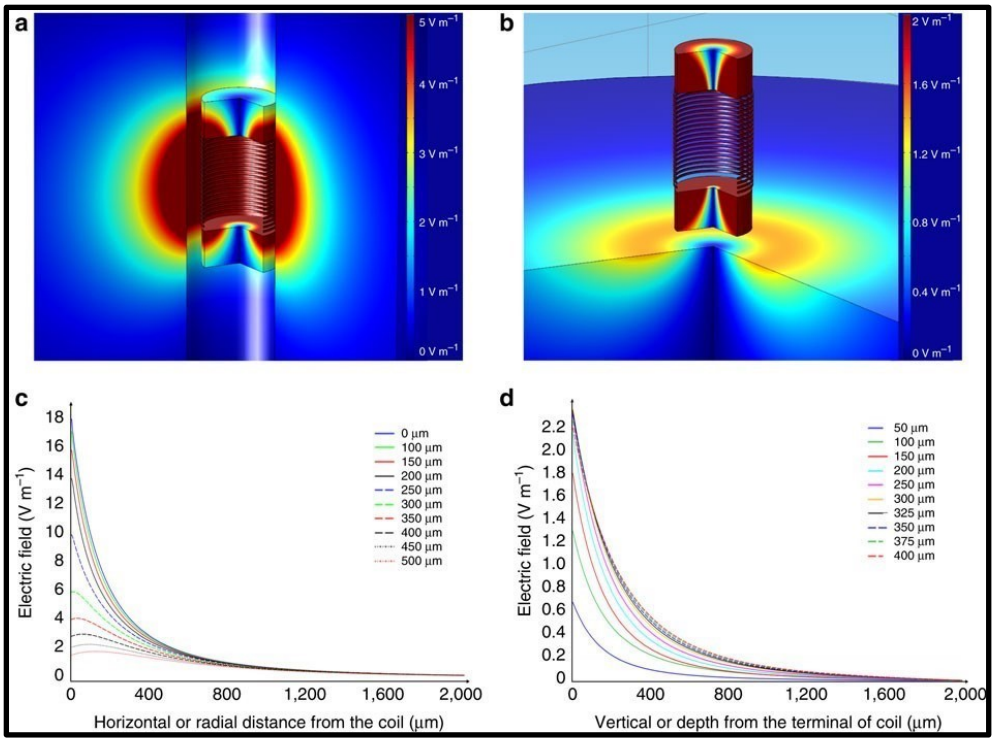

Figure 8: Microscopic magnetic stimulation of neural tissue

(Source: Nature.com, 2022)

Further, it has been observed that substantial differences in neural activities induced differences in culture along with different parameters of stimulation. As per the research by Mukesh (2018), this difference can be analysed through differences in numbers and activities of neurons. This gets activated by differences in stimulus pulse, differences in alignment and location, and differences in “cell morphology”. On the other hand, the researchers have focused on the heating and power consumption of these stimulation techniques. An optimised research setup was conducted to identify the mechanism of the magnetic field in human due to neurons, to reach definite results. The “state-of-the-art” cochlear implants are considered to be the best option that uses magnetic stimuli to convey messages to human neurons.

Discussion

In the research study, researchers have stated that human MRI scanners at "ultra-high magnetic field" have strengths of 7T and increasing availability in the "neuroscience community". From the above findings themes, it has articulated that ultra-high field MRI increases the spatial resolution with acquired data. As per the understanding by Dumoulin *et al*. (2018), research findings have remarked that by applying "nuclear magnetic resonance" the study is a biological process. Previous research conducted in this field has provided several solutions on these platforms. This solution demonstrated the significant advantages in "signal-to-noise-ratio" and biological information. Therefore, the primary difference from the magnetic field is the deviation from the field regime and correspondence to "hydrogen resonance conditions". These uniformities are initially considered detrimental progress and provide high-field strength in a magnetic field.

As per the perspective of Uğurbil (2018), secondary qualitative data sources have been used to derive the parallel imagination in the transmission of messages to neurons. Therefore, technology and development in instrumentation have upgraded the ultrahigh field and provided tremendous changes in brain function. A recent research study has analysed the extensive magnetic field in human neurons. "Neuro-regeneration" has imposed substantial challenges in neuroscience for treating "neurodegenerative diseases". As per the study by Yuan *et al*. (2018), the main objective of the research study is to analyse the hypothesis of the "nerve growth factor" to functionalize the performance of neurons in the human body. NGF is useful in enhancing cellular uptake and promoting neuronal growth. The function of NGF is driven by dynamic and static MFs and provides theoretical perspectives related to the "cytoskeleton force model".

In addition, "Spintronic devices" are based on "domain wall" motion through nanowire paths and receive great interest in the component of "neuromorphic information processing system". Hence, in the previous research study, the journal and articles have provided a piece of relatable information to conduct a recent research study. As per the view of Brigner *et al.* (2019), a previous research study has proposed "Spintronic artificial neurons" that are essential for external stimuli to perform functionally. The use of this magnetic field results in decreasing energy efficiency or an increment in fabrication complexness. From the collected articles, it has been demonstrated that three "terminal magnetic tunnels" in neurons perform the leaking operation without affecting the external stimuli.

The structure of a shape-based drift provides proper functionality for the neuron in the human body. As cited by Aberra *et al.* (2020), the major consequence of "miniature bioelectronics" is the wireless delivery of messages to the human body. Electromagnetic waves suffer from impedance mismatches and absorption at biological interfaces. Therefore, magnetic fields do not suffer any losses which may lead to magnetic "powered bioelectric implants". This implant is based on the magneto thermal and induction effects. On the other hand, this approach has not produced a stimulator that is useful in operating clinical relevant frequencies. Research findings have suggested that "magneto-electric materials" has enabled bioelectronics for research study and clinical applications.

Recommendations

Support ideas that intermediate magnetic field and influence membrane channels

Different research studies have stated that a moderate "static magnetic field" can influence the membrane channels of the human body. In the context of Wang *et al*. (2019), data sources collected from articles have visited in order of magnitude of the "energy magnetic terms" with the moderate field. This pressure seems to be strong and involves channel activation of the biological mechanisms. On the other hand, small magnetic forces can activate the voltage-gated "potassium channels". Therefore, the human brain has billions of nerves that are known as neurons. Each neuron in the human brain performs differently.

A Series of magnetic fields are used to interfere with electrostatic and elastic energies

Neurons transmit with each other through "Chemical signalling" and a process in which they interchange their chemical is known as "neurotransmitters". Neurons perform in a series of magnetic fields and electrical impulses travel through the neuron. The triggers and releases from neurotransmitters have a different group that is found among neurons (Hanani and Spray, 2020). To do their job well they perform as a team and communicate with each other. People can communicate, learn, make decisions, and manage emotion due to neurons in the human body.

Limitations

In the research study, certain limitations in interpreting the impacts of the magnetic field on the human due to neurons. Researchers have concluded two rival ideas that show the negative impact of magnetic fields on the human body (Dong *et al*. 2020). The magnetic field triggers the chemical reaction in "proteins" that is called "crypto chromes". Crypto chromes have been

found in the retina and determined to control the neural path. On the other hand, due to "lowfrequency" magnetic field circulates current in the human body. As per the observation by Abreu *et al.* (2018), the strength of the current depends on the "intensity" of the outer magnetic field. In case there is a large stimulation of the current it can affect human muscles and nerves, or affect the biological procedure. A magnetic field can generate an electric current in the human brain that can mimic "EEG signals".

Conclusion

As concluded, the research study has stated that the impact of magnetic stimulation can affect the human nervous system. A strong magnetic field is considered to be more sensitive than the control cells. The finding themes have resulted that exposure to the static magnetic field is stronger and may lead to the growth of abnormalities at the "cellular level". The activity of the neurons must be strong and generate electrical substances in the synapses of the neuron system. The main role of magnetism in the human body travels along with the nerve cells. This can be analysed when humans feel or touch something the nerves of the body carry an electric impulse to move the muscles of the body. On the other hand, researchers have concluded that exposure to low electromagnetic fields can affect human health.

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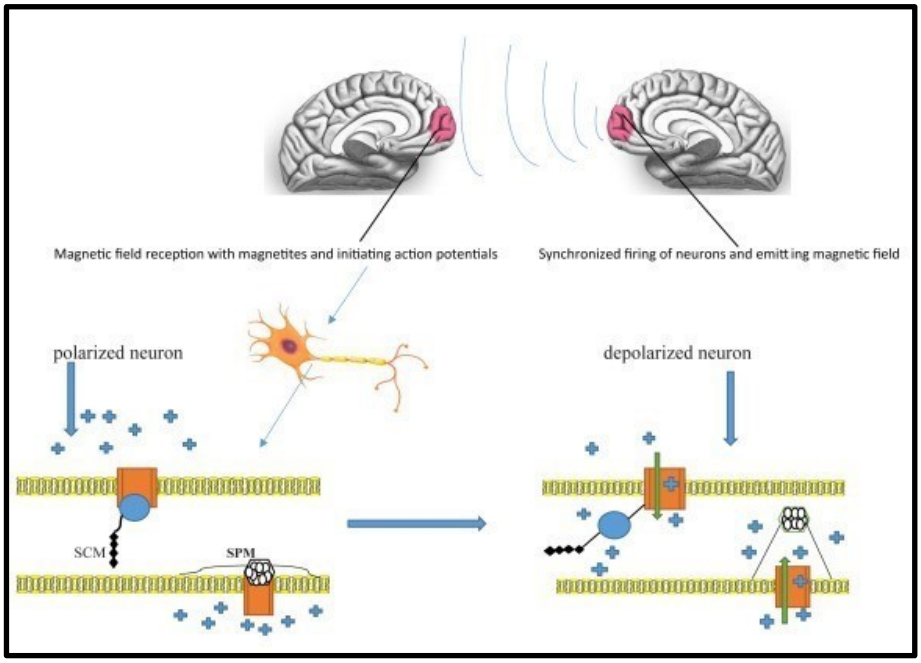
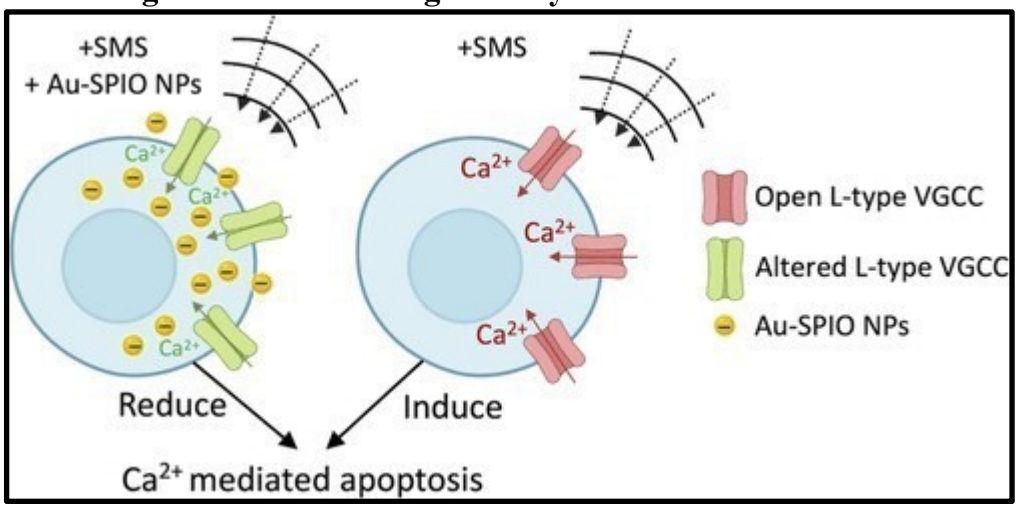
Appendices

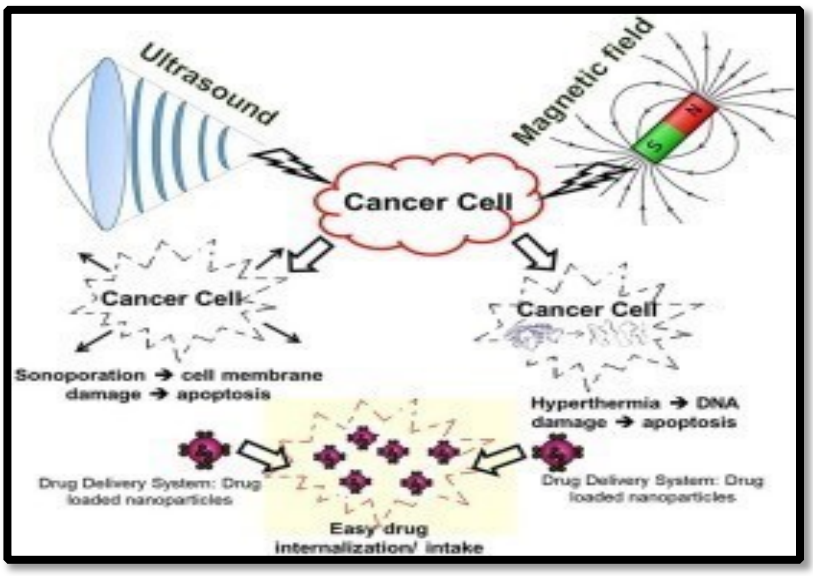
Appendix 1: Brain-to-brain communication



Appendix 2: Magnetic field and magnetically stimulated midbrain neurons



Appendix 3: Magnetic field for invasive cancer treatment



Appendix 4: Magnetic nano-particles for cancer treatment