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Thermodynamic Energy Transfer Modeling of Neurodegeneration with the ELMAS's Theory of Thermodynamics which is the Main Scientific Approach for 5th Law of Thermodynamics

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Abstract

ELMAS's Theory of Thermodynamics is a scientific approach that argues that energy and matter should be considered not only as scalar but also as vector quantities. This theory, put forward by Asst. Prof. Dr. Emin Taner ELMAS, aims to expand the scope of traditional thermodynamics and provide a foundation for the 5th Law of Thermodynamics.

The ELMAS's Theory of Thermodynamics, which serves as a foundational scientific framework for the 5th Law of Thermodynamics [1], offers profound insights into understanding medical treatments involving various medications or drugs. This theory explains how these treatments influence energy and matter within cellular structures, resulting in positive, negative, or neutral changes depending on the nature and dynamics of the interactions. According to the ELMAS Thermodynamic Theory, effective medical interventions must carefully regulate these thermodynamic processes to achieve desired therapeutic outcomes. Energy and matter function as dynamic parameters—similar to forces or velocities—that propel cellular bioprocesses

during treatment. Through these interactions, the system seeks equilibrium, with total energy and total mass across cellular boundaries balancing themselves. In essence, the combined effects of positive, negative, or neutral shifts in energy drive one equilibrium state, while similar variations in matter establish another interconnected balance across cellular systems within the human body. This equilibrium highlights the delicate interplay between energy and matter pivotal to therapeutic success. [1]

In this article, this theory offers a balanced statement consistent with the traditional scalar-based Law of Conservation of Energy and Mass, but introduces a new perspective by defining them as vector parameters (such as force, velocity, and acceleration).

The interaction of drugs with body cells is modeled as vectorial energy and mass transfer according to this theory. The treatment process is explained by controlling these interactions in positive, negative, or neutral directions.

For neuroengineering; the theory forms the basis of new medical methods such as "Applied Medi-Brain Energy-Tronic" used in the treatment of neurological diseases such as SMA (Spinal Muscular Atrophy), ALS, and Alzheimer's. Regarding the resonance and frequency into consideration as the main parameters; it is argued that the thermodynamic interaction between body cells behaves like a force or velocity component, and that these interactions need to be regulated for treatment.

Unlike Einstein's Energy formula, Dr. Elmas argues that in biological and mechanical systems, energy exhibits a direct equivalent balance with mass: This equation states that the total energy transfer in the system must be vectorially equal to the total mass change.

The mathematical foundation of ELMAS's Theory of Thermodynamics is based on an "Energy-Mass-Velocity" triangle that combines traditional thermodynamics with vector mechanics.

This holistic perspective regards biological systems as open thermodynamic entities, extending the scope of understanding beyond classical medicine. Researchers like Dr. Emin Taner Elmas underscore this viewpoint by conceptualizing neurodegeneration as a "disruption of energy and information flow." 1. Thermodynamic Modeling of Neurodegeneration From a physical standpoint, the brain functions as a dissipative system, continuously consuming energy while generating heat and entropy. - **Entropic Degradation**: In conditions such as Alzheimer's, Parkinson's, and ALS, protein misfolding exacerbates intrinsic entropy within the system. This thermodynamic instability represents increased molecular disorder and reduced available

energy (exergy), undermining cellular function. - **Negative Entropy and Life**: As proposed by Schrödinger, life persists by absorbing "negative entropy"—an influx of order—from external sources. During neurodegeneration, the brain loses its metabolic ability to sustain negative entropy, initiating a chaotic march toward thermal equilibrium, ultimately leading to cell death. - **Thermal Gradients**: The disruption of micro-thermodynamic processes within neurons adversely affects ion channel activity and neurotransmitter transmission, impairing neural communication on a physical level. 2. Acoustic Frequencies and the Ney (Nây-ı Şerîf, Instrument of Ney. (Ney: Turkish Reed Flute, Nay): A Physiological Regulator Music transcends aesthetic appeal, operating as mechanical energy waves that alter environmental pressure and density. - **Resonance and Harmonic Order**: The Ney flute, with its abundant natural harmonics (overtones), interacts with brain waves—particularly Theta and Alpha waves that foster deep relaxation—via resonance principles. These harmonics can influence the brain's neurophysiological state, promoting equilibrium. - **Stochastic Resonance**: Therapeutic sound waves can amplify weak signals in disordered neuronal systems, reducing "noise" levels in neural networks and enhancing signal transmission. This process lowers entropy while restoring order in cellular communication. - **Frequency-Matter Interaction**: Specific sound frequencies have the potential to affect vibrational modes in cellular structures like microtubules and proteins. It is hypothesized that low-frequency, stable vibrations could disrupt protein aggregations (plaques) or mechanically stimulate waste removal processes (such as through the lymphatic system), thereby promoting neurophysiological balance. [1-54]

Keywords: ELMAS's Theory of Thermodynamics, 5th Law of Thermodynamics, Medical Thermodynamics, Applied Medi-Brain Energy-Tronic, Alzheimer's, Parkinson's, ALS, Neuroengineering, Neurodegeneration, Neurodegenerative Diseases, Entropy, Negentropy, Resonance, Frequency, Thermodynamic, Energy Transfer, Fluid Mechanics, Heat Transfer, Mathematics, Music, Nây-ı Şerîf, Instrument of Ney. (Ney: Turkish Reed Flute, Nay), Energy-Mass Balance, Music Frequencies

Introduction

ELMAS's Theory of Thermodynamics is a scientific approach that argues that energy and matter should be considered not only as scalar but also as vector quantities. This theory, put forward by Asst. Prof. Dr. Emin Taner ELMAS, aims to expand the scope of traditional thermodynamics and provide a foundation for the 5th Law of Thermodynamics. [1]

Fundamental Principles of the Theory: [1-54]

At the heart of the theory is the idea that energy and matter are directional quantities (vectors) and can exist in three different states:

Positive Direction: The state where the system gains energy or mass.

Negative Direction: The state where the system loses energy or mass.

Neutral Direction: The state where the system is in a steady or stable (equilibrium) state.

In this approach, total energy and total mass are formulated as the vector sum of these three components:

Medical Thermodynamics and Applications: [1-54]

ELMAS's Theory of Thermodynamics (the 5th Law of Thermodynamics approach) allows biological systems (such as human body cells) to be analyzed as explicit thermodynamic systems. [1]

• Drug Interaction: The interaction of drugs with body cells is modeled as vectorial energy and mass transfer according to this theory. The treatment process is explained by controlling these interactions in positive, negative, or neutral directions.

• Neuroengineering: The theory forms the basis of new medical methods such as "Applied Medi-Brain Energy-Tronic" used in the treatment of neurological diseases such as SMA (Spinal Muscular Atrophy), ALS, and Alzheimer's. • Resonance and Frequency: It is argued that the

thermodynamic interaction between body cells behaves like a force or velocity component, and that these interactions need to be regulated for treatment.

Scientific Context: [1-54]

This theory offers a balanced statement consistent with the traditional scalar-based Law of Conservation of Energy and Mass, but introduces a new perspective by defining them as vector parameters (such as force, velocity, and acceleration).

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Material, Method and Discusssion

This holistic approach treats biological systems as open thermodynamic systems, beyond classical medicine. This perspective, which researchers like Dr. Emin Taner Elmas also emphasize, defines neurodegeneration as a "disruption of energy and information flow."

1. Thermodynamic Modeling of Neurodegeneration: [1-54]

Physically, the brain is a dissipative structure that constantly consumes energy and releases heat/entropy.

Entropic Degradation: In diseases such as Alzheimer's, Parkinson's, and ALS, the misfolding of proteins increases the intrinsic entropy of the system. Thermodynamically, this is an increase in "disorder" at the molecular level and a decrease in the amount of usable energy (Exergy) of the system.

Negative Entropy and Life: In Schrödinger's words, life sustains itself by receiving "negative entropy" (order) from the outside. In the neurodegenerative process, the brain becomes metabolically unable to produce this negative entropy and enters a chaotic process approaching thermal equilibrium (death).

Thermal Gradients: Disruption of micro-thermodynamic processes within the cell physically hinders the functioning of ion channels and neurotransmitter transmission.

2. Acoustic Frequencies and the Ney: A Physical Regulator: [1-54]

Music is not just an aesthetic phenomenon, but mechanical energy waves that change the pressure and density of the environment.

Resonance and Harmonic Order: Due to its physical structure, the Ney is very rich in natural harmonics (overtones). These harmonics interact with brain waves (especially Theta and Alpha waves, which provide deep relaxation) through the principle of resonance.

Stochastic Resonance: It is when a weak signal (therapeutic sound) enhances the performance of a noisy system (sick brain). Sound waves at specific frequencies can reduce "noise" in neuronal networks, making signal transmission more orderly (low entropy).

Frequency-Matter Interaction: Sound frequencies can affect the vibrational modes of cellular microtubules and proteins. It is theorized that low-frequency and stable vibrations produced by something could physically shake protein aggregations (plaques) or mechanically stimulate the cellular waste removal (lymphatic) system.

3. Treatment Correlation: [1-54]

In this model, treatment is the injection of "information and order" (in the form of acoustic waves) into the patient from the outside.

1. Synchronization: Realignment of disrupted neuronal rhythms with an external reference frequency (specific tones such as 440 Hz or 528 Hz).

2. Energy Transfer: The mechanical energy of sound waves disperses thermal accumulation (inflammation) in the area by increasing blood flow and microcirculation.

3. Homeostasis: Restoring thermodynamic balance and increasing the cell's "energy efficiency".

This study reflects Dr. Emin Taner Elmas's interdisciplinary approach; it is a unique perspective combining medicine, thermodynamics, and acoustic physics. Elmas considers neurodegenerative processes not only as biological diseases but also as energy systems disrupted within the framework of universal physical laws. [1-54]

Thermodynamic Framework and Alzheimer's Analysis: [1-54]

According to Elmas's approach, diseases such as Alzheimer's, Parkinson's, and ALS are examined on the basis that the human body is an open thermodynamic system:

Increase in Entropy: A healthy brain is a low-entropy (high-order) structure. In the Alzheimer's process, the misfolding of proteins (amyloid-beta plaques) increases the microscopic disorder in the system, i.e., entropy.

Loss of Negative Entropy: Living systems receive "negative entropy" (order) from the outside to maintain their lives. Elmas defines neurodegeneration as the cell's inability to process this negative entropy and its inability to efficiently use energy (ATP), resulting in a loss of exergy (usable energy).

Thermal Imbalance: Disruption of metabolic activities in the brain disrupts thermodynamic balance, leading to errors in heat distribution at the cellular level and molecular chaos.

Emin Taner Elmas is conducting research on the use of the natural sound of the Ney-i Şerif (a type of flute) in the treatment of neurological diseases such as Alzheimer's and Parkinson's. These studies focus on the healing effects of the Ney's sound on human health and mental tranquility. [1-54]

Details about the Ney-i Şerif and Elmas's work are as follows:

Therapeutic Effect: Research is being conducted on the positive effects of the Ney's natural sound on metabolic heat production and energy transfer in the human brain, and its potential to support treatment.

Field of Study: Emin Taner Elmas is examining the potential of the frequencies of this sound to promote relaxation and healing in Parkinson's and Alzheimer's patients within the context of "natural musical sound." [1-54]

Music Frequencies (Ney) and Treatment Relationship: [1-54]

Dr. Elmas argues that thermodynamic disorder (disease) can be balanced with externally applied harmonic physical energies (sound waves):

Acoustic Resonance: Sounds produced by instruments like the ney have physically specific frequency spectrums. These frequencies create mechanical vibrations in the brain tissue, triggering cellular resonance. Ordering by Frequency: Sound waves produced by the ney, based on the "golden ratio" and laminar airflow, can synchronize chaotic neuronal signals. Physically, this is an attempt to slow down the rate of entropy increase by injecting an external "regulating frequency" into the system.

Biophysical Effect: It is emphasized that certain frequency ranges (e.g., 432 Hz or the maqams in Sufi music) can help in the removal of toxic proteins by creating a mechanical pump effect on blood-brain barrier permeability and lymphatic drainage.

In summary, Emin Taner Elmas's work positions disease as a "physical chaos" and music (the sound of the ney) as an "acoustic regulating tool". In this model, treatment is the re-optimization of the impaired bio-thermodynamic efficiency using the mechanical energy of sound.

1- Thermodynamic Framework and Alzheimer's Analysis: [1-54]

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Emin Taner Elmas's work; It positions the disease as a "physical chaos" and music (the sound of the ney) as an "acoustic regulatory tool." In this model, treatment is the re-optimization of the impaired bio-thermodynamic efficiency using the mechanical energy of sound.

2- Resonance Interaction in Alzheimer's Treatment: [1-54]

The ELMAS Theory of Thermodynamics [1] uses sound energy to overcome the blood-brain barrier problem in Alzheimer's disease.

Ney and Ultrasound Integration: The frequency of the ney instrument is increased to a high speed with the help of an ultrasound device.

Vectorial Energy Transfer: The resulting high sound energy aims to eliminate the impermeable layer in the blood-brain barrier through a thermodynamic interaction.

Parameter Control: Using the relationship between wavelength and frequency, the amount of energy transferred to the brain tissue is controlled as a directional parameter.

3- Pharmacological Applications (Drug Interaction): [1-54]

Human body cells are considered as open thermodynamic systems.

System Boundary Crossing: The mass and energy transfer that occurs when drug molecules cross cell membrane boundaries is analyzed using the theory's "positive/negative/neutral" equations.

Cellular Recovery: The treatment process is optimized by regulating this vectorial transfer according to the patient's needs (e.g., in the positive direction if the cell needs to gain energy).

4- Bionic Prostheses and Neuroengineering: [1-54]

The theory also forms the basis for controlling bionic prostheses (e.g., robotic hands).

Force Balance: The energy distribution between servo motors and moving parts is designed not only with scalar quantities but also with the vectorial force and velocity balance predicted by the theory.

Conclusion

The mathematical foundation of ELMAS's Theory of Thermodynamics is based on an "Energy-Mass-Velocity" triangle that combines traditional thermodynamics with vector mechanics. [1-54]

1. Vectorial Energy and Mass Formulation: [1-54]

The essence of the theory is the assumption that energy is not just a quantity but also a direction (vector). This is formulated with the proposed 5th Law of Thermodynamics as follows:

Here:

Positive: Work, heat, or mass entering the system.

Negative: Losses or exhaust leaving the system.

Neutral: Rest energy that maintains the internal equilibrium (entropy control) of the system.

2. Energy-Mass Balance: [1-54]

Unlike Einstein's formula, Dr. Elmas argues that in biological and mechanical systems, energy exhibits a direct equivalent balance with mass: This equation states that the total energy transfer in the system must be vectorially equal to the total mass change.

3. EEG Algorithms and Data Processing: [1-54]

In the "Applied Medi-Brain Energy-Tronic" system, brainwaves are processed in the following steps:

1. Signal Separation: Data from the 14-channel EEG device is separated into Alpha, Beta, Theta, Delta, and Gamma waves.

2. Vector Transformation: Each wavelength is defined as a thermodynamic force component.

3. Transfer Function: The "raise my arm" command from the brain is encoded as (positive energy) in theory. The algorithm analyzes the amplitude and frequency of this signal to calculate the direction and intensity of the electrical discharge that will stimulate the muscle.

4. Resonance Control: If the signal is weak, an external stimulator intervenes and brings the cell to its natural resonance frequency.

4. Entropy and Chaos Control: [1-54]

The theory defines diseased cells as "high-entropy (disordered)" systems. The algorithms used aim to restore the cell to a "neutral" or stable equilibrium state by generating a negative entropy (negentropy) flow.

Elmas's perspective analyzes diseases like Alzheimer’s, Parkinson’s, and ALS through the lens of the human body as an open thermodynamic system: 1. **Entropy Increase**: A healthy brain represents a low-entropy (highly ordered) structure. In Alzheimer's disease, protein misfolding (e.g., amyloid-beta plaque formation) heightens microscopic disorder within the system, effectively increasing entropy. 2. **Decline in Negative Entropy**: Living organisms sustain themselves by absorbing "negative entropy" (order) from external sources. Elmas characterizes neurodegeneration as the cell's growing inability to process this negative entropy or to

efficiently utilize energy (ATP), culminating in a reduction of exergy (usable energy). 3. **Thermal Imbalance**: Disruptions in the brain's metabolic processes upset its thermodynamic equilibrium, leading to improper heat distribution at the cellular level and resulting in molecular disarray.

BIOGRAPHY OF AUTHOR:

Asst. Prof. Dr. Dipl.-Ing. Emin Taner ELMAS

Asst.Prof. Dr. Emin Taner ELMAS is a Mechanical Engineer having degrees of B.Sc., M.Sc., Ph.D., and was born in Sivas in 1974. He completed his doctorate at Ege University, Graduate School of Natural and Applied Sciences, Mechanical Engineering Department, Thermodynamics Science Branch, and his master's degree at Dokuz Eylül University, Mechanical Engineering Department, Energy Science Branch. He also completed his undergraduate education at Hacettepe University, ZEF, Mechanical Engineering Department and graduated from the faculty with honors in 1995 and became a mechanical engineer. He was awarded a non-refundable scholarship by the Turkish Chamber of Mechanical Engineers in his 4th year because he was the most succesful student during his first 3 classes study at the faculty. He graduated from İzmir Atatürk High School in 1991.

Asst. Prof. Dr. ELMAS has completed his military service as a NATO Officer in Bosnia and Herzegovina. He was a "Reserved Officer" as a "2nd Lieutenant" as an "English-Turkish Interpreter". He was also a "Guard Commander" and served in Sarajevo, Camp Butmir within the SFOR task force of NATO. He has been awarded with 2 (two) NATO Medals and Turkish Armed Forces Service Certificate of Pride (Bosnia & Herzegovina).

In addition to his academic duties at universities, he has worked as an engineer and manager in various industrial institutions, organizations and companies; He has served as Construction Site Manager, Project Manager, Management Representative, Quality Manager, Production Manager, Energy Manager, CSO-CTO, CBDO, Factory Manager, Deputy General Manager and General Manager.

Asst. Prof. Dr. Elmas is Department Head and is an Assistant Professor of Automotive Technology at the Department of Motor Vehicles and Transportation Technologies at Vocational School of Higher Education for Technical Sciences at IGDIR UNIVERSITY, Turkey. He is also an Assistant Professor of Bioengineering & BioSciences at the same university. He has nearly 30 years of total experience in academia and in industry.

He has served as a scientific referee and panelist for ASME, TUBITAK and many scientific institutions, organizations and universities, including NASA.

He has published numerous international and national academic scientific articles, books, and book chapters, and serves as an editor for international academic journals. He also serves on

the scientific committees of many international conferences, publishing conference and congress proceedings and giving presentations.

“Mechanical Engineering, Energy Transfer, Thermodynamics, Fluid Mechanics, Heat Transfer, Higher Mathematics, Evaporation, Heat Pipes, Space Sciences, Automotive, Bioengineering, Medical Engineering Applications, Neuroengineering, Medical Technique” are his academic and scientific fields of study; “Heating-Ventilation Air Conditioning Applications, Pressure Vessels, Heat Exchangers, Energy Efficiency, Steam Boilers, Power Plants, Cogeneration, Water Purification, Water Treatment, Industrial Equipment and Machinery, Welding Manufacturing, Sheet Metal Forming, Machining” are his industrial experience fields.

As of 2026, he has been awarded the Nobel Scientist Award by the international platform organization Scientific Laurels.

Asst. Prof. Dr. Emin Taner ELMAS is also a musician, saz (baglama) virtuoso player and ney (Nay, Turkish Reed Flute) performer. He plays also cümbüş instrument and performs darbuka rhythm instrument. He has a YouTube Music Channel (Emin Taner ELMAS) which includes some of his sound recordings of him playing the saz-baglama and blowing the ney. He composed the poem written by the great poet Âşık Veysel ŞATIROĞLU under the name of “Raşit Bey” in memory of his father Judge (Hâkim) Raşit ELMAS as “Raşit Bey Türküsü”, wrote it down, notated and published it as an academic article and broadcasted this song on his own music channel. He wrote the poems entitled “Canım Babam” and “Geldim Babam” which he wrote also in memory of his father and published in an academic literature journal, and composed instrumental musics for these poems. He also composed an instrumental song called “Annem Annem Türküsü” and gave it to his mother, Lawyer Tuna ELMAS, as a gift on Mother’s Day, 11.05.2025. He also has a poem titled "Ney and Neyzen." He also wrote and presented a poem titled "Esra Kardeşim" to his sister, Esra ELMAS, an archaeologist and English teacher. He has published books including "Saz-Bağlama Tuning System Method" (“Saz- Bağlama Akort Sistemi Metodu”) and "Ney and Neyzen; Ney's Pitches, Frets, Sound Stages, Octaves, Structure, Performance, Ney Maintenance and Basic Music Theory" (Ney ve Neyzen; Ney’de Perdeler, Ses Devreleri, Oktavlar, Yapısı, İcrası, Ney Bakımı ile Temel Musiki Nazariyatı) and My Collection of Literary and Musical Art Works – I Story / Anecdote / Essay / Poetry / Verse / Prose / Humorous; witty - satirical; poetic stories / Lyrics / Composition (Edebiyat ve Musiki Sanat Eserleri Külliyatım – I Hikâye / Anekdot / Deneme / Şiir / Manzume / Nesir /Mizahi; nükteli – hicivli; şiirsel hikâyeler

/ Güfte / Beste). He continues his artistic studies by writing various articles, books, poetry, lyrics and also realizing musical composition and repertoire works.

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