Study of extremely low frequency electromagnetic wave effects on the acetylcholine and, achievements on the Alzheimer disease

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Abstract: There are different achievements about the Electromagnetic waves interaction with acetylcholine and the resultant studies on the Alzheimer patients. Because the acetylcholine intermediate enzyme is reduced in the brain of these patients, based upon some research works it is believed that the absorption of electromagnetic field in acetylcholine may tend to increased this enzyme amounts in the brain of these patients, then in this research we studied the excitation and the radiation absorption process effects of the extremely low frequency (ELF) electromagnetic waves in the acetylcholine from this magnetic field. The absorption process calculated with the aid of IR (Infra Red), UV (Ultra violet), and the Visible spectroscope devices.

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Introduction

The fast progress in technology of mankind life's is not together with his physical & psychological healthfulness[1-2].One problem of industrialized and developing societies is the neuropathic disorders and anomaly of brain, that is together with unknown causalities[3].One of this anomaly& brain disorder is Alzheimer disease. This disease is one of the most complicated mentally disease that only after death of the patient it's crucial diagnostics through the brain autopsy is rather possible [4].The progress of the disease in the patients is slow and at last steps it reached to the end stage with patients death, sometime also the symptom of disease, mistakes with the patients senility because boat are the aged diseases.

It is known that this disease, involved 2- 5% of the aged people and is because of the hypo camp region cells destruction and prevent to produced acetylcholine more. The electromagnetic radiation absorption effects on the human body first discovered in the1960s decade. This wave in long terms tend to vision disordered like cataract, blood changeness and the brain systems disturbances [5].High does electromagnetic radiation exposure effects on mankind are included as follows:

- Spontaneous misabortion
- Menstrual irregularity
- Sudden epilepsy
- Speech inability
- Some cancers involving
- Even the possibility of occurrences of brain disturbances from long term exposure of radiation could be schizophrenia, M.S etc. Early at the beginning of the 20th century the first Alzheimer disease symptoms were known from those one can mentioned weakness memory and amnesia that are caused from the lack of acetylcholine intermediate enzyme in brain cells that transfer the messages .Then reduction of acetylcholine in brain cells is a symptom of the progress of Alzheimer disease [6].This is why we studied the short term electromagnetic radiation absorption as a symptom of increasing this enzyme in brain. The exposure of radiation in this research studiedI- by a homemade device and the radiation absorption studied by2- an spectroscope in the IR, UV, and visible range of electromagnetic radiation.

Material method

1- With pure water as buffer avail of acetylcholine transform to liquid.
2- We used our homemade device for producing electromagnetic waves and magnetic field(Fig-1)
3- This device also equipped with a unite for temperature control.
4- Spectrophotometer in the IR UV and Visible Rang for absorption calculation.
5- A 2cc sampler with 1000 ppm.
6- The electromagnetic waves ranges from 1Hz-1KHz

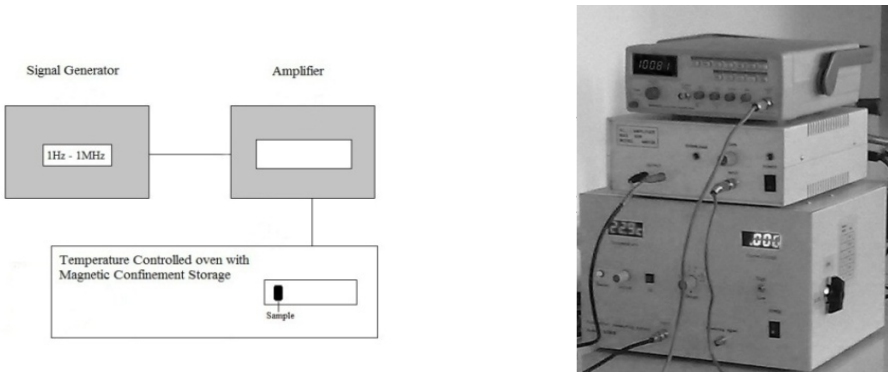

Fig-1 Home made device for electromagnetic radiation production and temperature unite control

To fix the temperature of the acetylcholine we put it into refrigerator for a time period about 24hours before the exposure, at the time of experiment we put it into the temperature unite control oven to reach the 37ċ. This process is for fixing the enzyme temperatureabout37ċ, then we selected 2mm sampler, to expose to (ELF) electromagnetic radiation for time ranges about 5,15,30,45 and60minutes respectively. the spectrophotometer are working in IR, visible and UV range of electromagnetic and the calculated specter taken during time divisions as mentioned above, while the frequency of exposure also are selected in ELF ranges. It should be mentioned that one sample also put into the spectroscope instrument without electromagnetic exposure that could be act as an evidence in the spectroscopic measurements .All achievements are seen in the table-1.All experimental resultants are seen in Figs.1

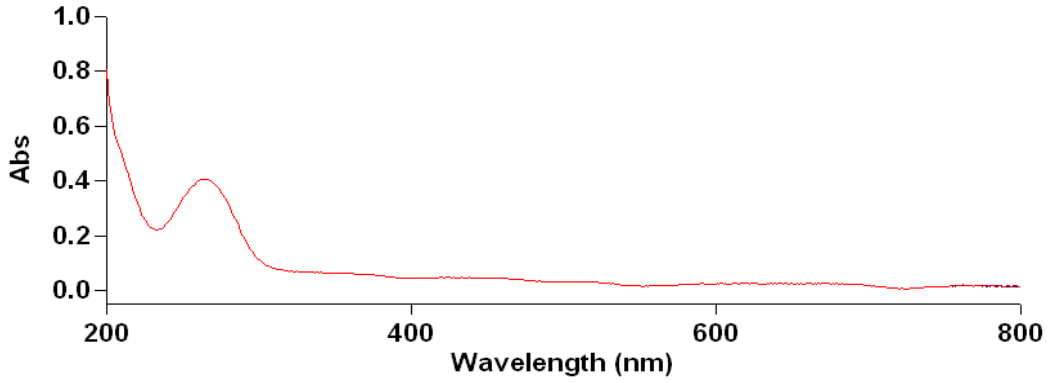

Fig-2. Far-UV-visible Acetylcholine absorption in the absent of electromagnetic field

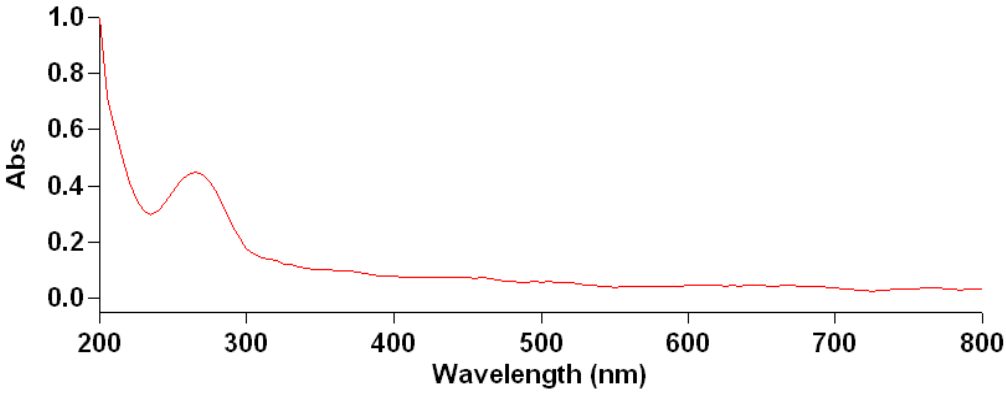

Fig-3.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 50HZ, frequency, 7.65µT magnetic field. The maximum absorption wave length is265nm,the time of exposure is 5 min and the enzyme temperature 37ċ

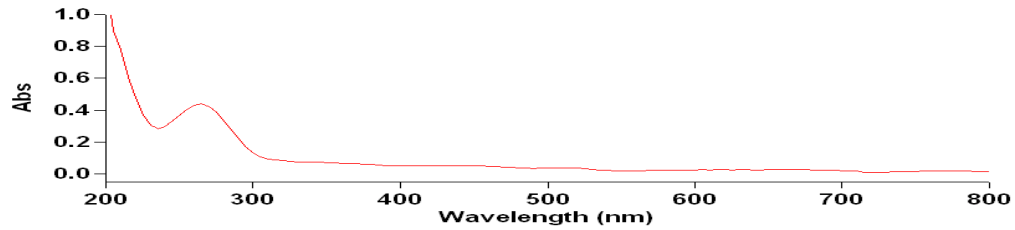

Fig-4.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 50HZ, frequency, 7.65µT magnetic field. The maximum absorption wave length is265nm.the time of exposure is 15 min and the enzyme temperature37ċ

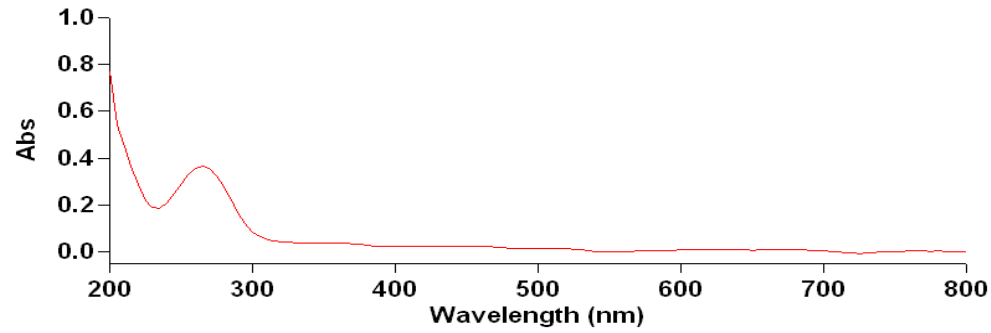

Fig-5.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 50HZ, frequency 7.65µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is30 min and enzyme temperature37ċ.

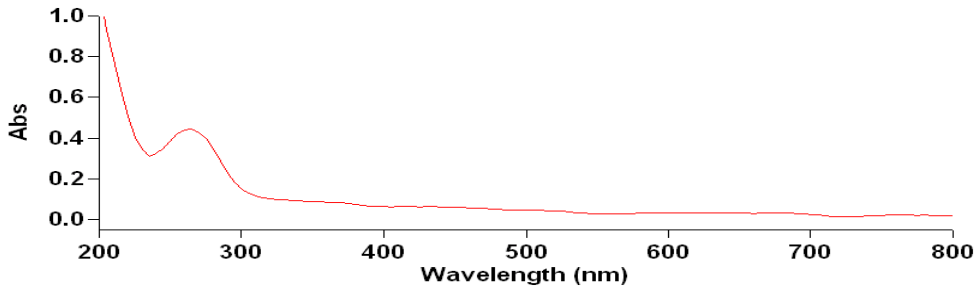

Fig-6.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 50HZ, frequency 7.65µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is45 min and the enzyme temperature37ċ.

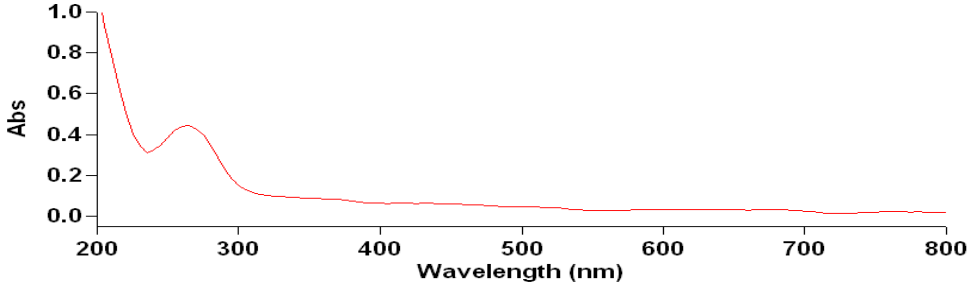

Fig-7.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 50HZ, frequency 7.65µT magnetic field. The maximum absorption wave length is265nm, the time of exposureis60 min and the enzyme temperature37ċ.

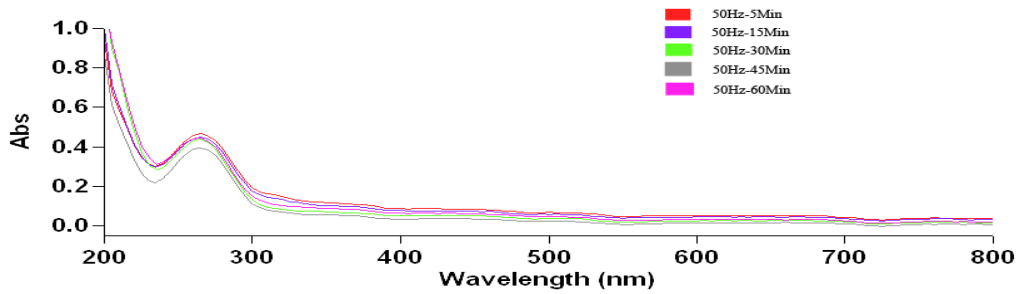

Fig-8.UV-visible. Absorption specters of Acetylcholine in the present of electromagnetic wave 50HZ frequency and 7.65µT magnetic field. With the time ranges 5-60 min for comparison, the enzyme temperature again is 37ċ

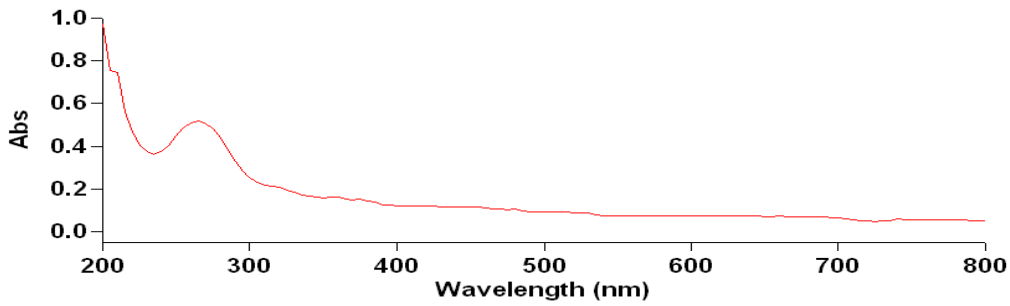

Fig-9.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 500HZ, frequency 9.114µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is5 min and the enzyme temperature37ċ.

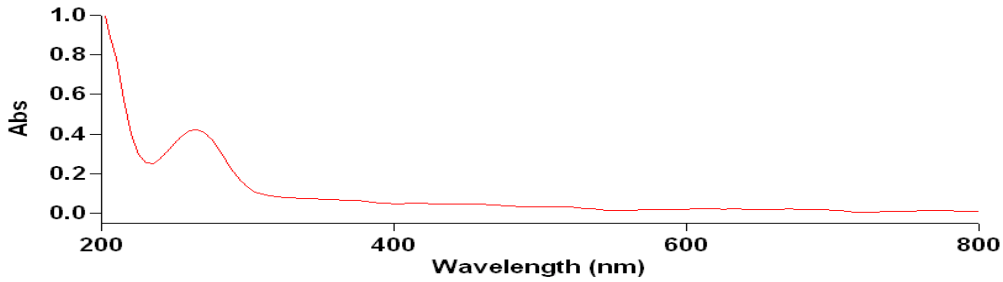

Fig-10.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 500HZ, frequency 9.114µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is15min and the enzyme temperature 37ċ .

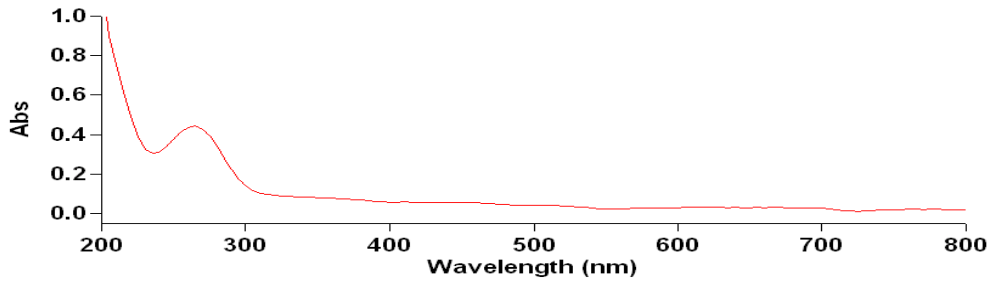

Fig-11.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 500HZ, frequency 9.114µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is30min and the enzyme temperature 37ċ

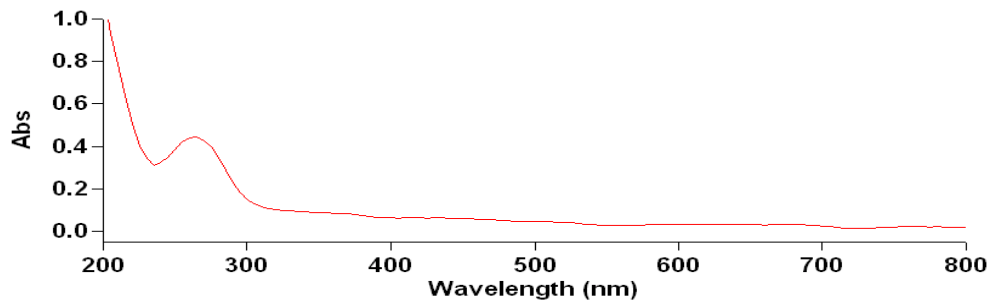

Fig-12.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 500HZ, frequency 9.114µT magnetic field. The maximum absorption wave length is265nm, the time of exposureis45min and the enzyme temperature37ċ.

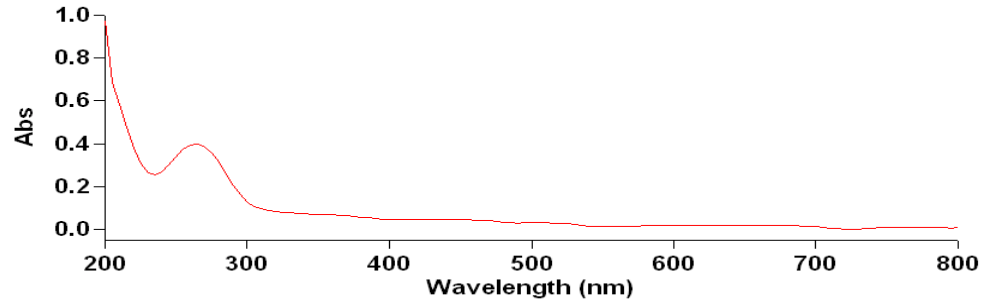

Fig-13.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 500HZ, frequency 9.114µT magnetic field. The maximum absorption wave length is265nm, the time of exposureis60min and the enzyme temperature37ċ.

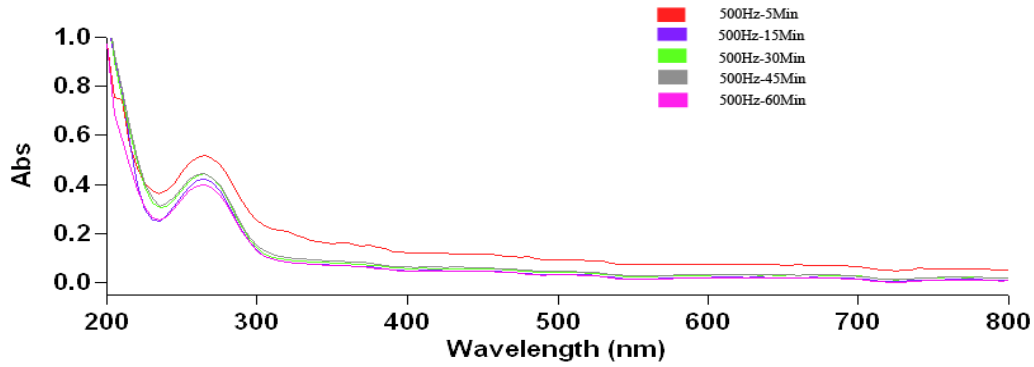

Fig-14.UV-visible. Absorption specters of Acetylcholine in the present of electromagnetic wave 500HZ frequency and 9.114µT magnetic field. With the time of exposures ranges 5-60 min for comparison, the enzyme temperature again 37ċ.

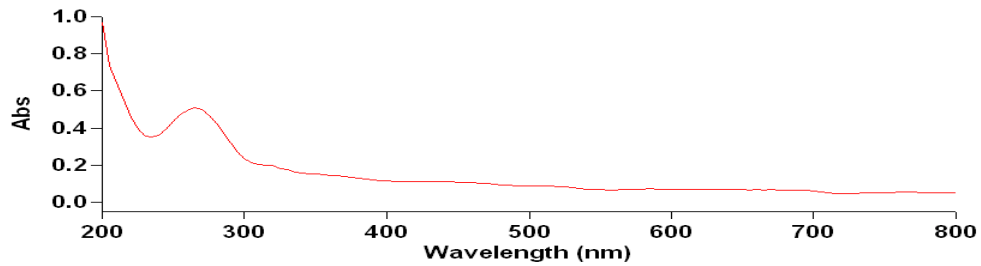

Fig-15.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 1KHZ, frequency 9.268µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is 5min and the enzyme temperature37ċ.

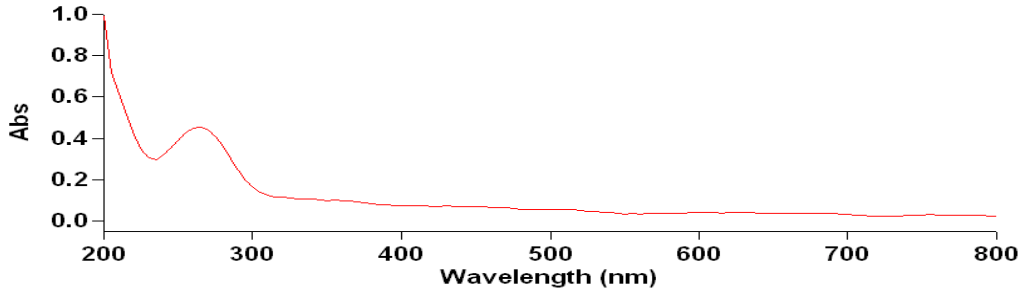

Fig-16.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 1KHZ, frequency 9.268µT magnetic field. The maximum absorption wave length is265nm, the time of exposureis15min and the enzyme temperature37ċ.

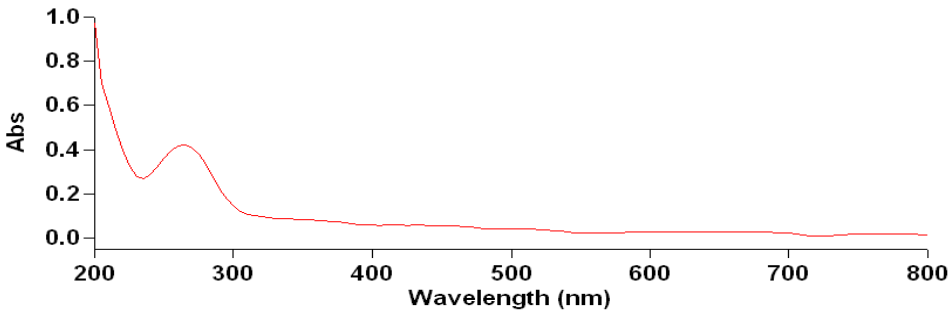

Fig17.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 1KHZ, frequency 9.268µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is30 min and the enzyme temperature37ċ.

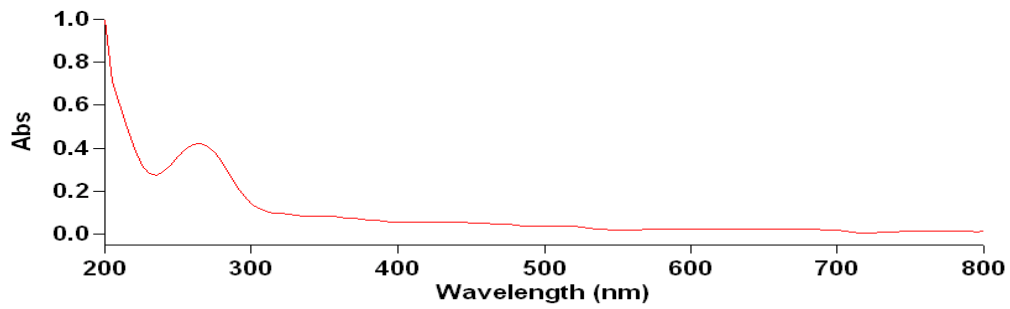

Fig-18.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 1KHZ, frequency 9.268µT magnetic field. The maximum absorption wave length is265nm, the time of exposureis45min and the enzyme temperature37ċ.

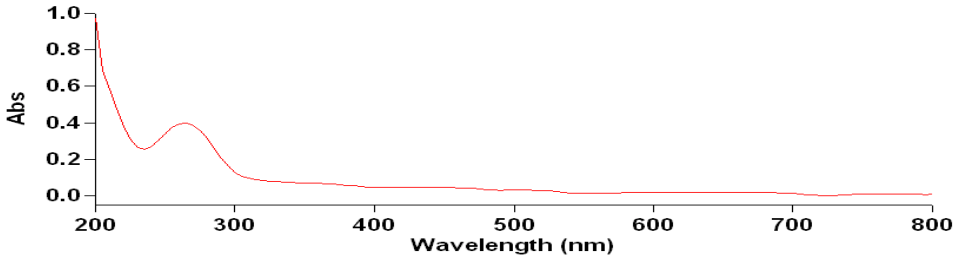

Fig-19.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 1KHZ, frequency 9.268µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is60min and the enzyme temperature37ċ

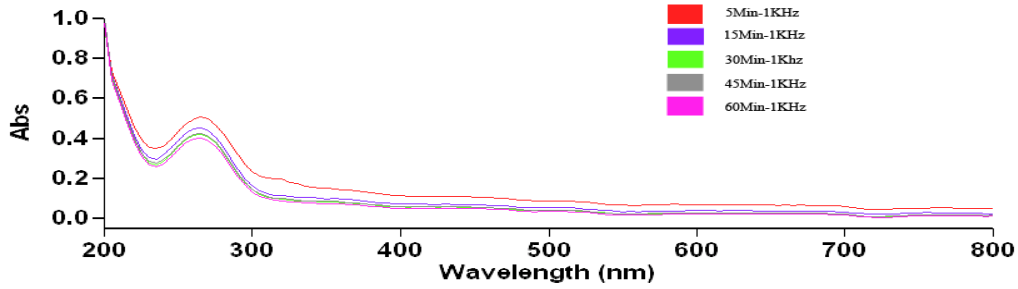

Fig-20.UV-visible. Absorption specters of Acetylcholine in the present of electromagnetic wave 1KHZ frequency and 9.268µT magnetic field. With the time ranges 5-60 min for comparison, the enzyme temperature again 37ċ.

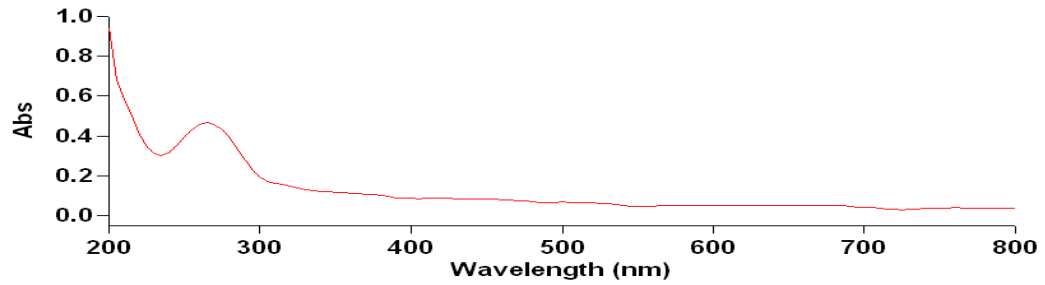

Fig-21.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 5KHZ, frequency 9.173µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is5min and the enzyme temperature 37ċ

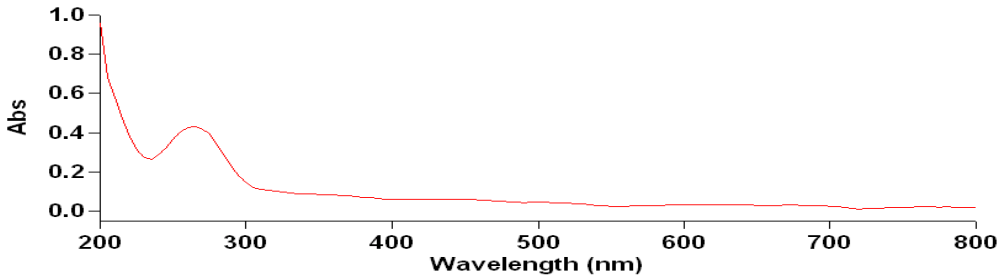

Fig-22.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 5KHZ, frequency 9.173µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is15min and the enzyme temperature37ċ

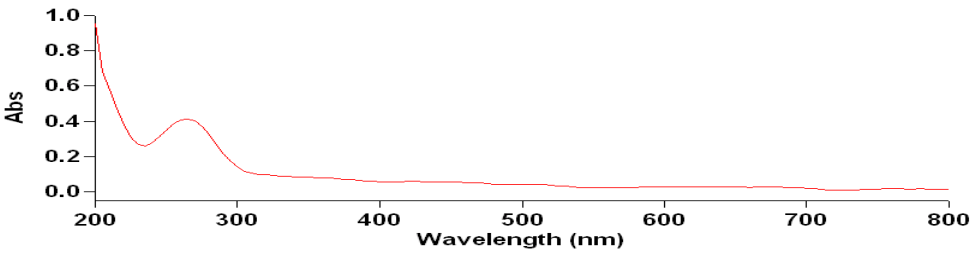

Fig-23.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 5KHZ, frequency 9.173µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is30min and the enzyme temperature37ċ.

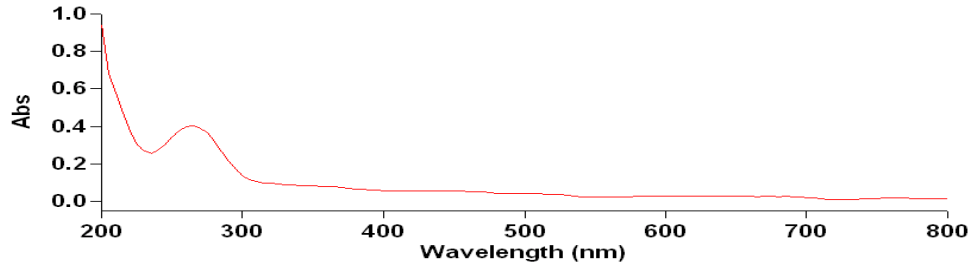

Figure24.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 5KHZ, frequency 9.173µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is45min and the enzyme temperature37ċ.

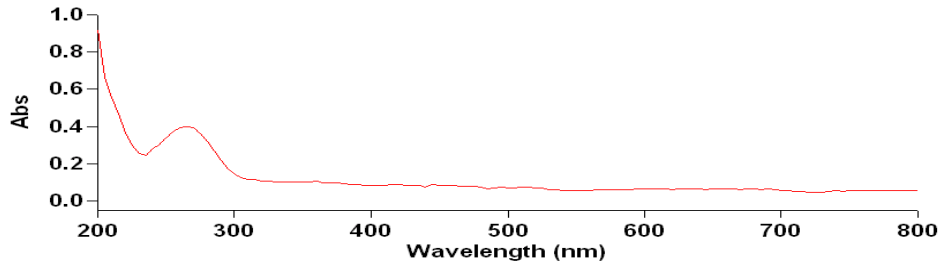

Fig-25.UV-visible. Absorption spectra of Acetylcholine in the present of electromagnetic wave 5KHZ, frequency 9.173µT magnetic field. The maximum absorption wave length is265nm, the time of exposure is60min and the enzyme temperature 37ċ

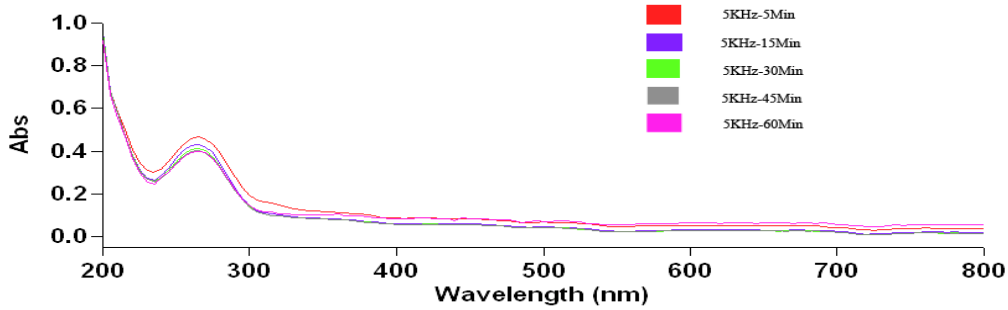

Fig-26.UV-visible. Absorption specters of Acetylcholine in the present of electromagnetic wave 5KHZ frequency and 9.173µT magnetic field. With the time ranges 5-60 min for comparison, the enzyme temperature again 37ċ.

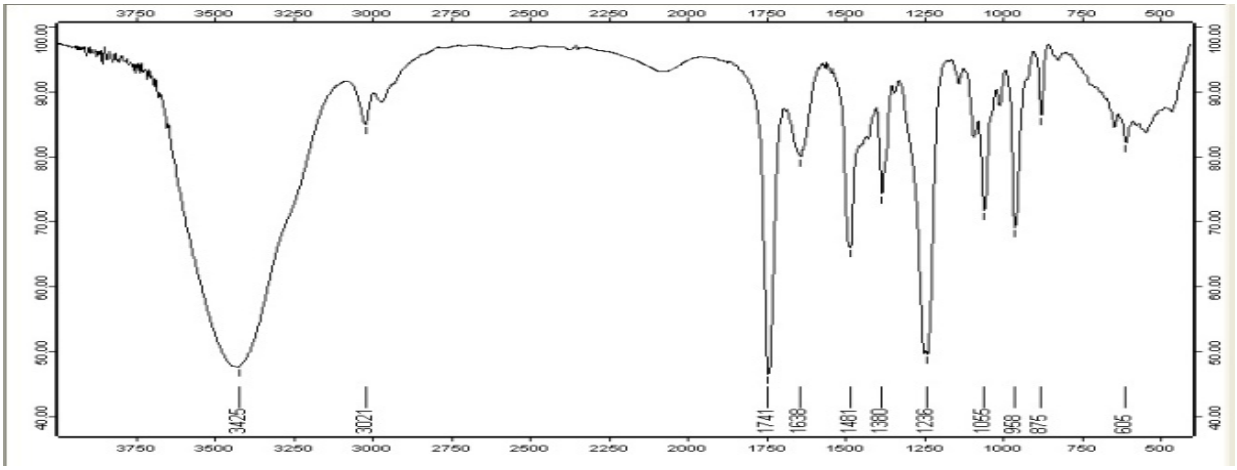

Fig-27.IRabsorption specter for Acetylcholine in the absent of Electromagnetic field at the temperature 37ċ.

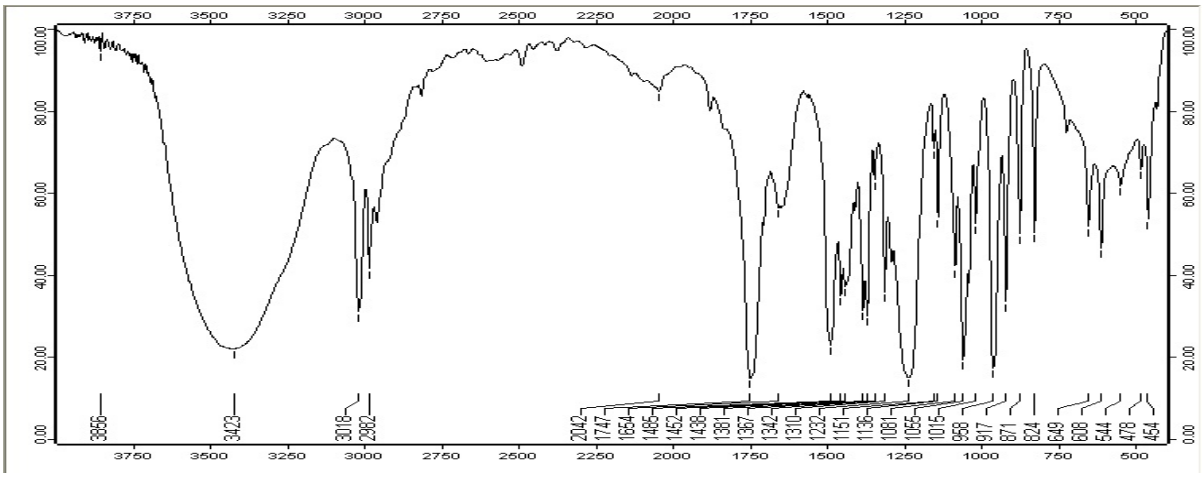

Fig-28.IR Relative absorption of the Acetylcholine in the present of Electromagnetic field, frequency 50 Hz, and Magnetic field 7.65µT, at the temperature37ċ

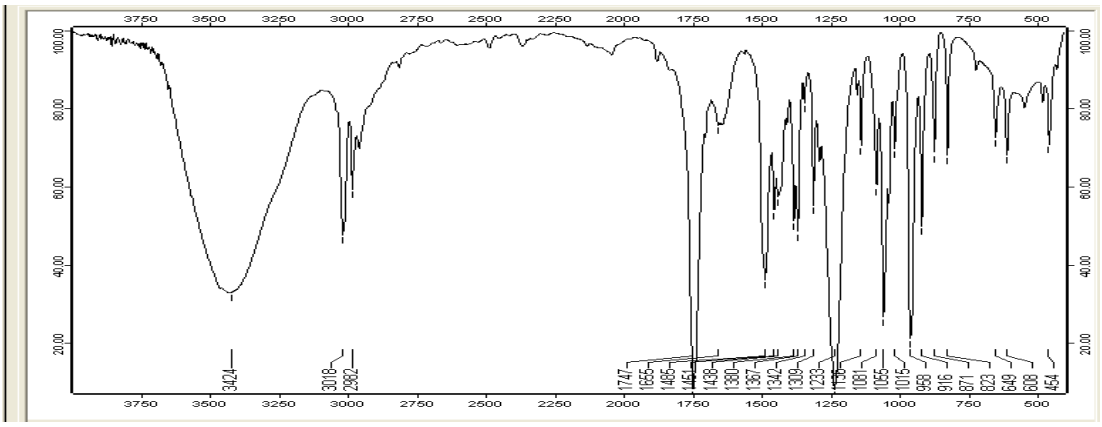

Fig29.IR Relative absorption of the Acetylcholine in the present of Electromagnetic field, frequency 500 Hz, and Magnetic field 9.114µT, at the temperature37ċ

Conclusion Remarks

Extremely Low Frequency (ELF)electromagnetic field induced currents& electromagnetic field in biological systems depending to the waves intensity that may be very small and sometimes regardless.[7] in a special range of the waves .If frequency in the ELF range increased more the noticeably absorption of waves presented[8]. Molecular excitation during high amounts absorption of radiation in physical words is a proof of increased of entropy and the increasing of molecular impacts [9]. Although high amount of radiation absorption may tend to stress, tiredness in one hand, it may in turn tend to increased acetylcholine amount in the brain of patients in other hand, increasing Acetylcholine in the brain cells of Alzheimer patients could tend to relative relief of the Alzheimer disease. Our studies shows that the best absorption occurred in the wave length(see please Figs2-25)of265nm-275nm on the spectroscopic studies that belongs to the wave frequency 1KHz ,with 9.268μT magnetic field and the 5 minute time of exposure . We agreed that some biological action-reaction may be because of electromagnetic wave absorption at the time of exposure which tends to increased of the acetylcholine in the brain cells of the patients that are unknown yet. The lower limit of ELF waves and exceeding time of exposure did not tend to increase noticeable amounts of the acetylcholine .Also our research showed that the waves absorption in the visible range is not so many important (as all Figs showed) because in all ELF wave length very low amounts of the absorption of radiation in the wavelength greater than the UV occurred.

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