hydroxyl radical resulted from 150V ELF-MF exposure. These results indicate that ELF-MF exposure may accelerate the in vitro reaction of hydroxyl radical generation. This study, however, was conducted in so simple in vitro system, that we failed to conclude the authentic in vivo effects of ELF-MF on free radicals. Therefore, we should study further with more complex system similar to in vivo environment to confirm the biological influences of ELF-MF on free radical generation.

[PA1-53] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Extremely low frequency magnetic field induces hyperalgesia in mice by acting on nitric oxide synthesis through Ca++-channel.

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The exposure to extremely low frequency magnetic field (ELF-MF, 60 Hz) has been shown to affect pain threshold and nitric oxide (NO) synthesis. The aim of present study was to investigate the relation of hyperalgesia and NO synthesis modulated by ELF-MF in central nervous system (CNS). We evaluated the pain thresholds using hot plate test and NO concentration in CNS after mice were exposed to sham or 20 G ELF-MF (60Hz) for 48 hours. The exposure to ELF-MF induced hyperalgesia, which was inhibited by non-selective NOS inhibitor, L-NNA, suggesting that NO was involved in ELF-MF induced hyperalgesia. These ELF-MF effects were blocked by calcium channel blocker, nimodipine, but not by NMDA receptor antagonist, MK-801. Both of them are known to block the influx of Ca++ essential in activating the constitutive nitric oxide synthase in CNS. ELF-MF exposure to mice also increased NOx level in brain and spinal cord, in which this elevation of NOx by ELF-MF was attenuated by nimodpine and L-NNA treatment. These results indicate that the exposure of ELF-MF may produce the hyperalgesia by acting on nitric oxide synthesis through Ca++-channel.

[PA1-54] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Enhanced levels of thiobarbituric-acid-reactive substances in rat's brain exposed to extremely low frequency magnetic field

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To investigate whether extremely low frequency magnetic field (ELF-MF) may change the level of lipid peroxides in brain tissue, we evaluated concentration of the thiobarbituric-acid-reactive substances (TBARS) after rats were exposed to ELF-MF. Furthermore, we correlated the TBARS with endogenous antioxidant systems such as reduced and oxidized glutathione (GSH and GSSG), superoxide dismuatase (SOD) and glutathione peroxidase (GPx). Rats were fed ad libitum in sham or ELF-MF (60 Hz, 5, 10 or 20 G) environment for 3 or 5 days. After exposure, rats were decapitated in anesthesia and brains were immediately isolated into four regions (cortex, cerebellum, thalamus and striatum). TBARS level was significantly increased by 20 G ELF-MF in all brain regions though weaker ELF-MF (5 or 10 G) did not elevate TBARS. Non-enzymatic antioxidant system, GSH and/or GSSG, was shown to decrease in significant (cortex and cerebellum) or moderate (striatum and thalamus) level in ELF-MF exposure group. 20 G ELF-MF did not alter the activity of SOD and GPx acting as antioxidant enzyme in living cells. These results show that higher ELF-MF may lead to enhanced lipid peroxidation in living animals through impeding non-enzymatic antioxidant system. However, considering complex antioxidant systems, we should conduct more detailed experiments to attain to conclusion.

[PA1-55] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

The influence of the extremely low frequency magnetic field on bicuculline-induced seizures in rodents.

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There have been some reports showing that magnetic fields can cause the change of numerous neurotransmitters including excitatory and inhibitory transmitters, which are involved in seizures. In this study we aimed to examine the effect of extremely low frequency magnetic field (ELF-MF) on the sensitivity of seizure response to bicuculline in rats and mice. Rats were exposed to sham or 20 G ELF-MF for 6 hours and then bicuculline was administered i.c.v. at doses of 0.3, 1, 3 mg/kg. Seizure induction time and duration time were measured. In Mice, bicuculline was injected i.p. at various doses after exposure of sham or 20 G MF for 24 hours to measure induction time of convulsion and to calculate LD50(lethal dose) and CD50(convulsant dose) of clonic and tonic convulsion. ELF-MF exposure to rats reduced convulsion induction time and prolonged convulsion duration compared to bicuculline alone treatment. Mice exposed to ELF-MF showed moderately decreased CD50 and LD50 of bicuculline-induced seizure. These results suggest that extremely low frequency magnetic fields may increase the sensitivity of seizure response to bicuculline in rodents. The further study should be taken to elucidate the mechanism of this hypersensitivity.

Poster Presentations - Field A2. Therapeutics

[PA2-1] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

The Inhibition of Beta Amyloid Aggregation by a Novel Series of Benzhydryloxy Piperidino Butyl Benzoate Derivatives

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The neuropathological characteristics of Alzheimer's disease (AD) are the accumulation of beta amyloid (Aβ 1-42) deposits and the collapse of systematic cholinergic neurotransmitters pathway. This study aims at the evaluation and development of benzhydryloxy piperidino butyl benzoate (BPBB) derivatives recently synthesized as an AD therapeutic agent. For this purpose we have screened BPBB derivatives through inhibition of both Aβ aggregation and acetylcholinesterase (AChE) for either delayed set on or curing of AD among the various therapeutic strategies.
Fluorescence assay was conducted with 5μM of ThT and AChE I assay was performed Ellman's method. The molecular simulations were performed using the SYBYL modeling package (Tripos Inc.). Our results show that piperidine derivatives which were synthesized as an AChE inhibitor had an inhibition effect to beta amyloid aggregation. The IC_{50} values to AChE of the compounds with electron withdrawing group among BPBB derivatives were about 0.3μM to 8μM. The IC_{50} of these compounds to Aβ aggregation were about 20 μM to 76μM. We also have investigated the Aβ(12-42) with anti-parallel β-sheets in order to elucidate the characteristics for the aggregation. The active sites of the Aβ dimmers were analyzed by using the piperidine derivatives, which had an inhibition effect to Aβ dimmers, similar to Congo Red. It was estimated that these values were lower than Rifampicin,α-Tocopherol,β-Cyclodextrin,Ascorbic acid and Tacrine.

[PA2-2] [04/18/2002 (Thr) 14:00 - 17:00 / Hall E]

Efficacy of Recombinant Human Growth Hormone in Children with Growth Hormone Deficiency or Turner Syndrome

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Recombinant human growth hormone (rHGh) has used in treatment of growth deficiency with several causes and its efficacy varies with them. To evaluate efficacy and adverse effect of rHGh in children with growth hormone deficiency and Turner syndrome, this was carried with review of medical record.
The collected data was the change of height standard deviation score (SDS), weight SDS, growth velocity