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Mahboubeh Manouchehrabadi et al., J Neurol Neurosci 2017, 8:6
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Carvacrol protects against 6-OHDA toxicity in a PC12 inducible cell model for Parkinsonism

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Parkinson's Disease (PD) is a progressive neurodegenerative movement disorder characterized by selective loss of dopaminergic neurons and the presence of Lewy bodies. Treatment for PD that prevents neuronal death in the dopaminergic system and abnormal protein deposition in the brain is not yet available. Evidence from human and animal studies has suggested that oxidative damage critically contributes to neuronal loss in PD. This study aimed to evaluate the potential neuroprotective effects of carvacrol on PC12 cells treated with 6-OHDA, a cellular model of Parkinson's disease. Carvacrol, a naturally occurring monoterpenic phenol and food additive, has been shown to have antimicrobials, antitumor, neuroprotective and antidepressant like activities. We found that carvacrol protect against 6-OHDA induced cell death in a dose-dependent manner. Neuroprotection was found to coincide with increasing cell viability and reductions in intracellular reactive oxygen species and lipid peroxidation. This study demonstrates that carvacrol protected against 6-OHDA induced cell death via inhibition of oxidative stress, suggesting that carvacrol may be a candidate neuroprotective agent for 6-OHDA induced Parkinsonism and possibly for other genetic or sporadic forms of PD.

Biography

Mahboubeh Manouchehrabadi is currently pursuing MSc in Developmental Biology from Islamic Azad University of Karaj, Iran. She is expert in experimenting *in vitro* and *in vivo* models of Parkinson's disease.

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Burden of normality and deep brain stimulation for Parkinson's disease: A model of psychosocial adjustment

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Statement of the Problem: Deep Brain Stimulation (DBS) has become a leading treatment for alleviating the motor symptoms of Parkinson's disease (PD). Patients may nevertheless experience psychosocial maladjustment after surgery. Initially conceptualized in epilepsy surgery, the burden of normality (BoN) has been viewed as an applicable model for addressing this issue in DBS for PD; however, there is a lack of empirical data supporting this assumption.

Methodology & Theoretical Orientation: We reviewed the literature to identify elements of psychosocial maladjustment in DBS for PD described in the three levels of the BoN: (1) precursory conditions: Chronic illness, sense of disablement and chance for dramatic cure, (2) clinical manifestations of psychosocial maladjustment and (3) two mediating variables: Pre-treatment expectations and discarding roles associated with pre-DBS PD. Next, we administered a DBS-adapted version of the semi-structured Austin CEP interview-designed to assess the BoN in epilepsy to 19 patients aged 58.8±10.1 years treated with DBS for PD.

Findings: The applicability of the BoN found strong support in the literature for each of the three levels, although no research addressed sick roles. Similarly, patients from the pilot study fulfilled the precursory conditions with a disease duration of 11.3±3.5 years, a low pre-DBS quality of life (SF-36 means: PCS=38.1±7.2, MCS=39.8±7.4) and a significant improvement of motor symptoms sustained in the long term (24.5±7.7 months, UPDRS-III: 28.5%, r=0.667, p=0.003). Qualitative data revealed that psychosocial maladjustment was characterized by psychological, behavioral, affective and sociological symptoms, which appeared to be fostered by unrealistic/ambivalent expectations and difficulties to forgo sick roles.

Conclusion & Significance: The BoN is useful to comprehend the post-DBS psychosocial maladjustment experienced by patients with PD and could constitute a theoretical basis for clinical rehabilitation.

Biography

Marc Baertschi has been working under the supervision of Alessandra Canuto on the psychological predictors of quality of life in patients treated with deep brain stimulation for a variety of movement disorders including Parkinson's disease.

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Elaboration of a questionnaire assessing preoperative expectations: Comparison of patient candidates for deep brain stimulation and epilepsy surgery

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Statement of the Problem: Clinical studies in Epileptic Patients (EP) successfully treated with temporal lobectomy have identified a range of psychosocial postoperative maladjustments. Such postoperative issues have also been reported in patients treated with Deep Brain Stimulation (DBS). Researchers have suggested that pre-surgery unrealistic or unspecific expectations may lead to adverse outcomes, despite significant improvements in objective measures. Although various assessments of expectations have been used, there is no validated tool clearly focusing on expectations or hopes related to surgical treatment for neurological diseases. The main purpose of this study was thus to develop an instrument assessing pre-surgery expectations/hopes and to explore its psychometric properties across two clinical populations: Patients undergoing epilepsy surgery and patients qualified for the DBS.

Methodology: The Treatment Hope and Expectations Questionnaire (THEQ) were elaborated following a thorough review of relevant literatures. It consists in 22 statements exploring four expectations domains (daily living activities, mental and physical health, psychological wellbeing, social-relational life). Each domain is assessed on 3 subscales: Realistic expectations, hopes and current state (control measure). The THEQ was completed by 30 DBS and 30 EP before the planned surgery.

Findings: The THEQ had good psychometric properties. Paired t-tests conducted on realistic expectations and hope total scores (i.e., cross-domains) revealed that both EP and DBS patients reported significantly higher hopes than realistic expectations. Moreover, the two groups were characterized by high expectations and hopes for the mental and physical health domain. Nevertheless, DBS patients had significantly higher expectations and hopes for the social-relational life domain as compared to EP. By and large, DBS patients' expectations and hopes were more attuned towards psychological or interpersonal improvements as compared to EP.

Conclusion: DBS and EP endorsed different preoperative expectations, which may affect their adherence to treatment and their postoperative satisfaction. Hence, the THEQ may help clinicians anticipating postoperative adjustment issues.

Biography

Michalina Radomska has completed her Master's degree in Clinical and Cognitive Psychology from Faculty of Psychology and Educational Sciences at University of Geneva, Switzerland. She is currently working as an Assistant and Clinical Psychologist in Psychopathology and Cognitive Neuropsychology Unit at University of Geneva. She is also pursuing her PhD in Psychology in the field of psychological outcomes of deep brain stimulation for Parkinson's disease. Her main research interest lies in the understanding of the relationship between preoperative expectations and postoperative psychological adjustment in PD patients.

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The usefulness of combined brain perfusion SPECT, DAT-SPECT and MIBG scintigraphy for the diagnosis of dementia with Lewy bodies

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Background & Aim: Current diagnostic criteria recommend neuroimaging as a diagnostic support tool for the clinical diagnosis of dementia with Lewy bodies (DLB). Because DLB causes characteristic impairments and disabilities, such as neuroleptic hypersensitivity, which may significantly increase morbidity and mortality, its prompt and correct diagnosis is very important. The aim of this study was to evaluate the extent with which diagnostic accuracy can be increased using a combination of brain perfusion SPECT (bp-SPECT), I-metaiodobenzylguanidine Myocardial Scintigraphy (MIBG scintigraphy) and DAT-SPECT. Taking finances and patient burden into consideration, we compared the tests to determine priority.

Methods: 34 patients with probable DLB (75.0±8.3 years old, 14 male: 20 female) underwent bp-SPECT, MIBG myocardial scintigraphy and DAT-SPECT.

Results: Our comparison of three functional imaging techniques indicated that MIBG scintigraphy (79%) or DAT-SPECT (79%) had better sensitivity for characteristic abnormalities in DLB than bp-SPECT (53%). The combination of the three modalities could increase sensitivity for diagnosis of DLB to 100%. Additionally the ratio of patients with rapid eye movement sleep behavior disorder (RBD) was significantly higher in MIBG (+) group than in MIBG (-) group.

Conclusions: In the stand-alone diagnostic means, priority should be placed on MIBG scintigraphy or DAT-SPECT for the diagnosis of DLB. However, our results suggest that the combination of bp-SPECT, MIBG scintigraphy and DAT-SPECT increased accuracy of the clinical diagnosis of DLB.

Biography

Seiju Kobayashi is currently the Director of the Department of Psychiatry and also a Faculty of Medicine at Nakae Hospital, Japan.

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Sunanta Prommin et al., J Neurol Neurosci 2017, 8:6
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Longitudinal assessments of gross motor development during 6-12 months in orphaned infants: A pilot study

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Several researches demonstrate that infants in orphanage had delayed gross motor development [1-5]. However, these evidences reported delayed gross motor development of orphans when being adopted or while living in orphanages using a cross-sectional assessment. Previous longitudinal study of Darrah and colleagues found that motor development of typically-developing infants are not stable in the rate of emergence of gross motor development. The greatest variability was observed from infants aged 6 to12 months and instability within individual infants over time during the first 12 months [6]. Longitudinal study seems to be a helpful design to provide useful data about gross motor development variations of individual within a group on some behaviors over time. The purpose of this study therefore was to investigate gross motor developmental milestones via a longitudinal design while infants are living in the orphanages.

Methodology: Six participants aged 6 months were recruited from an orphanage in Northeastern part of Thailand. The gross motor development of each infant was assessed monthly at the age of 6.5 months until 11.5 months using the Alberta Infant Motor Scale (AIMS). Demographic data were reported using descriptive statistics. The AIMS scores were summarized and plotted on the norm reference graph from the study of Canadian infants [7]. The number of times and percentile of infants with scores occurring below designated cut-offs were reported.

Findings: The sample of 6 infants include 5 boys and 1 girl. Table 1 shows characteristics of participants. Figure 1 shows the variation of individual orphans' percentile ranks from 6.5 months to 11.5 months, with no systematic pattern of change noted across infants. However, there were observable less instability compared with typically-developing child in Darrah et al's study. Three orphans showed variation of less than 50 percentiles across six assessments. One infant showed two times of scores which was lower than cut-offs percentile (the 5th percentile). The results could be that these participants had biological risk factors such as low birth weight and biological underlying. The lesser instability of gross motor in these orphans could be caused by limited environment in orphanage.

Conclusion: Infants who are living in the orphanages tend to have less instability of gross motor percentile. Recommendation: Results of this study implies that orphaned infants need a longitudinal screening for gross motor development especially those who were born with biological risk factors to confirm their gross motor development delay.

Biography

Sunanta Prommin is studying her Master degree at the School of Physical Therapy, Faculty of Associated Medical Sciences, Khon Kaen University, Thailand. She graduated with a Bachelor's degree in Physical therapy programs. Her further project is interested in the effect of an organized play and environmental modification program in orphans.

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Ting-Ting Yang et al., J Neurol Neurosci 2017, 8:6
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BDNF inhibition of LPS-induced microglial activation in Parkinson's disease

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Microglial Activation (MA) and Dopaminergic (DA) neuron loss are features of aging brain in Parkinson's disease (PD). Although the etiology of PD remains unclear, age and inflammation are known PD risk factors. Because Reduced Brain-Derived Neurotrophic Factor (BDNF) are associated with DA neuron loss in the Substantia Nigra (SN), age and LPS-related BDNF/ TrkB signaling pathway for MA and DA neuron loss in PD have been characterized. Infusing recombinant BDNF into the SN of mice at 6-month-old by osmotic mini-pump for 3 months, we found BDNF inhibited LPS-evoked area of MA in SN, striatum, hippocampus. Exposure to LPS induced phosphorylation of p38, JNK and GSK3, which then increased phosphorylation of NF-κB. Phosphorylated NF-κB translocated into nucleus and bound to CBP and other co-activators. The NF-κB-CBP complex then induced transcription of inflammatory-related genes. Exogenous supplement with BDNF or endogenous up-regulating the expression of BDNF by exercise inhibited MA. Potential suppressive mechanisms of BDNF on MA might depend on three pathways: (1) BDNF induced Erk activation, which then phosphorylates CREB. Activated CREB inhibited NF-κB activity through competition for limited amounts of CBP. Activated CREB was also known to induce transcription of anti-inflammatory genes. Furthermore, activated CREB might also induce a positive feed forward production of BDNF, (2) BDNF actives Akt, which inhibited the activation of GSK3, resulting in a decrease of NF-κB activation and an increase of CREB activation and (3) BDNF up-regulated MKP-1, which then reduced the LPS-induced phosphorylation of p38 and JNK.

Biography

Ting-Ting Yang is the Professor of Neuroscience at School of Medicine and a Senior Fellow of School of Chinese Medicine for Post-Baccalaureate at I-Shou University. She has completed her Master's level training and Doctoral training in Cellular and Molecular Biology at Nagasaki University. The major focus of her ongoing research is the investigation of disease and treatment-induced changes in gene and protein expression profiles that regulate neuro-energetics and neuroplasticity signaling pathways in neurodegeneration disease including Alzheimer's disease and Parkinson's disease.

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Wai Kwong Tang, J Neurol Neurosci 2017, 8:6
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Prevalence study of poststroke behavioral disinhibition in Hong Kong

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Introduction: Previous studies reported stroke patients exhibited Poststroke Behavioral Disinhibition (PSBD). The prevalence rates across studies were inconsistent and vary widely (ranged from 5 to 76%). Moreover, the clinical correlates of PSDB were unknown. Therefore, this study aimed to determine the prevalence of PSDB and its correlates with clinical variables, i.e. functional dependence, cognitive functioning, anxiety and depressive symptoms, after 3-month after stroke.

Methods: Stroke survivors who had ischemic stroke admitted to the Acute Stroke Unit of the Prince of Wales Hospital from September 2016 to April 2017 were recruited. PSBD was assessed by the disinhibition subscale of the Chinese version of the Neuropsychiatric Inventory (CNPI), which was responded by the caregivers. The stroke survivors' functional dependence, anxiety and depressive symptoms were assessed by Barthel Index, the anxiety subscale of the Hospital Anxiety Depression Scale, and the Beck Depression Inventory respectively.

Results: Twenty-eight stroke survivors were recruited, 9 were excluded due to the absence of caregivers (n = 8) and history of schizophrenia (n = 1). Thus, 19 stroke survivors and their caregivers were assessed. The mean age of the stroke survivors was 67.11 (SD = 6.79) and 11 (57.9%) were male. The types of caregiver were spouse (63.2%), children (26.3%), and others (10.5%). None of the caregivers reported the presence of behavioral disinhibition of the corresponding stroke survivors.

Conclusion: PSBD is uncommon amongst ischemic stroke survivors in Hong Kong.

Acknowledgement: The project is supported by the Direct Grant for Research 2015/2016 (Round 1) Ref. No. 2015.1.061.

Biography

Professor WK Tang was appointed as professor in the Department of Psychiatry, The Chinese University of Hong Kong in 2011. His main research areas are Addictions and Neuropsychiatry in Stroke. Professor Tang has published over 100 papers in renowned journals, and has also contributed to the peer review of 40 journals. He has secured over 20 major competitive research grants. He has served the editorial boards of five scientific journals. He was also a recipient of the Young Researcher Award in 2007, awarded by the Chinese University of Hong Kong.

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The detrimental roles of neutrophil gelatinase-associated lipocalin in ischemic stroke

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Ischemic stroke is a major cause of death and long-term disability worldwide. Tissue plasminogen activator (tPA) is the only drug approved for pharmacological intervention to reverse acute ischemic stroke, but reestablishment of circulation may paradoxically initiate reperfusion injury. Activated immune cells (neutrophils, macrophages) infiltrate into ischemic brain tissue, release free radicals, pro-inflammatory cytokines and proteins, thus causing brain edema, disruption of blood-brain barrier (BBB) and neuronal cell death. Therefore, treatments that can inactivate these immune cells and limit stroke-reperfusion injuries are urgently needed. Our recent results demonstrate that neutrophil gelatinase-associated lipocalin (NGAL) was acutely induced in mice and humans after ischemic stroke and is an important mediator of stroke-reperfusion injury. Increased levels of NGAL were observed in mouse serum as early as 1 hour after transient middle cerebral artery occlusion (tMCAo), reaching peak levels at 23 hours. NGAL was also detected in neutrophils infiltrating into the ipsilateral hemisphere, as well as a subset of astrocytes after tMCAo, but not in neurons and microglia. Cerebral infarctions, neurological deficits, infiltration of immune cells, pro-inflammatory molecules and BBB permeability after tMCAo was significantly reduced in NGAL null mice. The plasma concentration of NGAL was markedly elevated in patients with ischemic stroke. During a four year follow-up, patients with higher levels of NGAL had higher mortality rates. These results demonstrate that NGAL is a neurotoxic factor secreted rapidly in response to cerebral ischemia, suggesting its potential usage as an early stroke biomarker and a novel therapeutic target to reduce stroke-reperfusion injury.

Biography

Yi-Chinn Weng has completed her PhD from Department of Molecular Medicine, University of Texas Health Science Center, San Antonio and Postdoctoral studies from University of California, San Francisco. She has published several research papers in reputed journals including *Nature, Proceedings of the National Academy of Sciences, Annals of Neurology* and *Journal of Biological Chemistry*.

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Alexander Nikolaevich Trofimov et al., J Neurol Neurosci 2017, 8:6
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Learning deficit and altered *MMP9* and *TIMP1* gene expression in adult rats exposed to bacterial endotoxin during early postnatal development

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Perinatal brain pathologies are known to impair the development of CNS functioning and are involved in the etiology of chronic cognitive dysfunction. These pathological conditions are associated with high production of pro-inflammatory cytokines by the cells of the immune and nervous systems. It is well established that neurons express receptors for pro-inflammatory cytokines, which provides evidence for the functioning of cytokines as neuromodulators. However, the exact molecular and cellular mechanisms of cytokines in the impairment of brain development have not yet been fully elucidated. To address this question, we studied the expression of neuroplasticity-regulating genes matrix metalloproteinase-9 (*MMP9*) and tissue inhibitor of metalloproteinases-1 (*TIMP1*) in the medial prefrontal cortex and dorsal and ventral hippocampus. Wistar rat pups were treated with lipopolysaccharide (LPS; 25 μg/kg), an inducer of pro-inflammatory cytokine synthesis, during the 3rd week of postnatal life. Adolescent and adult LPS-treated animals demonstrated increased anxiety-like behavior and decreased exploratory behavior in the open field arena. Impaired learning in the active avoidance task and Morris water maze was also observed. Gene expression of *MMP9* and *TIMP1* was differentially altered in the cortex and hippocampus of pups vs. adult untrained rats and remained unchanged in rats trained in either learning task, revealing that prolonged pro-inflammatory challenge during early postnatal development negatively affects the plasticity factors involved in memory acquisition in adulthood. These results suggest that an increase in cognitive stimulation might be an effective approach to reduce the negative effects of neonatal immune challenges on brain functioning.

Biography

Alexander Nikolaevich Trofimov is a Research Fellow and pursuing his PhD at the Institute of Experimental Medicine, Saint Petersburg, Russia. He has completed his BSc and MSc degrees in 2009 and 2011, respectively from Saint Petersburg State University, Russia. His work focuses on the investigation of molecular and cellular mechanisms in the context of immune activation in CNS functioning and in impaired brain development.

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Interrelation between testosterone, β-estradiol, physical aggression and 2D:4D ratio in young men

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Statement of the Problem: Aggression development mechanisms research is important for modern society because excessive aggression manifestations are dangerous for individual and society. Testosterone is shown to have the organizing effects on neural circuits in perinatal period. They are realized through testosterone aromatization into β-estradiol in specific brain regions. The ratio of second and fourth fingers lengths (2D:4D ratio) is believed to be retrospective biomarker of exposure to androgens during fetal development. According to this hypothesis 2D:4D ratio is negatively correlated with prenatal testosterone level. However, there are works contradicting this hypothesis and not all authors believe that 2D:4D ratio is good marker of prenatal exposure to androgens. The purpose of this work was to study interrelations between testosterone, β-estradiol, physical aggression and 2D:4D ratio of the right hand.

Methodology & Theoretical Orientation: The study involved young men (14 Indian population persons, 21 Ukrainian population individuals). Physical aggression was evaluated using Buss-Durkee Hostility Inventory. The fingers length measurement was carried out using calipers. Blood serum hormone levels were determined by ELISA kits.

Findings: Moderate but insignificant correlation between total blood testosterone and physical aggression was found both in the general group and men of every population. Positive correlation was found between testosterone and β-estradiol levels in men of both Indian and Ukrainian populations. In the total group and Indian population men, positive correlation between testosterone level and 2D:4D ratio was revealed.

Conclusion & Significance: The results indicate weak correlation between the baseline testosterone and aggressiveness and the inability to use total blood testosterone as peripheral marker of predisposition to aggression. Positive correlation between 2D:4D ratio and testosterone indirectly indicates effects on 2D:4D ratio not only of testosterone but also other regulatory factors and the impossibility to use this ratio as retrospective biomarker of exposure to androgens during fetal development.

Biography

Liudmyla D Popova has completed her PhD degree and is currently a Biochemistry Department Professor in Kharkiv National Medical University, Ukraine. Her field of scientific interests is the study of the aggression development mechanisms.

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Accepted Abstracts

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The relationship between inflammatory markers and cognitive impairment in acute ischemic stroke patients

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Background: Patients with acute ischemic stroke are at a higher risk of developing cognitive impairment. Cognitive impairment is often associated with cytokine activation.

Aim: To assess the pattern of cognitive impairment in patients with acute ischemic stroke and to explore its relationship to the inflammatory markers.

Patients & Methods: 44 patients with acute ischemic stroke (1st 48 hours) were subjected to neurological examination, assessment of stroke disability using National Institute of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS), neuropsychological assessment using mini mental state examination (MMSE), Montreal cognitive assessment (MoCA) scale, trail making test-B (TMT-B) and controlled oral word association test (COWAT), measurement of (IL-8, ESR, CRP) levels and neuroimaging. 44 ages, sex and educational level matched controls were included for comparison of neuropsychological tests and serum level of IL-8.

Results: The patients showed worse performance in neuropsychological tests (MMSE, MoCA, COWAT, TMT-B) than controls. The level of IL-8 was significantly higher in all patients than the control subjects. There was a significant negative correlation between the serum level of IL-8 and both screening (MoCA) and detailed (COWAT) cognitive assessment. Significant negative correlation was found between the IL-8 serum level and TMT-B.

Conclusion: The cognitive impairment in early acute ischemic stroke is highly correlated to the serum level of IL-8.

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The assessment of the combined effect of transcranial direct current stimulation and transcranial magnetic stimulation using neuro-imaging in tinnitus patients

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From prior study, standard stimulation techniques for neuromodulation were settled by the theory that brain activity can controlled by frequency; low frequencies cause neuron activity decrease and high frequencies function in contrary way. But it has not yet known which pathway involved and how it works of inhibitory top-down neuromodulation for stimulation in the human brain. We have treated Transcranial Direct Current Stimulation (tDCS) or Transcranial Magnetic Stimulation (TMS) on tinnitus patients, onset from 3 months to 40 years chronic tinnitus, having various hearing and subjective tinnitus sound. Total 4 treatment group, TMS group which treated with 0.8 multiplied threshold of RMT, 200 pulses, on single side temporal area, bifrontal tDCS group, sham TMS group after tDCS and tDCS combined TMS group. Each group has 13 subjects equally assigned treatment double blind test, with a mean age of 54.15 years (SD=13.50). In the tDCS-TMS combined group, Visual Analogue Scale (VAS) of tinnitus intensity showed a decrease in 76.9% (10/13) of subjects. (Pearson's chi-squared test, $p=0.123$). It is contrary to prior study, it means tDCS reduce not only distress also tinnitus intensity. Analyzing pre-post tinnitus VAS score, there was no correlation among VAS intensity, distress, perception and THI improvement. In responders, we confirmed that tinnitus intensity, distress or perception of each treatment groups have decreased in statistically significance (Wilcoxon test, $p<0.045$) on single stimulation. Also, the statics and qEEG showed that only ipsilateral responders are observed in the TMS group and the tDCS group or combined group has contralateral tinnitus responders. Our results are an implication that the type of tinnitus with effect can be different depending on the stimulation methods. Still, the patient numbers are not enough to validate each type of tinnitus in statics, to standardize the treatment; it should be apply to larger population.

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Intra-nucleus accumbens gastrin-releasing peptide: The effects on reward processing and feeding behavior

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Gastrin-Releasing Peptide (GRP) is the mammalian counterpart of the amphibian peptide Bombesin (BB) and is known to act as a satiety peptide to suppress feeding. Receptors for GRP are widespread throughout the central nervous system with particular abundance in the Nucleus Accumbens (NAcc), a structure that is part of the mesolimbic dopamine pathway linked with reward. Our lab revealed that an injection of GRP (1.7 g/L) directed at the NAcc caused an immediate and significant release of dopamine. This finding provided evidence of involvement of GRP in reward processing. The objective of this experiment is to assess the effects of intra- NAcc microinjections of GRP (0.87, 1.7 g/L) and systemic D-amphetamine (1 mg/kg) in a behavioral paradigm linked to reward and motivation, operant responding for food reward using a progressive ratio (PR) schedule of reinforcement. It is hypothesized that GRP will increase the number of food rewards obtained. Sprague-Dawley rats were trained to lever press on a PR schedule of reinforcement for sugar pellet food reward followed by observation of feeding behavior. Injections of GRP and D-amphetamine significantly increased the number of food rewards obtained, suggesting increased motivation for food reward and did not affect feeding behavior, suggesting involvement in pathway's distinct from the satiety pathway. This is likely through the activation of mesolimbic dopamine neurons, which can be investigated in future studies.

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Interaction between 5-HT4 and CB1 function in the pre-limbic cortex on memory consolidation deficit in inhibitory avoidance task

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This study performed to investigate the influence of bilateral post-training intra-pre limbic (PL) microinjections of serotonergic 5-HT4 receptor agents (RS67333, as a 5-HT4 receptor agonist and RS23597-190, as a 5-HT4 receptor antagonist) upon amnesia induced by a cannabinoid CB1 receptor agonist, Arachidonylcyclopropylamide (ACPA) in rats. The step-through Inhibitory Avoidance (IA) and open filed apparatuses were used to examine the memory consolidation and locomotion behaviors, respectively. Bilateral guide-cannulae were implanted to allow intra-PL microinjections of the drugs. Also, post-training administration of the drugs was performed with the volume of 0.6 µl/rat (0.3 µl/side). Based on our findings, post-training bilateral intra-PL microinjection of ACPA (0.1 and 0.5 µg/rat) decreased, whereas RS67333 (0.5 µg/rat) increased IA memory consolidation. Meanwhile, post-training bilateral intra-PL administration of RS23597-190 (0.005, 0.01, 0.1 and 0.5 µg/rat) did not alter memory consolidation. Moreover, intra-PL micro-infusion of RS67333 (0.005 µg/rat) plus the lower (0.001 µg/rat) or the higher (0.1 µg/rat) dose of ACPA potentiated or restored the memory consolidation impairment induced by ACPA, respectively. While, post-training administration of RS23597-190 (0.5 µg/rat) plus the higher dose of ACPA (0.1 µg/rat) potentiated the ACPA response. However none of the above interventions affect locomotors activity. In conclusion, our results suggest that the PL 5-HT4

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Review of musical training and second language acquisition research

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There is continued research in the world exploring the relationship between second language acquisition and musical training. When measuring the effect of musical tones on speech segmentation, it has found that the behavioral data collected is not statistically different (reaction time and accuracy) but the brain tells a different story. Because neuronal responses are extremely fast, EEG is a good tool to observe rapid cognitive processes. It has the ability to record millisecond responses after a stimuli l in contrast to MRI or FMRI that records data in minutes. This paper looks into a study conducted at the neuro-cognition of language lab at Teacher's College, Columbia University on a research to explore, among others, the relationship between musical tones and speech segmentation.

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Neurodegenerative diseases: A new view through iron homeostasis

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Alzheimer's Disease (AD), Parkinson's Disease (PD) and Amyotrophic Lateral Sclerosis (ALS) are part of neurodegenerative diseases. Their development is slow, progressive and most common is seen in elderly patients. Hepcidin leads to iron deposition in neuronal structures as a result from oxidative stress. We tried to evaluate serum hepcidin levels in neurodegenerative diseases and search for connection to disturbed iron homeostasis. 23 patients with AD, 17 cases with PD and 13 with ALS were included, 24 males (45.3%). They were clinically and neurologically reviewed, EMG, IMT and ABI were measured. They were evaluated for routine biochemical parameters and additional serum hepcidin were quantified. AAS, nephelometric, ELISA and statistical methods were used during analyzes and obtained results interpretation. All results were compared to age and gender matched healthy controls. We found statistically significant elevated serum hepcidin in patients with neurodegenerative diseases (AD: 47.9±3.1 μg/L, PD: 49.8±5.1 μg/L, ALS: 53.8±4.9 μg/L) compared to healthy controls (19.9±4.1 μg/L); $P<0.001$. Serum hepcidin correlates negatively to glutathione peroxidase and superoxide dismutase changes in evaluated neurodegenerative diseases patients ($0.9<r<0.7$, $P<0.05$). Our findings support role of serum hepcidin quantification as a marker for iron deposition in neurodegenerative diseases and might bring new view to early therapeutic implementation in Alzheimer's disease, Parkinson's disease and amyotrophic lateralSclerosis.

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Combined effect of Baclofen and Acamprosate in experimental models of peripheral neuropathic pain in Wistar rats

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Neuropathic Pain (NP) is defined as pain associated with damage or permanent alteration of the peripheral or central nervous system. Current drug treatment for the management of neuropathic pain associated with various adverse effects. The present study was designed to investigate the combined effect of Acamprosate and baclofen in experimental model of peripheral Neuropathic pain in Wistar rats. Neuropathic pain was induced by chronic constriction injured (cci) of sciatic nerve in rats. Acamprosate (100 and 200 mg/kg p.o) and Baclofen (10 and 20 mg/kg p.o) was given in different groups for 14 days starting on 7th day post sciatic nerve ligation. Further combination of Acamprosate (100 mg/kg p.o) and Baclofen (10 mg/kg p.o) was also given to one group. On 1st, 3rd, 7th, 14th and 21st day behavioral parameters like mechanical allodynia and thermal hyperalgesia were assessed. Then animals were sacrificed on 22nd day and biochemical parameters (GSH, LPO, catalase, nitrite, SOD) were assessed. Ligation of sciatic nerve significantly induced mechanical allodynia and thermal hyperalgesia with increase in oxidative stress (increase in lpo and nitrite) and decline of anti-oxidant enzyme levels (catalase, SOD, GSH) in sciatic nerve homogenate. Acamprosate (100 and 200 mg/kg p.o) and Baclofen (10 and 20 mg/kg p.o) attenuated all the behavioral and biochemical parameters alone and/or combination.

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