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Galantamine potentiates neuroprotective potential of Taurine in Aβ (1-42) induced animal model of Alzheimer's disease: The synergistic role of GABAA & α 7 nicotinic acetylcholine receptors

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Background: Taurine, 2-aminoethanesulfonic acid, acts as a neuromodulator, osmoregulator, prevent mitochondrial dysfunction, apoptosis and oxidative stress. Also prevent the neurotoxicity of beta amyloid peptide ((A) (1-42)) by binding on GABAA receptor. Galantamine, acetylcholinesterase inhibitors (AChEIs), is a novel treatment for AD and modulates nicotinic acetylcholine receptors (nAChRs). It also produces neuroprotection by inhibiting neuroinflammatory pathway (nAChR-Jak-NFkB) and the ROS pathway (iNOS/NOX). In this study, the combination of taurine and AChEIs (galantamine) is used as a therapeutic strategy to improve cognition in AD.

Objective: The objective of this study was to evaluate the neuropotentiating effect of galantamine on taurine in amyloid beta ((Aβ) (1-42)) induced cognitive dysfunction in rats.

Materials & Methods: Intrahippocampal (i.h.) Aβ (1-42) (1μg/μl; 4μl/site) were administered, followed by drug treatment with taurine (25, 50 and 100 mg/kg), galantamine (2 mg/kg) and their combinations for a period of 21 days. Various neurobehavioral parameters followed by biochemical, acetylcholinesterase (AChEs) level, neuroinflammatory marker (TNF-α), mitochondrial respiratory enzyme complexe level (I-IV), neurotransmitters level and histopathological alterations were assessed.

Results: Administration of Aβ (1-42) significantly impaired cognitive performance in Morris water maze (MWM) test, causes oxidative stress, raised AChEs level, neuroinflammation, mitochondrial dysfunction alterations in histopathology and neurotransmitter levels as compared to sham treatment. Treatment with taurine (25, 50 and 100 mg/kg) and galantamine (2 mg/kg) alone improved cognitive performance as evidenced by reduced transfer latency and increased time spent in the target quadrant in MWM test, reduced AChEs activity, neuroinflammation, oxidative damage (reduced LPO, nitrite level and restored SOD, catalase and GSH levels), TNF-α level, restored mitochondrial respiratory enzyme complex (I, II, III, IV) activities, histopathological alterations and neurotransmitter levels as compared to Aβ (1-42) treated animals. Further, combinations of taurine (25 and 50 mg/kg) with galantamine (2 mg/kg) significantly modulate the neuroprotective potential of taurine.

Conclusion: The present study suggests the neuropotentiating effect of galantamine on taurine. This combination in multifaceted pattern improved A ((1-42) induced neurotoxicity as indicated by improving oxidative stress, mitochondrial functions, neuroinflammation, histopathological alterations and neurotransmitter levels.

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Leonardo Cristiá Lara, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Serum levels of natural ocurring IgG against neuronal antigens, Amyloid β peptide and Aldolase in Cubans over 60 years old

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Alzheimer's disease (AD) is the most prevalent form of dementia among the aging population in Cuba and the World . Its long preclinical phase and the lack of biomarkers that would allow an early diagnosis pose great challenges for the development of effective therapeutic approaches. At the earliest clinical stages of Alzheimer's disease, when first symptoms are mild, making a reliable and accurate diagnosis is difficult. In recent years, the potential use of natural ocurring auto-antibodies against neuronal antigens has been investigated. Though in some cases the results were promising, the controversial evidence is still not enough to support their worldwide use as biomarkers in AD dignosis. However, the enormous evidency that links this auto-antibodies with the patogénesis and develop of the desease. The moust described of all thems are the auto-antibodies against Amyloid Beta peptide (Aβ). The objective of this study was to describe the serum levels of natural ocurring IgG against Neuronal antigens, against Aβ and against Aldolase in probable AD, mild cognitive impairment (MCI), and cognitively normal (NC) Cubans over 60 years. We conducted a cross-sectional study targeting the Cuban population over 60 years living in Havana. Natural ocurring IgG against Neuronal, against Aβ and against Aldolase were measured by different ELISA designs. Differences in mean antibody levels were assessed for significance with repeated measures ANOVA with a significance level of 0.05. Only the serum levels of natural ocurring IgG against Aβ were statistically higher in the probable AD patients than in the MCI and CN individuals. Additionally, in patients with probable AD, higher serum levels of natural ocurring IgG anti-Aldolase correlates with higher serum levels of natural ocurring IgG anti-Aβ. Although more research is needed, the results suggest that natural ocurring IgG against Aβ could be use a potential biomarker in AD diagnosis. Also, indicates the existence of a possible association between natural ocurring IgG against Aβ and natural ocurring IgG against Aldolase serum levels in AD patients.

Biography

Leonardo Cristiá Lara has completed his Bachelor in Biochemistry and Molecular Biology at the University of Havana. By the end of his Bachelor`s studies he was awarded for his aotstanding scientific labor as student. Also he has passed with honors several post-graduated course at the University of Havana and has been part of its Young Teachers Training Program. Currently he is studying a Master in Sciences at the University of Zürich. He has work in the Neurosciences Center of Cuba during the last 3 years as Junior Researcher. He has recieved several awards in scientific events inside Cuba and published 2 papers in reputed journals.

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Stephen J Morewitz, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Gender Differences in Persons with Dementia including Alzheimer's Disease who go Missing: Implications for Managing Dementia

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Background: Researchers are beginning to investigate the social and behavioral risk factors among persons with dementia including Alzheimer's disease. Missing persons with Alzheimer's disease and other dementias may become disoriented, injured, or the victims of foul play. Individuals with severe mental impairments at time that they go missing may severely injure or kill themselves, especially within the first 24 hours after they go missing.

Methods: The present investigation is part of the Missing Persons Project, which is based on a random sample of 998 missing-persons reports that were filed between 1991 and 2011 and published in the North American Missing Persons Network and the National Center for Missing & Exploited Children websites. This study tests the null hypothesis there are no gender differences among persons with dementia including Alzheimer's disease who go missing. Each missing-persons report was coded using a 228-item protocol. The coded data were entered into a data file and Chi-Square and correlational analyses were then performed using Systat 9 for Windows program (1999).

Results: The null hypothesis was rejected. Males with dementia including Alzheimer's disease (68.3%) were more likely to go missing than females with the same mental disorder (31.61%) (Chi-square=22.81, df=1, p<.000). These results remained statistically significant after controlling for possible intervening factors.

Conclusions: These findings suggest that males with dementia including Alzheimer's disease are more likely than females with the same mental disorder to go missing. This investigation assesses the implications of these findings for enhanced mental management of demetia and the injury/death prevention.

Biography

Stephen J Morewitz completed his PhD at the age of 29 years from the University of Chicago. He is a Lecturer in the Department of Nursing and Health Sciences at the California State University, East Bay. He is an award-winning researcher with more than 100 publications, including 12 books.

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Bieke Van Deun, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Paratonia in Flemish nursing homes: State of the art

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Besides well-known cognitive challenges, motor abilities are affected in dementia due to several underlying movement disorders. A major underlying motor problem is paratonia, a form of hypertonia characterized by a variable, involuntary resistance against passive movement. Paratonia is often associated with contractures, decubitus and difficulties in comfortable positioning and daily care procedures. The body of knowledge with regard to paratonia is scarce and thereby evidence-based management is lacking. In an online survey, physiotherapists working in nursing homes in Flanders (Belgium) were inquired for the eventual presence of any implemented (standardized) paratonia policy or protocol and for their clinical appreciation of currently used 'therapeutic' strategies and positioning methods/aids. Though paratonia was estimated to be present in 40% of the nursing home residents suffering from dementia, only a minority (17%) of nursing homes seems to have a standardized paratonia policy. With respect to the most applied and appraised therapeutic interventions, positioning and soft passive mobilization could be withheld. For a lying or seated position, respectively C-shaped positioning cushions and a multiposition wheelchair were the most commonly applied and positively appraised positioning aids. According to the respondents, active movement should be encouraged as long as possible, and several relaxation techniques may be of use. Crucial for the success of any therapeutic intervention for paratonia, a multidisciplinary involvement is highlighted as prerequisite, comprising a good communication and cooperation between all staff members. The need for fundamental and clinical research and demand for practical guidelines was highly endorsed by this survey.

Biography

Bieke Van Deun has a Master of Science degree in Motor Rehabilitation and Physiotherapy. She has been working as a physiotherapist in a hospital and a nursing home for 10 years. At present, she is a PhD student at the Department of Rehabilitation Sciences and Physiotherapy of the Ghent University. Her research topic is paratonia in dementia.

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Hanumanthachar Joshi et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Potentials of Gangetin based Phytopharmaceutical formulation Mysgan-2 in management of Dementia

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Background: Management of cognitive disorders like dementia and Alzheimer's disease has been challenging since no potential drug is available with proved efficacy. Some nootropic drugs like piracetam, aniracetam and cholinesterase inhibitors such as Donepezil® have found to exhibit severe toxic effects in elderly. In Ayurveda, dementia is known as Smutibhransh. In the present study, phytochemical based formulations with clues from ayurveda and alternative and complementary medicines were investigated for their efficacy in the management of dementia in animal models relevant to Alzheimer's disease.

Methods: Elevated plus Maze, Passive Shock Avoidance and Morris watermaze were the exteroceptive behavioral models. Scopolamine, ibotenic acid, β-amyloid and ageing induced amnesia were the interoceptive behavioral models. *In vitro* acetylcholinesterase (AChE) and cycloxygenase-1 (COX-1) enzymes activity was also determined. Anti-oxidant activity using DPPH was assessed.

Results: MYSGAN-2 significantly improved the transfer latency, step down latencies and TSTQ when tested on exteroceptive and interoceptive behavioral models. It profoundly improved learning and memory in amnesic mice when tested on interoceptive behavioral models. The cerebroprotective effect of MYSGAN-2was well supported by photomicrographs of Hippocampus of brain, where as severity of cell damage, number of pyknotic black neurons, formation of karyorrhexis, karyolysis and number of neuronal cell death were less comparative to scopolamine, ibotenic acid and β-amyloid treated groups.

Conclusion: MYSGAN-2 can be useful in restoring memory in the treatment of various types of dementia.

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A Oulhaj et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Beneficial interaction between B vitamins and omega-3 fatty acids in slowing brain atrophy and cognitive decline in subjects with Mild Cognitive Impairment (MCI)

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Introduction: Raised plasma homocysteine (tHcy) and low intake of omega-3 long chain fatty acids (FA) are risk factors for Alzheimer's disease (AD). In subjects with MCI the VITACOG trial showed that B-vitamin treatment reduced the brain atrophy rate and slowed cognitive decline. We now show that these effects of B-vitamins are influenced by baseline plasma omega-3 FA concentrations.

Method: The effects of B vitamin intervention in VITACOG subjects was analysed according to baseline omega-3 FA (DHA and EPA) concentrations.

Results: There was a significant interaction (P = 0.024) between B-vitamin treatment and plasma omega-3 FA on brain atrophy rates. In subjects with high omega-3 FA, B-vitamin treatment slowed the atrophy rate by 40% compared with placebo, whereas B-vitamins had no effect on atrophy in subjects with low omega-3 FA. A similar interaction was found between omega-3 FA and the beneficial cognitive effects of B-vitamin treatment: high baseline omega-3 FA levels enhanced the slowing of cognitive decline following B-vitamin treatment.

Conclusion: The beneficial effect of B-vitamin treatment on brain atrophy and cognition was found only in subjects with high plasma omega-3 FA. The results highlight the importance of identifying subgroups likely to benefit in clinical trials. A clinical trial is needed to see if a combination of B-vitamins and omega-3 FA will slow conversion from MCI to AD.

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Fahad Safah Kayed Manee, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Survey of cognitive rehabilitation practices in the state of Kuwait

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Rehabilitation professionals must be astute at recognizing, assessing, and treating individuals with cognitive deficits. No research is available to examine cognitive rehabilitation practices applied to individuals with neurological conditions in Kuwait. Objectives of this study were to identify the use of cognitive assessments, the availability of resources, and the barriers to cognitive rehabilitation practices in Kuwait. Face-to-face interviews were conducted with health care professionals working with adult individuals with neurological conditions. These professionals included occupational therapists, speech-language pathologists, psychiatrists, and neurologists. Results of this study showed that the most commonly used cognitive based assessments are MMSE (41%), and MoCA and LOTCA (15.2%). The only clinical assessment used is the Line-Bisection Test (2.2%). The most used occupation-based assessments are FIM (6.5%), COPM (4.3%), the Interest Checklist (2.2%), and the Barthel Index (2.2%). Resources related to cognitive rehabilitation in Kuwait that are unavailable to practitioners include journal clubs (91%), special interest groups (89%), and continuing education programs (82.6%). Barriers to cognitive rehabilitation practice included lack of sufficient funds for continuing education, lack of time, lack of standardized assessments, and lack of interprofessional teamwork. Conclusion many adults in Kuwait live with cognitive impairment. There is a need to develop appropriate evidence-based cognitive rehabilitation clinical guidelines in Kuwait.

Biography

Fahad Manee has completed his PhD at the age of 36 years from Texas Woman's University majoring in Occupational Therapy. He is a Faculty of Allied Health Sciences in The Occupational Therapy Department at Kuwait University. He has published more than 7 papers in reputed peer review journals. He served as a chair of the Occupational Therapy Department.

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Panaree Busarakumtragul, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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The study of association between serum brain derived neurotrophic factor protein and dyslipidemia on memory performance in thai Alzheimer disease patients

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This study aimed to investigate the association between Serum Brain Derived Neurotrophic Factor (BDNF) Protein and dyslipidemia on memory performance in Thai Alzheimer Disease (AD) patients. It is well known that BDNF protein has important function in neuronal survival, synaptic plasticity, and neurogenesis in rat hippocampus including learning and memory. The lower BDNF protein level results in a decrease in synaptic transmission leading to neuronal damage in hippocampus and neurodegenerative disease in ageing. Moreover, BDNF protein also promotes neurite outgrowth. After this research project has been approved and certified by human ethic committe Srinakharinwirote University, we recruited volunteer male and female subjects with aged 45 or more. Before all subjects began to participate in this research, they had to perform Thai Mini Mental State Examination (TMMSE). Then thirty subjects were enrolled as control group whereas fifteen AD patients were participated as experimental group. Then they were withdrawn 10 milliltres of venous blood samples from left antecubital vein. Blood samples were left at room temperature (25oC) until they become clotted. They were centrifuged to seperate supernatant for BDNF protein assay by Enzyme Linked Immunosorbent Assay (ELISA) (Milliplex assay kit, Merck Millipore, Germany). Serum BDNF protein in AD patients was lower and significant different from that in control group at $p<0.05$. However, total cholesterol , triglyceride, high density lipoprotein, and low density lipoprotein in AD had no significant different compared with control group. Furthermore, TMMSE score in AD has significant lower than control group at $p<0.05$. We can be concluded that the lower level of serum BDNF protein in AD patients may cause the less scores of TMMSE leading to reduction in memory performance in Thai AD patients.

Biography

Panaree Busarakumtragul has completed her PhD at the age of 44 years from Mahidol University and she was trained during studying PhD at Seoul National University, Republic of Korea. She has postdoctoral training from Medical Innsbruck University. She is Associate Dean of Administrative and Academic (Preclinic), Faculty of Medicine, Srinakharinwirot University. She has been serving as an editorial board member of journal of medicine and health science.

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Ivan V Maksimovich, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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The application of Transcatheter Laser Revascularization for the restoration of cerebral microcirculation, tissue structure and the mitochondrial cellular apparatus in AD

Ivan V Maksimovich
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Background: AD treatment should be aimed at normalization of cellular metabolism, restoration of mitochondrial cellular structures, destruction and excretion of pathological proteins, which in turn requires the restoration and normalization of cerebral microcirculation.Here presented are the results of AD treatment based on angiogenesis stimulation, recovery of microcirculatory bed, and tissue and cell brain structures by means of transcatheter impact of low-energy laser.

Methods: From 93 patients with AD 48 patients aged 34-79 (average 65) were singled out, among which: *Group (TDR-0)* - 4 (8.33%) - pre-clinical AD stage without any particular cognitive impairment and dementia manifestations; *Group (TDR-1)* - 16 (33.33%) - AD history up to 2 years, mild dementia, mild cognitive impairment and mild manifestations of the disease (corresponds to CDR-1); *Group (TDR-2)* - 21 (43.75%) - AD history up to 6 years, moderate dementia, persistent cognitive impairment and more severe manifestations of the disease (corresponds to CDR-2); *Group (TDR-3)* - 7 (14.58%) - AD history of 7-12 years, severe dementia, severe cognitive impairment and late stages of the disease (corresponds to CDR-3). The examination included MMSE, CDR, TDR assessment, cerebral CT, MRI (with temporal lobes atrophy degree calculation and AD stages determination by «Tomography Dementia Rating scale» -TDR), SG, REG, and cerebral MUGA. Basic cerebral changes at AD were identified: temporal lobes atrophy, along with capillary blood flow reduction in the temporal and fronto-parietal regions, with simultaneous multiple arteriovenous shunts in the same regions, and early venous capillary blood dumping. Low-energy laser systems were used to carry out transcatheter treatment.

Result: Good angiographic outcome manifested in persistent angiogenesis, capillary blood flow restoration and arteriovenous shunts reduction, was obtained in all cases, which in turn led to amyloid beta metabolism normalization in the cerebral tissue. In the long period (2-6 years) all 48 patients showed 8-15% increase in the tissue mass of temporal lobes accompanied by dementia decrease and cognitive functions improvement, indicating recovery of cerebral structures.

Conclusions: Transcatheter laser revascularization leads to angiogenesis stimulation and to the recovery of microcirculation, cerebral cell and tissue structures, promotes the excretion of amyloid beta thereby decreasing the level of dementia and cognitive impairment during AD.

Biography

Ivan V Maksimovich, MD, PhD. ISTAART member, ESC member, EAPCI member, WSO member, ESO member, EPA member. Head Physician of Clinic of Cardiovascular Diseases named after Most Holy John Tobolsky (Moscow, Russia) since 1993. One of the major problems the clinic deals with is the diagnosis and treatment of various brain lesions including Alzheimer's disease. Over the past 20 years I have published over 200 scientific works on this subject.

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Cerebral small vessels disease in Alzheimer's disease

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Background: The research focuses on the peculiarities of microcirculatory lesions (CSVD) in AD, the determination of the time during which these changes occur before clinical AD manifestation, the correlation between these changes and neurodegenerative processes in the brain, and the comparison of these changes to vascular changes during other neurodegenerative diseases.

Methods: 1110 examined patients with various types of neurodegenerative diseases: 98 (8.83%) patients featured various AD stages: preclinical TDR-0 - 10 (10.20%) patients, early clinical TDR-1 - 26 (26.53%), middle clinical TDR-2 - 40 (40.82%), late clinical TDR-3 - 17 (17.35%), 5 (5.10%) patients aged 8-11 were direct ascendants of AD patients – Test Group. 1012 (91.17%) patients had other cerebral neurodegenerative lesions: different atherosclerotic brain lesions - 946 (93,79%), Binswanger's disease (BD) - 23 (2.27%), Parkinson's syndrome - 34 (3.36%), Parkinson's disease - 9 (0.89%) – Control Group. The examination included MMSE, CDR, TDR assessment, cerebral CT, MRI, SG, REG, MUGA.

Results: All Test Group patients had dyscirculatory angiopathy of Alzheimer's type (DAAT), which is accompanied by specific CSVD changes in temporal and frontoparietal regions:

- reduction in the number of arterioles and capillaries in temporal and frontoparietal regions;
- development of multiple arteriovenous shunts in the same regions;
- early dumping of arterial blood via those shunts into the venous bed;
- abnormal widening of lateral venous branches receiving blood from arteriovenous shunts;
- stagnation of venous blood at the border of the temporal and parietal regions due to the increased amount of blood from arteriovenous shunts;
- increased looping of distal intracranial arterial branches.

Control Group patients with other cerebral neurodegenerative lesions did not have the same complex of the changes in the vascular and microcirculatory system.

Conclusions: The data received prove that CSVD during AD have a complex of specific features, which we named dyscirculatory angiopathy of Alzheimer's type (DAAT). Other neurodegenerative diseases have no complex of such CSVD changes, which means DAAT is characteristic only of AD. DAAT appears many decades before the primary clinical AD symptoms. Direct descendants of patients with AD acquire DAAT in their childhood; it is also characteristic for patients with AD pre-clinical stage. DAAT progression leads to disorders in the metabolism of abnormal proteins causing their accumulation in cerebral tissues and the vascular wall, which inhibits cerebral microcirculation even more leading to atrophic changes in the cerebral tissue and AD progression.

Biography

Ivan V Maksimovich, MD, PhD. ISTAART member, ESC member, EAPCI member, WSO member, ESO member, EPA member. Head Physician of Clinic of Cardiovascular Diseases named after Most Holy John Tobolsky (Moscow, Russia) since 1993. One of the major problems the clinic deals with is the diagnosis and treatment of various brain lesions including Alzheimer's disease. Over the past 20 years I have published over 200 scientific works on this subject.

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Protective effect of Atorvastatin on *D-galactose* induced aging Model in Mice

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Atorvastatin (Ator), competitive inhibitors of 3-hydroxymethyl-3-glutaryl-coenzyme-A reductase, is a cholesterol lowering drug. Ator has been shown to have neuroprotective, antioxidant and anti-inflammatory properties making that a potential candidate for the treatment of central nervous system (CNS) disorders. Here we assessed the effect of Ator on the D-galactose (D-gal)-induced aging in mice. For this purpose, Ator (0.1 and 1 mg/kg/p.o.), was administrated daily in D-gal-received (500 mg/kg/p.o.) mice model of aging for six weeks. Anxiety-like behaviors and cognitive functions were evaluated by the elevated plus-maze and novel object recognition tasks, respectively. Physical power was assessed by forced swimming capacity test. Animals brains were analyzed for the superoxide dismutase (SOD) and brain-derived neurotrophic factor (BDNF). We found that Ator decreases the anxiety-like behaviors in D-gal-treated mice. Also, our behavioral tests showed that Ator reverses the D-gal induced learning and memory impairment. Furthermore, we found that Ator increases the physical power of D-gal-treated mice. Our results indicated that the neuroprotective effect of Ator on D-gal induced neurotoxicity is mediated, at least in part, by an increase in the SOD and BDNF levels. The results of present study suggest that Atro could be used as a novel therapeutic strategy for the treatment of age-related conditions.

Biography

Iman Fatemi has started his PhD at the age of 28 years from Rafsanjan University of Medical Sciences. He has published more than 10 papers in reputed journals.

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Ayat Kaeidi, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Ampakine Farampator (CX691) improves cognitive impairment and hippocampus BDNF levels in a rat model of Aβ1-42-induced Alzheimer's disease

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An emerging body of data suggests that dysfunction of the glutamatergic system and AMPA receptors has been implicated in Alzheimer's disease (AD). Because AMPA receptor plays a critical role in the regulation of hippocampus synaptic plasticity, the positive modulation of this receptors may rescue learning and memory deficits in AD. In the present study, by using the Morris water maze paradigm, we explored the pro-cognitive effect of Farampator, a specific positive allosteric modulator of the AMPA-type glutamate receptors in rat model of AD produced by injection of amyloid-beta1-42 (Aβ1-42) in to the hippocampus. Furthermore, we investigated the effects of Farampator on brain derived neurotrophic factor (BDNF) protein expression in the hippocampus tissue. Results show that intrahippocampal injection of Aβ1-42 caused learning and memory deficits in rats subjected to the Morris water maze and decreased BDNF expression in the hippocampus. Also we found that treatment with farampator for 10 days (0.3 mg/kg, twice a day) improved the performance of Alzheimeric rats in Morris water navigation task with increased level of BDNF protein. Altogether, our data suggest that Farampator ameliorate Aβ1-42-induced learning deficits, at least part, via up-regulation of BDNF protein in the hippocampus. The results of this investigation may shed light on a possible therapeutic approach to treating and control the progression of AD.

Biography

Ayat Kaeidi has started his PhD at the age of 32 years from Rafsanjan University of Medical Sciences. He has published more than 12 papers in reputed journals.

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Yulia Lerner, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Challenging the neuroprotective potential of physical exercise: Insights into plasticity-related mechanisms in the aging brain

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Mild cognitive impairment (MCI) is a prodromal stage of Alzheimer disease (AD). To date, therapeutic approaches to AD are symptomatic and of modest efficacy. Nonetheless, studies in animal and human populations suggested that physical training results in structural and functional brain changes. The current project aims at exploring brain mechanisms mediating the neuroprotective effect of different types of physical exercise among patients with amnestic MCI (aMCI). Specifically, we performed a comprehensive study to examine the effect of aerobic and non-aerobic training. Neuropsychological evaluations, assessment of neurotrophic factor (BDNF), cardiorespiratory fitness assessment and fMRI have been performed before the physical training and following the intervention. 24 participants suffering of aMCI carried out their activity routines 3 d/wk during 4 months under supervision of an experienced trainer. Inter-SC and GLM methods have been used for data analysis. Following intensive individual training, we found improvement in memory and executive functions in both physical training groups. In the fMRI, we found reliable responses in regions that are related to higher order processing of information: temporo-parietal junction, marginal and supramarginal gyri, frontal areas. Hippocampal activation in memory encoding task increased following aerobic intervention. Increased BDNF was correlated with improved cognition, with no association with the type of exercise. The physical training results in functional and structural changes in a-MCI. Our findings demonstrated that cognitive performance can be affected by exercise of both types. The insights gained from the study may have important scientific value and clinical implications for individuals at the early stages of AD.

Biography

Yulia Lerner has completed her PhD at the Weizmann Institute of Science in 1994. Then she has been trained as a neuroscientist and conducted fruitful research at the New York University and Princeton University. Currently, she is a PI in the Neurocognitive lab at the Functional Brain Center, in the Tel Aviv Sourasky Medical Center. She has performed numerous cutting-edge studies that were published in first-rate journals.

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Mallikarjuna Nimgampalle et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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In vivo studies to assess the protective influence of *Lactobacillus plantarum* MTCC1325 on Alzheimer's disease

Mallikarjuna Nimgampalle and **Yellamma Kuna**
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The present investigation was aimed to assess the protective effect of Lactobacillus plantarum MTCC1325 against D-Galactose induced Alzheimer's disease (AD) in male albino rats. Recently, we have demonstrated that *L. plantarum* modulates the functions of total ATPases and ameliorates the pathological features of AD. In this study, we have evaluated the potential antioxidant nature of *L. plantarum* through *in vitro* assays (DPPH, NO and H2O2), and then estimated the antioxidant enzymes (SOD, CAT and GR) and lipid peroxidation levels (MDA) in vivo in selected brain regions such as hippocampus and cerebral cortex of male albino rats. Further, the alterations in gene expressions (BDNF and AChE) in the hippocampus of experimental and control group rats were assessed by semi-quantitative PCR. From the obtained results it was evident that chronic injection of D-Galactose caused significant impairment of oxidative stress, lipid peroxidation and nerve degeneration in the brain. But the treatment of AD induced rats with *L. plantarum* for sixty days significantly nullified all above mentioned impairments as compared to AD-Model group. These research findings highlight the protective effects of *L. plantarum* MTCC1325 against D-Galactose induced oxidative stress, nerve degeneration and variations of BDNF and AChE levels in the AD rat brain.

Biography

Nimgampalle Mallikarjuna completed M.Sc. (Industrial Microbiology) from Sri Venkateswara University, Tirupati in 2011. Later he worked as Quality Executive Microbiologist in Heritage Foods India Ltd, (Tirupati Branch) during 2012-13. Since 2013 he is pursuing Ph.D. under the guidance of Prof. K. Yellamma, S.V University, India. His areas of research are Functional foods, bioactive compounds from Actinomycetes, Probiotics and their therapeutical applications in neurological disorders.

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Neuroprotective activity of novel 1,2,4-triazine derivatives against H_2O_2 and Aβ-induced neurotoxicity, new leads for Alzheimer's

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Alzheimer's disease (AD) is a neuropathologic disorder characterized by intracellular neurofibrillary tangles and amyloid aggregates in the CNS. In recent years numerous approaches have been used to combat AD like small molecule inhibitors of Aβ aggregation, anti-inflammatory agents, cholinesterase, a- and β-secretase. Herein, we report synthesis of some 5,6-diaryl-1,2,4-triazines 3a-f and 8a-e as potential agents for treatment of AD. We evaluated them against both H2O2 and β-amyloid induced toxicity in PC-12 and SH-SY5Y cells and the extent of cell viability and apoptosis were assessed during 24 and 48 h of treatment. All compounds showed significant neuroprotective activity with EC50 values ranging from 14-30 μM. Most compounds could increase cell viability compared to amyloid treated group. Surprisingly, 3-thioxo-1,2,4-triazin-2(3H)-yl) acetate derivative 8e was the most potent compound in both tests with EC50 of 14 μM in H2O2 induced apoptosis and could increase 40% of cell viability revealed by cytometric analysis with Annexin V/PI staining. It was also shown that 8e has more neuroprotective activity than Quercetin in beta-amyloid induced toxicity. Moreover, compound 8e attenuated late-apoptosis from 42% to 6% ($P<0.005$) and 7% to 1% at 24 and 48 hour respectively compared to amyloid treated cells. Similarly, apoptosis was reduced from 12% to 4% at 24 hours. LDH release was not changed at any time points, pointing anti-apoptotic effect of compound 8e. Morphologic evaluation of cells by DAPI staining and TUNEL assay showed the effectiveness of this compound to improve neurite outgrowth and to prevent apoptosis and DNA fragmentation in neuronal cells.

Biography

Hamid Irannejad has completed his Pharm.D at Kerman University of Medical Sciences and PhD at Tehran University of Medical Sciences, IRAN. Postdoctoral studies was accomplished at University of Siena, Italy, under the supervision of Prof. Maurizio Botta. Currently, he is serving as an assistant professor at Mazandaran University of Medical Sciences. He has published nearly 20 papers in reputed journals in the field of medicinal chemistry.

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Notes:

Sahil Doshi, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Stochastic modeling of signaling pathways and gene expression mechanisms in Alzheimer's disease using Continuous Time Markov Chains

Sahil Doshi
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As the sixth-largest cause of death in the U.S., Alzheimer's Disease (AD) is one of the most debilitating neurodegenerative disorders that has incited significant research within the scientific community. While researchers have discovered hallmarks of AD such as amyloid beta plaques and tau hyperphosphorylation, the initial molecular events that result in AD still remain unclear. Among current research, a major factor that has been attributed to AD pathogenesis is the presence of oxidative species that enhance expression of amyloid beta-producing enzymes such as BACE1 and impair expression of amyloid beta-clearing enzymes such as neprilysin. Oxidative species affect gene expression through signaling pathways composed of kinases, and this project focuses on the JNK signaling pathway's role in activating BACE1 expression. Using a Continuous Time Markov Chain (CTMC), a method for simulating stochastic processes where events occur independently of the past, the JNK pathway and BACE1 gene expression network are simulated as three different Markov chains that simultaneously execute reactions in distinct regions of the network. In order to portray the intracellular environment pertaining to AD accurately, oxidative species and enzyme denaturation are randomly added to the network, resetting the Markov chains with altered reaction transition intensities that leads the cell toward a state of further chaos and dysfunction. Results have shown that while each individual event occurs probabilistically, oxidative species hyperactivate the JNK pathway, leading to increased amyloid beta production, so such simulations could serve to explore the molecular origins of AD further.

Biography

Sahil Doshi is a rising senior at Upper St. Clair High School who has been researching Alzheimer's Disease and its pathological origins for the past two years. He recently earned honorable mention at the MIT THINK Scholars Program for developing a molecular dynamics simulation and was invited to present at the International Conference for Systems and Synthetic Biology in Munich, Germany for his computational modeling work. Prior to that, he was named America's Top Young Scientist in 2014 for a carbon dioxide battery and presented it to President Obama at the White House Science Fair.

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Oscar Tranvag, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Dignity-preserving dementia care: A metasynthesis

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Background: Research indicates the essentiality of dignity as a vital component for quality of life. Estimates show 47 million people living with dementia worldwide. World Health Organization, United Nations, European Union, UNESCO and Alzheimer's Disease International emphasize dignity as an inherent human quality, an essential need and fundamental human right. Several countries are now preparing for the growing challenges within dementia care by developing national plans, placing dignity-preservation as a fundamental aspect. However, these documents do not specify the underlying components of dignity-preserving dementia care, as perceived by healthcare professionals within dementia care practice.

Aim: The aim was to develop a theory-model concerning crucial aspects inherent in dignity-preserving dementia care as perceived and practiced by nurses and allied healthcare professionals (HCP) documented in previous empirical qualitative studies.

Method: Noblit and Hare's meta-ethnography was utilized to synthesize 10 qualitative articles from various cultural contexts, exploring nurse and allied HCP perception concerning dignity-preserving dementia care practice. Constructing a theoretical under- standing of the findings, Katie Eriksson's Theory of Caritative Caring was utilized as theoretical framework.

Results: Advocating autonomy and integrity of each person with dementia, involving hav- ing compassion for the person, confirming the person's worthiness and sense of self, as well as creating a humane and purposeful environment, was found a primary foundation for dignity-preserving dementia care. Balancing individual choices among persons no longer able to make sound decisions, against the duty of making choices on behalf of the person, was considered dignifying in certain situations – employ- ing persuation and/or a certain degree of mild restraint in order to meet the person's essential needs.

Conclusion: Sheltering human worth – remembering those who forget, was identified as a comprehensive motive and core value within dignity-preserving dementia care.

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Notes:

Mai Mwafy et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Neuroinflammation & Alzheimer's disease

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Neuroinflammation is a common feature of Alzheimer's disease pathology, which is characterized by the presence of reactive astrocytes and activation of the microglia (the brain's resident macrophages), as well as increased expression of pro-inflammatory cytokines & complement system activation. Amyloid beta protein accumulation in the brain of Alzheimer's disease patients is the activator of the complement system and leads to glial cells activation and subsequent release of neurotoxic substances and free oxygen radicals. We are studying different aspects of neuroinflammation in a cohort of two groups "post-mortem human brain tissue" of Alzheimer's disease and age matched controls in different brain areas including frontal and temporal cortices to highlight the role of innate immunity in the disease and if it can be considered as potential targets for treating Alzheimer's disease.

Biography

Mai Mwafy is currently a PhD student in University of Bristol, Dementia Research Group, also work in Infection & Immunity as a collaborator in Cardiff University, Mai has completed her Master's Degree in Medical Microbiology & Immunology in Egypt, Faculty of Medicine Tanta University in 2013. Funded by: Newton- Mosharafa fund British Council in Egypt in collaboration with the Egyptian Government awarded 2015, and ARUK small grant awarded 2017.

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Noura AL Mulhim et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Investigations of non-classical axis of renin angiotensin system in Alzheimer's Disease

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Introduction: The classical axis of RAS (ACE-1/Ang II/AT1R) has been highlighted as exerting damage effects on the brain in both animal and human studies. Hyperactivity of this axis contributed to the pathogenesis of Alzheimer's disease (AD). However, the involvement of the non-classical axis of RAS (ACE-2/Ang (1-7)/MasR) in the etiology and progression of AD remain to be clarified. Therefore, investigating components of the non-classical axis of RAS is important for understanding the role of this system in the pathogenesis of AD.

Methods: Human Post-Mortem brain tissue used in this study was obtained from the South West Dementia Brain Bank, University of Bristol, with local Research Ethics Committee approval. The AD cases (n=72) and the age-matched controls (n= 47) were selected. In this cohort, we measured Ang (1-7) levels in the mid-frontal cortex (Brodmann area 9) using in-house direct ELISA. A commercially available ELISA kit was used to measure MAS1 levels. Data on Ang II and ACE-2 activity had been previously obtained for all cases.

Results: In this study, Ang (1-7) levels were unchanged in AD group compared to age-matched controls. However, Ang II/Ang (1-7) ratio (as a proxy indicator of ACE-2 activity) was significantly increased in AD group, indicating a reduction of ACE-2 activity in AD. For the first time, we showed that the MAS1 levels were significantly reduced in AD. This reduction in MAS1 levels was correlated with reduction in ACE-2 activity.

Conclusions: Together, our findings suggested that dysregulation of ACE-2/Ang(1-7)/MasR) axis might be implicated in the pathogenesis of AD. Thus, maintaining the activity of the non-classical axis of RAS may be essential for targeting therapeutic strategies of AD.

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Sherin Yohannan, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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A study on stress, burden, social support and the desire to institutionalization among caregivers of persons with dementia

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Demographic trends regarding the issue of aging underscore the fact that both current situations and future trends directly concern all of us. Dementia is seriously disabling for those who have it and is often devastating for their caregivers and families. Improving the awareness and understanding of dementia across all levels of society is needed to decrease discrimination and to improve the quality of life by reducing stress, burden and increase in the social support for people with dementia and their caregivers. The present study has adopted a descriptive research design for the purpose of the study covering 50 caregivers to assess the stress, burden, social support, and desire to institutionalization among caregivers of persons with dementia who are seeking treatment from geriatric clinic services in NIMHANS. Data gathered by using standardized scales like The Perceived Stress Scale, Multidimensional Scale of Perceived Social Support, The Zarit Burden Interview, and The Desire to institutionalization scale. Results show that there is a significant relation between burden, stress, social support from family, friends, significant others and desire to institutionalization among the caregivers of persons with dementia. Results indicate that this personal stressful feeling of caregiver burden which may be high and more troublesome in countries like India gives way to thought about institutionalization of patients with dementia. The results of the study might have been influenced by culture and inadequate availability of dementia care facilities in India and thus warrants further similar studies to be conducted in India and other developing countries

Biography

Sherin Yohannan, PhD scholar in the department of Psychiatric Social Work, NIMHANS, Bangalore, India. My research area is on Dementia care. Currently I am working on the topic " Psychosocial support for families of persons with dementia through home based care programme". I completed my M.Phil. in Psychiatric social work from NIMHANS in 2015 and my dissertation was on stress, burden, social support and desire to institutionalization among caregivers of persons with dementia. I have completed my Masters in Social Work with the specialization in Medical and Psychiatric Social Work from BCM College, India in the year 2012.

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Z Kristofikova et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Interactions of intracellular amyloid beta peptides and biomarkers of Alzheimer disease in cerebrospinal fluid

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Ideal biomarker of Alzheimer disease (AD) does not exist yet. Cerebrospinal fluid (CSF) levels of amyloid β 1-42 (Aβ 1-42), τ and phospho-τ are often used standards (senzitivity > 85% and specificity > 75-85% are expected for a good biomarker). We evaluated new biomarkers based on interactions of Aβ and its intracellular binding partners (mitochondrial 17β-hydroxysteroid dehydrogenase type 10 (17β-HSD10) and τ) and on abilities of amyloid peptides/proteins to oligomerize/aggregate. In young patients with neuroinflammatry diseases, no changes in Aβ were found. Increased concentrations of 17β-HSD10 were observed only in people with multiple sclerosis in later stages probably as a compensatory response to attacts of immune system. In old patients with neuroinflammatory diseases, changes in Aβ (but not in τ/phospho-τ or 17β-HSD10) were similar to those in AD. Results can be interpreted by age- and neuroinflammation-dependent alterations in extracellular Aβ and a key role of Aβ in interactions. Changes observed in MCI-AD (Aβ, τ/phospho-τ, Aβ – τ complexes, 17β-HSD10, thioflavinT-based to intrinsic amyloid fluorescence signals ratio) were similar to those in AD. Results suggest early changes in intracellular Aβ and accumulations of amyloid peptides/proteins in the brain, in addition to increased oligomerization/aggregation. Both fluorescences are probably based on different amyloid structures (ThioflavinT-based on oligomers, instrinsic amyloid fluorescence on aggregates partly accumulated in the brain). Characteristic of new biomarkers of AD are as follows: Aβ – τ complexes (senzitivity 68.6% and specificity 73.3%), 17β-HSD10 (80.0% and 73.3%), 17β-HSD10 – Aβ complexes (66.7% and 68.8%), ThioflavinT-based to intrinsic amyloid fluorescence signals ratio (61.1% and 70.8%).

Biography

Zdenka Kristofikova studied at Czech Technical Univerzity in Prague (Ing., Department of Nuclear Chemistry) and at Univerzity of Defence, Faculty of Military Health Sciences in Hradec Kralove (PhD, Department of Toxicology), both in the Czech Republic. She works at National Institute of Mental Health (as a senior researcher and a head of working group) and is interested in Alzheimer disease. She has published many publications based on neurochemical analyses of the human or rodent brain tissue (e.g. validations of various pharmacological and genetic animal models of Alzheimer disease) and of cerebrospinal fluid (evaluations of new biomarkers of Alzheimer disease).

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Guy Massicotte et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Sphingosine-1-phosphate receptor 1 (S1PR-1): A new target for the treatment of Tau-related pathologies

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University of Quebec, Canada

Tau proteins are known to help maintaining the structure of a neuron, including tiny tube-like structures called microtubules, which deliver nutrients throughout cells. However, when hyperphosphorylated, these proteins can become toxic for neurons by forming tangles in the hippocampus; one important region of the brain early affected by Alzheimer's disease. Researchers believe that therapies capable to limit Tau phosphorylation in the hippocampus may reduce tangle formation and ultimately intervene in the development of Alzheimer's disease and other Tau-related disorders. Global sphingosine-1-phosphate receptor (S1PR) agonists were recently found to exert neuroprotective effects in several model systems reproducing different brain disorders. Consequently, we assessed the influence of such compounds on Tau phosphorylation in the hippocampus. Transverse rat hippocampal slices were prepared with a McIlwain tissue chopper and placed on a nylon mesh in a liquid-gas interface chamber. They were treated for a period of 3 hours with S1PR-1 (SEW2871) and S1PR-3 (CYM5541) agonists. Tau phosphorylation was then estimated by Western blotting procedures. We noticed an important reduction in Tau-Ser262 phosphorylation after hippocampal slice treatments with the S1PR-1 agonist SEW2871. In terms of molecular mechanisms, SEW2871-induced Tau-Ser262 dephosphorylation seems to be dependent on AMPK (AMP-activated protein kinase) inactivation, a process involving the protein phosphatase PP2A. Comparable experiments indicate that neither Tau nor AMPK were influenced by the S1PR-3 agonist CYM5541. Our results suggest a new target for Tau dephosphorylation and provide an insight into the potential therapeutic effects of S1PR agonists in Alzheimer's disease and other Tau-related pathologies.

Biography

Guy Massicotte's work is mainly focusing on the role phospholipase enzymes and lipids in glutamate receptor regulation during both normal and neuropathological conditions. Full professor in human physiology at the University of Québec, He is actually investigating the role of ceramide derivatives in premature ageing of the brain. He is the author of 80 publications, some being published in top-quality journals such as Nature, Proceedings of the National Academy of Sciences, FASEB Journal, Diabetes, Neuroscience and Biobehavioral Reviews.

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Tejkalová Hana et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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The role of animal models in neuropsychiatric research

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At present, animal models are viewed as useful and widespread tools in translational neuroscience research and CNS drug development. To mimic brain pathogenesis and the spectrum of quantifiable disease endpoints in human neurodevelopmental disorders many model studies are done, using mainly rodents. We can evaluate many patterns in the ethogram exhibited by the species used in specific experimental situations. It has recently become increasingly important to develop translational models that enable multiple behavioural domains to be explored in parallel together, combined with other data obtained from various animal tissues to evaluate useful biochemical and morphology analyses. The results of these translational models depend on well-defined requirements for animal models that take into account the ethological approach, the biology of experimental animals used, the life history of individuals and many other factors in order to produce a good project with valuable data. Alzheimer disease (AD) is characterized by gradual cognitive decline, sensory and motor deficits and is the primary cause of dementia. To examine the role of early neuroinflammation in neurodevelopmental diseases, a translational model with neonatal subchronic lipopolysaccharide (LPS) insult was used. Our finding suggests that LPS may have long-lasting effects on the future development of behavioural parameters together with altered morphological markers. Animal models of neuropsychiatric and neurology disorders are indispensable tools for studying target key neurobehavioural domains of these diseases and help to provide better insights into the complexity of brain functions, brain pathogenesis and find novel biomarkers and therapies.

Biography

Tejkalová Hana obtained both her degree at the age of 24 and her later PhD. from the Faculty of Science, Charles University in Prague. She is a senior researcher at the National Institute of Mental Health (NIMH). She has published nearly 50 papers in reputed journals (total citations 177, inc. self-citations). Her research activities involve the use of behaviour in the animal modelling of psychiatric disorders, especially schizophrenia. She also acted as the Czech representative in FELASA from 2010 until 2014.

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Konstantine Zakzanis et al., J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Men with experience preparing meals show greater functional independence in mild cognitive impairment

Konstantine Zakzanis, Courtney Berezuk, Joel Ramirez and **Sandra Black**
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Objective: The purpose of this study is to examine whether experience preparing balanced meals is associated with functional independence in men with mild cognitive impairment (MCI). We hypothesized that experience preparing meals may increase one's "functional reserve", thus promoting independence across other instrumental activities of daily living (IADLs).

Participants and Methods: Men with MCI were taken from the Alzheimer's Disease Neuroimaging Initiative (ADNI). We conducted ten Chi-square analyses comparing experience preparing meals (dichotomous) and difficulty on each IADL (dichotomous), assessed using the Functional Activities Questionnaire.

Results: No significant differences in age, years of education, and Montreal Cognitive Assessment (MoCA) scores existed between men with meal preparation experience (n=359) and those without (n=153). Chi-Square analyses found that meal preparation experience is associated with independence in the ability to prepare a balanced meal ($p<.001$); shop alone ($p<.001$); keeping track of current events ($p<.002$); remember appointments and dates ($p<.001$); follow TV, books, or magazines ($p<.001$); and travel out of the neighborhood ($p=.015$).

Conclusion: Given that preparing a balanced meal is cognitively multifaceted (e.g., requires planning, organizing, retrospective and prospective memory), shared neural networks may exist between cooking and other IADLs. These findings may have implications for identifying those at a higher risk for functional decline. For example, inexperience preparing meals may contribute to a lower "functional reserve", thus reducing one's resiliency to functional decline overall. Future replication studies are needed using a more sophisticated measure of functional reserve.

Biography

Konstantine Zakzanis completed his PhD in clinical psychology at York University, Canada and is a registered clinical neuropsychologist in the province of Ontario. He is a tenured Professor of Psychology and Neuroscience and the Associate Chair of the Mental Health and Co-op Programs in the Department of Psychology at the University of Toronto Scarborough and a Research Scientist (Affiliate Status) at the Centre for Addiction and Mental Health. Dr. Zakzanis has over 200 peer reviewed publications and is currently an Associate Editor for APA's Neuropsychology and a Consulting Editor for The Clinical Neuropsychologist and The Journal of Clinical and Experimental Neuropsychology.

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Sarko Mohammed Salih, J Alzheimers Dis Parkinsonism 2017, 7:6(Suppl)
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Effect of using (physical-skill) training for developed the performance according to several Biomechanics Volatiles with Foil Lunch accuracy

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Research Summary: The extreme of Variables kinematic extreme importance of duty motor for most sports, especially fencing that depending on of their performance skills on the attack velocity and accuracy during the opponent methods, and through during researcher on previous studies in the field of fencing (foil) found that there is a weakness in an instant appeal by not focusing on the right technique to challenge any un signified of focus on the angles and variables kinematic for this movement, as well as that to go into the field kinematic for this game was a little bit. The researcher suggests a researcher study this problem by studying the Effect of using(physical-skill)training for developed the performance according to several Biomechanics Volatiles with Foil Lunch accuracy, according to some Biomechanics variables in the development of skill challenge and aim of the research to identify some Biomechanics variables in the performance the foil fare prepare special exercises similar to the movement in accordant the variables biomechanical under discussion identify affected by the exercises according to the biomechanical variables in the development of skill challenge, accuracy, and represents a sample of the players Sulaymaniyah team foil-youth and adult population (6) players and consists of one group of pre-test post- test and posttest, and after the end of a tribal Alachtbaat been Tnvez training program using a similar movement performance the research sample by exercises (12) unite developmental rate of 2 units per week and was the unit time (90 minutes) and reached the time of the proposed exercises (35-40) minutes per unit in the part of the main program, and after program appetited was conducted post tests of the sample, as well as the use of appropriate statistical methods to the results of variables, concluded the researcher conclusions following which the proposed exercises have a positive effect in the developed skill appeal to sample the need to work kinetic analysis revealed a vary of biomichanic variables that are difficult to be obtained from the simple observation eye to detect weak points and strength during training praise workouts, while the researcher recommended the need to adopt trainers and coaching athletes foundations and mechanical rules in training and education on fencing skills. Conduct studies on the Games and other skills using a similar character with a mechanical exercise.

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Notes:

9th International Conference on

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Accepted Abstracts

Dementia 2017

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Predictive molecular diagnosis of Alzheimer's Dementia: Towards new clinical models for preventive treatment

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There is an unmet need for first preventive, that is disease-modifying, treatments of Alzheimer´s dementia (AD). However, preventive treatment calls for predictive diagnosis since novel preventive treatment options can only be offered if patients are identified during preclinical stages of the incipient AD. Per definition, a preclinical stage can not be detected by clinical tools and accordingly, patients at high risk for later AD have to be identified by biomarker guided predictive diagnostics. The presentation will demonstrate that patients with preclinical AD can meanwhile be identified within the clinically heterogenous cohort of Mild Cognitive Impairment (MCI) with positive and negative predictive values of at least 90% by a multiparameter biomarker approach relying on CSF dementia biomarkers, MRI volumetry and/or F18-Amyloid-PET. In view of a prevalence of approximately 20% of preclinical AD within the MCI risk cohort the latter predictive values are clinically significant. Morevover, it will be critically discussed in how far first blood-based assays may support the identification of preclinical AD. Finally, the presentation will exemplify that novel diagnostic targets may indicate promising novel therapeutic targets.

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Multi-target-directed ligands inhibition of acetylcholinesterase, amyloid aggregation and its significance in Alzheimer's disease treatment

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A treatment to the Alzheimer's disease (AD) consists of inhibition of the Acetylcholinesterase, which is responsible for the acetylcholine control in the synapses. A new class of multi-target-directed ligands (MTDLs) based on a 1,10-phenanthroline-5,6-dione derivatives were tested in vitro against acetylcholinesterase (AChE) these compounds inhibit AChE-induced anti-amyloid (Aβ) aggregation. 1,10-phenanthroline5,6-dione can act as a lead molecule for developing drug(s) against AD disease with dual functions namely. The in vitro evaluation of the prepared compounds were tested by using Ellman's colorimetric method in 96-welled microplates some of them showed lower IC50 values on inhibiting the AChE and the IC50 value 6E-6-[(2-hydroxyphenyl) imino]-1,10-phenanthrolin-5(6H)-one was 53 mM. This study provided beneficial information for further development of resveratrol derivatives as multitarget-directed agents for AD therapy.

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Challenging the neuroprotective potential of physical exercise: insights into plasticity-related mechanisms in the aging brain

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Mild cognitive impairment (MCI) is a prodromal stage of Alzheimer disease (AD). To date, therapeutic approaches to AD are symptomatic and of modest efficacy. Nonetheless, studies in animal and human populations suggested that physical training results in structural and functional brain changes. The current project aims at exploring brain mechanisms mediating the neuroprotective effect of different types of physical exercise among patients with amnestic MCI (aMCI). Specifically, we performed a comprehensive study to examine the effect of aerobic and non-aerobic training. Neuropsychological evaluations, assessment of neurotrophic factor (BDNF), cardiorespiratory fitness assessment and fMRI have been performed before the physical training and following the intervention. 24 participants suffering of aMCI carried out their activity routines 3 d/wk during 4 months under supervision of an experienced trainer. Inter-SC and GLM methods have been used for data analysis. Following intensive individual training, we found improvement in memory and executive functions in both physical training groups. In the fMRI, we found reliable responses in regions that are related to higher order processing of information: temporo-parietal junction, marginal and supramarginal gyri, frontal areas. Hippocampal activation in memory encoding task increased following aerobic intervention. Increased BDNF was correlated with improved cognition, with no association with the type of exercise. The physical training results in functional and structural changes in a-MCI. Our findings demonstrated that cognitive performance can be affected by exercise of both types. The insights gained from the study may have important scientific value and clinical implications for individuals at the early stages of AD.

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Notes:

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Effect of magnetic tacrine-loaded chitosan nanoparticles on spatial learning, memory, amyloid precursor protein and seladin-1 expression in the hippocampus of streptozotocin-exposed rats

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Alzheimer's disease (AD) is a progressive neurodegenerative disease characterized by memory and cognitive dysfunction due to neuronal cell loss in higher brain centers. Senile plaques containing amyloid β (Aβ) are associated with this disease as well as a reduction in cholinergic neuron numbers. Tacrine is a reversible cholinesterase inhibitor in clinical use to treat moderate forms of AD. Chitosan nanoparticles represent an effective systemic delivery system for drugs. The application of tacrine-loaded chitosan nanoparticles has been shown to selectively increase tacrine concentrations in the brain tissue. In this study, we compared magnetic and non-magnetic tacrine-loaded chitosan nanoparticles for their bioactivity and neuroprotective potency in streptozotocin (stz)-induced neurodegeneration, an accepted animal model for AD. Male rats received a single injection of stz via an implanted cannula into the lateral brain ventricle. Tacrine (tac)-loaded chitosan nanoparticles were delivered into the tail vein. Spatial learning and memory were analyzed using the Morris water maze task. Amyloid precursor protein gene (APP) and seladin-1 gene expression were studied in the hippocampus by real time-PCR. Tac-loaded non-magnetic and tac-loaded magnetic chitosan nanoparticles improved spatial learning and memory after stz treatment with magnetic nanoparticles being most effective. Similarly, tac-loaded chitosan nanoparticles increased seladin-1 and reduced APP gene expression. Again, magnetic nanoparticles were more effective. These data reveal that tac-loaded non magnetic and tac-loaded magnetic chitosan nanoparticles to a higher extent improve brain deficits related to stz application. We conclude that the magnetic target drug delivery system is a promising therapeutic strategy to protect AD-related degenerating in the CNS.

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Effect of essential oil of leaf and aerial part of Rosmarinus Officinalis on passive avoidance memory in aged and young mice

Farshid Asadi and **Pooneh Kishani Farahani**
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Background and Objective: In this study, the effect of essential oil of aerial part of Rosmarinus officinalis, which is rich of antioxidants, was investigated on memory of young and aged mice with passive avoidance apparatus.

Materials and Methods: Five groups of each young and aged mice (n = 8) were selected for this study. All doses of essential oils of leaf and aerial part of Rosmarinus officinalis (200, 400, 600, 800 mg/kg) were injected intraperitoneally once a day for 7 days to four groups of age and young mice and fifth group (control) received 10 ml/kg distilled water once daily for 7 days.

Results: Mean of step-down latency on day 4 in comparison with day 2 became significantly longer ($P<0.05$) in all young and aged groups of mice. On the other hand, the mean of step-down latency in all groups received different doses of essential oil to compare with control group showed significant ($P< 0.05$) improvement in memory test in day 4. Also in all aged group received different doses of essential oil step-down latency were significantly ($P<0.05$) longer than young groups.

Conclusion: The result showed that, the essential oil of Rosmarinus officinalis improves memory in all young and aged animal groups, but it was more effective on aged mice

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Histological study on the effect of fruit extract of phoenix dactylifera (datepalm) l. On mercury–induced cerebral and hippocampal damage in adult wistar rats

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Background: Management of cognitive and anxiety disorders like dementia and Alzheimer's disease has been challenging since no potential drug is available with proven efficacy. This has prompted many researchers to evaluate new compounds in the hope that other anxiolytic and nootropic drugs will have less undesirable effects.

Aim: This study was aimed to histologically evaluate the ameliorative effect of aqueous fruit extract of Phoenix dactylifera (AFPD) against mercury–induced cerebral and hippocampal damage in adult Wistar rats.

Materials and methods: Twenty-four (24) Wistar rats of either sex (150-200 g) were divided into six groups (I –VI) of four rats each. Group I served as control, administered distilled water (1 ml/kg, p.o), while groups II–VI were treatment groups. Brain damage was experimentally induced in Wistar rats by administering mercuric chloride (MCL). Group II was administered MCL (5 mg/kg, p.o). Group III was administered vitamin C (100 mg/kg, p.o), while groups VI–VI were administered AFPD (250 mg/kg, 500 mg/kg and 1000 mg/kg, p.o, respectively). Treatment groups were concomitantly administered MCL (5 mg/kg, p.o) for a period of 2 weeks. Histopathological analysis of brain sections, applying routine (H & E) staining techniques, was employed to study the activity of AFPD on the rats' cerebral cortex and CA1 and CA3 regions of hippocampus.

Results: Histopathological examination of brain sections revealed neuronal degeneration of cerebral and hippocampal cells such as, neuronal shrinkage, perineuronal vacuolation, gliosis and alteration in the general histoarchitecture of cerebral cortex and hippocampus in MCL treated group. The administration of AFPD remarkably ameliorated neuronal damage induced by MCL administration, dose dependently, when compared with tissue sections of the control.

Conclusion: Findings revealed that AFPD is of ameliorative potentials on heavy metal-induced cerebral and hippocampal damage in Wistar rats. Key words: Ameliorative, Cerebral cortex, Hippocampus, Phoenix dactylifera, Wistar rats.

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