to investigate the effectiveness of fluoxetine (10mg/kg, i.p.), ketamine at sub-anaesthetic dosage is the only efficacious antidepressant treatment for TRD while plasma Acet-Tub represents a potential biomarker of disease progression and pharmacological efficacy. Therefore, microtubules represent a potential target for future drug development in TRD.

PS119
Effect of pramipexole for learned helplessness behavior and cranial nerve activities
Hidenori Sagara1, Hiroaki Araki2, Nami Isooka1, Rina Jougataki1, Takahiro Okabe1, Shimon Takahashi1, Akihiro Tanaka2
1Matsuyama University, Japan, 2Ehime University Hospital, Japan

Abstract
Purpose: In recent years, research has been reported that dopamine agonists used in the treatment of Parkinson's disease have also shown effectiveness in treating patients for depression. We treated animals with the pramipexole (PRM) and observed behavioral changes and changes in the function of the cranial nerves in animal models of learned helplessness. The purpose of the experiment is to investigate the dopamine agonist's effect as an antidepressant for depressive states as well as its role regarding the cranial nerves.

Method: The experiment included a learned helplessness behavior test, and an assessment of the cranial nerve function using c-Fos immunohistochemistry staining. The learned helplessness model involved a 5-day protocol. The drug was given for four consecutive days, and on the fifth day we measured the number of failed escape attempts using the same method as the second day. The increase or decrease in number of escape attempts was used as an indicator of the drug's effectiveness. In order to examine the effect of PRM on cranial nerve activities in learned helplessness, after completion of the test on the fifth day, the brains were collected and any changes to nerve function in the nucleus accumbens, amygdala and hippocampus were assessed using c-Fos immunohistochemistry staining.

Results and Observations: In learned helplessness models given a single dose of PRM (1.0mg/kg, i.p.), a significant decrease was observed in the number of failed escape attempts related to learned helplessness behavior. This therefore suggests that PRM, in addition to improving Parkinson's symptoms, is a drug that also has antidepressant effects. Furthermore, regarding the parts of the brain affected by PRM's antidepressant function, the nures of the nucleus accumbens shell, central nucleus and basolateral of the amygdala, and dentate gyrus and CA3 regions of the hippocampus were shown to be affected by the antidepressant function.

PS120
Effects of linalool on chronic stress-induced depressive-like behaviour and BDNF protein in the hippocampus of rats
Somrudee Satyudthong, Chantana Mekseepralard, Dawrung Srijittapong
Srinakriniwiroot University, Thailand

Abstract
Linalool, one of the major components of essential oils extracted from many aromatic plants, has shown sedative, anticonvulsant...
and anxiolytic properties in several studies. However there is limited data showing the beneficial effect of linalool following exposure to chronic stress. The aim of the present study was to investigate the effect of linalool in chronic stress rats on behaviour related depressive disorder and BDNF protein in hippocampus. Male Wistar rats were randomly divided into 5 groups, 1) Tween 80 + home cage (HC) 2) Tween 80 + restraint stress (RS) 3) linalool 50 mg/kg + RS 4) linalool 160 mg/kg + RS and 5) linalool 500 mg/kg + RS. Either Tween 80 or linalool was intraperitoneally injected to rats daily for two weeks. Some rats were housed in home cage but the others induced chronic restrained stress (15 min daily) for two weeks. At the end of the treatment, rats were assessed for depressive-like behavior using the forced swimming test. Then, the rats were immediately decapitated and hippocampus was removed for the measurement of BDNF protein by ELISA. Restrained rats injected with linalool 500 mg/kg for two weeks significantly reduced immobility time (p<0.05) but increased climbing time (p<0.05) compared their controls, suggesting that this dose produced antidepressant activity. Linalool had no effect on the level of BDNF protein in hippocampus. Therefore, these findings suggest that linalool decreases behaviour related depressive disorder but has no effect on hippocampal BDNF in chronic restrained stress.

PS121

Evaluation of extrapyramidal side effects in the treatment of behavioral and psychological symptoms of dementia (BPSD): Interactions between anti-Alzheimer drugs and antidepressants
Saki Shimizu, Aiyoishi Inada, Yukihiro Ohno, Shunsaku Sogabe, Megumi Yamanaka, Ryoto Yanagisako
Osaka University of Pharmaceutical Sciences, Japan

Abstract
Background/Objectives: Antidepressants are often used in conjunction with anti-Alzheimer drugs to treat the behavioral and psychological symptoms of dementia (BPSD). Here, we studied the interactions between anti-Alzheimer drugs, cholinesterase inhibitors (ChEIs), and antidepressants in inducing extrapyramidal side effects (EPS).

Methods: Male ddY mice were used. Using the pole test, we examined the actions of serotonin reuptake inhibitors (SSRIs), fluoxetine and paroxetine, a serotonin and noradrenaline reuptake inhibitor (SNRI) milnacipran, a noradrenergic and specific serotonin antidepressant (NaSSA) mirtazapine in modulating the ChEIs (galantamine and donepezil)-induced bradykinesia.

Results: Both fluoxetine and paroxetine significantly potentiated galantamine-induced bradykinesia in a synergistic manner. The EPS augmentation by fluoxetine was antagonized by ketanserin (5-HT antagonist) and SB-258585 (5-HT antagonist), but not by ondansetron (5-HT antagonist). In contrast to SSRIs, milnacipran and mirtazapine failed to augment galantamine-induced EPS. In addition, combined treatment of prazosin (α1 antagonist), but not yohimbine (α2 antagonist), with milnacipran significantly potentiated galantamine-induced EPS.

Conclusion: The present results indicate that SSRIs and ChEIs synergistically facilitate the EPS induction, the activation of 5-HT, and 3-HT receptors, in the treatment of BPSD. The combination of ChEIs with SNRIs (or NaSSA) is recommended in terms of EPS liability for the BPSD therapy, where the activation of α1 receptors by SNRIs seems to reduce EPS.

PS122

Overexpression of N-acetyltransferase Shati/Nat8l in the dorsal striatum induces depression-like behaviors in mice.
Kenyo Sodeyama1, Toshiyuki Fuziura1, Toh Miyazaki1, Kyoosuke Uno1, Shin-ichi Muramatsu2, Toshikata Nabeshima1, Yoshiaki Miyamoto1, Atsumi Nitta1
1Institute of Mental Health/Peking University Sixth Hospital, Shimotsuke, JAPAN, 2University of Toyama, Toyama, JAPAN, 3Jichi Medical University, Shimotsuke, JAPAN, 4Meijo University, Nagoya, JAPAN.

Abstract
Depression is one of the most serious psychological disorders, but its pathogenesis remains unclear and the current medical treatment is mainly restrictive effect. We have identified Shati/Nat8l, which is containing a well-conserved N-acetyltransferase sequence, in the brain of psychosis animal model. Shati/Nat8l synthesizes N-acetylaspargate (NAA) from L-aspartate and acetyl-CoA, and NAA is subsequently converted into N-acetylaspartylglutamate (NAAG) by being condensed with glutamate. It is reported that NAA and NAAG abundantly exist in human brains and those both or one quantity change in the postmortem brain of patients with psychological disorders including depression. In the present study, to clarify the functional roles of Shati/Nat8l in depression, we investigated various behavioral analyses in Shati/Nat8l-overexpressed mice.

Firstly, the expression levels of Shati/Nat8l mRNA were assessed in the brain of depressed C57BL6J mouse model, which was exposed repeated social defeat stress for 10 days following procedure as physical stress for 10 min and sensory stress for 24 hrs by aggressor ICR mice. And, Shati/Nat8l mRNA in the dorsal striatum of the depression mice significantly increased compared with that of control mice. Therefore, mice were microinjected Shati/Nat8l-inserted or non-inserted (Mock) adeno-associated virus vectors into the dorsal striatum. The Shati/Nat8l-overexpressed mice exhibited decreased social interaction and sucrose preference after subthreshold social defeat stress as the exposure to aggressor ICR mice for 5 min × 3 on only one day, which showed normal behaviors in the Mock mice. These two phenotypical impairments in the Shati/Nat8l-overexpressed mice were ameliorated by treatment with a selective serotonin reuptake inhibitor fluvoxamine at the dose of 10 mg/kg i.p., which has no effect in the Mock mice.

These findings suggest that Shati/Nat8l in the striatum play an important role in depression-like behaviors including diminished sociability and pleasure by regulating the serotoninergic neuronal system.

PS123

Altered peptide ligands of myelin basic protein produce persistent antidepressant-like effects
Cheng-Yu Sun, 1,2,*, Ling-Zhi Xu, 1,2,*, Shi-Qiu Meng, 1,2,*, Jia-Hui Deng, 1,2 Lin Lu 1,2,*
1Institute of Mental Health/Peking University Sixth Hospital and Key Laboratory of Mental Health, Ministry of Health, Beijing, China; 2National Institute on Drug Dependence, Peking University, Beijing, China; 3Peking-Tsinghua Center for Life Sciences and PKU-IDG/McGovern Institute for Brain Research; * Equal contribution to this work

Abstract
Cytokine levels were generally changed in both depressed patients and animal models. Altered peptide ligand (APL) of myelin basic protein (MBP) regulates levels of various cytokines,