14.3% and 0% respectively. The rates were determined as 77.8%, 85.7%, and 42.9% in RES, GBP10mg/kg and D20,01mg/kg groups respectively and as 71.4% and 57.1% for RES+GBP10mg/kg and RES+D20,01mg/kg group combination respectively. The seizure severity score was 0 in GBP20mg/kg and D20,02mg/kg groups. The scores in RES, GBP10mg/kg and D20,01mg/kg groups or in combinations of RES with GBP and DZ were determined as 4 and 5. There was no significant difference between groups in terms of the mortality rates. There were acidophilic neurons indicating acute neuronal injury and gliosis in hippocampal CA1, CA3, H, DG regions and cerebellar hemorrhage in all groups except GBP 20 and D2 0,2mg/kg groups.

GBP 20mg/kg and DZ 0,2mg/kg significantly decreased the seizure severity and provided protection against PTZ-induced seizures. Any preventive effect or any reduction in seizure severity were not observed when RES used alone or in combinations with subeffective doses of GBP and DZ. Histopathological evaluations also supported the behavioral results.

Keywords: diazepam, gabapentin, pentylentetrazole, resveratrol, seizure

PT604
Attenuation of PTZ-induced epileptic seizure by deficiency in the gene encoding solute carrier OCTN1/SLC22A4
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Abstract
Identification of novel molecular targets for treatment of epilepsy is required to solve the problems in its pharmacotherapy including side effects and tolerance in currently used antiepileptic drugs. Carnitine/organic cation transporter OCTN1 is functionally expressed in brain neurons, and transports various organic cations including the food-derived antioxidant ergothioneine and the neurotransmitter acetylcholine. The aim of the present study is to examine possible involvement of OCTN1 in epilepsy to find a target for its treatment. The γ-aminobutyric acid (GABA) receptor antagonist pentylentetrazole (PTZ) was administrated to wild-type or octn1 gene knockout (octn1−/−) mice, and then severity of seizure and PTZ concentration in the body were evaluated by behavioral observation and LC-MS/MS, respectively. octn1−/− mice showed lower seizure score and higher survival rate compared to wild-type mice, whereas tissue concentrations of PTZ was almost the same between the two strains. To clarify the mechanism underlying the attenuation of PTZ-induced seizure in octn1−/− mice, we examined the difference in expression of GABA receptor subunits, efficacy of the GABA receptor agonist pentobarbital or diazepam, and release of GABA into the synaptic cleft, between wild-type and octn1−/− mice. Expression of GABA receptor subunits mRNA in cerebral cortex and hippocampus, and sleep latency and sleeping time induced by the GABA agonists were almost the same between the two strains. The measurement of GABA concentration in brain interstitial fluid with microdialysis showed no significant difference at steady-state between the two strains, whereas the increase in GABA by treatment with high potassium in octn1−/− mice tended to be more rapid than that in wild-type mice. These results suggest that OCTN1 may positively regulate PTZ-induced seizure via the mechanism different from pharmacokinetic regulation or modulation of GABA receptor function, supporting necessity of further studies to establish OCTN1 as a target molecule of anticonvulsant.

PT605
Alterations of functional connectivity in pilocarpine-induced mouse model of temporal lobe epilepsy in latent period
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Abstract
Temporal lobe epilepsy is a neurological disorders that characterize abnormal electrical activities in hippocampus as epileptogenic. During epileptogenesis, spontaneous recurrent seizures (SRSs) occurred and introduce to a chronic stage. Seizure-free period with no SRSs during epileptogenesis is important to early diagnosis and medication of epilepsy. However, researches related to latent period of temporal lobe epilepsy are not well understood. Although few reports have been investigated this period in epilepsy mouse model, there is one previous study indicated that social behavior deficits and abnormal cortical activity appear in latent period. We could have questions about this underlying mechanisms that how can the epileptic mice show disruptions of social behavior similar to chronic stage even though SRSs were not occurred in latent period. Moreover, patients with temporal lobe epilepsy suffered from psychiatric comorbidities including depression, anxiety, psychotic disorders, cognitive and personality changes and many human fMRI studies suggested that altered resting-state functional connectivity is associated with these symptoms and psychiatric comorbidities. Therefore, we could hypothesize that resting-state functional connectivity is altered in several brain regions which has been associated various deficits of behavior. Furthermore, the resting-state functional connectivity mapping with optical intrinsic signal imaging (fOIS) recently reported that could investigate the large-scale brain networks in mice. Using this functional neuroimaging, we observed the changes of intrinsic functional connectivity in latent period of chronic epilepsy mouse model by seed-based functional connectivity analysis. We demonstrated that there were significant decreased interhemispheric functional connectivity in frontal, temporal and visual cortex regions. Moreover, we detected two clusters centered on the left frontal and cingulate cortex regions using connectivity matrix and these two clusters showed persistently reduced functional connectivity with several brain regions. Interestingly, there were significantly differences in spectral features over the functional connectivity band in latent phase. These results suggest that the psychopathology of epilepsy might be involved with the altered intrinsic functional connectivity and could help to understand about latent period that is important to early diagnosis of temporal lobe epilepsy.

PT606
Effects of Chronic Ethosuximide Treatment on Cardiovascular Changes in Genetic Absence Epileptic WAG/Rij Rats
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Abstract
Objective: There is limited evidence about the cardiovascular changes in absence epilepsy (AE). Ethosuximide (ETX), a T-type calcium channel blocker, is one of the most commonly used drug in AE treatment. But its effects on cardiovascular functions in AE also has not been investigated. This study aimed to
investigate the efficacy of ETX treatment on absence seizures and its effect on potentially observable cardiovascular changes in genetic absence epileptic WAG/Rij rats.

**Method:** We divided 2-month-old Wistar and WAG/Rij rats into two groups (n=16): Control and ETX groups. The ETX groups were treated with ETX (orally, 300 mg/kg/day) for 3 months. Control groups received physiological saline. After 3 months; the number, mean duration and total duration of spike wave discharges (SWD) were evaluated using EEG recordings. Each group was then divided into two subgroups. In the first group mean arterial blood pressure (MAP) and heart rate (HR) measurements were performed. In the second group, in vitro isolated organ studies were conducted on the thoracic aortas of animals.

**Results:** ETX treatment significantly reduced the number, mean duration and total duration of SWDs in WAG/Rij rats compared to control group. Wistar groups did not have any SWD. In WAG/Rij control group, MAP was significantly higher than Wistar control. HR in Wistar ETX group was significantly lower than Wistar control group. KCl contraction responses significantly increased in the Wistar ETX and decreased in the WAG/Rij control group compared to Wistar control group. Carbachol relaxation responses significantly increased in WAG/Rij control and decreased in Wistar ETX group compared to Wistar control group. There was no significant difference in sodium nitroprusside responses.

**Conclusions:** Cardiovascular function changes have been observed in the WAG/Rij rats with AE and as a result of ethosuximide treatment, indicating that T-type calcium channels may play a major role in these changes.

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**PT607**

**Effect of Neural Stem Cell Transplantation on Absence Seizures in Genetic Absence Epileptic WAG/Rij Rats**

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**Abstract**

**Objective:** Absence epilepsy is characterized by spike-wave discharges (SWD) that are thought to be generated due to abnormal synchronization of cortico-thalamo-cortical networks. Although the pathophysiology of the disease remains uncertain, some evidence showed that absence seizures may be partially linked to reduced GABAergic neurotransmission. The WAG/Rij strain of rats is a well-established genetic model for absence epilepsy. In this study we aimed to investigate the efficacy of neural stem cell (NSC) treatment on absence seizures in WAG/Rij rats with genetic absence epilepsy.

**Method:** We divided 2 month old Wistar and WAG/Rij rats into three groups (n=10): Control, NSC and sham. NSCs taken from fetal medial ganglionic eminence (MGE) were transplanted into perioral regions of the primary somatosensory cortex (S1po) of NSC groups and we waited for 3 months for cell differentiation. We determined the cell differentiation into neurons, astrocytes, oligodendrocytes and GABAergic neurons in vitro. At the end of 3 months; the number, mean duration and total duration of SWDs were evaluated using EEG recordings.

**Results:** MGE-derived NSCs were found to differentiate into astrocytes, neurons, oligodendrocytes and GABAergic neurons in vitro. All Wistar groups did not have any SWD during EEG recordings. NSC treatment significantly reduced the number, mean duration and total duration of SWDs in WAG/Rij rats compared to control and sham groups (p<0.05). No significant changes related to seizure activity were observed between control and sham groups in WAG/Rij rats.

**Conclusions:** Our findings suggest that transplantation of GABAergic neurons into the S1po, a brain region that is thought to be responsible for the initiation of the SWDs in absence epilepsy, reduced absence seizures in WAG/Rij rats. NSC treatment may be a potential alternative to conventional antiepileptic drug therapy in absence epilepsy.

**PT608**

Analysis of glutamate-induced processing of proline-rich transmembrane protein 2 (PRRT2)

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**Results:** MGE-derived NSCs were found to differentiate into astrocytes, neurons, oligodendrocytes and GABAergic neurons in vitro. All Wistar groups did not have any SWD during EEG recordings. NSC treatment significantly reduced the number, mean duration and total duration of SWDs in WAG/Rij rats compared to control and sham groups (p<0.05). No significant changes related to seizure activity were observed between control and sham groups in WAG/Rij rats.

**Conclusions:** Our findings suggest that transplantation of GABAergic neurons into the S1po, a brain region that is thought to be responsible for the initiation of the SWDs in absence epilepsy, reduced absence seizures in WAG/Rij rats. NSC treatment may be a potential alternative to conventional antiepileptic drug therapy in absence epilepsy.