

Soe Minn Htway<sup>1</sup>, Takehiro Suzuki<sup>2</sup>, Sanda Kyaw<sup>1</sup>, Keiko Nohara<sup>2</sup>, Tin-Tin Win-Shwe<sup>2</sup>

<sup>1</sup> Department of Physiology, University of Medicine, Magway, Magway, Myanmar

<sup>2</sup> Center for Health and Environmental Risk Research, National Institute for Environmental Studies, Tsukuba, Japan

### Introduction

Arsenic is a well-known carcinogenic and also a developmental neurotoxicant. Our previous study showed that developmental arsenic exposure impaired social behavior and serotonergic system in C3H adult male mice. These effects might affect the next generation with no direct exposure to arsenic. This study aimed to detect the social behavior and related gene expression changes in F2 male mice born to gestationally arsenite exposed F1 mice.

### Methods

#### Experimental design

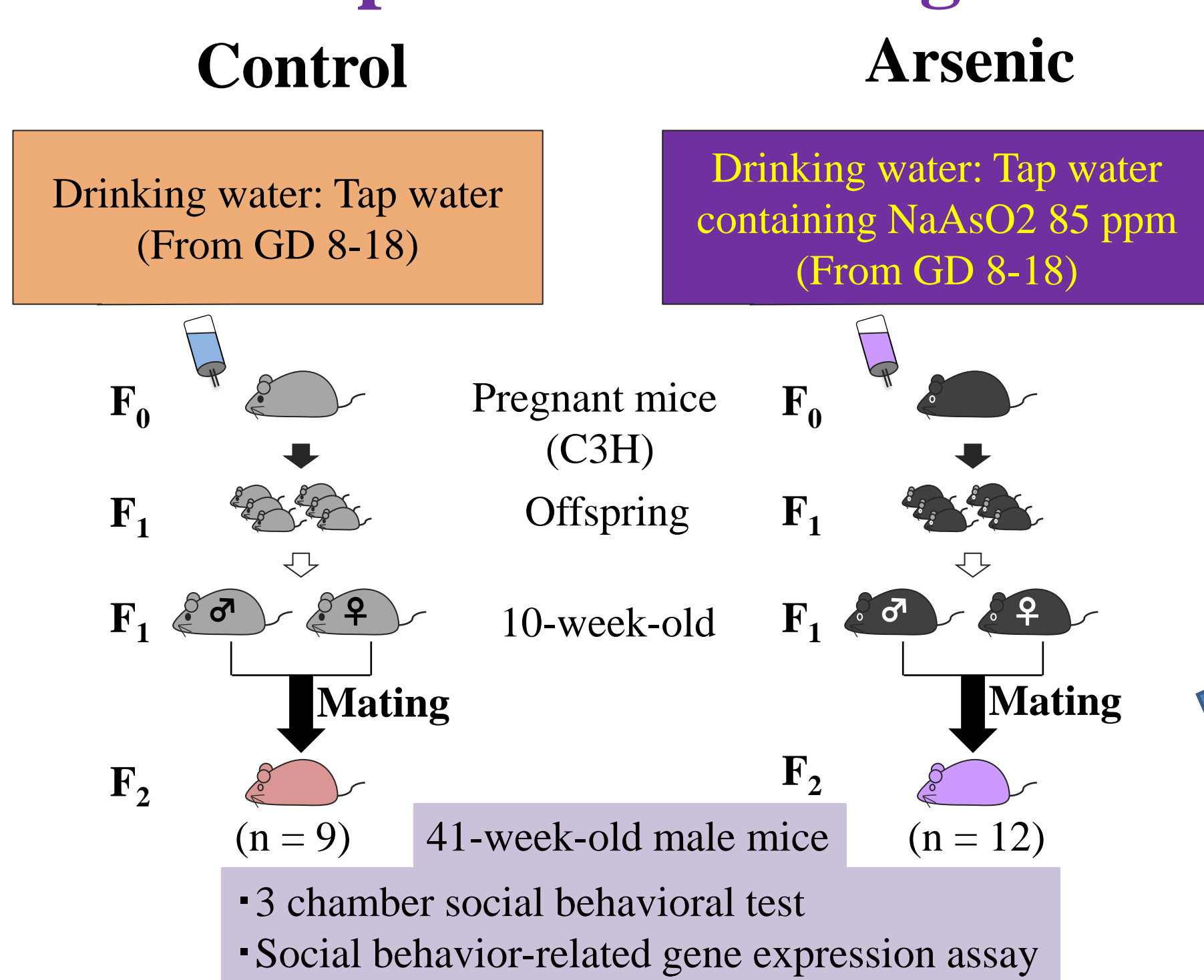
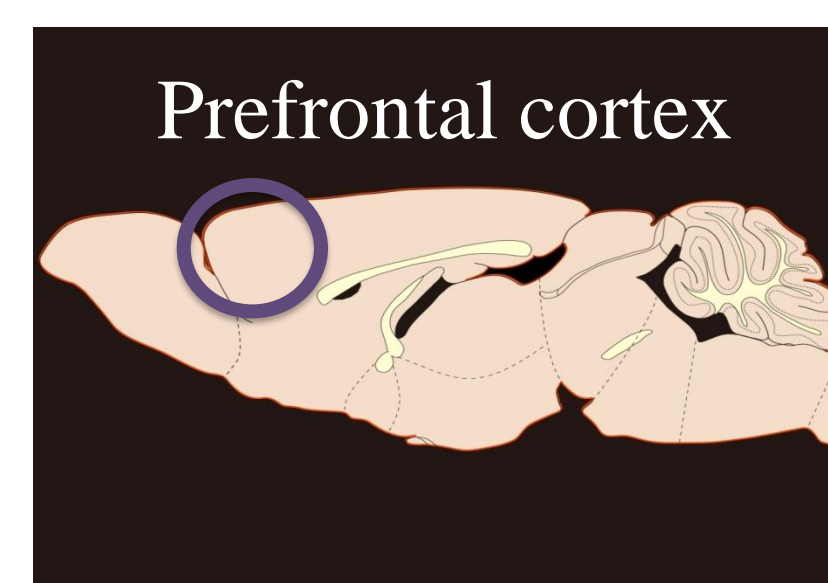
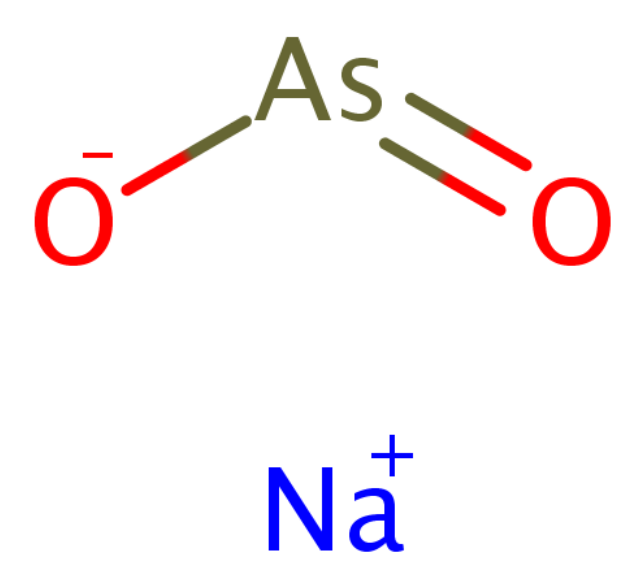


Fig.1 Animals and NaAsO<sub>2</sub> exposure



【Mouse Brain】

#### Gene Expression Assay

- Serotonin receptor (5-HT 5B)
- Brain-derived Neurotropic Factor (BDNF)
- Hemeoxygenase-1 (HO-1)
- Cyclooxygenase-2 (COX-2)



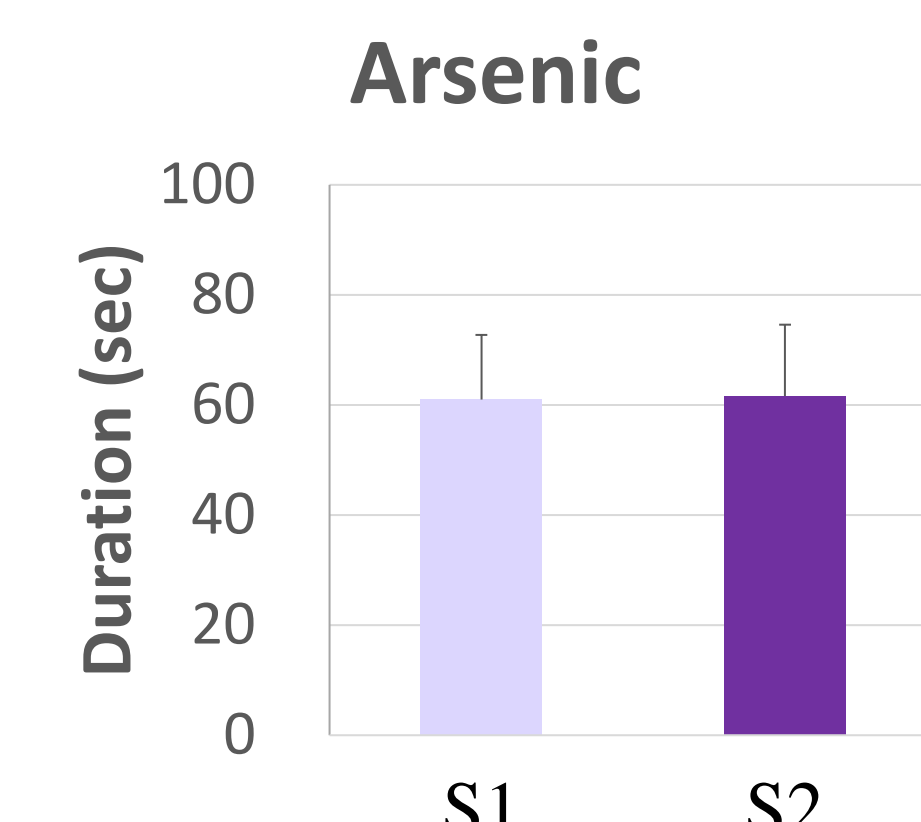
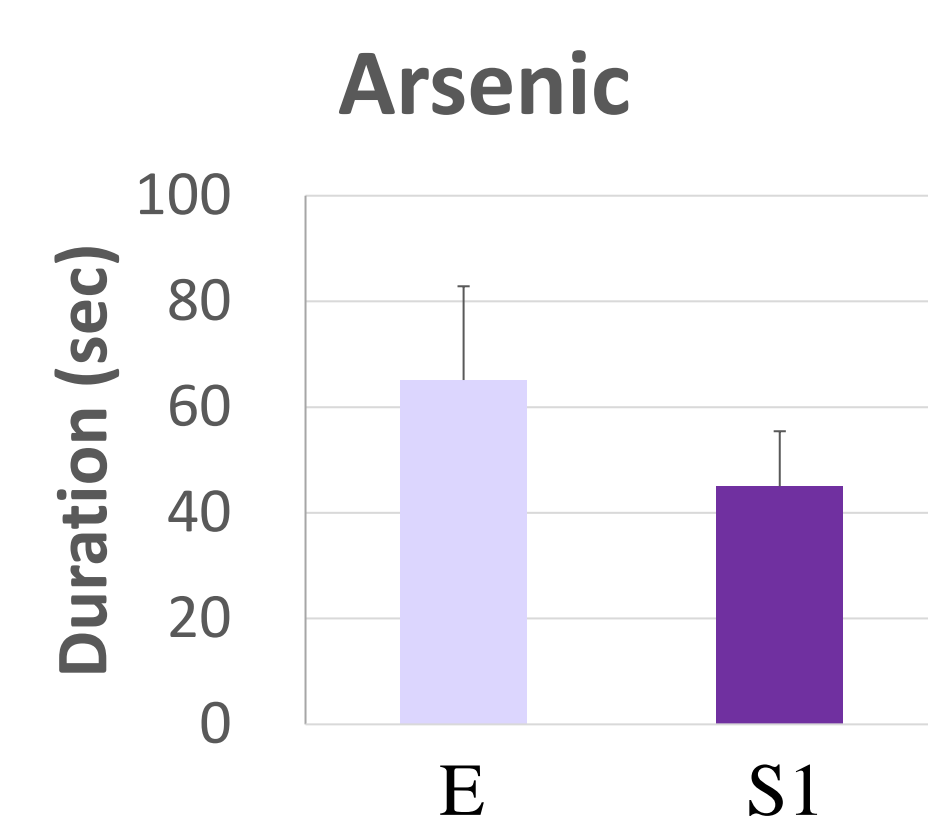
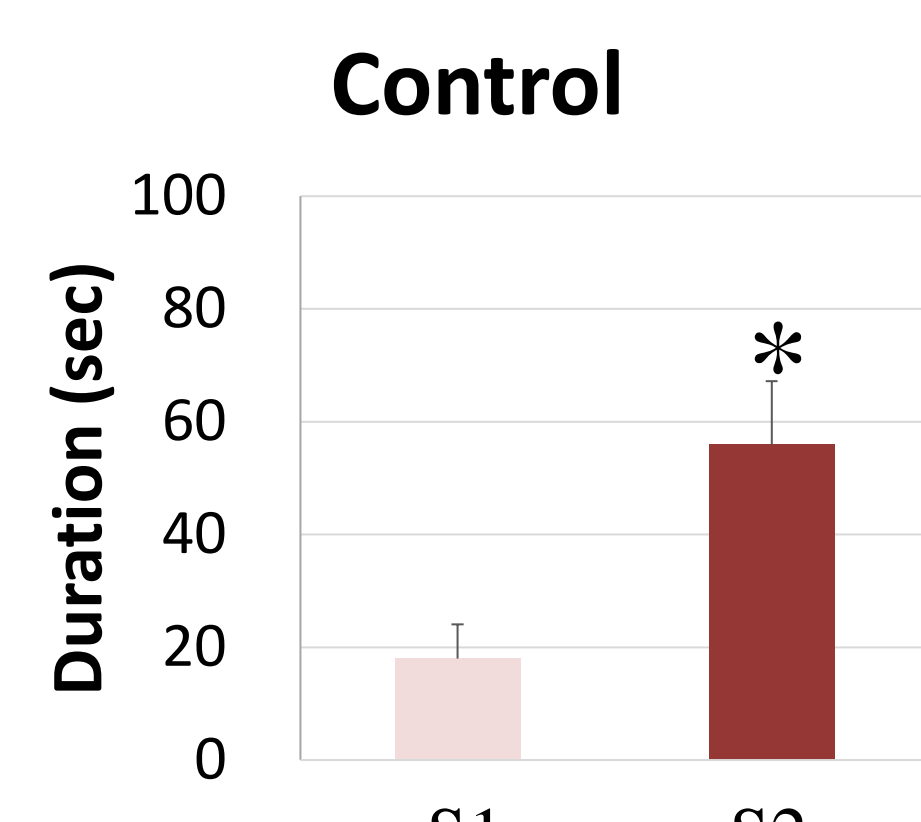
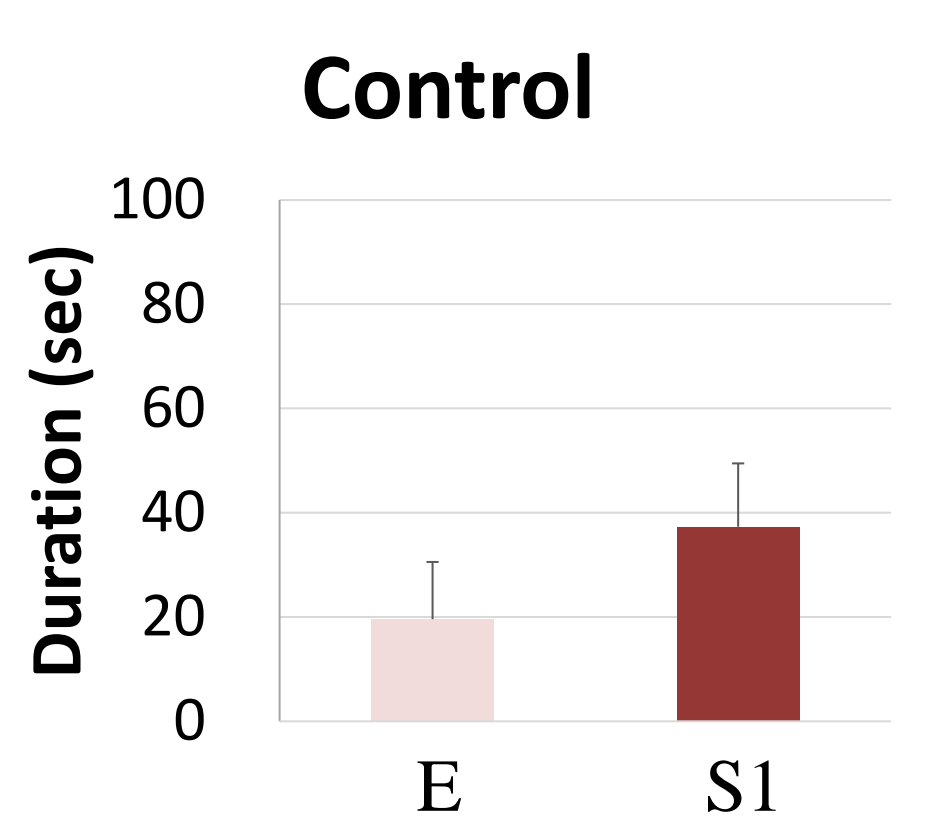
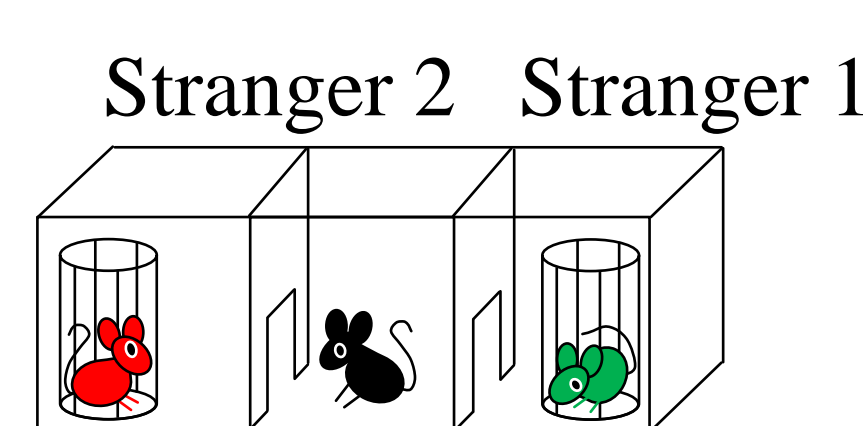
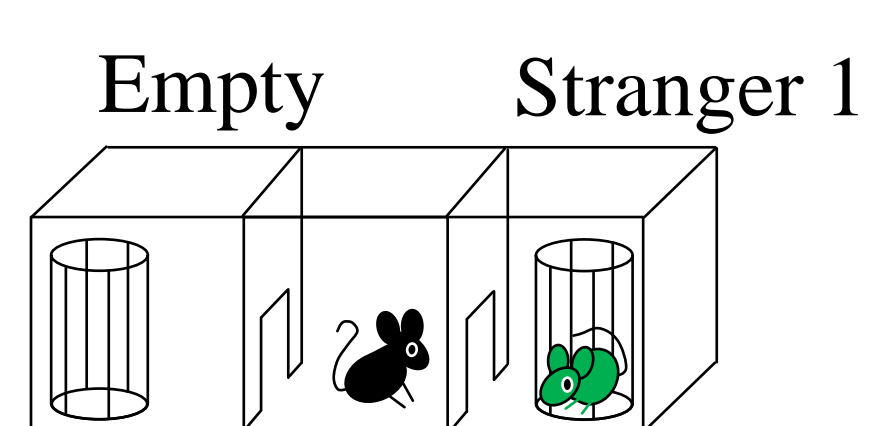
Fig.2 Real-time RT-PCR analysis by Life technology, Applied Biosystems (StepOne)

### Results

#### 3 Chamber social behavior test

##### Sociability test

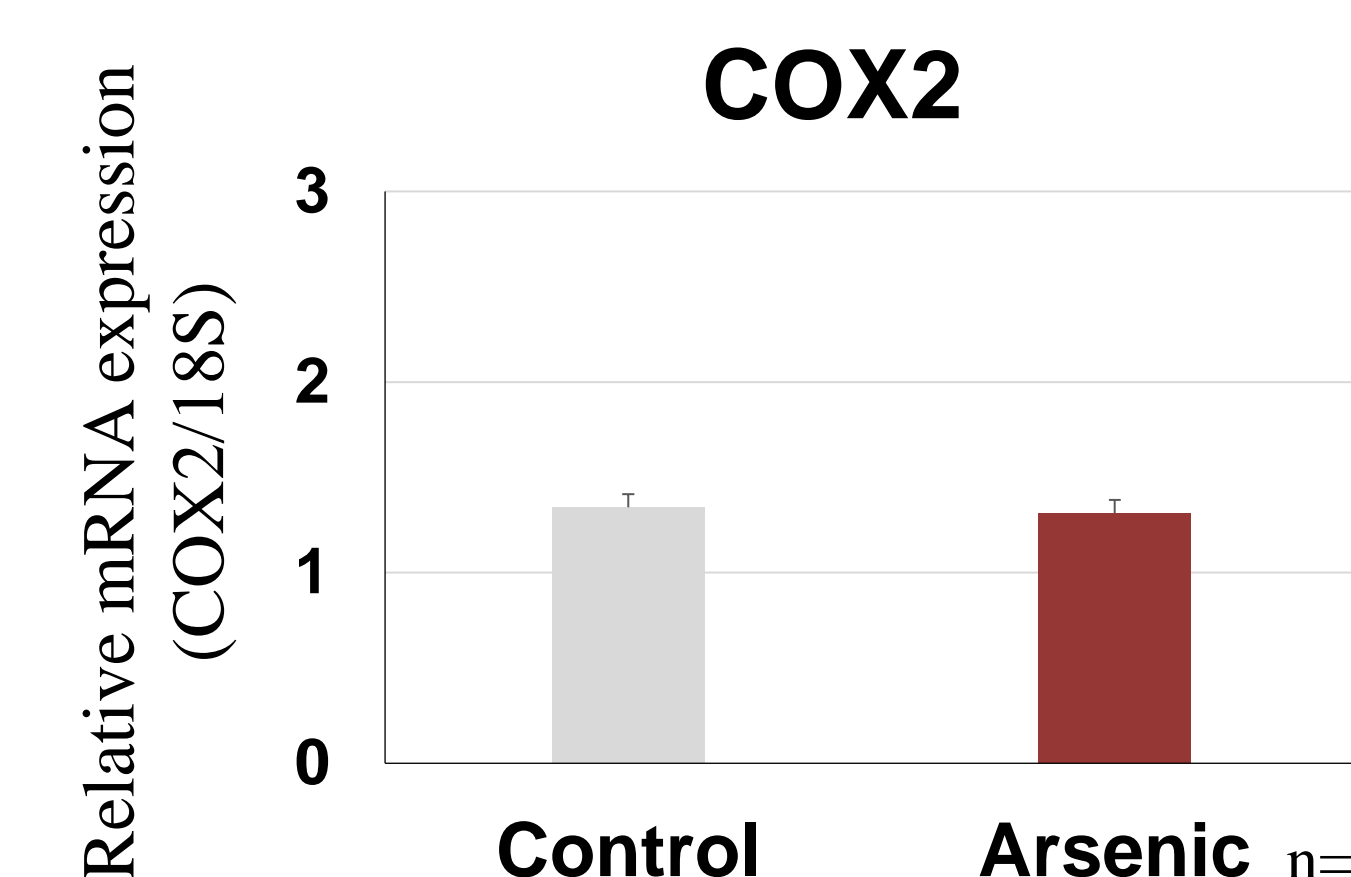
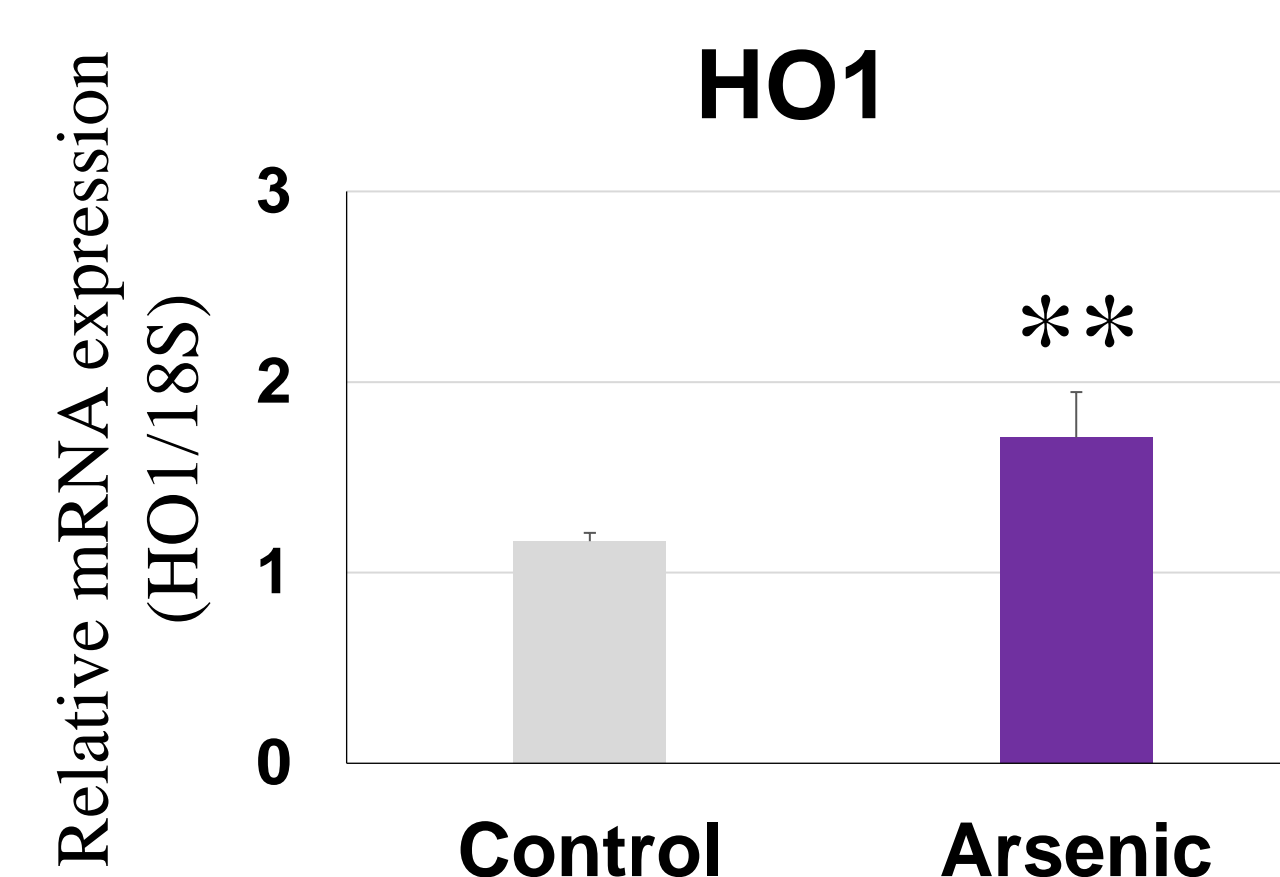
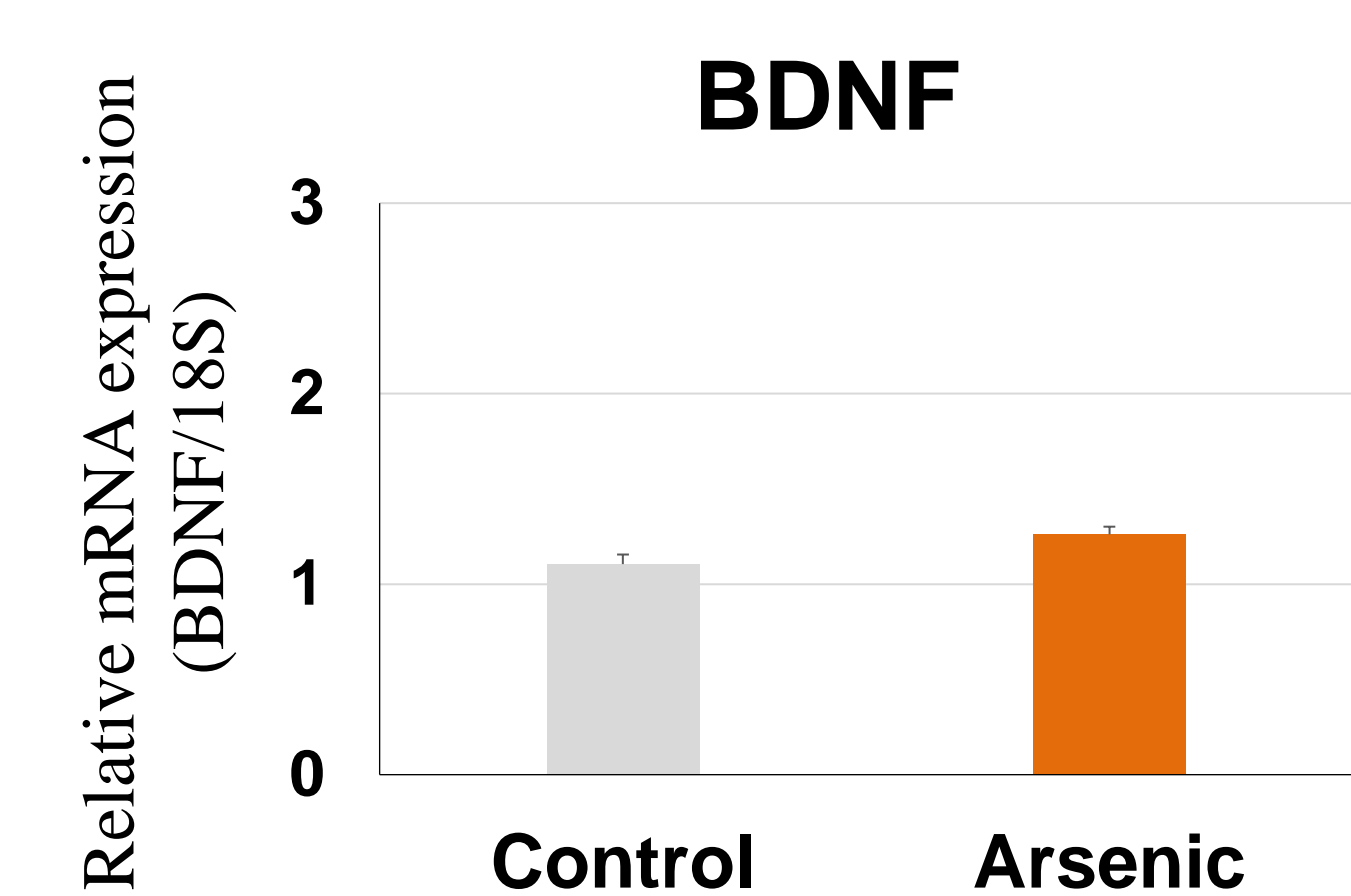
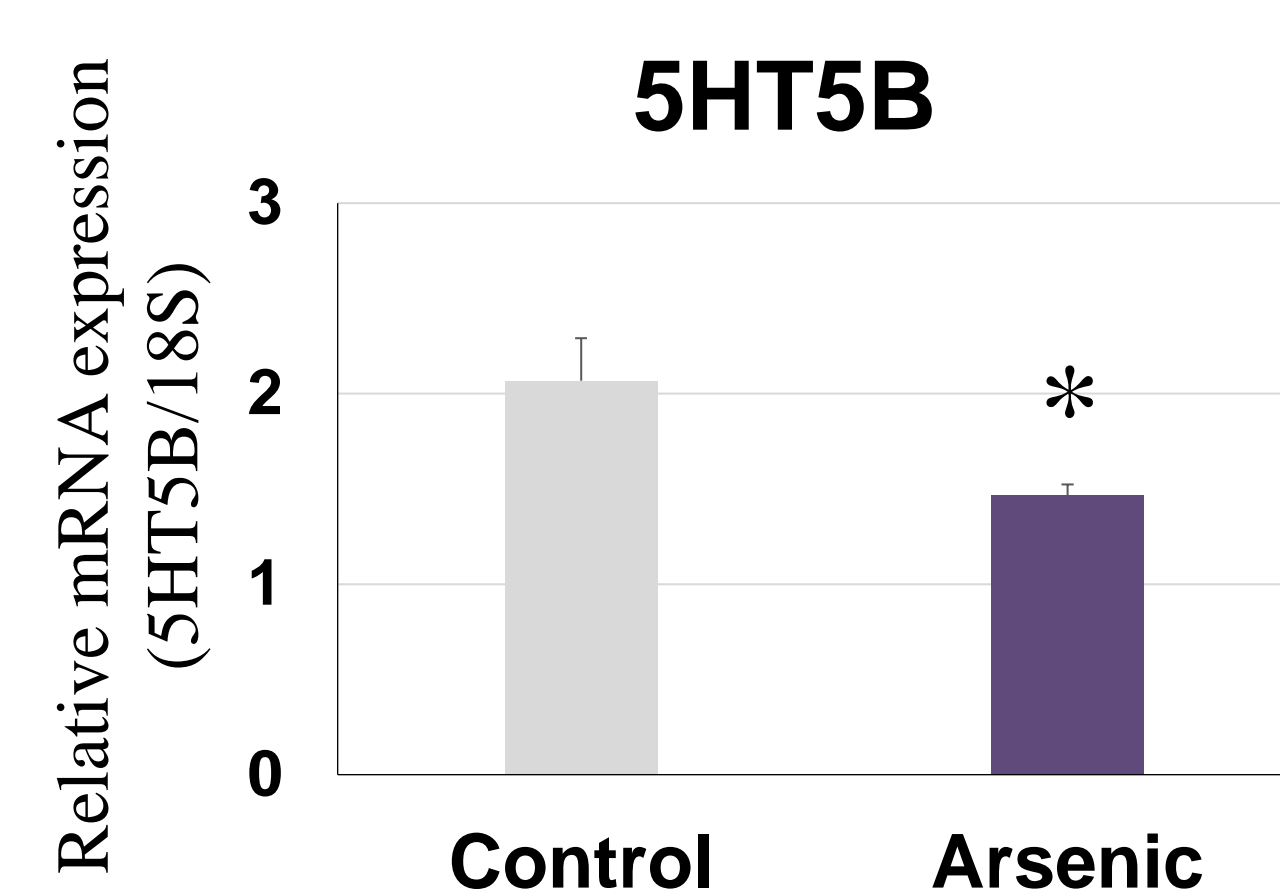
##### Social novelty preference test



E = Empty  
S1 = Stranger 1  
S2 = Stranger 2  
n=9-12, \*p < 0.05

Fig. 3 Effect of developmental arsenic (NaAsO<sub>2</sub>) exposure on social behavior in 41-week-old F2 C3H mice

#### Gene expression assay



n=9-12, \*p < 0.05, \*\*p < 0.01

Fig. 4 Effect of developmental arsenic (NaAsO<sub>2</sub>) exposure on neurological, oxidative stress and inflammatory biomarkers in prefrontal cortex of 41-week-old F2 C3H mice

### Conclusion

These findings suggested that the effect of developmental arsenic exposure was passed to the F2 male mice, impairing social behavior partly and serotonergic system in the prefrontal cortex. In this study, BDNF and COX-2 were not affected although oxidative stress marker (HO-1) was increased exceptionally.