Introduction
Resting state functional MRI in the brain has been a cornerstone and powerful tool for exploring functional connectivity (FC) and related disorders. Functional connectivity is commonly evaluated using correlation analysis of time series derived from brain regions. However, certain aspects of functional connectivity are not evident using this method and are significantly influenced by several sources of heat-induced fluctuations, such as slice-timing and spatial variance.

Here, we established a data processing pipeline that can robustly remove random and structured noise from rat rs-fMRI data. We show that: I) denoising and cleaning, GS – partial correlation with global mean signal as the control variable

Methods
We proposed a new data processing pipeline for rat rs-fMRI data which includes denoising, an ICA auto-classifier to remove structured noise, and a new FIX classifier for rat. The pipeline is tested on control rats and on a rat model of sporadic Alzheimer’s disease.

Results and Discussion
The temporal signal-to-noise ratio (tSNR) was assessed in terms of significant group differences at each timepoint. The effect of excluding FIX-ICA and/or partial correlation from our optimized pipeline was assessed in terms of standard deviation of functional connectivity matrices in healthy control group. Our proposed pipeline which is DN+SC+SM+HP+FIX+GS achieved the minimal standard deviation for functional connectivity matrices in the healthy control group (Fig. 3). This result may be useful in understanding disease mechanisms and investigating disease progression in animal models.

Conclusions