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Decreased *PSD95* expression in medial prefrontal cortex (mPFC) was associated with cognitive impairment induced by sevoflurane anesthesia

Key words: Sevoflurane, Cognitive dysfunction, *PSD95*

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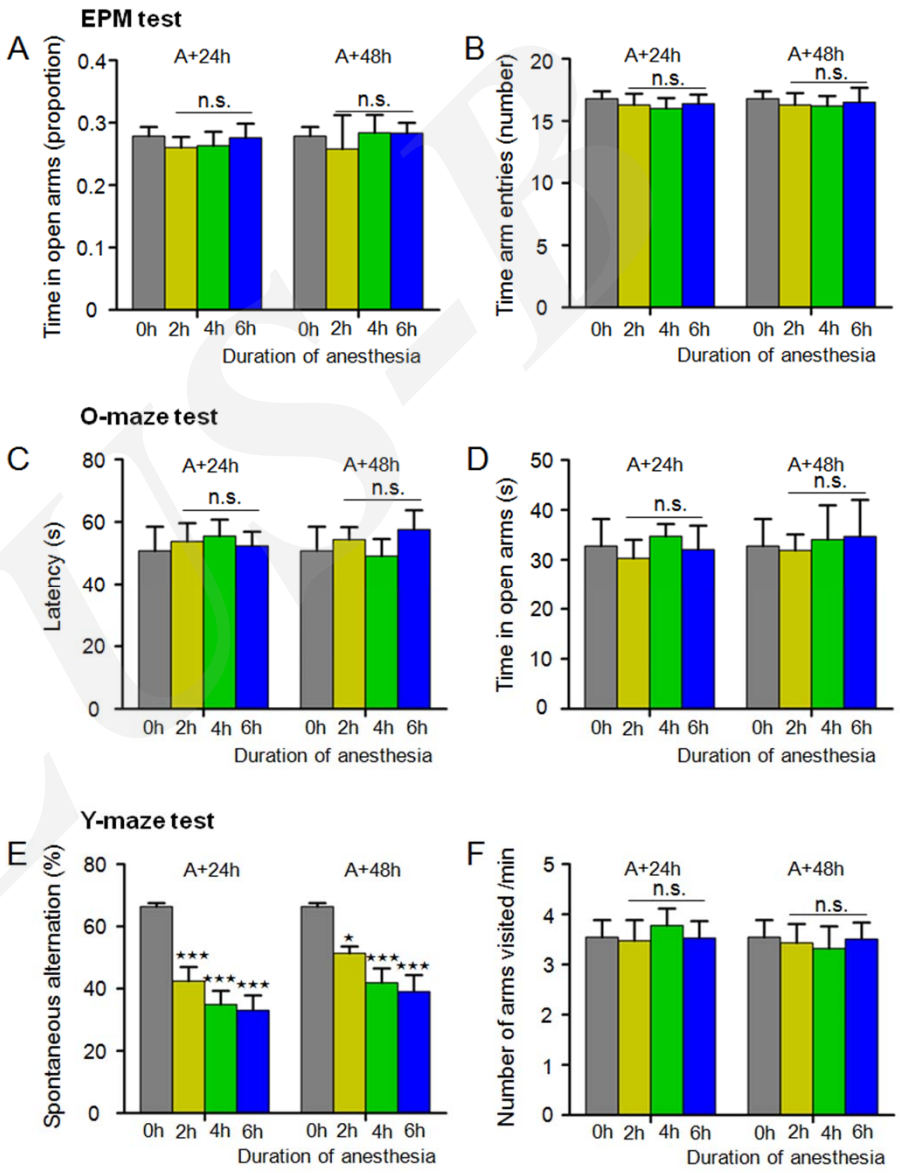
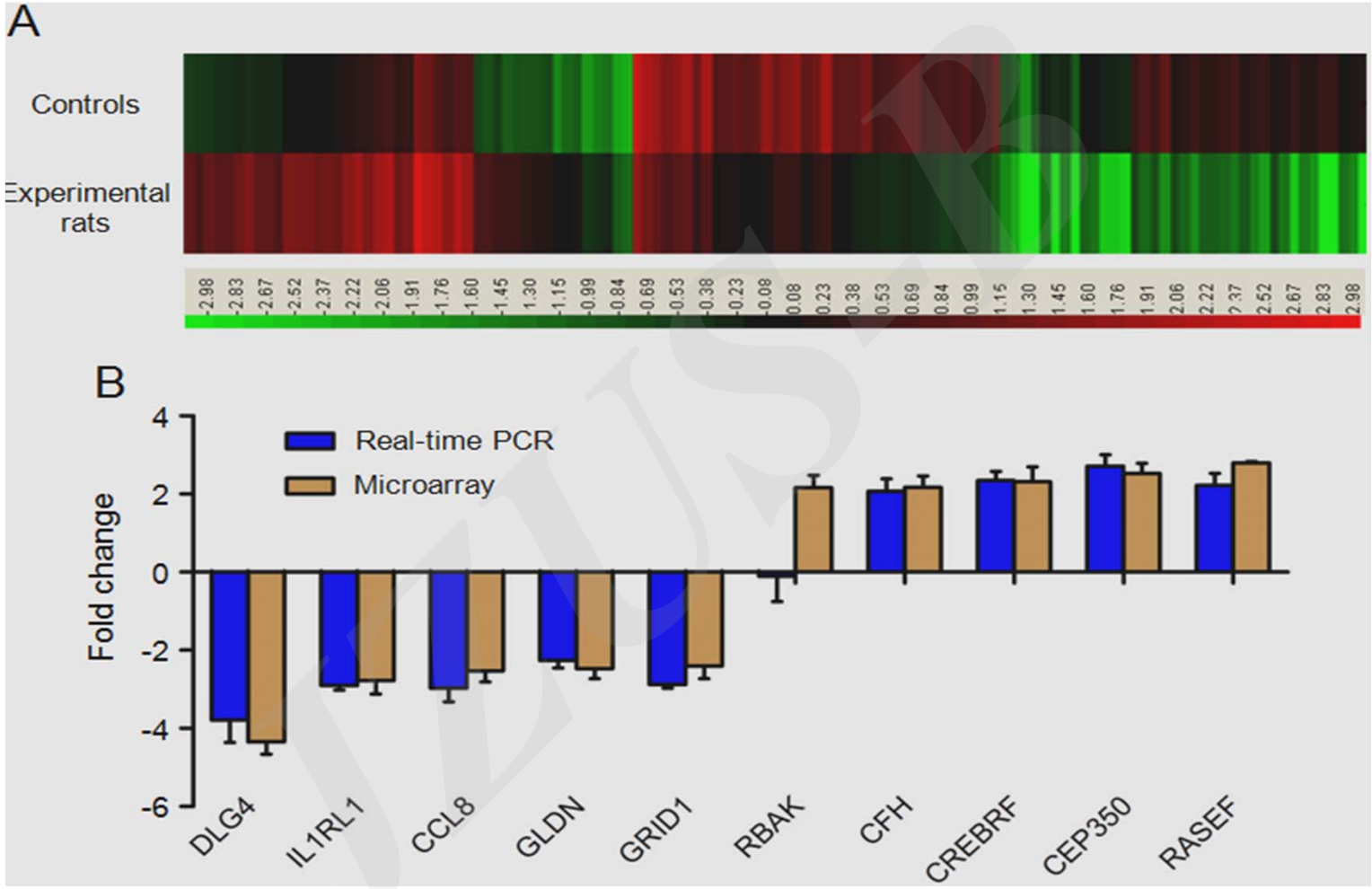
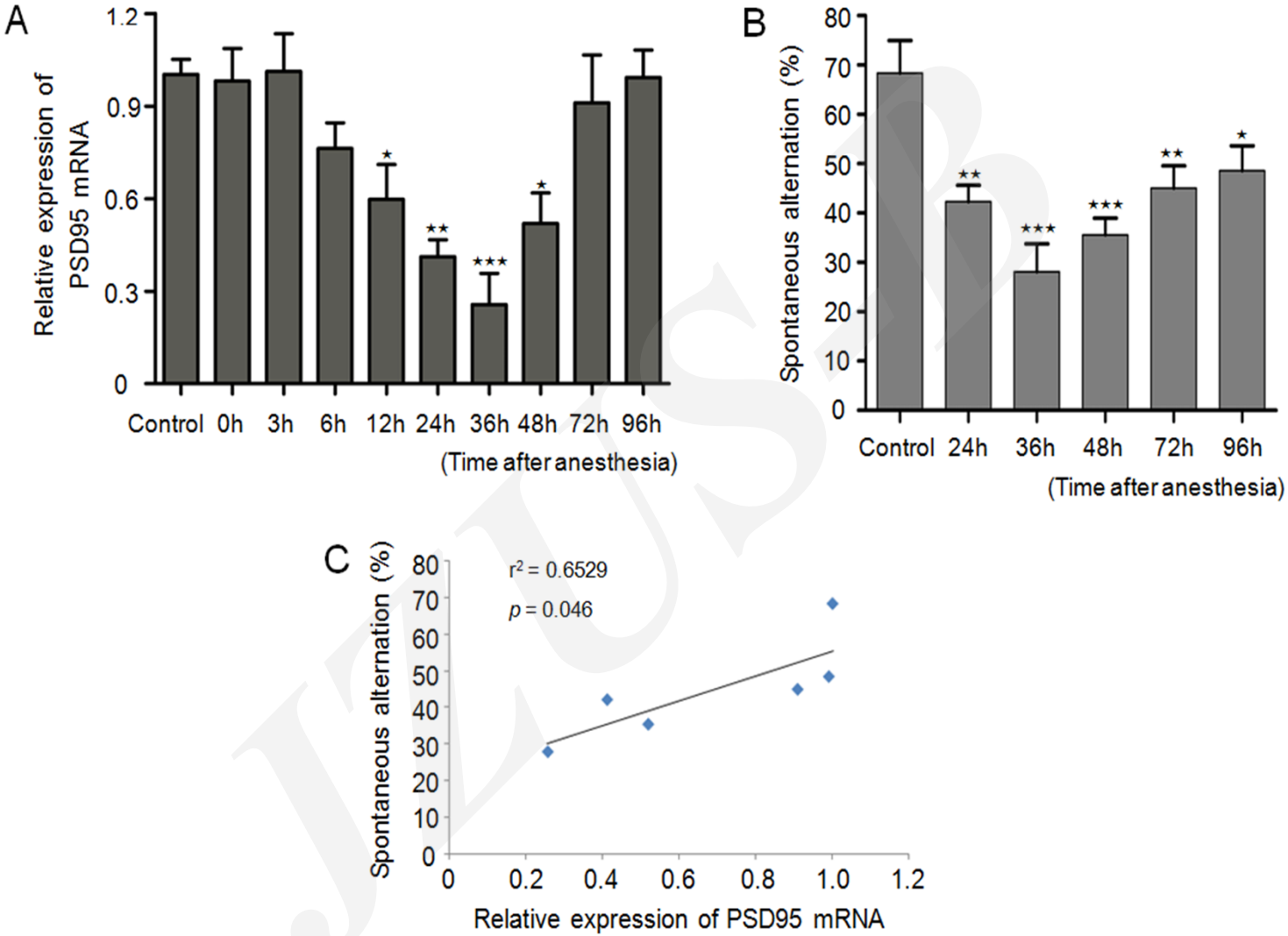
Research Summary

This study aimed to identify dysregulated gene expression in medial prefrontal cortex (mPFC) and investigate the underlying mechanisms involved in postoperative cognitive dysfunction (POCD) after exposure to sevoflurane.




A
Controls
Experimental rats
-2.98 -2.83 -2.67 -2.52 -2.37 -2.22 -2.06 -1.91 -1.76 -1.60 -1.45 -1.30 -1.15 -0.99 -0.84 -0.69 -0.53 -0.38 -0.23 -0.08 0.08 0.23 0.38 0.53 0.69 0.84 0.99 1.15 1.30 1.45 1.60 1.76 1.91 2.06 2.22 2.37 2.52 2.67 2.83 2.98
B
Real-time PCR
Microarray
Fold change
4
2
0
-2
-4
-6
DLG4
IL1RL1
CCL8
GLDN
GRID1
RBAK
CFH
CREBRF
CEP350
RASEF


A
Relative expression of PSD95 mRNA
1.2
0.9
0.6
0.3
0
Control 0h 3h 6h 12h 24h 36h 48h 72h 96h
(Time after anesthesia)
B
Spontaneous alternation (%)
80
70
60
50
40
30
20
10
0
Control 24h 36h 48h 72h 96h
(Time after anesthesia)
C
Spontaneous alternation (%)
r² = 0.6529
p = 0.046
0 0.2 0.4 0.6 0.8 1.0 1.2
Relative expression of PSD95 mRNA

Innovation points

Behavioral tests, including elevated plus-maze, O-maze and Y-maze tests, were performed on Wistar rats.

This is the first study to investigate the aberrant gene expression in mPFC as a result of exposure to sevoflurane.

This study could provide clues for preventing POCD in clinical operations.

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