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( [11-13] )

[1-3] )

( [14] )

(prepulse inhibition, PPI) [4, 5] [6, 7] [15, 16] PPI ( )

[17-20] ( )

[8] [4, 21, 22] PPI [6, 21]

PPI PPI

[3] PPI

[3] (auditory fear conditioning) PPI

1.1 运动增多

1 (open [21] field test) [4, 9, 10] PPI [22]

[10] PPI PPI

[2, 5] Wistar Lister Hooded PPI

[1, 5] Sprague-Dawley PPI [23]

( [2] ) “ - ” [24] PPI

1. Table 1. Main behavioral changes associated with social isolation of rats

Behavior	Behavioral changes associated with isolation rearing
Hyperactivity	Hyperactivity in isolation reared rats [1, 4, 5, 10-12] due to less time spent in resting while not due to velocity change [10] Handling or environment habituation could reverse this hyperactivity in isolated rats [2] Hyperactivity appears after 2 weeks of isolation [4, 11]
Startle and PPI	Baseline of startle increases [4, 21, 22] PPI decreases [6, 21] Enhancement of PPI induced by auditory fear conditioning declines [21, 22] Enhancement of PPI induced by perceived spatial separation declines [22] Possible brain areas involved are the amygdala, the posterior parietal cortex, the primary auditory cortex, and the prefrontal cortex [66]
Learning and memory	Deficit in fear conditioning [1, 21] Improvement in reward learning [29, 30, 67, 68] Deficit in reversal learning and no effect on acquisition learning [32, 33] Impairment in recognition [33]

PPI: prepulse inhibition.

[25]

[26, 27]

[27, 28]

### 1.3 学习和记忆功能异常

PPI

PPI

[21]

(contextual fear conditioning)

[1]

[29]

C57BL/6J

[30]

Wistar

[31]

8

[32]

Bianchi

[33]

## 2 早期

( [48])

### 2.4 谷氨酸的异常

NMDA

[49] Melendez

mGluR1 mGluR5

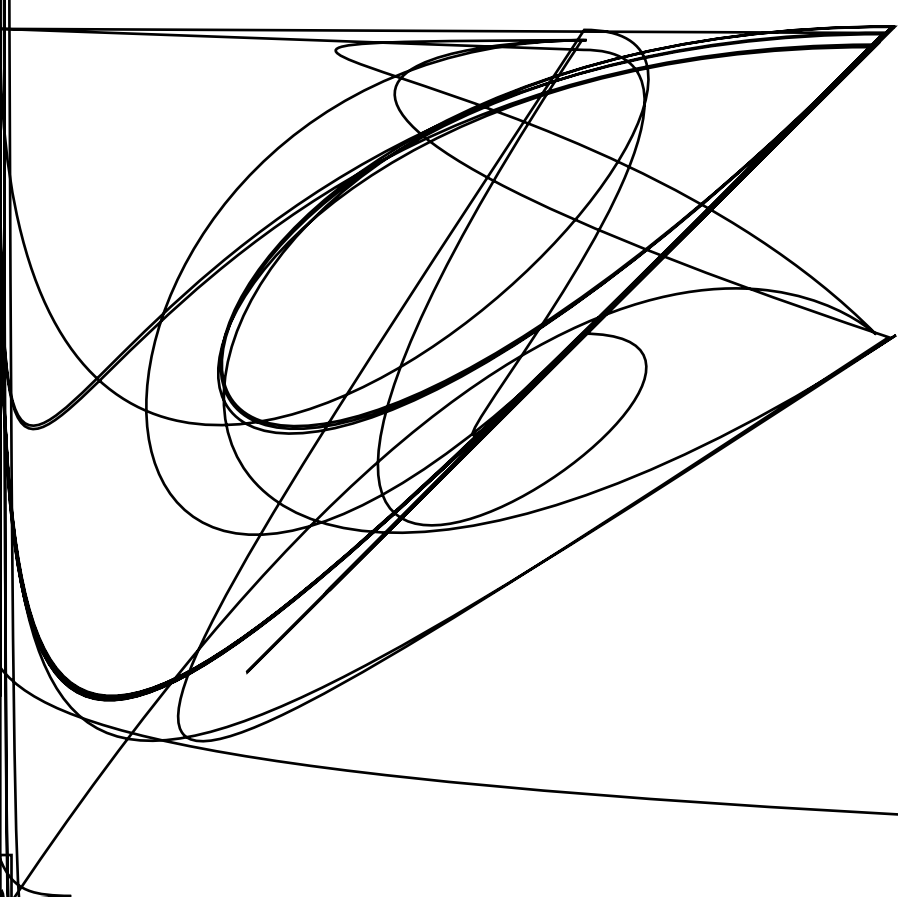
[50] 26

mGluR6 AMPA3

[10]

### 3 早期社会隔离引起的

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PPI

[60]

[61]

[37]

[62]

[63]

[64]

[65]

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