

**NEWS**

# Cognition and behavior: Maternal infection linked to anxiety

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**Fear factor:** Rats that learn to associate a certain sound with a foot shock freeze and emit distress calls whenever they hear that sound.

Pups born to pregnant rats with activated immune systems emit more distress calls when they receive electrical shocks than do controls, according to a study published 9 June in the *Journal of Psychiatric Research*<sup>1</sup>.

A number of studies have shown that activating the immune systems of pregnant mice and rats leads to **brain and behavior changes** in the offspring. These features resemble symptoms of **autism** and **schizophrenia**, and include social deficits and heightened anxiety.

Epidemiological studies have also found that women who have **inflammatory disorders** such as arthritis or develop influenza when pregnant have an increased risk of having a child with autism.

In the new study, researchers injected rats at day 15 of pregnancy with a molecule that mimics a virus. They then recorded the offspring's ultrasonic vocalizations — cries inaudible to the human ear — in response to a series of tones followed by foot shocks.

Rats born to mothers whose immune systems were stimulated emit more 22-kilohertz calls than do

control rats, the researchers found. Control rats normally produce these calls when exposed to predators, and the cries are associated with activity in the amygdala, a brain region involved in processing fear and emotion<sup>2</sup>.

By contrast, the immune-exposed rats emit 50-kilohertz cries — which have been linked to play and rewarding experiences — as often as controls do.

The immune-exposed rats jump just as high in response to a shock as controls do, suggesting that the shock is not more painful to them. They also freeze in anticipation of the shock, just as controls do. These results indicate that the difference is specific to the fear response as assessed by ultrasonic vocalizations.

## References:

1: Yee N. *et al. J. Psychiatr. Res.* Epub ahead of print (2012) [PubMed](#)

2: Parsana A.J. *et al. Behav. Brain Res.* **226**, 77-86 (2012) [PubMed](#)