

Press release

Max-Delbrück-Centrum für Molekulare Medizin (MDC) Berlin-Buch

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Running Activity of Mice during Pregnancy Stimulates Neurogenesis in Offspring

Embargoed until: Monday, March 6, 2006, 5:00 PM U.S. Eastern time, 10:00 PM London Time, 23:00 CET; March 7, 2006, 7:00 AM Japan time Jogging is apparently beneficial for brain development. This is the implication of the latest findings of brain researchers of the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch and the Charité - University Medical School Berlin. According to the study, mouse offspring whose mothers exercised voluntarily during pregnancy by running on an exercise wheel developed about 40 percent more neuronal cells than the offspring of inactive mouse mothers. The increase appeared in the hippocampus, a region of the brain that is strongly involved in learning and memory processes. As Dr. Anika Bick-Sander and Dr. Gerd Kempermann have now reported in the online edition of the Proceedings of the National Academy of Sciences (PNAS)* it is not yet completely clear what causes this effect. Certain growth factors and pre- and postnatal maternal behavior do seem to play a role. "Still, the results of our research on mice cannot be simply extrapolated to humans," Dr. Kempermann stresses. That is why he does not want the findings to be considered as concrete advice for expectant mothers to exercise more to stimulate brain development in their children. "Our results, however, show that, at least in mice, maternal physical activity has surprisingly direct effects on the brain development of the offspring." He points out that, until now, there have hardly been any studies in humans on the effects that sport during pregnancy might have on the development of the children. "Our work indicates that this could be a rewarding area of research," says the brain researcher, who for years has focused on stem cells of the brain and has addressed questions regarding neurogenesis due to physical and cognitive activity.

"Activity" in the broadest sense of the term is considered to be important and beneficial for the brain. There are indications that active people have a lower risk of developing certain diseases such as Alzheimer's or Parkinson's disease. How activity affects the early development of the brain has hardly been studied until now. The researchers in Berlin determined that the newborn offspring of physically active mice mothers were slightly underweight at birth and at first developed somewhat more slowly than the offspring of inactive mouse mothers. Yet, only three weeks after birth, the weaker mice had caught up. In the development of neuronal cells in the hippocampus, they had already surpassed the offspring of mouse mothers who had not been physically active. Here, a growth factor that researchers call FGF-2 could play an important role. It is known that FGF-2 circulating in the blood stimulates neuronal cell development. FGF-2 levels were clearly elevated in the brain of the offspring of physically active mouse mothers in comparison to the control group.

*Running in pregnancy transiently increases postnatal hippocampal neurogenesis in the offspring

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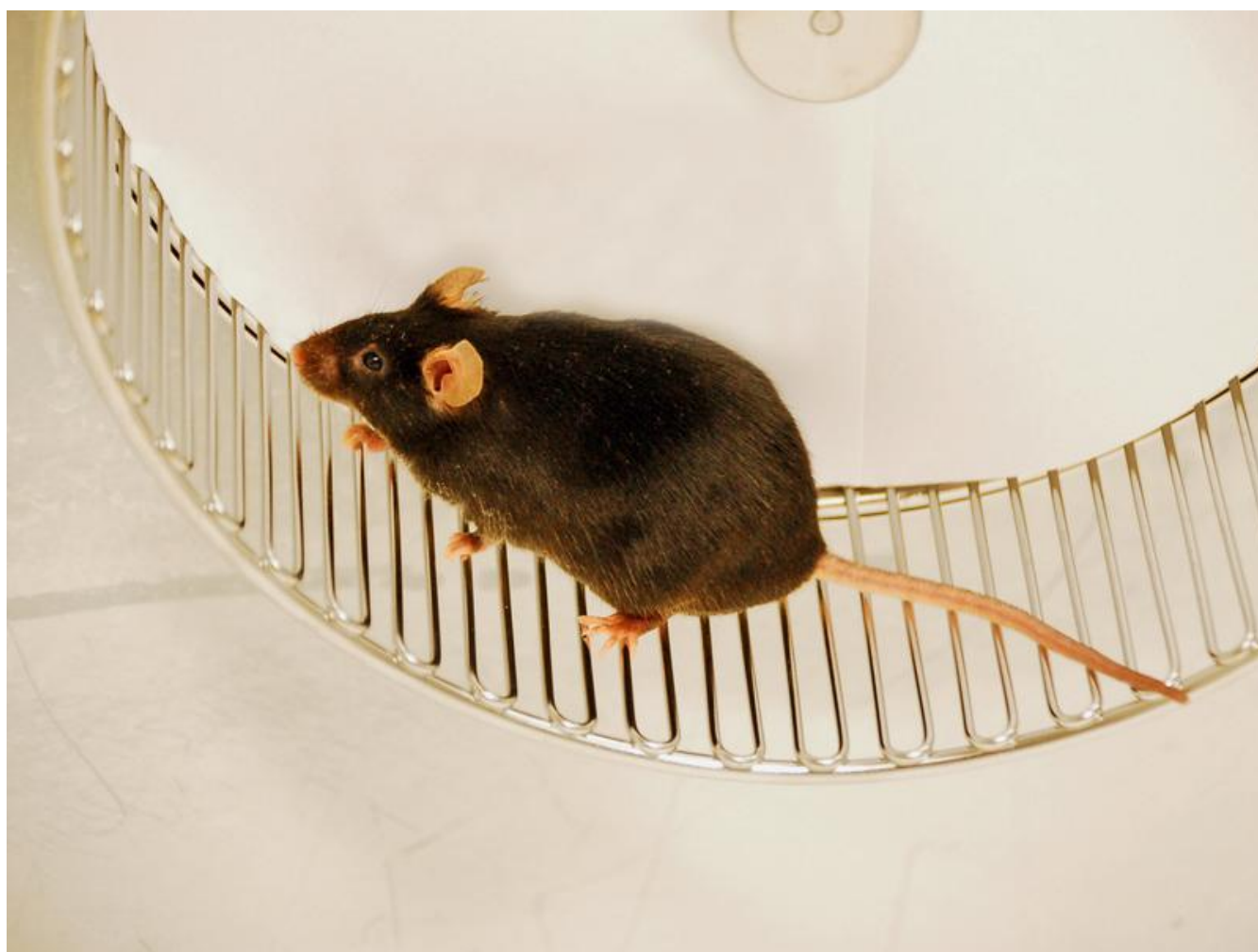
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Jogging is apparently beneficial for brain development - at least for offspring of mice as German researchers have found out.

Photo: Dr. Susanne Wolf /Copyright: MDC