Being Overweight Increases Risk of Alzheimer's

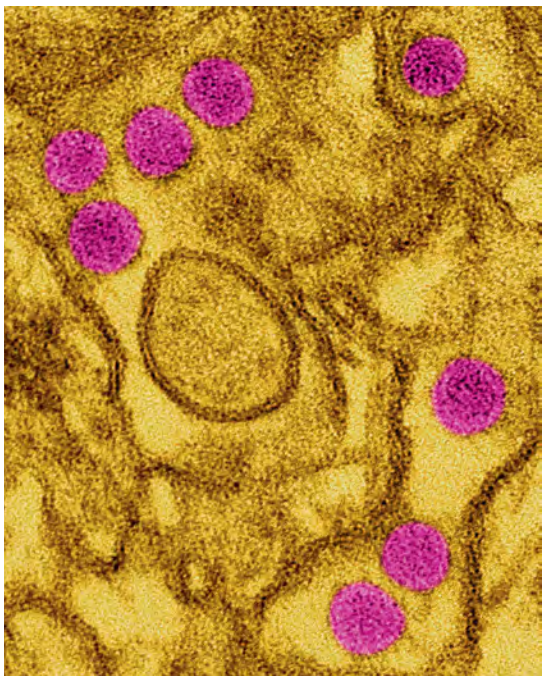
Obesity is associated with fewer connections between regions of the brain

Being severely overweight or obese not only increases the risk of diabetes, heart failure and arteriosclerosis, it evidently also compromises the brain. According to scientists at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, some areas of the brain are less strongly connected in severely overweight people aged 60 to 80. As a result, individual regions are less capable of interacting in the default mode network. This network becomes active when we let our mind wander, but also, for example, when we are planning future action or recalling the past. Weaker links within this network, on the other hand, are an early indicator of impending dementia. Older, severely overweight individuals could also be at greater risk for Alzheimer's. The researchers now plan to investigate how changes in diet affect the brain network and mental faculties in general.

Zika Viruses Produced in the Lab

Scientists fulfill a crucial prerequisite for vaccine production

In the last ten years, the Zika virus, which is transmitted by the yellow fever mosquito, spread from Africa and is now found in around 60 countries. The virus gained notoriety shortly before the 2016 Olympic Games in Brazil, when it became known that an infection during pregnancy can harm newborns. People who live outside of Africa have no natural immunity, so scientists are working to develop a vaccine against the pathogen. Researchers at the Max Planck Institute for Dynamics of Complex Technical Systems in Magdeburg, in collaboration with a research team in Brazil, have now propagated large quantities of Zika viruses in the lab. To that end, they adapted hamster cells to be able to grow in a liquid nutrient medium and infected them with viruses from Brazil. After almost two weeks, the scientists harvested nearly 40 million infectious viruses per milliliter from high-density cell cultures. Thanks to these findings, researchers can now conduct further studies on the Zika virus. (www.mpg.de/11293337)



Colored electron microscopy image of Zika viruses (pink) in kidney cells: The viruses are transmitted to humans by mosquitoes, but they can also be transmitted sexually. If pregnant women contract Zika fever, their babies may exhibit brain growth disorders (microcephaly) after birth.

Photo: SPL/D. Kunkel Microscopy

Diagnosing Cancer with a Breath Test

Inhale deeply … and exhale. This is what a test for lung cancer could one day look like. Today, most lung cancer patients die within five years of being diagnosed. One of the main reasons for this is that the disease isn't noticed until it is too late. Scientists at the Max Planck Institute for Heart and Lung Research in Bad Nauheim therefore developed a method that can detect the disease at an early stage. To do this, they analyzed breath samples for traces of RNA variants of the GATA6 and NKX2 genes, which are produced in different amounts in cancerous and healthy cells. Using a newly developed method, they can isolate the RNA molecules that are present in the breath in trace amounts, and usually fragmented. In one study involving healthy subjects and cancer patients, the breath test correctly determined the health status of 98 percent of the participants. With such a high success rate, this method could be used for routine early detection in clinics, as a complement to conventional methods. Together with the technology transfer organization Max Planck Innovation, the researchers are now seeking licensing partners to develop the breath test to maturity and market it. (www.mpg.de/11237619)