Squirrels and bears help fight heart attack damages

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Two fuzzy lessons of the heart.

Scientists hope to reduce the damages caused by heart attacks by inducing hibernation in squirrels and by synthesizing a chemical found in bear bile.

1. A team from the University of Alaska Fairbanks has figured out a way to send Arctic ground squirrels (Spermophilus parryii, pictured) into and out of hibernation at will – by identifying the switch that triggers that torpor.

The effects of hibernation on squirrels are drastic: their oxygen consumption dips to 1% of what it normally is and their body temperature falls below freezing.

Inducing hibernation-like states in patients could buy surgeons critical minutes when performing operations or save lives after a heart attack.

Turns out, the hibernation switch in squirrels is a receptor on brain cells for the ‘drowsiness’ neurotransmitter adenosine, which sends us to sleep by building up gradually in the brain during the day, New Scientist explains.

By blocking it using a chemical called cyclopentyltheophylline, the researchers could wake hibernating squirrels up; stimulating it using a chemical called cyclohexyladenosine sent them back to sleep.

**Induced hibernation in humans who have suffered oxygen starvation to the brain through strokes or heart attacks could lower their oxygen demand and prevent brain damage.**

In fact, according to US News and World Report, a hibernating animal has a reduced heart rate and blood flow similar to a person in cardiac arrest, yet the hibernator doesn’t suffer the brain damage that can occur in people.

This could also improve the health of those who have to remain sedentary for long periods of time, like when humans are sent to distant planets.

The study was published in the *Journal of Neuroscience*. 
2. Researchers from Imperial College London show that a synthesized compound also found in bear bile may help people recover after a heart attack.

Called **ursodeoxycholic acid (UDCA)**, it’s already used to reduce cholesterol production and to dissolve gallstones, but now it’s found to treat abnormal heart rhythms, or arrhythmia.

It alters the electrical properties of **myofibroblast** cells, which are present in the hearts of fetuses and patients who have suffered a heart attack. (These cells disappear shortly after birth, reappearing after a heart attack when they’re involved in laying down scar tissue.)

The new study shows that myofibroblasts disrupt the transmission of electrical signals that control the heart’s rhythm, BBC explains. **UDCA could help the heart muscle conduct electrical signals more normally.**

UDCA is used to treat obstetric cholestasis, a condition linked to a higher risk of arrhythmia and sudden death in fetuses. The chemical lowers the levels of harmful bile acids caused by the disease.

Bear bile is used in traditional Chinese medicines, but critics say the way it’s collected is cruel.

The work was published in *Hepatology* this month.

*Images: Arctic ground squirrel by US Fish and Wildlife via Animal Diversity Web / Asiatic black bear by Guérin Nicolas via Wikimedia.*

About Janet Fang

Janet Fang is a contributing editor for SmartPlanet.