Sleep Science In Space, Pruney Digits, Dairy On The Brain

By Nader Heidari

Over the span of 520 days, researchers on a simulated trip to Mars had a lot of opportunities to catch some space Zs. In between naps, they determined that the final frontier has peculiar effects on an astronaut’s circadian rhythm, the biological clock that manages sleep cycles (Proc. Natl. Acad. Sci. USA, DOI: 10.1073/pnas.1212646110). So for a mission to the Red Planet to be successful, they say, these effects will need to be addressed.

The sleep study was part of a larger experiment to simulate a manned round-trip expedition from Earth to Mars. During the investigation, the volunteer crew of six remained in isolation for 17 months—the time needed to mimic the 250 days it would take to get to Mars, a 30-day stint on the surface, and the 240 days to return. During this time, they had limited communication with the outside world and had no access to natural light.

Because circadian rhythms are usually determined by light fluctuations, humans and other animals typically adjust theirs to the day-night cycle. During a space journey, however, day-night cycles don’t exist, making circadian synchronization difficult.

The researchers monitored the crew members’ movements during sleep and administered neurobehavioral tests to them while they were awake. The team used these data to evaluate quality and quantity of sleep as well as the crew members’ activity levels and alertness. Over the duration of the study, most of the crew members became more sedentary and would sleep or rest for longer periods, the researchers found.

The findings are relevant not just to future space journeys, the researchers say. People in industrialized countries on Earth share a similar problem: Artificial light exposure, work and school schedules, and sedentary lifestyles can also lead to asynchronous circadian rhythms. Perhaps Newscripts will try an artificial sun lamp rather than refill that sleep aid prescription.

Unbelievable as it is, scientists still aren’t certain why humans’ fingers and toes become wrinkled when submerged in water for long periods. But researchers at Newcastle University, in England, may have an answer: The wrinkles and folds on people’s digits could be an evolutionary adaptation to help maintain a grip on wet objects, such as tub toys. The gripping hypothesis was originally proposed in a 2011 paper by evolutionary neurobiologist Mark A. Changizi and colleagues at 2AI Labs, in Boise, Idaho. However, the Newcastle team, led by Tom V. Smulders, believes it has the first experimental proof of the frictional properties of wrinkly digits.

By having participants pick up wet and dry marbles with hands that were either dry or pruney, the researchers found that participants with wrinkly fingers grasped wet objects better than those with dry fingers. The pruney participants were no better at grasping dry objects, though.

Want to increase your chances to win a Nobel Prize? According to a letter published in Practical Neurology, you should start drinking more milk (DOI: 10.1136/practneurol-2012-000471). A research team at Gloucester Royal Hospital assessed data from the Food & Agriculture Organization of the United Nations and found that countries with the highest numbers of Nobel Laureates also consume the most milk. Sweden ranked first with 33 laureates for every 10 million residents and an average milk consumption of 340 kg per person per year. Switzerland followed closely with 32 laureates for every 10 million and an average milk consumption of 328 kg per person per year. The United States ranked 44th, with 5 laureates per 10 million and an average milk consumption of 218 kg.
300 kg of milk consumed per year. One possible explanation, the authors say, is milk's rich vitamin D content, which might aid brain growth.

Nader Heidari wrote this week's column. Please send comments and suggestions to newscripts@acs.org.