

## Fat sand rats are SAD like us

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(PhysOrg.com) -- Saying goodbye to summer can be difficult for everybody. In some people the onset of winter triggers Seasonal Affective Disorder, or SAD, a mood disorder in which sufferers experience symptoms of depression. Happily, a special kind of gerbil exhibits remarkably similar reactions to SAD treatments as humans, opening a promising new channel for study and treatment of the common complaint.

With her work on the Israeli desert inhabitant gerbil called the Fat Sand Rat (*Psammomys obesus*), Prof. Noga Kronfeld-Schor of Tel Aviv University's Department of Zoology and her fellow researcher, Prof. Haim Einat of the University of Minnesota, have found new hope for the

study of these and similar disorders. Her results, recently published in the *International Journal of Neuropsychopharmacology*, indicate that her new test subjects are more suitable model animal for the study of SAD than the rats and mice used previously.

Until now, Prof. Kronfeld-Schor explains, most research on the mechanisms of affective disorders was carried out on mice and rats. But this has been problematic in applying the research results to humans — mice are nocturnal, while humans are diurnal. Clearly, when we conduct research of disorders like SAD which affect our circadian system, she says, our model animals should be diurnal as well.

## **Different as night and day**

Most laboratory mice don't produce melatonin, a natural hormone produced by humans and other mammals during the night. Moreover, as nocturnal animals, mice and rats become more active at night, when melatonin levels are high, while humans are active during the day, when melatonin levels are low. For most biomedical research, Prof. Kronfeld-Schor explains, mice are excellent model subjects. But for affective disorders, which rely heavily on the human circadian system, she hypothesized that a diurnal mammal would provide a superior animal model.

To test this theory, Prof. Kronfeld-Schor and her fellow researcher put two groups of Fat Sand Rats through several experiments. First, to test the effect of the length of light exposure on the rats' emotional state, one group was exposed to long hours of light similar to that of the summer season, and the other to shorter hours of the winter length daylight. In several tests, the sand rats of the second group behaved in ways similar to depressed humans, exhibiting despair, reduced social interactions and increased anxiety.

Once the researchers established that Fat Sand Rats and humans had a similar reaction to light, the team explored whether common medications or other SAD therapies would be as effective in their rat population. These studies included a variety of medications commonly used to treat the disorder in humans, as well as a program of exposing the depressed sand rats to brighter light for one hour every morning or evening.

## **More than a placebo**

According to Prof. Kronfeld-Schor, the results were surprising. The medications were effective in treating the sand rats' depression, but even more effective was the daily exposure to bright light in the mornings, a common treatment for human SAD. "Humans have been using this treatment for a long time," she explains, "but many of us thought that a large part of its success was based on the placebo effect. For the first time, we've found it to be effective in animals as well, which weakens the possibility of the placebo effect."

The breakthrough, says Prof. Kronfeld-Schor, is the discovery of a superior and viable animal model for studying affective disorders. Though several biological mechanisms for SAD have been proposed, they have not been scientifically proven. A good animal model to study the mechanisms of SAD will advance understanding of the disorder, help screen for effective treatments and allow for the development of new therapies.

Provided by Tel Aviv University

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