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Scientists observe brain cell development in 'real time'

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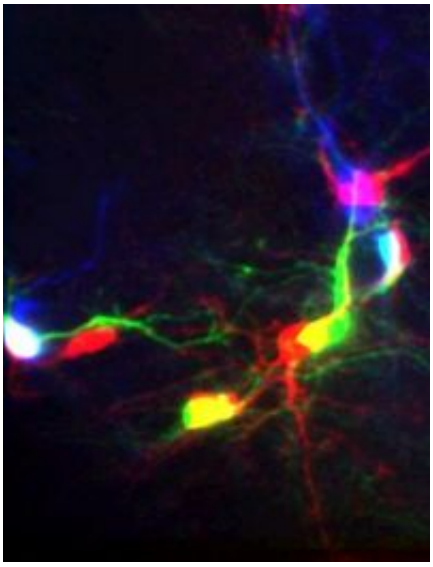

Magnified photo shows division of neuron in vivo. Credit: Hebrew University of Jerusalem photo

For the first time anywhere, a researcher at the Hebrew University of Jerusalem has succeeded in observing in vivo the generation of neurons in the brain of a mammal.

Dr. Adi Mizrahi of the Department of Neurobiology at the Alexander Silberman Institute of Life Sciences at the Hebrew University, used mouse models to study how neurons, or nerve cells, develop from an undifferentiated cellular sphere into a rich and complex cell. This has

great significance for the future of brain research, said Dr. Mizrahi, since "the structural and functional complexity of nerve cells remains one of the biggest mysteries of neuroscience, and we now have a model to study this complexity directly."

The results of Dr. Mizrahi's groundbreaking work appeared in the online edition of *Nature Neuroscience*.

Using special microscopic imaging techniques, combined with virus gene technology, Dr. Mizrahi was able to develop an experimental model to study development of neural dendrites in vivo. The dendrites are the string-like extensions of the neuron that spread out to reach other neurons and serve as the points of communication between the neurons.

The model employed by Dr. Mizrahi in his research was the newborn neuron population which develops into the olfactory bulb of adult mice, providing them with a sense of smell. The development and maintenance of newborn neurons in this area was assessed by time-lapse imaging over several days at different stages of development. Mizrahi revealed that dendritic formation is highly dynamic. Moreover, once incorporated into the network, adult-born neurons in the study also remained dynamic and capable of continuous change.

This method provides a mechanism for observing, for the first time in a mammal, how a neuron develops into a rich and complex cell and how, once developed, neurons are maintained in the highly active and changing environment of the brain.

As for further research that some day could lead to significant breakthroughs in treatment of neural disorders, Dr. Mizrahi noted that "there are only a few small areas in the brain which are capable of neurogenesis, and they hide secrets we want to reveal."

Source: The Hebrew University of Jerusalem