Drug used to treat cancer appears to sharpen memory

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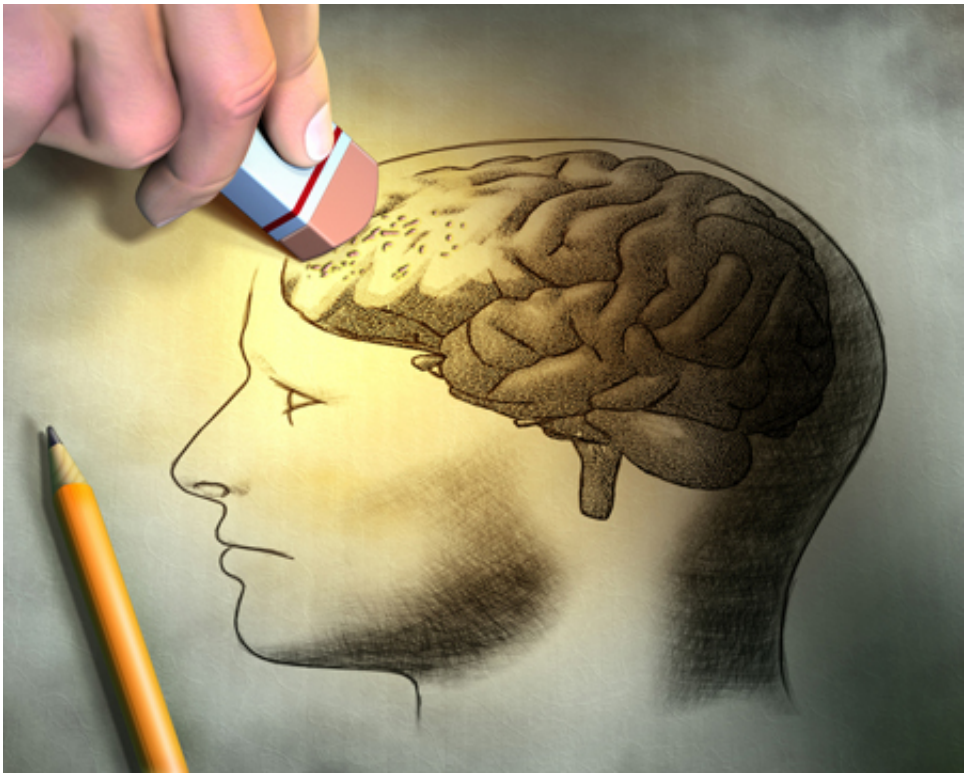

People with a dementia such as Alzheimer's disease lose their memory when brain cells shrink and die because connections can no longer transfer information.

Can you imagine a drug that would make it easier to learn a language, sharpen your memory and help those with dementia and Alzheimer's disease by rewiring the brain and keeping neurons alive?

New Rutgers research published in the *Journal of Neuroscience* found that a drug - RGFP966 - administered to rats made them more attuned to what they were hearing, able to retain and remember more information, and develop new connections that allowed these memories to be transmitted between brain cells.

"Memory-making in neurological conditions like Alzheimer's disease is often poor or absent altogether once a person is in the advanced stages of the disease," said Kasia M. Bieszczad, lead author and assistant professor in Behavioral and Systems Neuroscience in the Department of Psychology. "This drug could rescue the ability to make new memories that are rich in detail and content, even in the worst case scenarios."

What happens with dementias such as Alzheimer's is that brain cells shrink and die because the synapses that transfer information from one neuron to another are no longer strong and stable. There is no therapeutic treatment available that reverses this situation.

The drug being tested in this animal study is among a class known as HDAC inhibitors - now being used in cancer therapies to stop the activation of genes that turn normal cells into cancerous ones. In the brain, the drug makes the neurons more plastic, better able to make connections and create positive changes that enhance memory. Researchers found that laboratory rats, taught to listen to a certain sound in order to receive a reward, and given the drug after training, remembered what they learned and responded correctly to the tone at a greater rate than those not given the drug.

Scientists also found that the rodents were more "tuned in" to the relevant acoustic signals they heard during their training - an important finding Bieszczad said because setting up the brain to better process and store significant sounds is critical to human speech and language.

"People learning to speak again after a disease or injury as well as those undergoing cochlear implantation to reverse previous deafness, may be helped by this type of therapeutic treatment in the future," said Bieszczad "The application could even extend to people with delayed language learning abilities or people trying to learn a second language."

This hypersensitivity in processing auditory information enabled the neurons to reorganize and create new pathways - allowing more of the information they learned to become a long-term memory, said Bieszczad who collaborated with colleagues in the Department of Neurobiology and Behavior at the University of California Irvine.

"People normally remember an experience with limited detail - not everything we see, hear and feel is remembered," she said. "What has happened here is that memory becomes closer to a snapshot of the actual experience instead of being sparse, limited or inaccurate."

More information: *Journal of Neuroscience*, www.jneurosci.org/content/35/38/13124.full

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