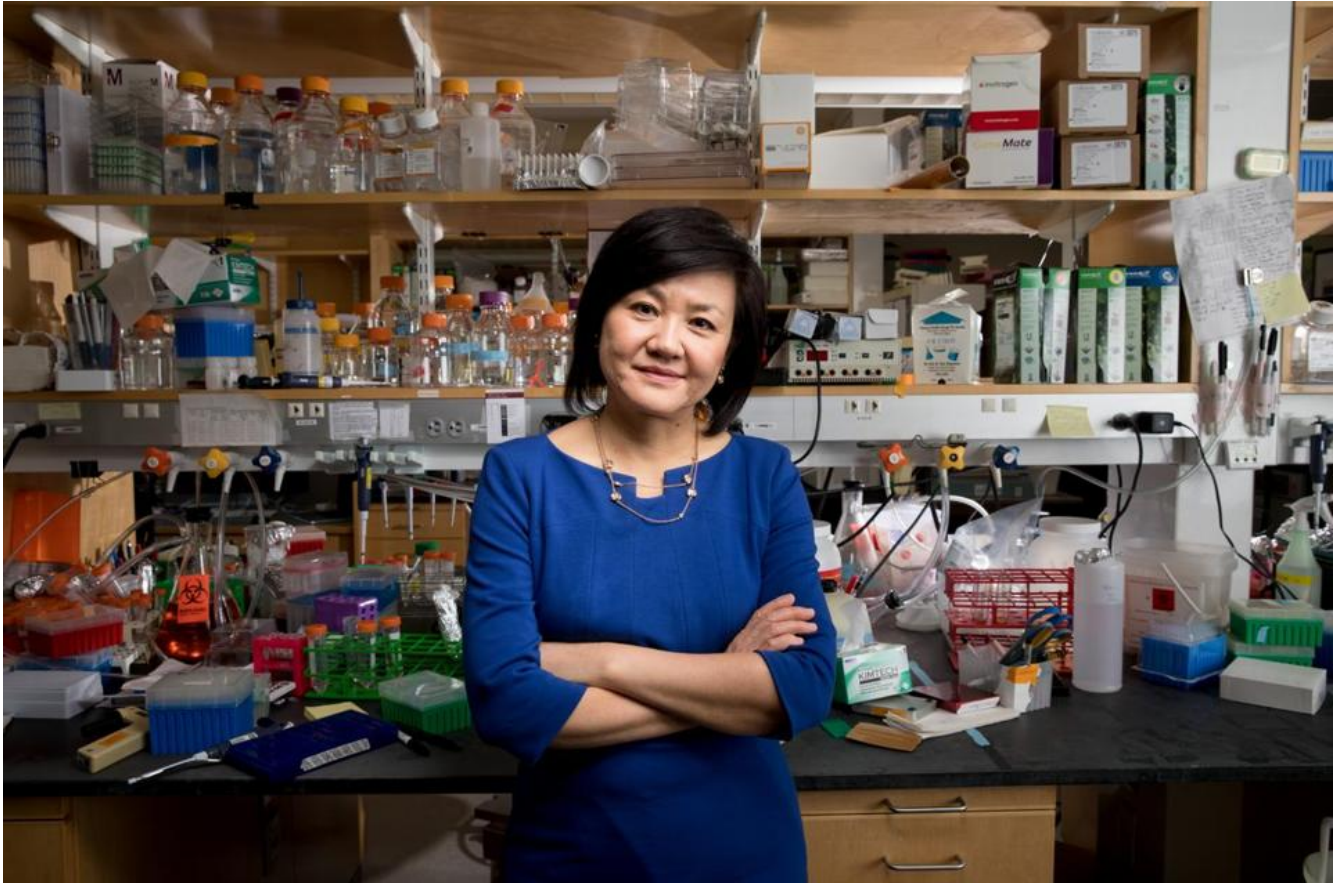


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MIT team uses LEDs to attack Alzheimer's



BRYCE VICKMARK

MIT professor Li-Huei Tsai at her lab in Cambridge.

By [Robert Weisman](#) | GLOBE STAFF DECEMBER 07, 2016

Experimental drugs from some of the world's top pharmaceutical companies have so far failed to halt the march of Alzheimer's disease, a neurodegenerative disorder that gradually robs people of their memory and cognition.

Now [MIT](#) scientists are trying an audacious approach that doesn't involve medicines of any kind: They're using LED beams to disrupt gamma waves in the brains of lab mice, hoping to reduce the buildup of beta amyloid plaques.

“This is a brand new concept for potentially treating Alzheimer’s disease,” said Massachusetts Institute of Technology professor Li-Huei Tsai, director of its [Picower Institute for Learning and Memory](#). “It’s a very non-invasive approach that doesn’t involve small molecules or any drugs or antibodies. We stimulate the brain’s ability to take care of itself, to clear out the plaque.”

A research team, led by Tsai and Ed Boyden, associate professor at the MIT Media Lab and the [McGovern Institute for Brain Research](#), described its light-flickering experiments in an article posted online Wednesday by the scientific journal [Nature](#). Mice that re-ceived the LED therapy for an hour seven days in a row had substantially less plaque than mice who didn’t.

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A medical technology startup called [Cognito Therapeutics Inc.](#), based jointly in Cambridge and San Francisco, said Wednesday that it’s licensing intellectual property stemming from the MIT research in an effort to market a system of LED lighting to treat Alzheimer’s.

“This is a monstrous opportunity,” said Daniel Burnett, the San Francisco-based chief technology officer of venture-backed Cognito. “There’s a dire need for Alzheimer’s therapies, and there’s little we can do about the disease right now. If we can develop something that can slow the decline of patients with very little side effects, that could be revolutionary.”

Alzheimer's treatments. One of them, Biogen Inc. of Cambridge, is scheduled to report new clinical data Friday from an early-stage study of a drug that slowed the mental decline of a small number of patients, in findings published last year. Smaller companies around the world, including ExQor Technologies Inc. of Boston, are working on different approaches.

But those working in the field received disappointing news last month when drug giant Eli Lilly & Co. of Indianapolis said a late-stage clinical trial of its experimental drug for Alzheimer's didn't significantly slow cognitive decline in patients with mild dementia. It was the latest in a long series of setbacks in the search to find a treatment for the disorder.

The scientists at Picower Institute used LEDs flickering at a precise frequency to substantially reduce beta amyloid plaque in the visual cortex of the brains of mice with Alzheimer's by restoring gamma rhythms that had been altered by the disease.

Tsai, a scientific co-founder of Cognito, said the new company will seek to move the MIT approach into clinical trials quickly and hopes to determine in the next few years whether the same techniques will work in humans to suppress the production of beta amyloid and invigorate plaque-destroying cells.

The effects on humans are "unknown" so far, Tsai said.

"I don't want to make a fool of myself by saying it's going to work in humans," she said. "There's so many innovations in the past that seemed to work in mice that failed in humans."

Cognito was launched earlier this year with funding from Morningside Venture, an arm of the Hong Kong-based Morningside Group, said Burnett. He did not specify how money was invested in the company but said it was a substantial outlay.

Burnett is also founder of TheraNova LLC, a medical device incubator in San Francisco where a half dozen Cognito employees are working to prepare its lighting

operations will be based, Burnett said.

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He said Cognito expects to hire more employees early next year and will have a staff of 15 to 25 employees on both coasts by the end of 2017.

“We work at light speed to get quality management set up, make sure we’re on the right track, and initiate clinical trials with minimal delay,” Burnett said.

Robert Weisman can be reached at robert.weisman@globe.com. Follow him on Twitter [@GlobeRobW](https://twitter.com/GlobeRobW).

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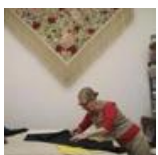
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