

# DEFY AGING



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**one**<sup>18</sup>  
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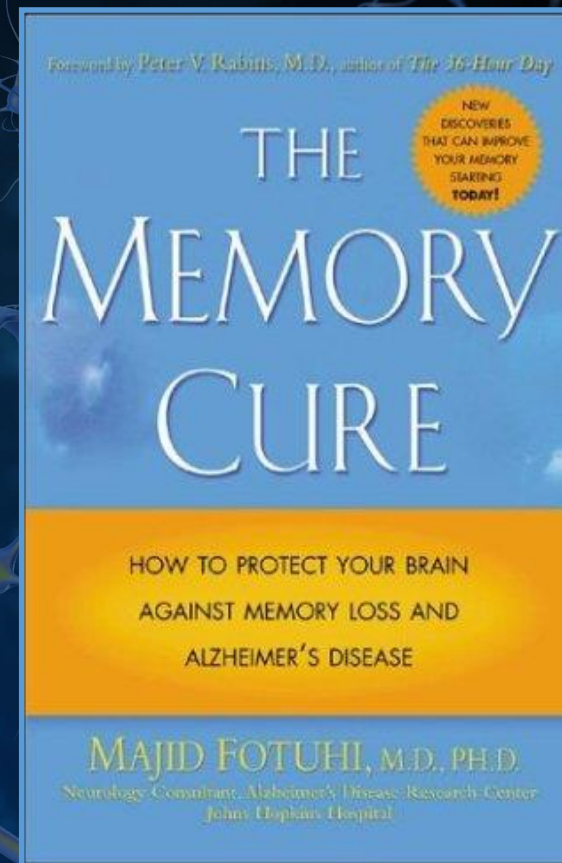
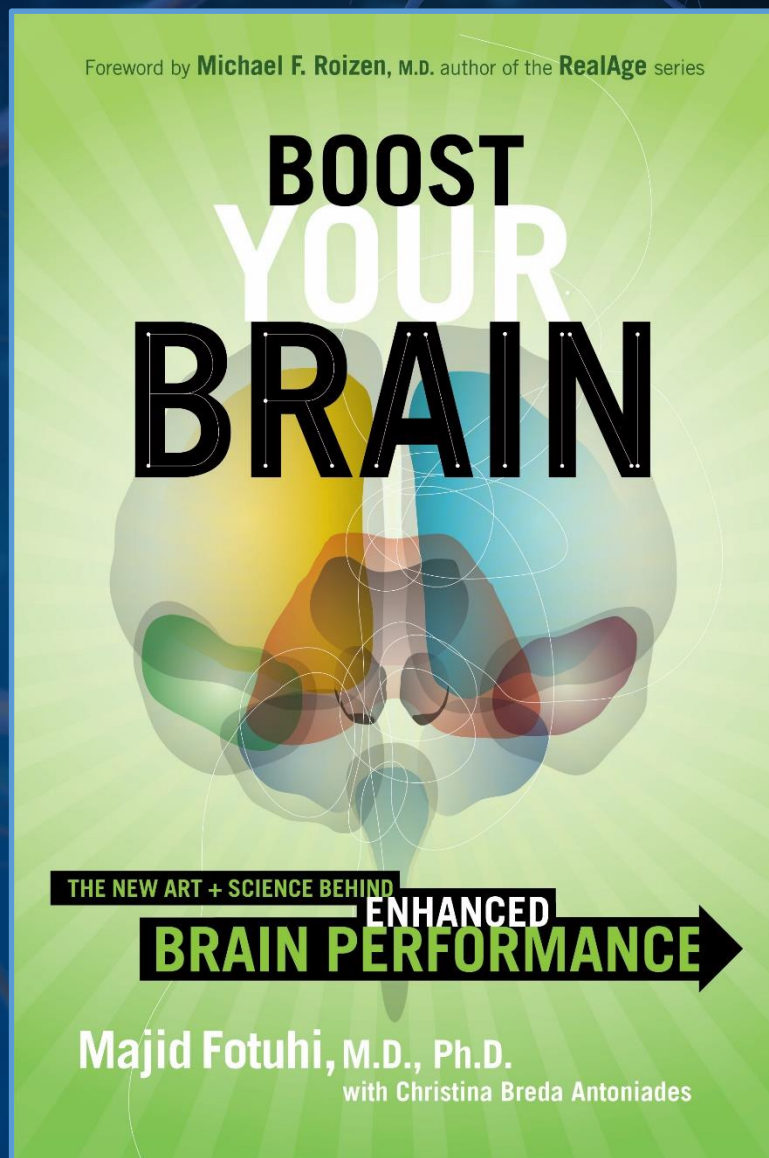
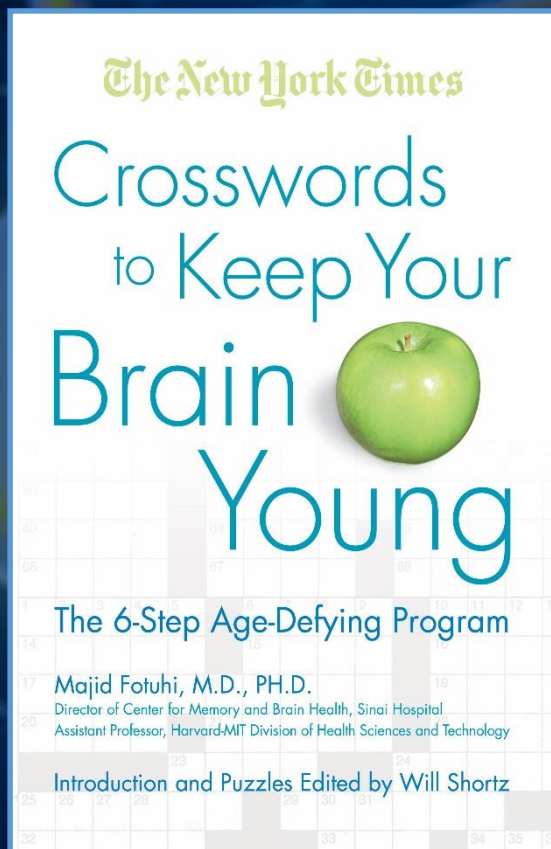


# Neuroplasticity in the Human Brain:

My Research & Publications



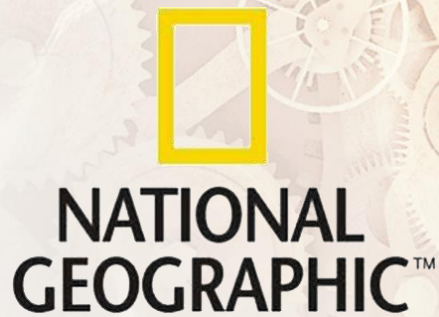
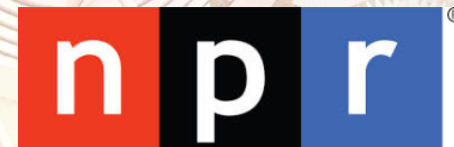








Forbes



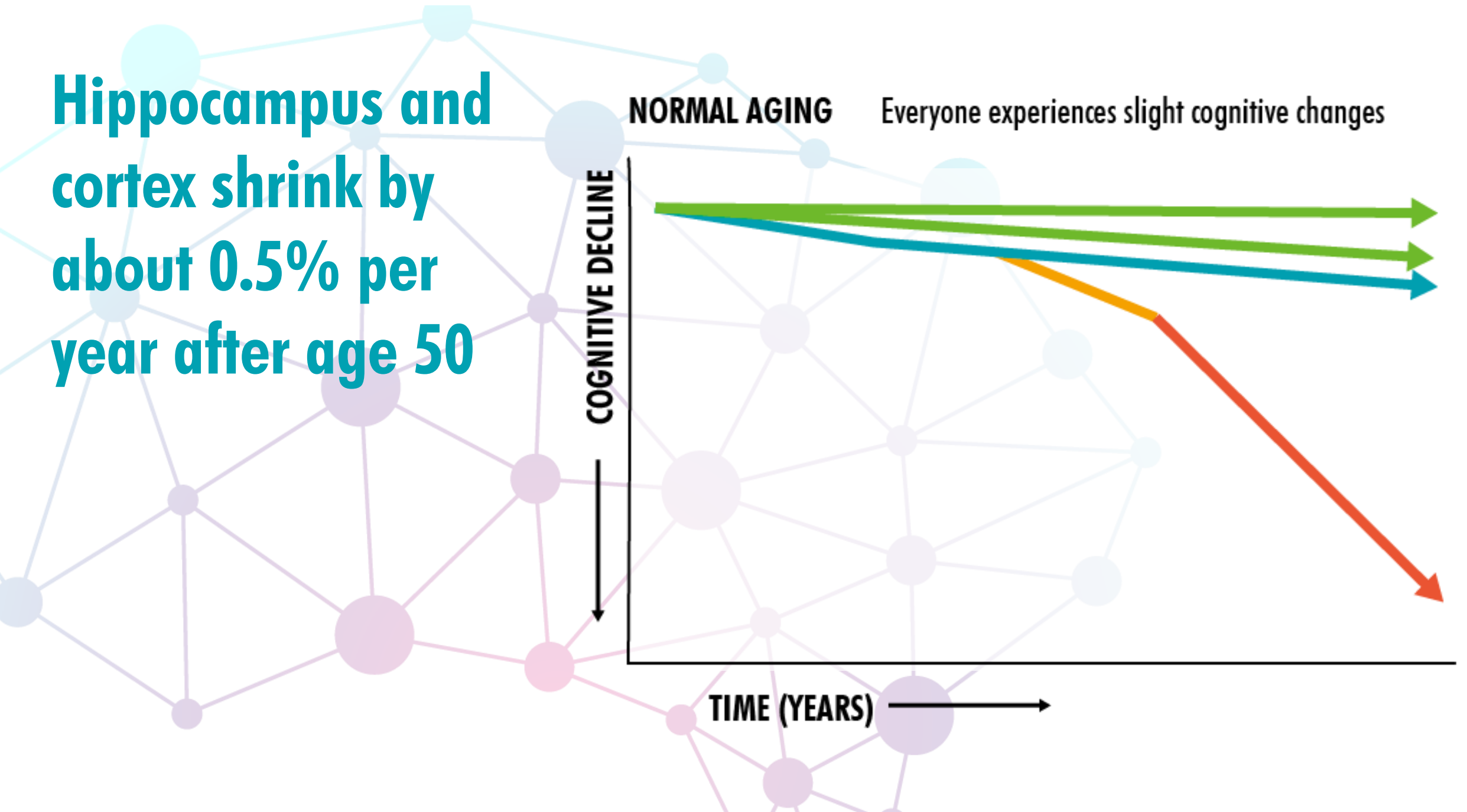
**Hippocampus and cortex shrink by about 0.5% per year after age 50**

**NORMAL AGING**

Everyone experiences slight cognitive changes

**COGNITIVE DECLINE**

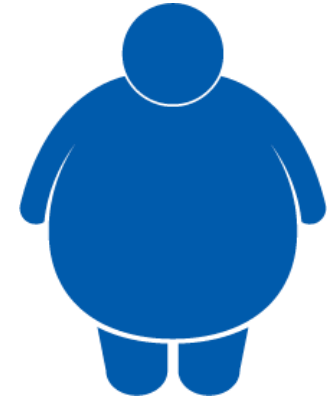
**TIME (YEARS)**



# What causes shrinkage in the cortex & hippocampus?



**Insomnia  
Sleep Apnea**



**Obesity  
Diabetes**



**Concussion**

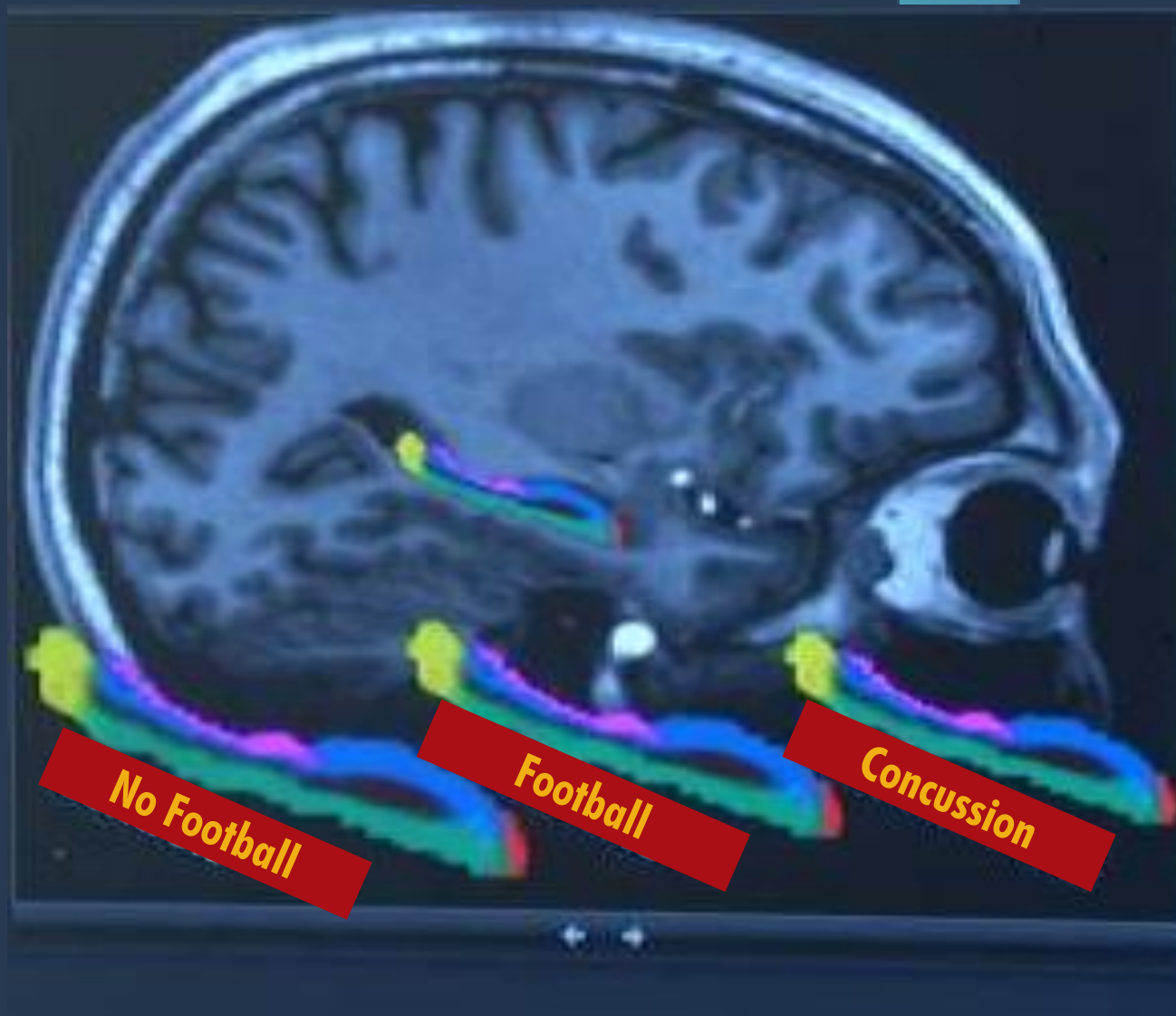


**Alzheimer's**



**Stress  
Depression**

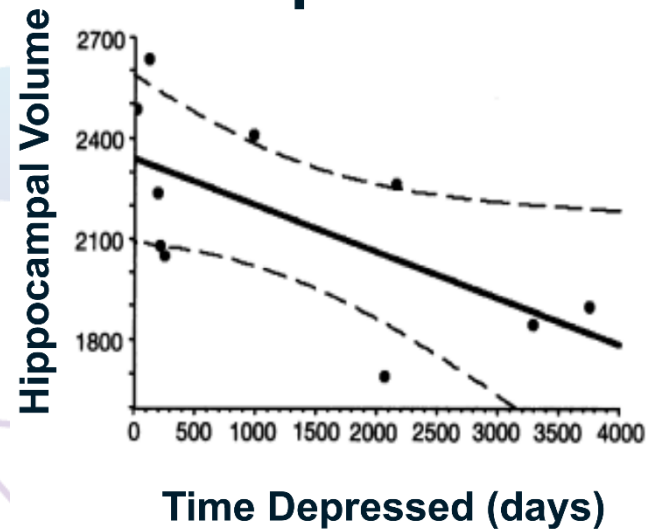




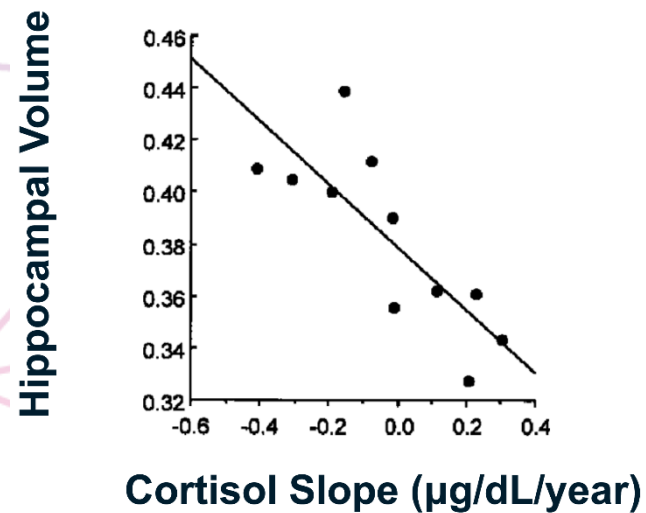
**More football and  
concussions, smaller  
hippocampus**

More depression,  
obesity, stress and  
insomnia,  
smaller hippocampus

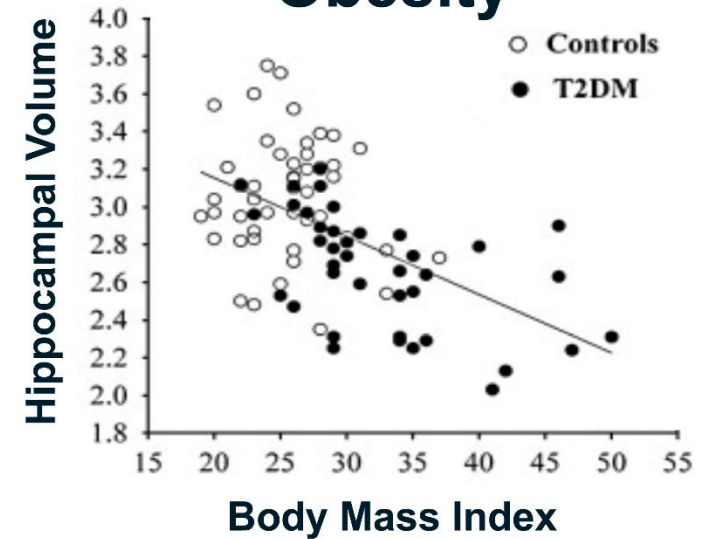
## Depression



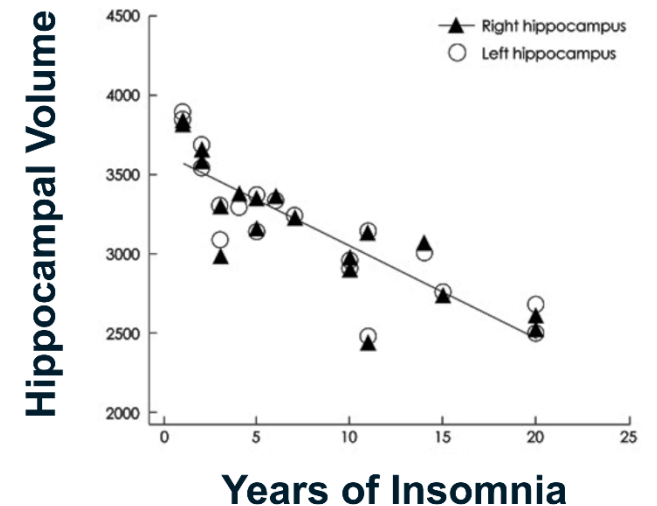
## Stress



## Obesity



## Insomnia





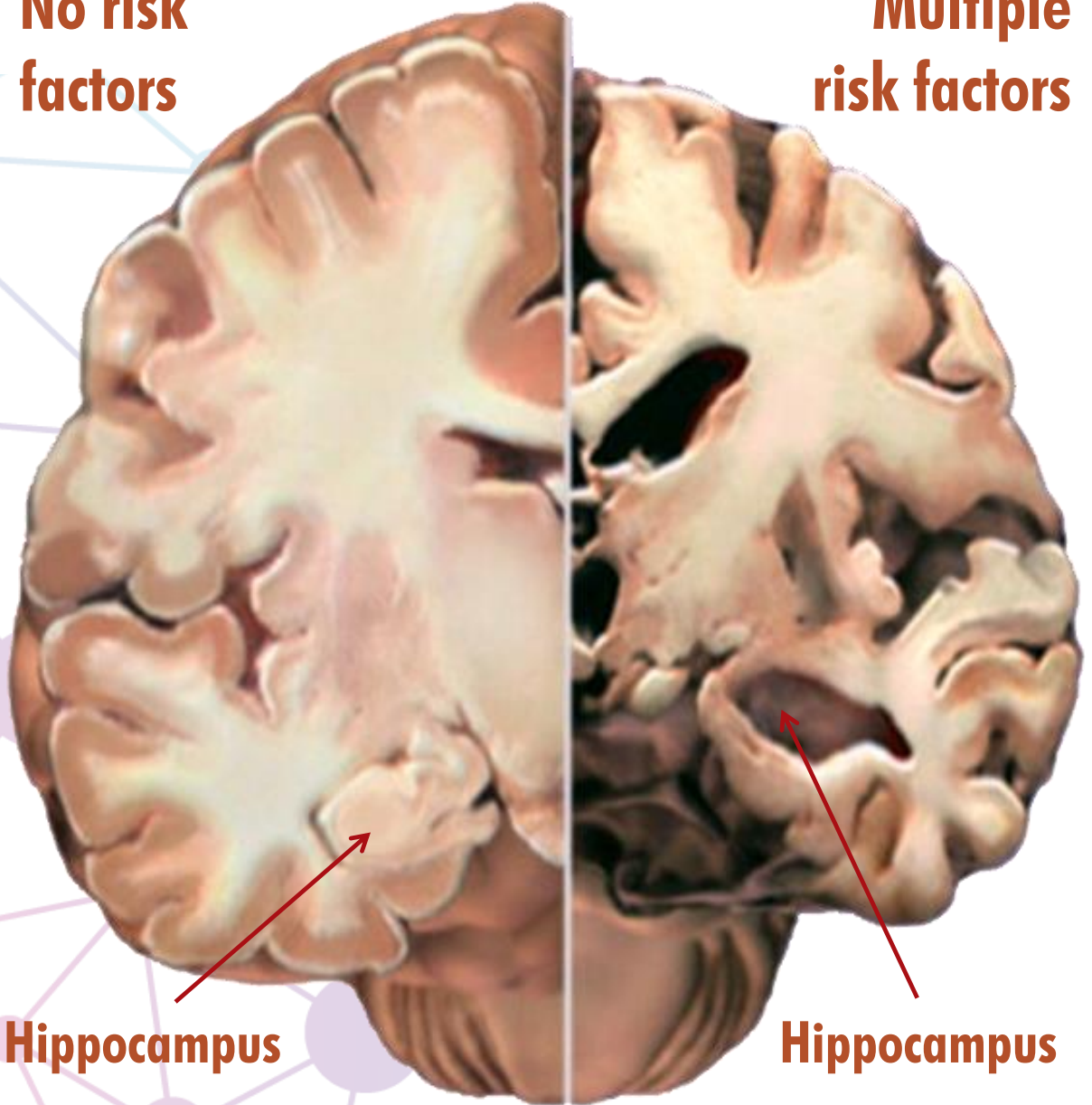
**Multiple risk factors,  
much smaller cortex &  
hippocampus**

**No risk  
factors**

**Multiple  
risk factors**

**Hippocampus**

**Hippocampus**

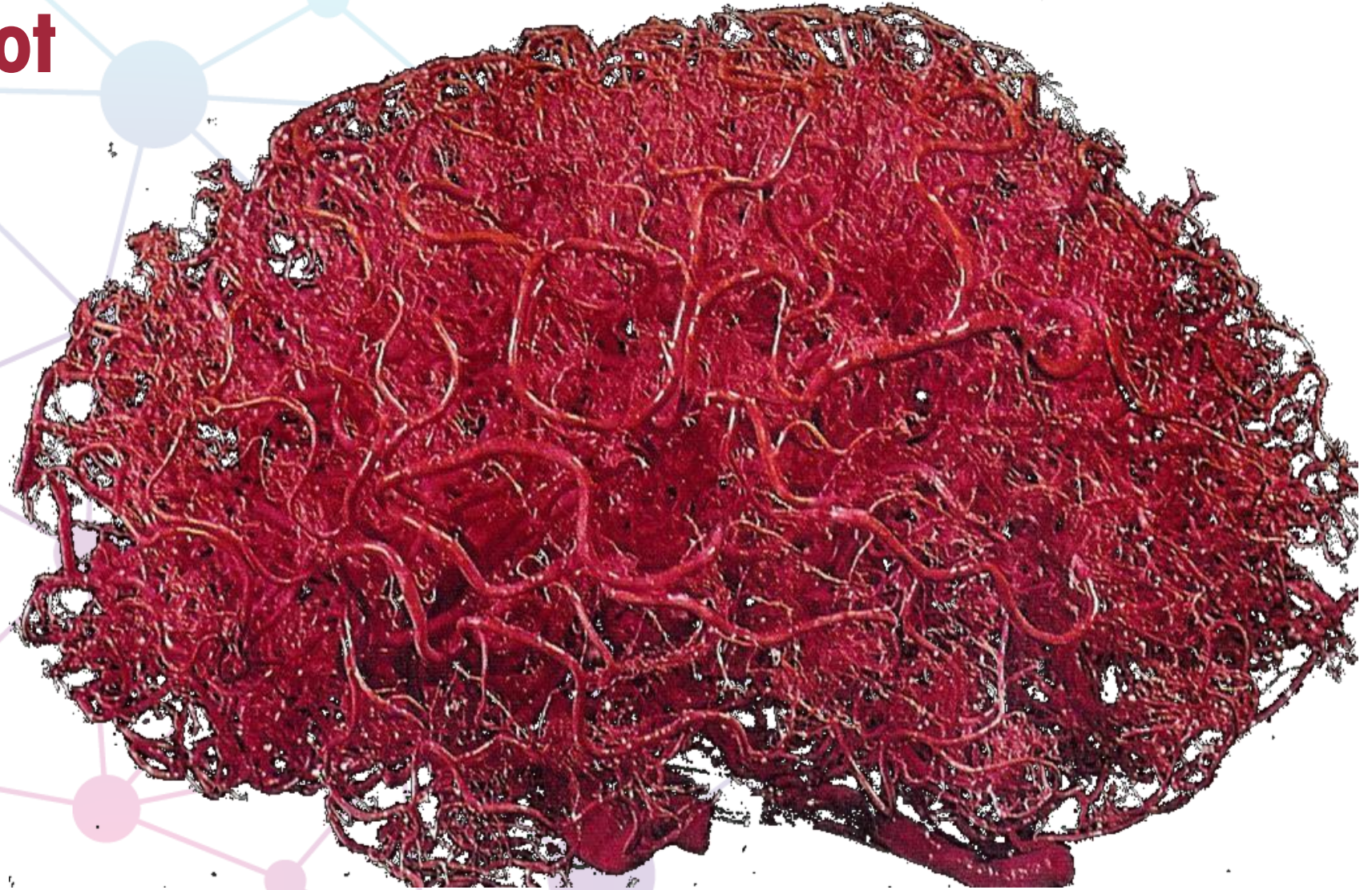
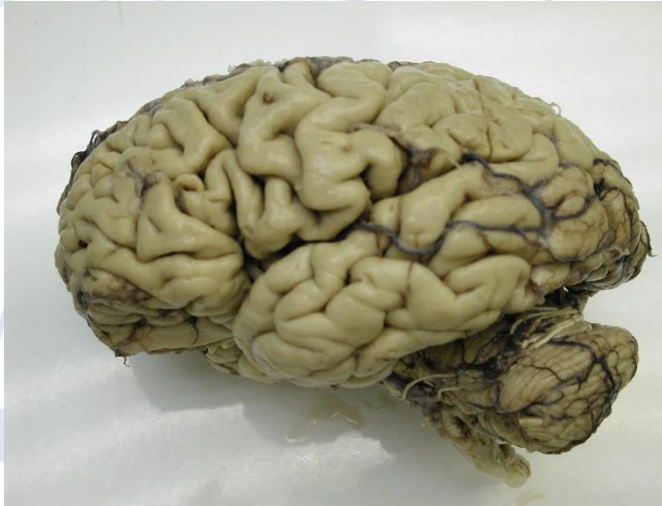




**Diabetes  
Obesity  
Sleep Apnea  
Head Trauma  
Depression  
Stress  
Alzheimer's**



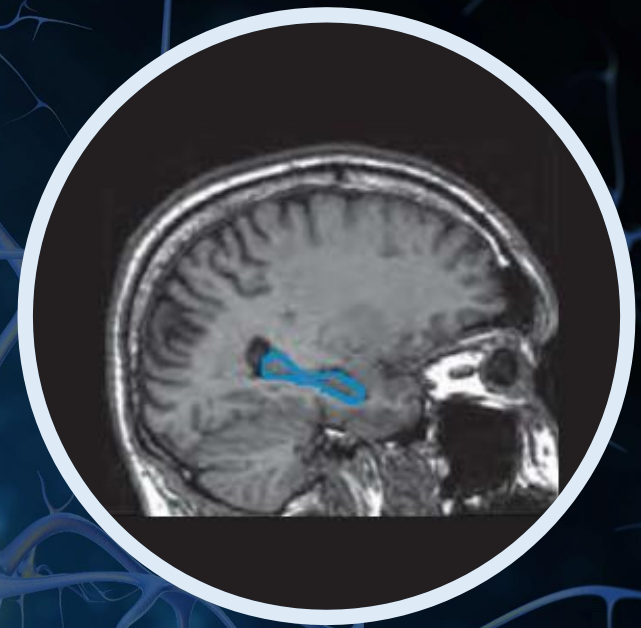
**The brain has a lot  
of blood vessels**



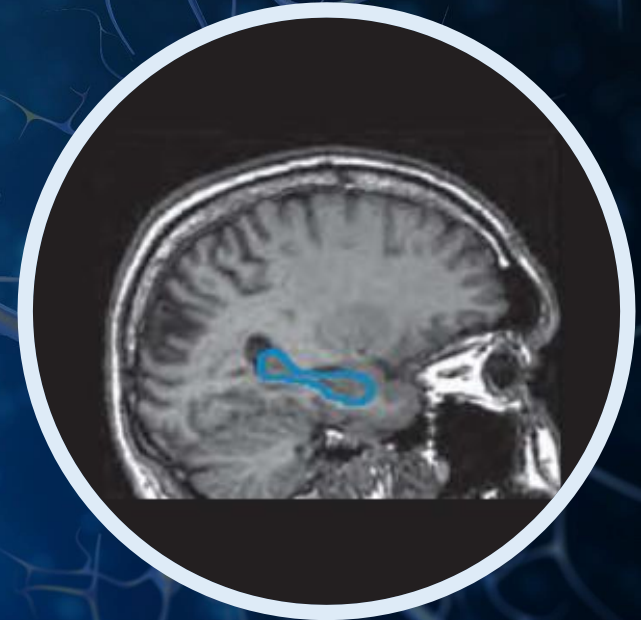


# Three months of vigorous exercise, bigger hippocampus

Before  
exercise

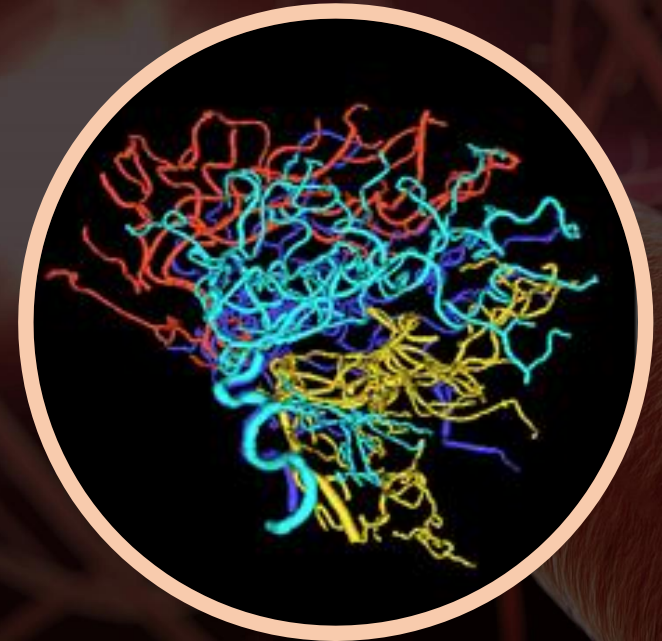
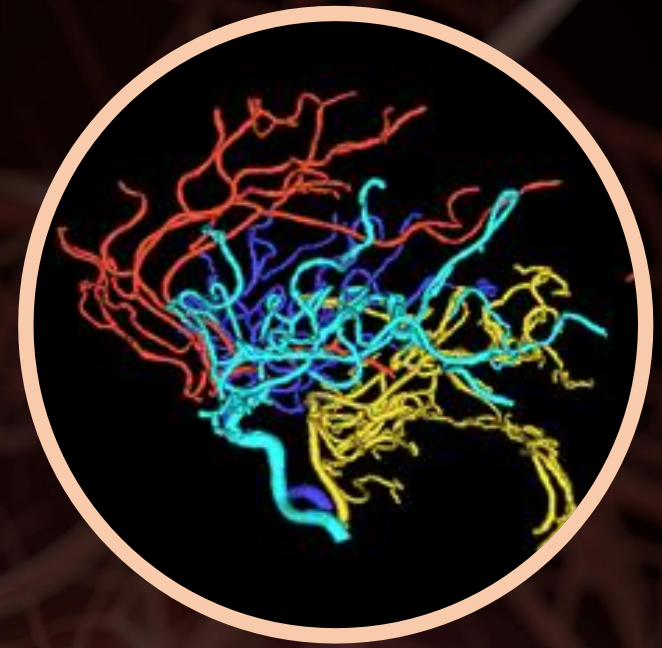


After  
exercise





# More exercise, more blood vessels in the brain

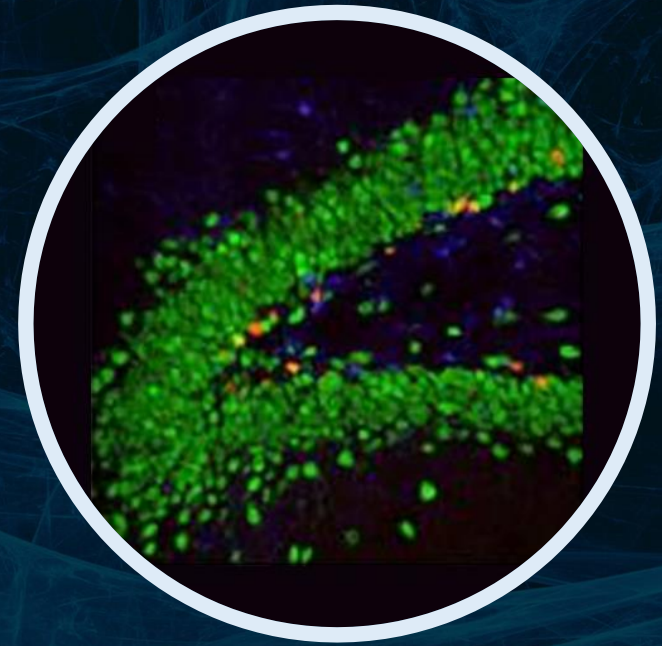


<http://archive.jsonline.com/news/health/35319459.html/>

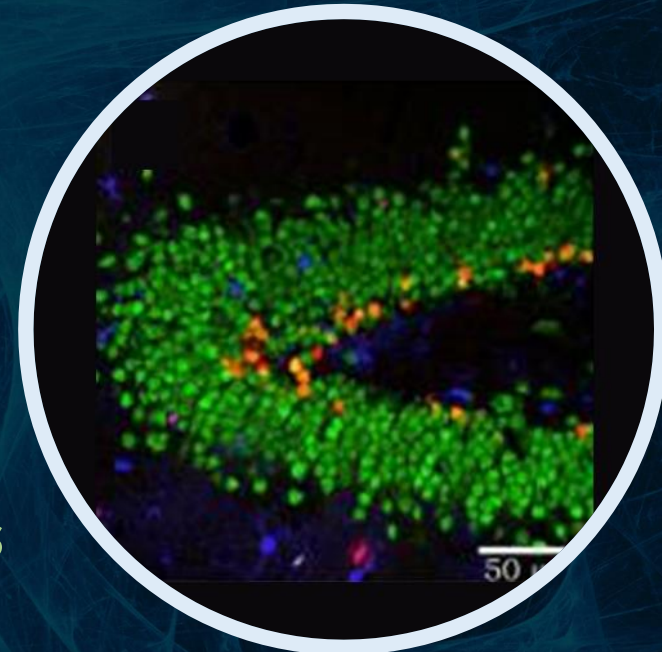


# More exercise: more neurogenesis

Runners



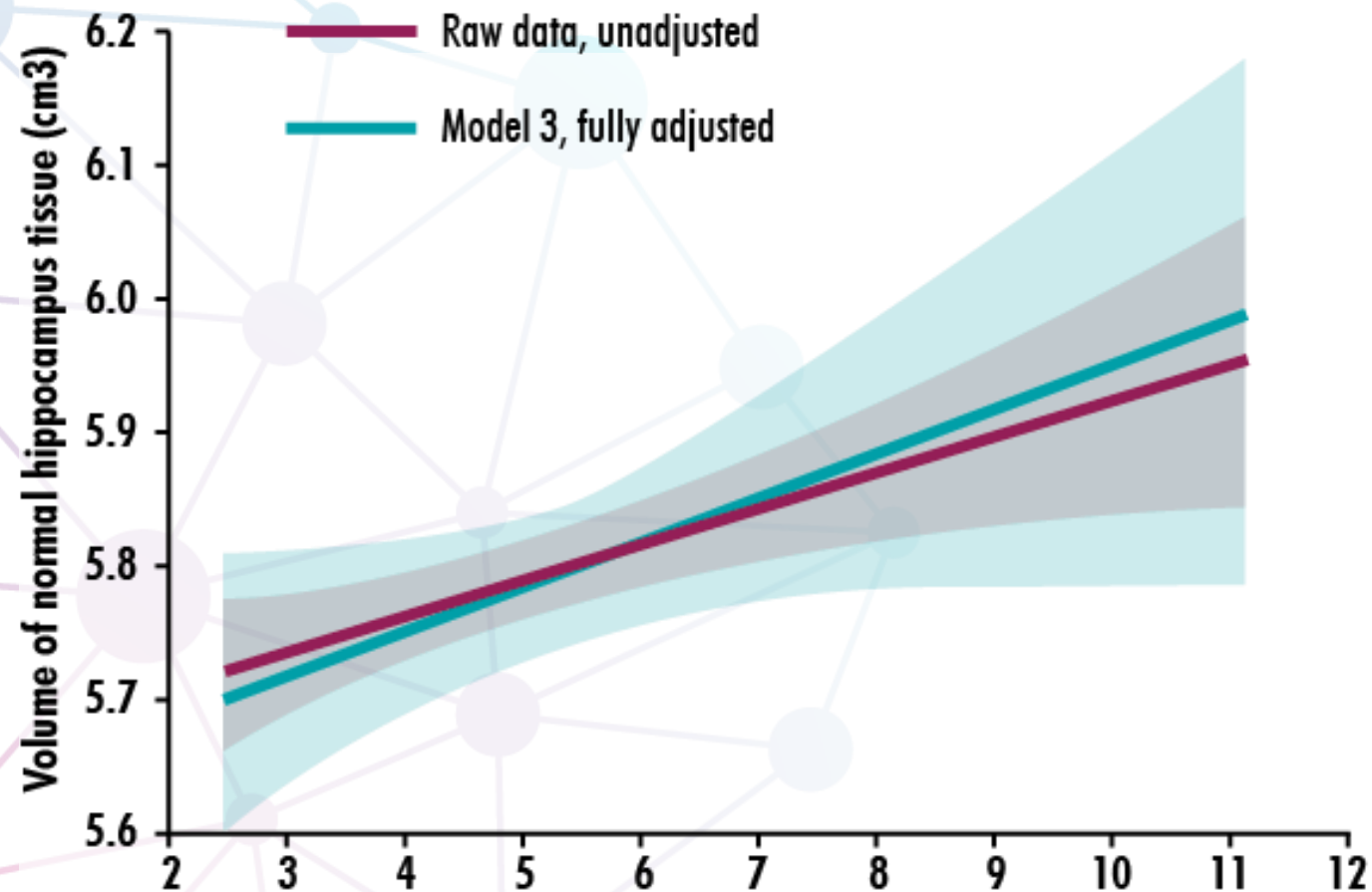
Controls





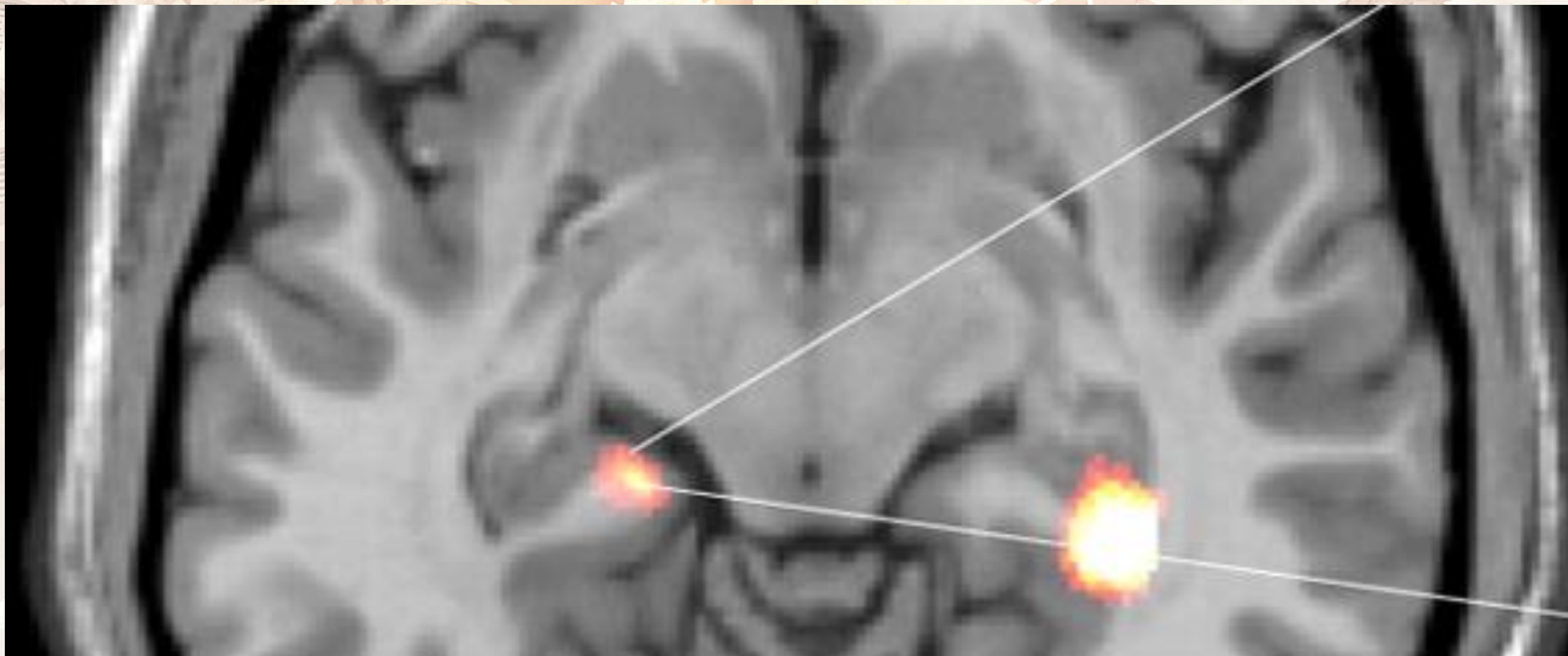
## 2. Eat a Mediterranean diet

### Take omega-3 supplements



### 3. Learn something new

Learn a new language



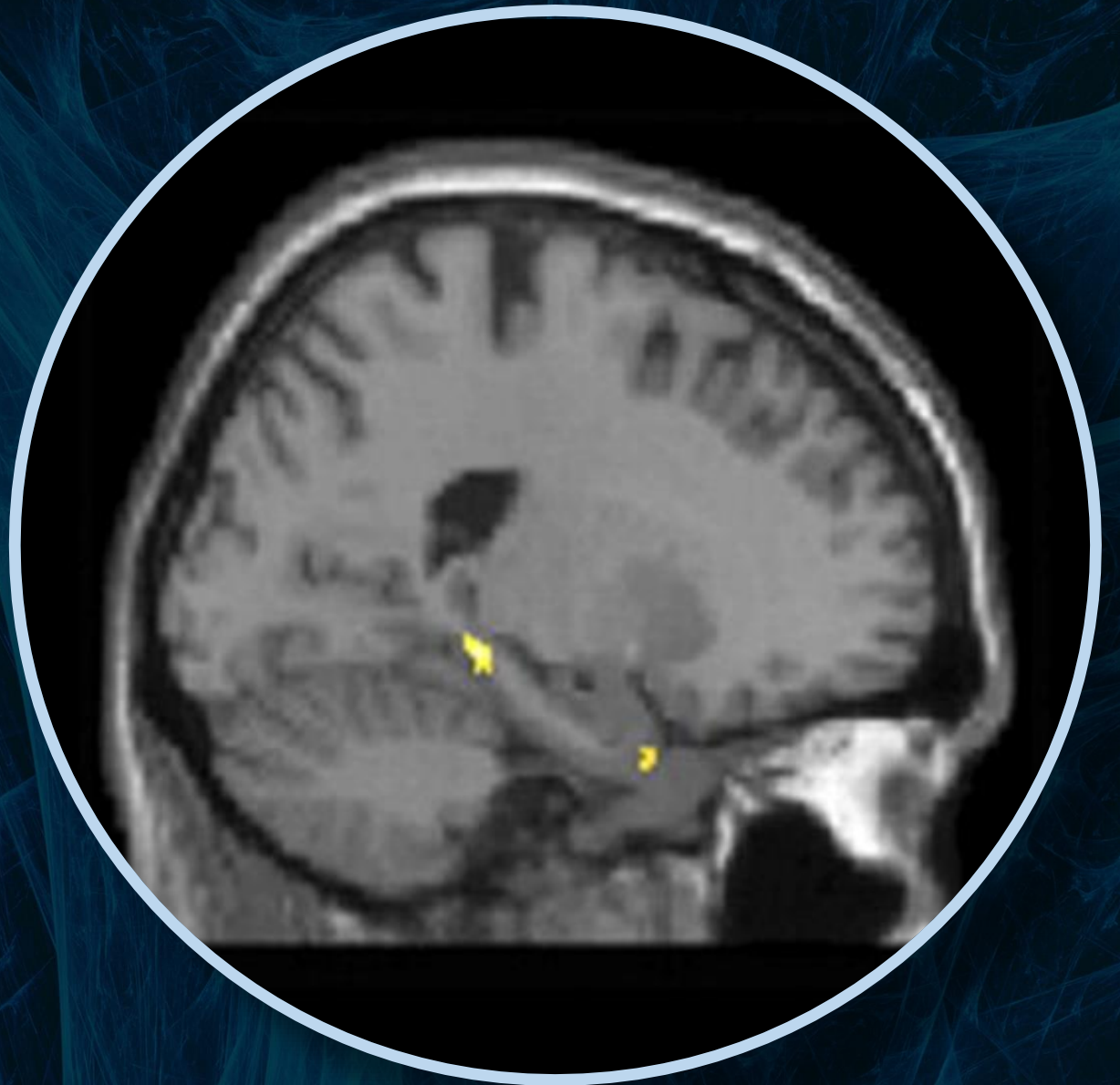


# Learning to play golf grows your cortex



## 4. Sleep well

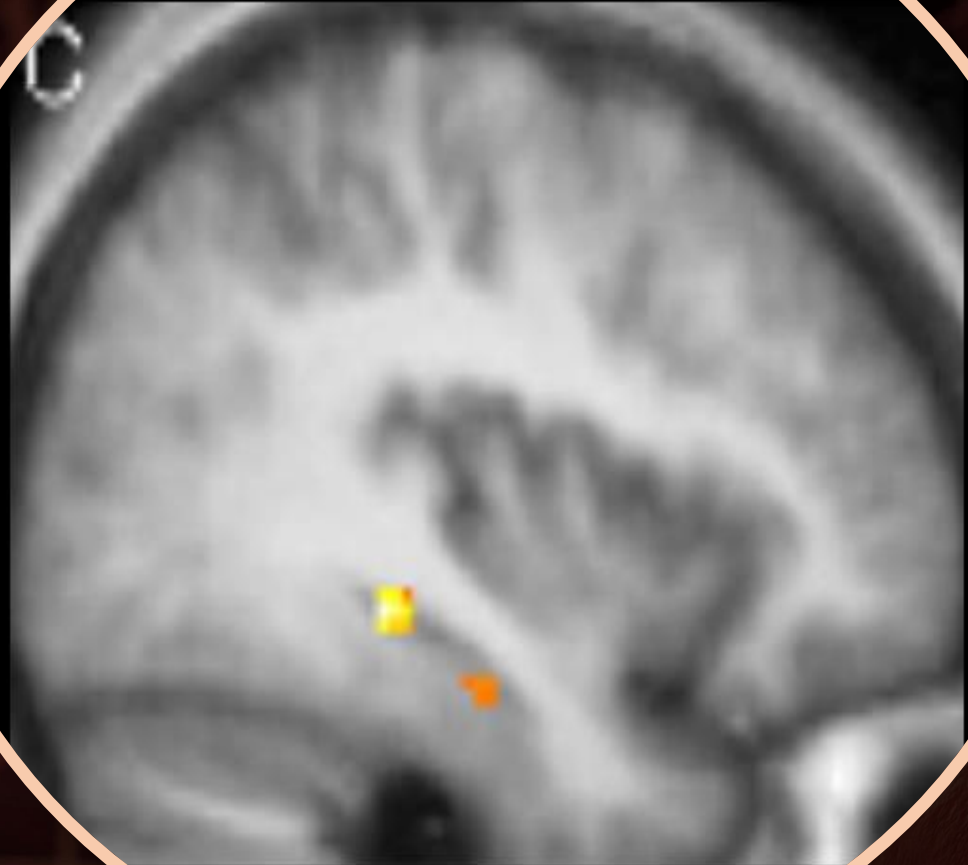
**Treat your sleep apnea**





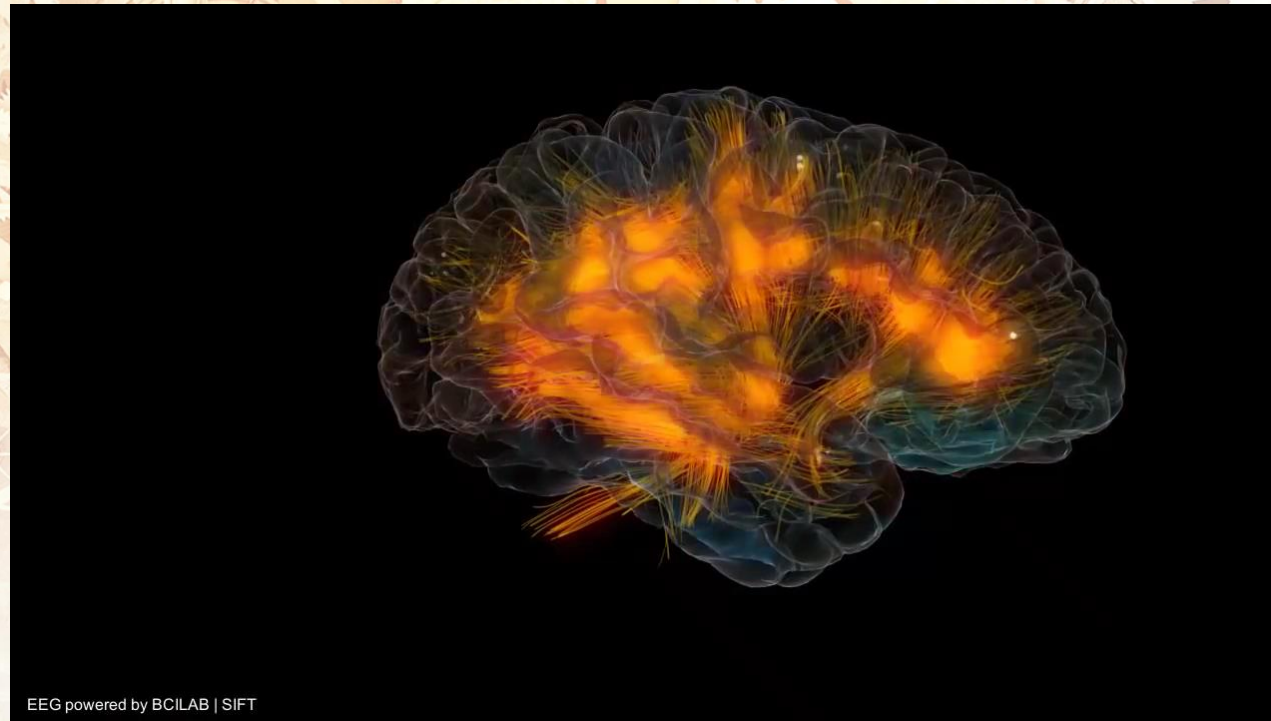
## 5. Meditate

Lower your stress, be happy



# Neuronal pathways use electricity to communicate with each other

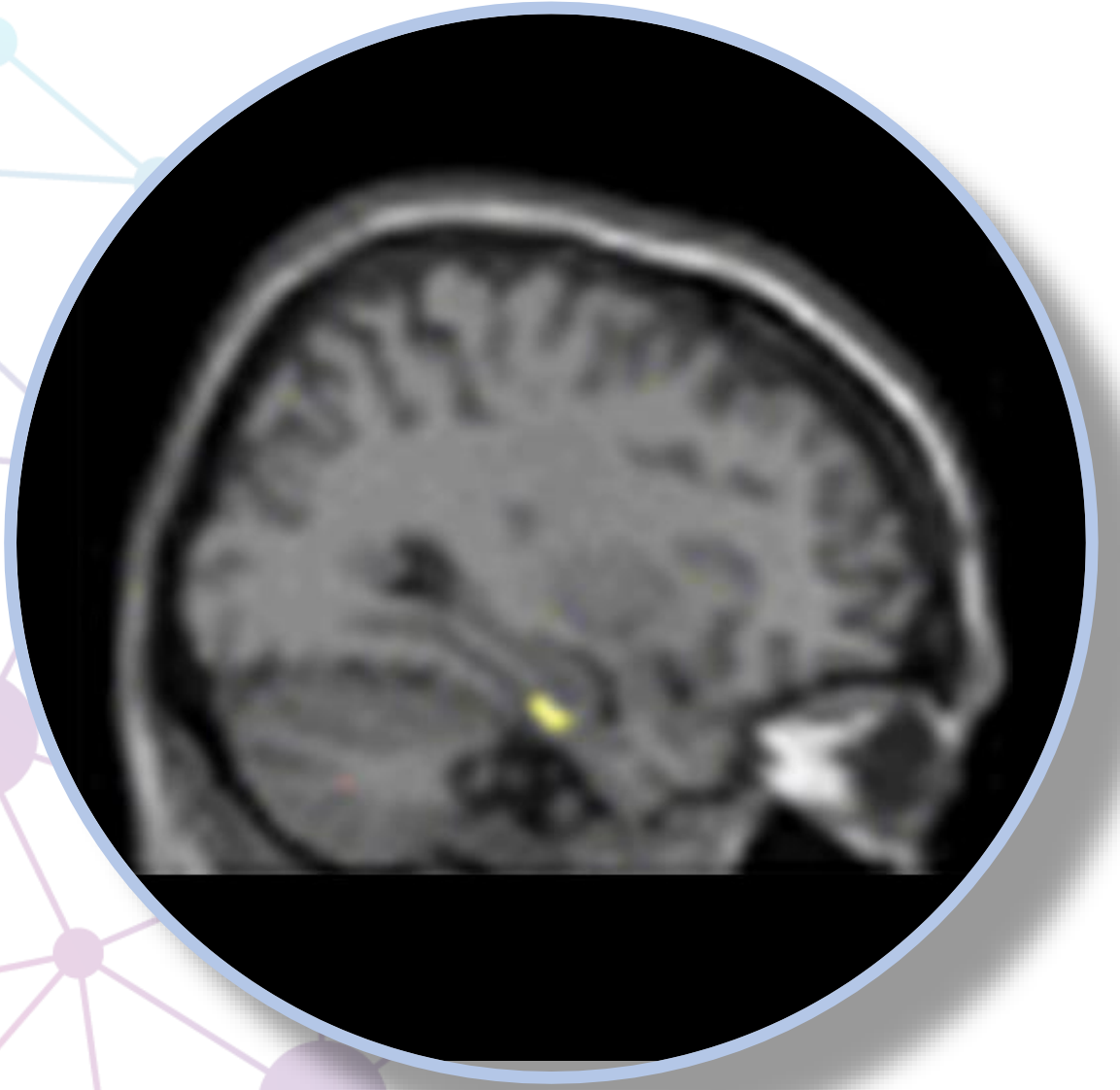
These pathways can be degraded or upgraded



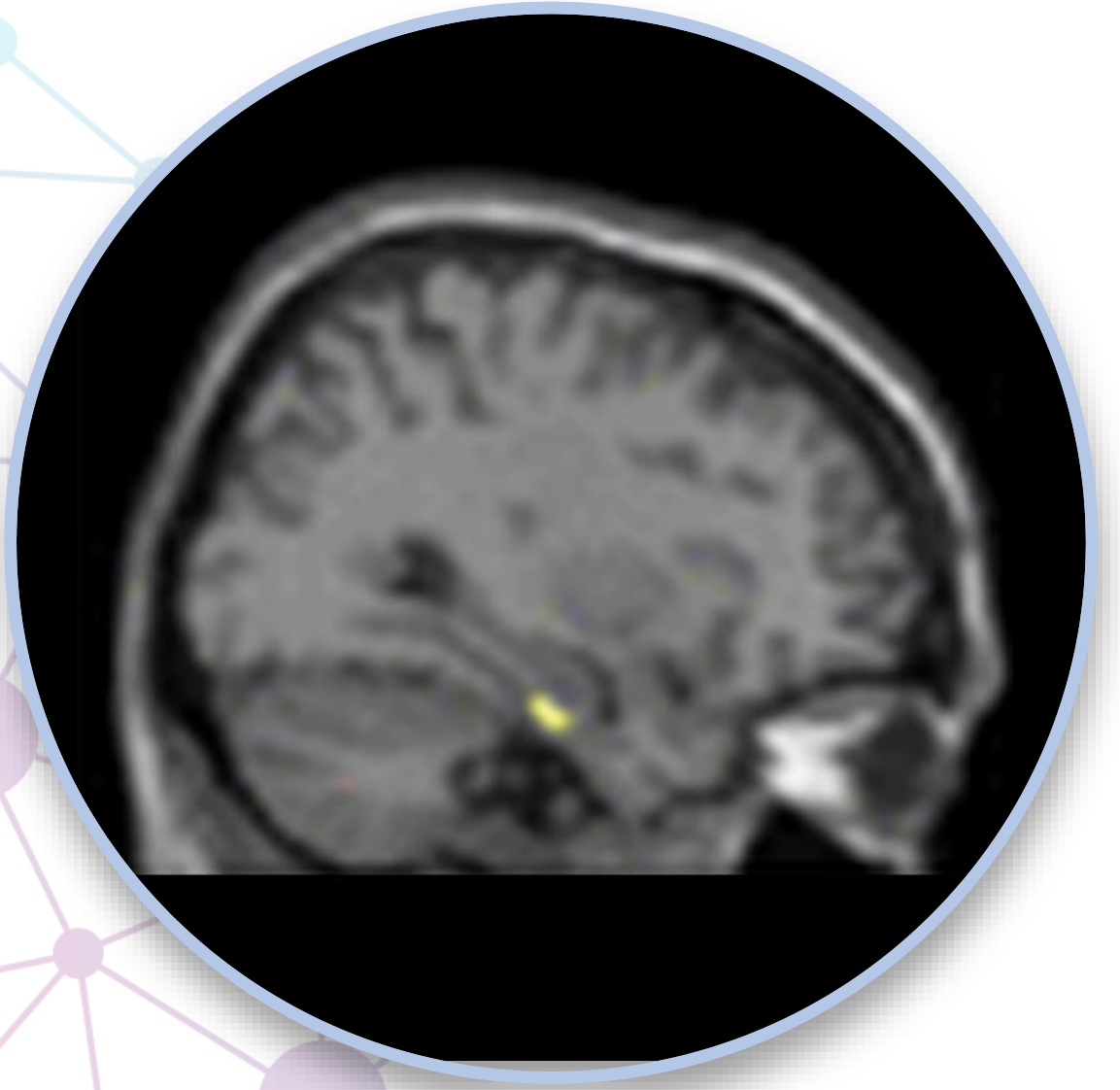
EEG powered by BCILAB | SIFT



**Dancing can grow  
your hippocampus**



**Dancing can grow  
your hippocampus**

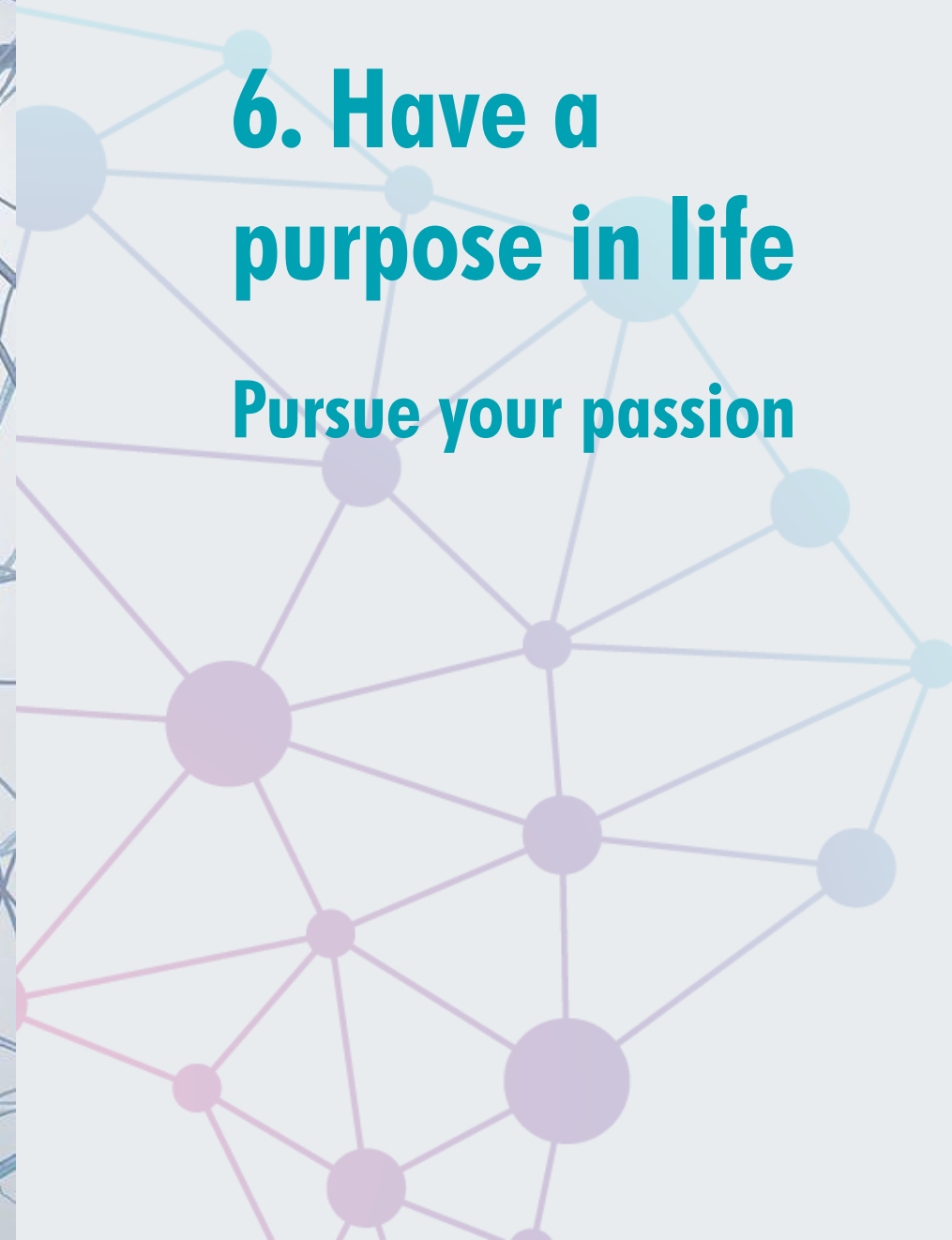






## **6. Have a purpose in life**

**Pursue your passion**





# Brain Fitness Program:

## A personalized set of interventions

**Meditation training**



**Brain training**



**Sleep counseling**



**Diet counseling**



**Exercise training**

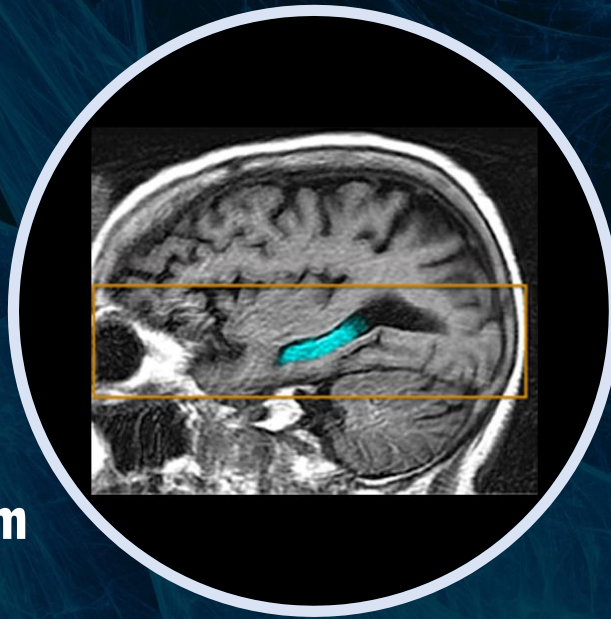


**Weekly monitoring**

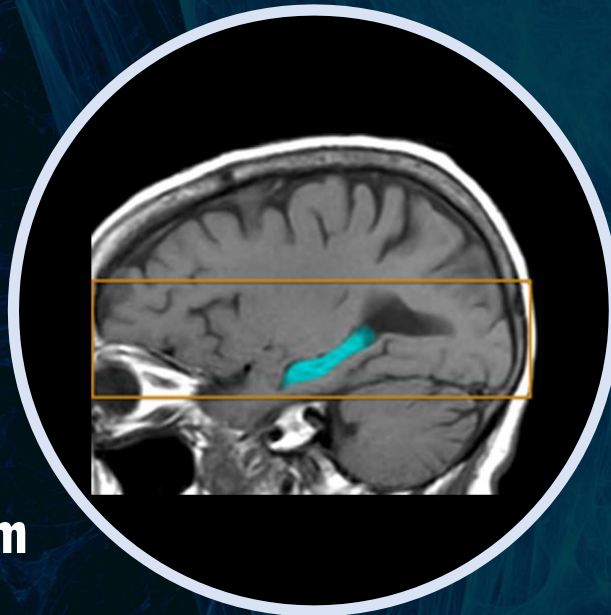




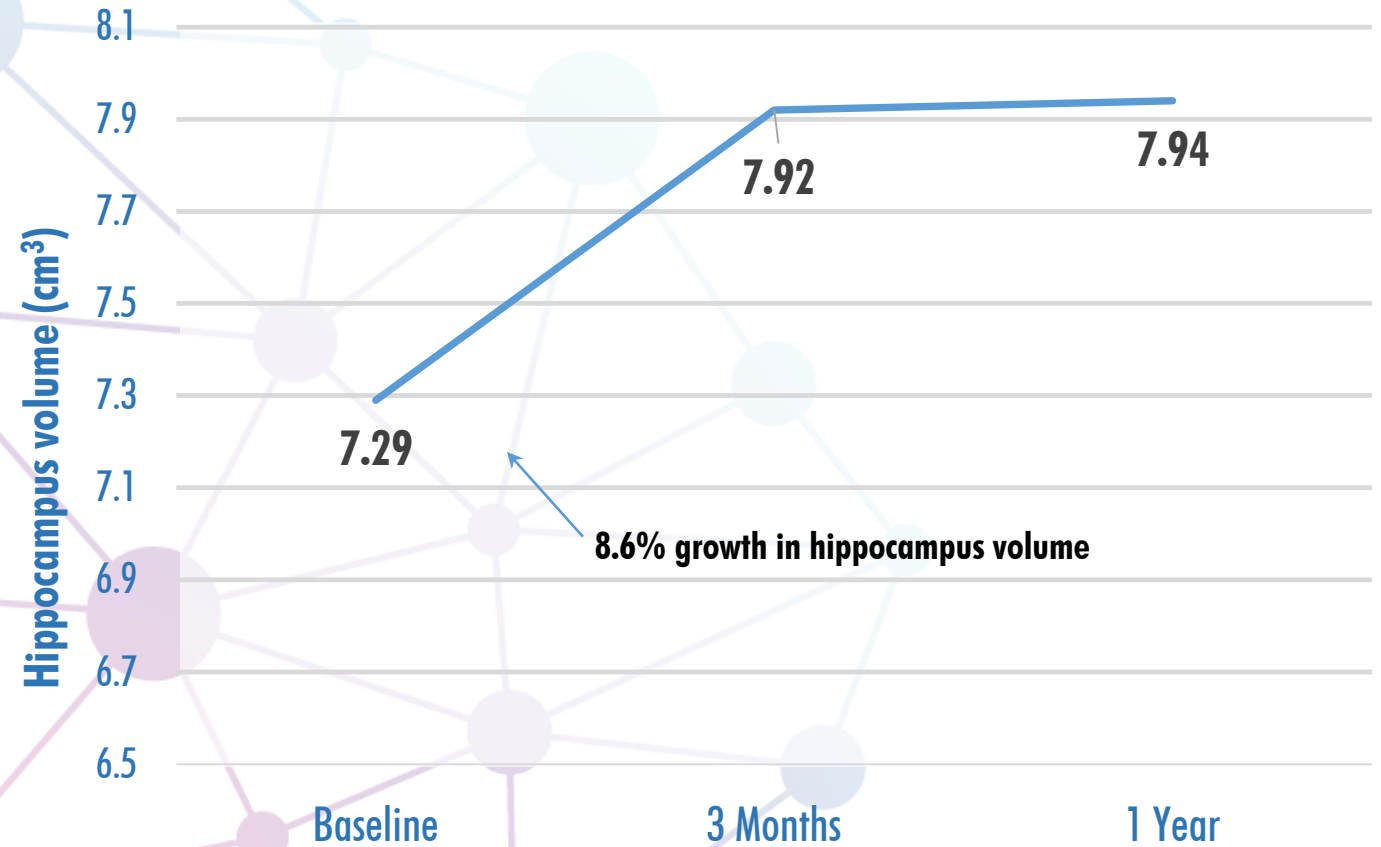
**Before  
program**



**After  
program**



# Sustained benefits one year later







# Published in The Journal of Prevention of Alzheimer's Disease

*The Journal of Prevention of Alzheimer's Disease - JPAD©*

**A Personalized 12-week “Brain Fitness Program” for Improving Cognitive Function and Increasing the Volume of Hippocampus in Elderly with Mild Cognitive Impairment**

*M. Fotuhi<sup>1,2</sup>, B. Lubinski<sup>1,3</sup>, N. Hausterman<sup>1,4</sup>, T. Riloff<sup>1</sup>, M. Hadadi<sup>5</sup>, C.A. Raji<sup>6</sup>*

**TIME**

# DEFY AGING



Get fit  
Medit. diet  
Omega-3 suppl.  
Learn new things  
Sleep well  
Meditate  
Have purpose

Diabetes  
Obesity  
Sleep apnea  
Head trauma  
Depression  
Stress  
Alzheimer's





**THANK  
YOU!**



**one<sup>18</sup>**

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