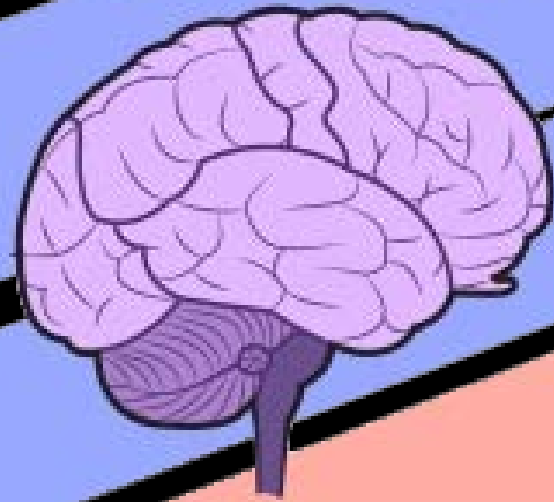


# Brains



# and



# Brawn

Joseph Kezele, M.D.,  
Associate Professor of Biology, ACU  
Logos Research Associate  
Fellow, Creation Research Society  
Past President, Arizona Origin Science Assn.

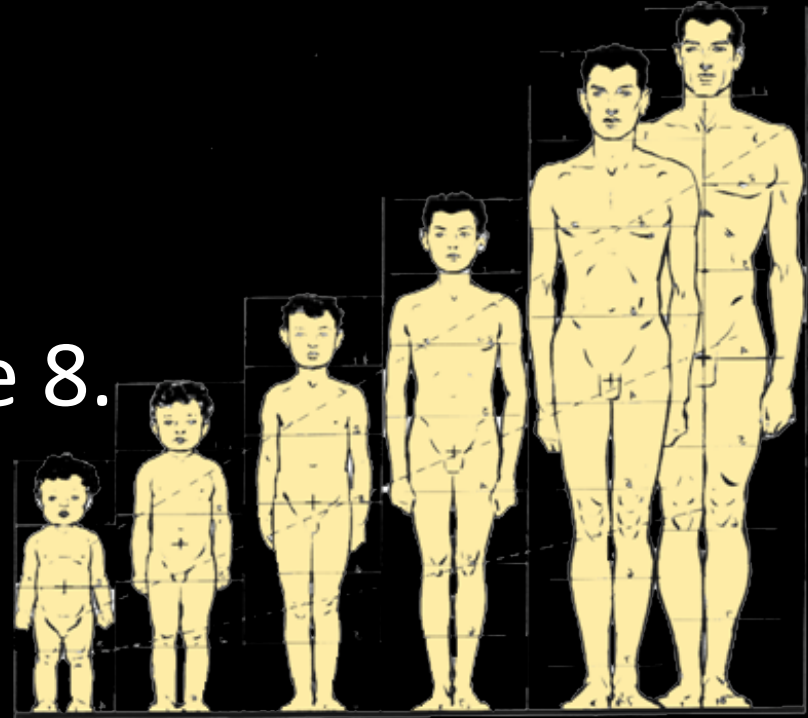
# The Brain



Joseph Kezele, M.D.,  
Associate Professor of Biology, ACU  
Logos Research Associate  
Fellow, Creation Research Society  
Past President, Arizona Origin Science Assn.

# The Human Brain

Attains mature size by age 8.



Finishes forming synapses around age 24.

Weighs around 3 pounds,  
which is about 1.5 to 2%  
of body weight.

Metabolizes 20% of basal  
energy expenditure.



# Characteristics and Actions

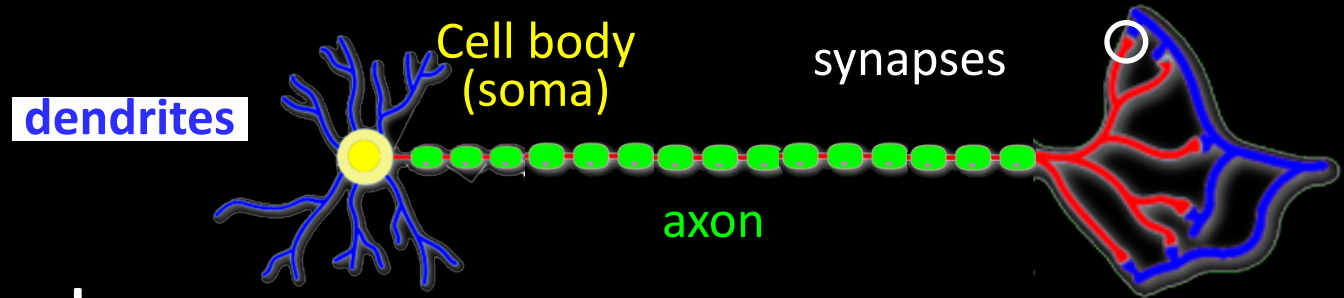
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9. The “Mozart Effect”
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11. Biophoton Brain Communication

# Characteristics and Actions

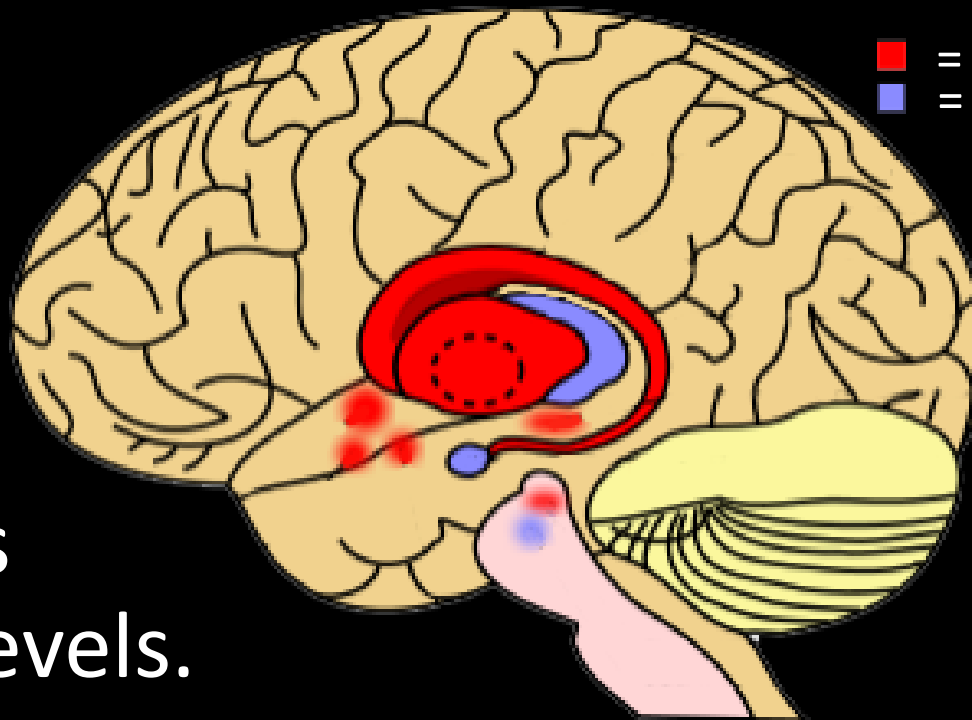
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# Perfect Optimization

Engineers and electricians use the “save wire” principle.

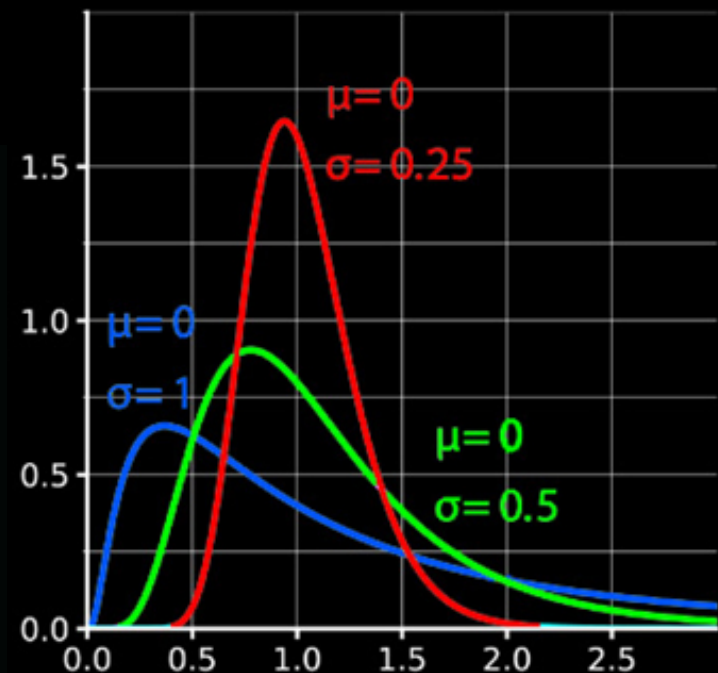
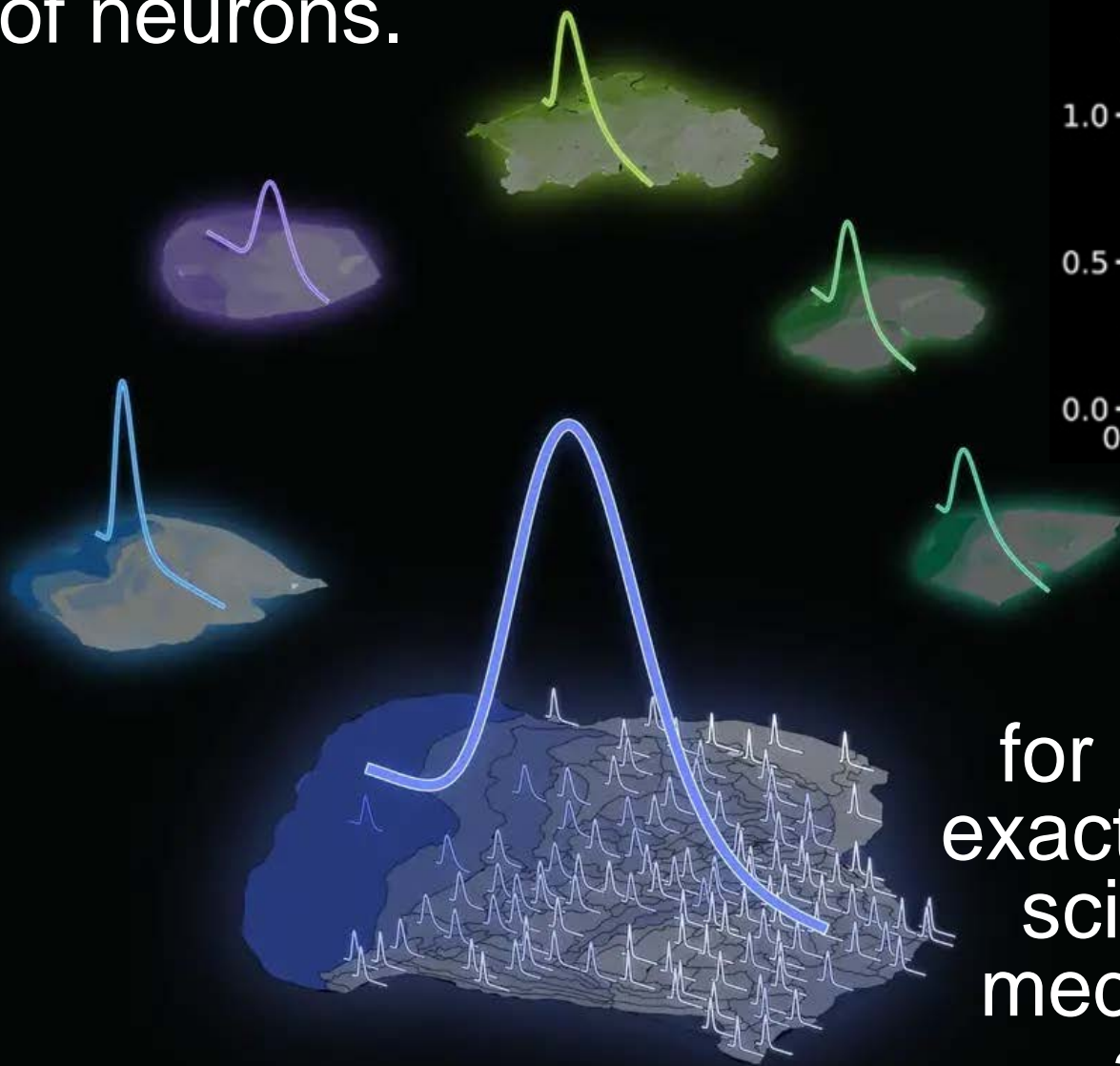


The architecture of the brain employs this same principle at all of its multiple levels.



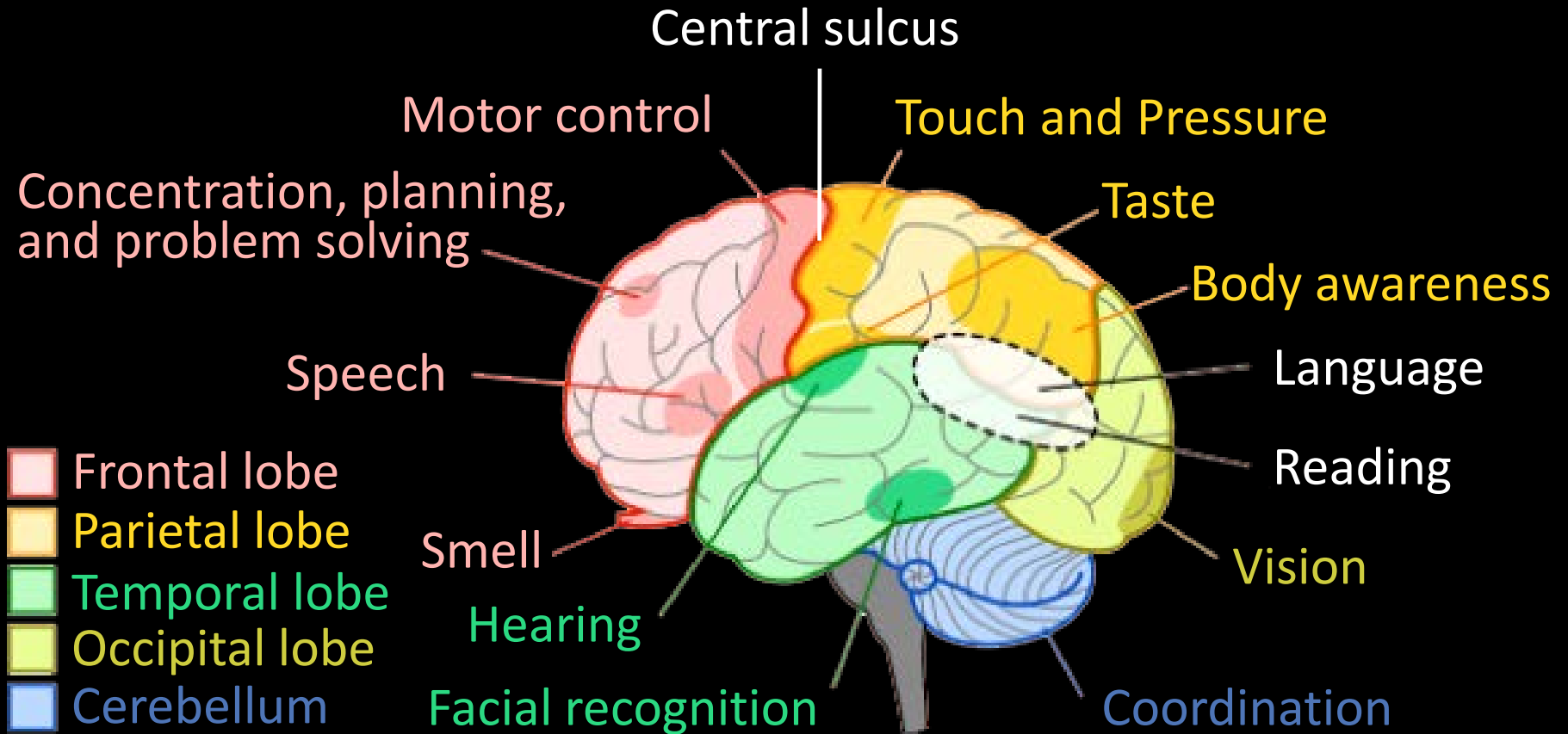
■ = ganglia  
■ = associated structures

There is mathematical precision to the distribution of neurons.



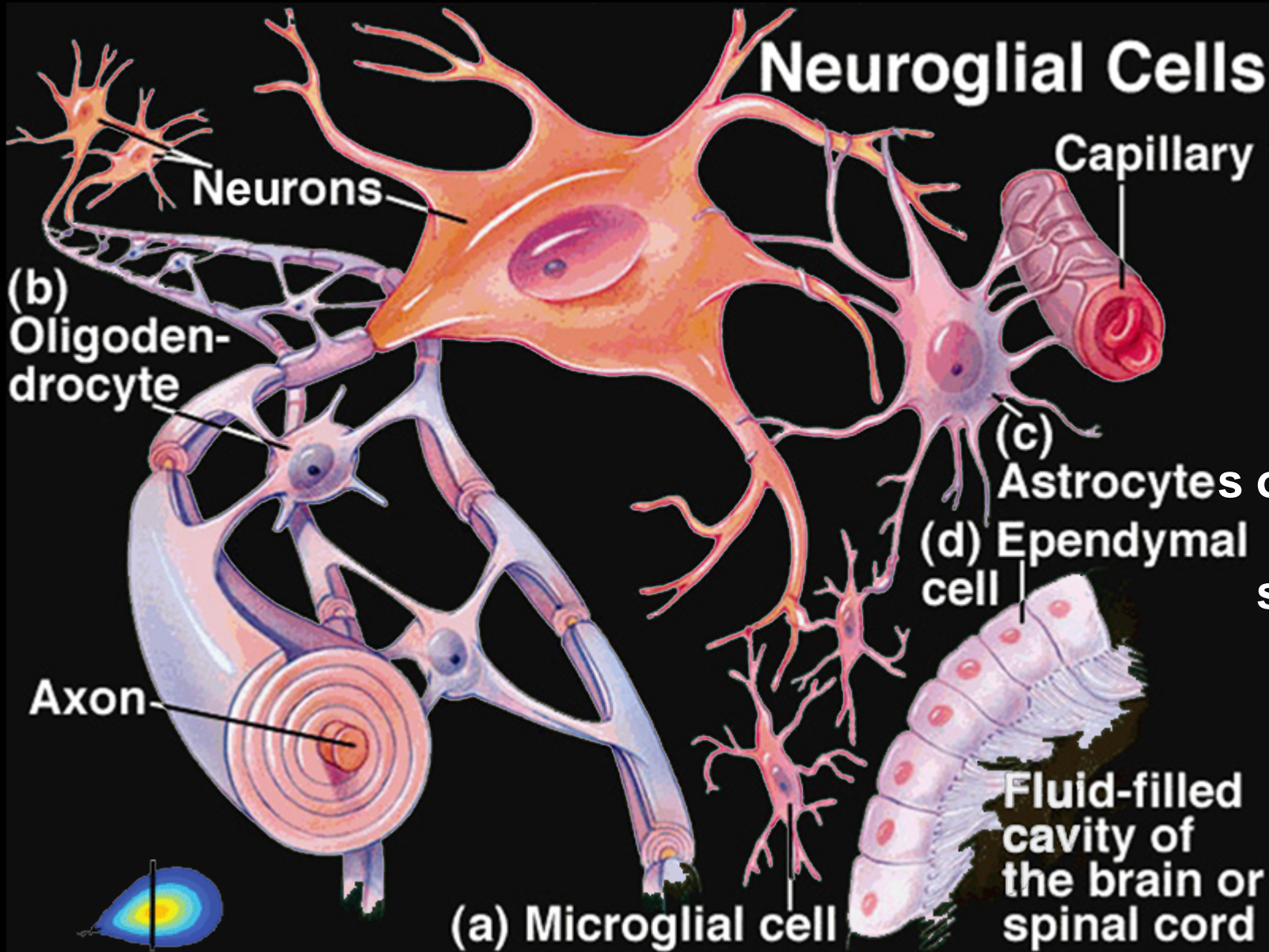
“It is a convenient and useful model for measurements in exact and engineering sciences, as well as medicine, economics and other topics.”

# Regionalization of Functions





# Neuroglial Cells



Neurons

Capillary

(b) Oligodendrocyte

(c) Astrocytes orchestrate new synapses

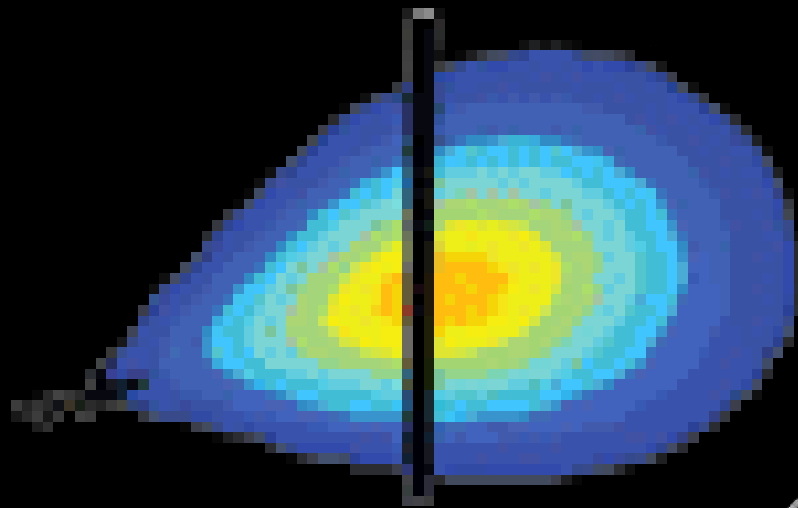
(d) Ependymal cell

Axon

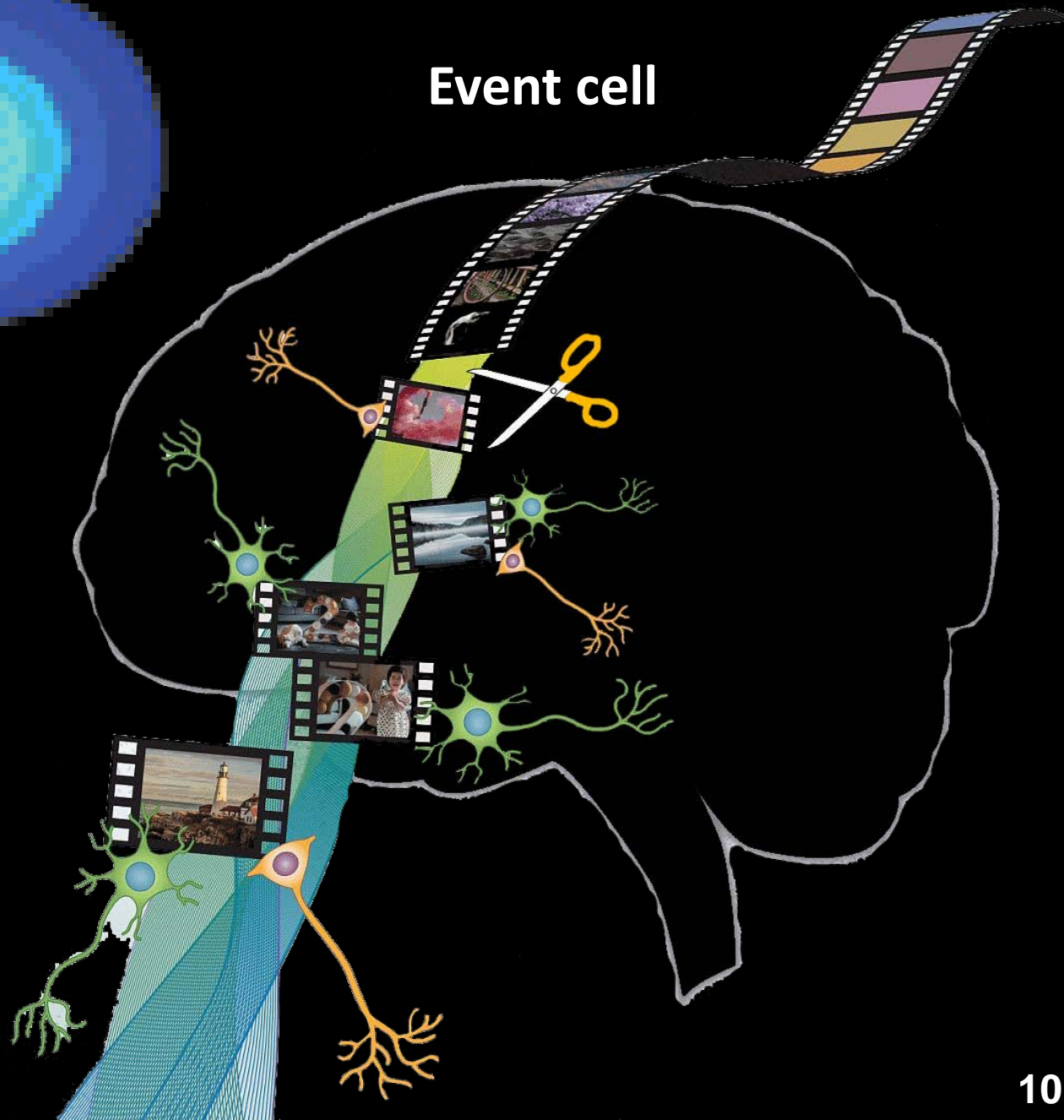
Fluid-filled cavity of the brain or spinal cord

(a) Microglial cell

(e) Boundary cell

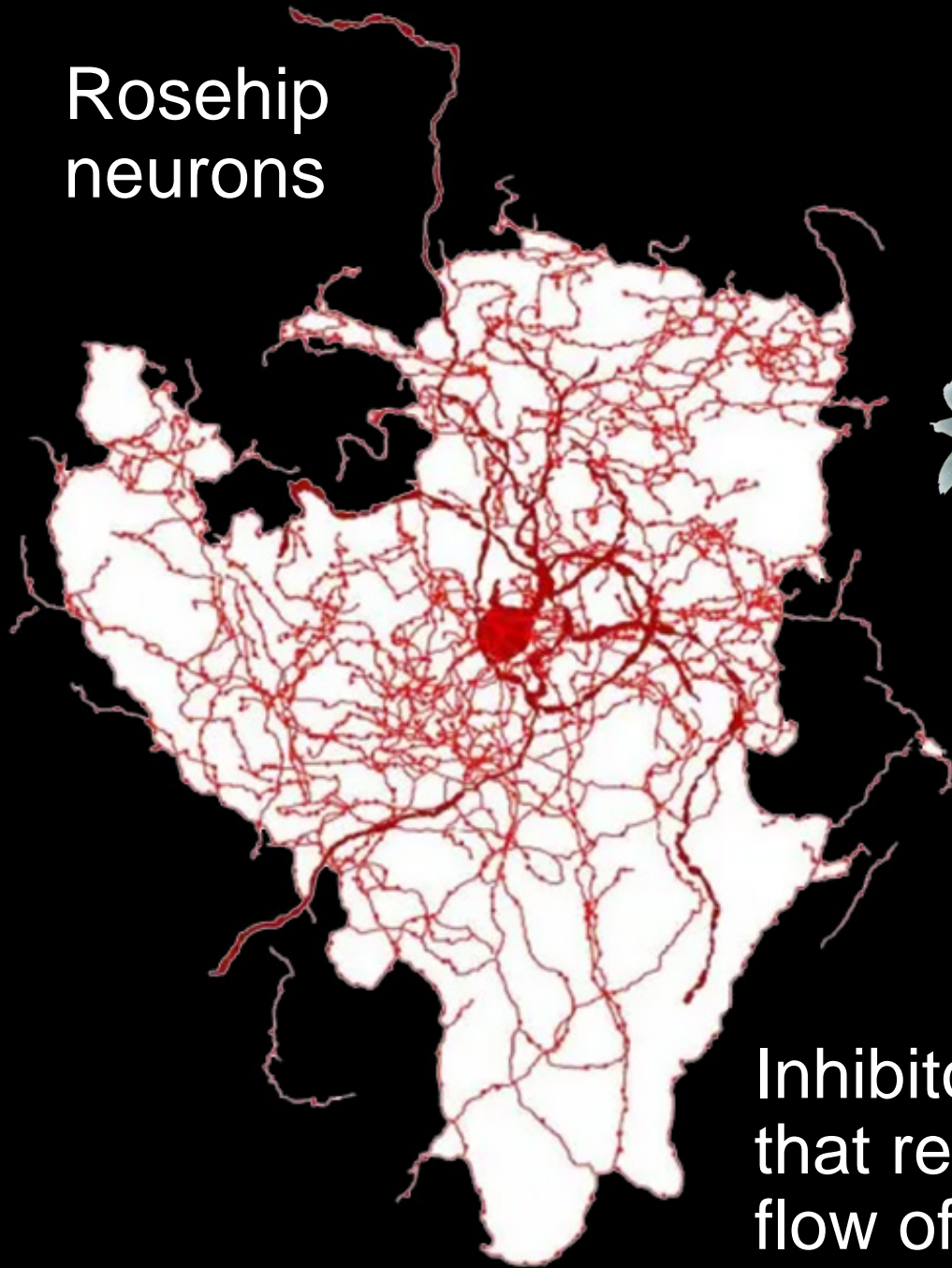


**Boundary cell**



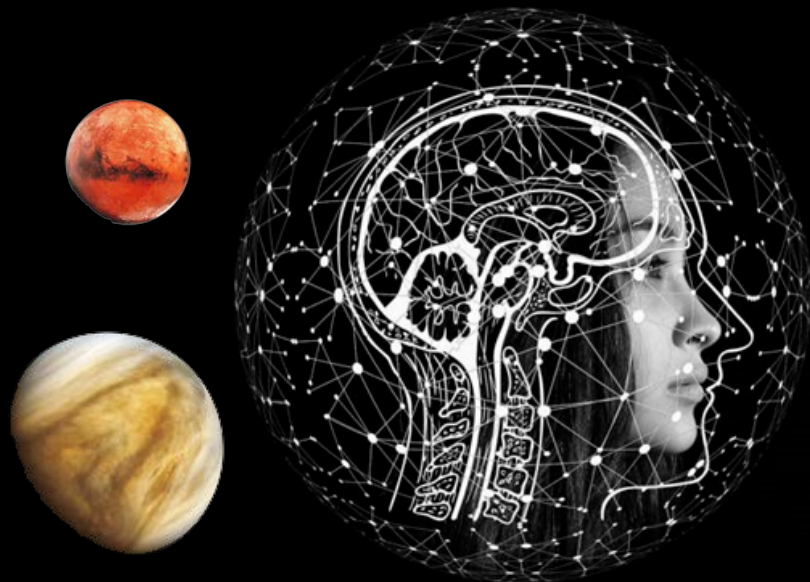
**Event cell**

# Rosehip neurons



Inhibitory neurons  
that regulate the  
flow of information.

# Artificial intelligence tool detects sex-related differences in brain structure **May 14, 2024**



Genesis 1:27

So God created mankind in his own image, in the image of God he created them; male and female he created them.

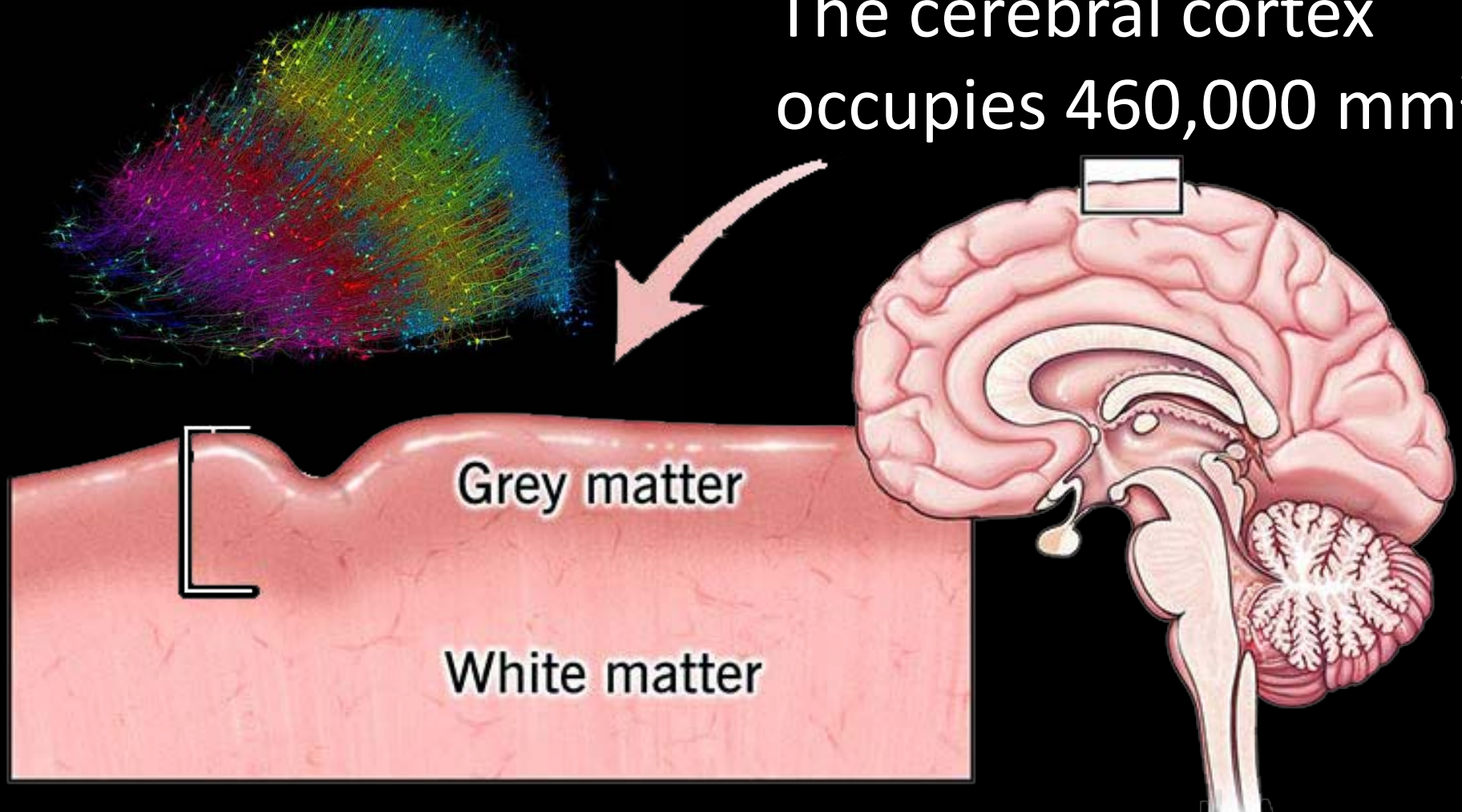
Artificial intelligence (AI) computer programs that process MRI results show differences in how the brains of men and women are organized at a cellular level. These variations were spotted in white matter, which fosters communication between regions.

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The cerebral cortex  
occupies 460,000 mm<sup>3</sup>



A cubic millimeter of brain tissue contains 57,000 cells, 230 millimeters of blood vessels, and 150 million synapses, amounting to 1,400 terabytes of data.

Credit: Google Research and Lichtman Lab at Harvard University

# Biological Masterpiece – Evolution Wired Human Brains To Act Like Supercomputers

**TOPICS:** Brain Cognition Neuroscience Popular University Of Cambridge University Of Queensland University Of Sydney

By UNIVERSITY OF SYDNEY SEPTEMBER 16, 2023



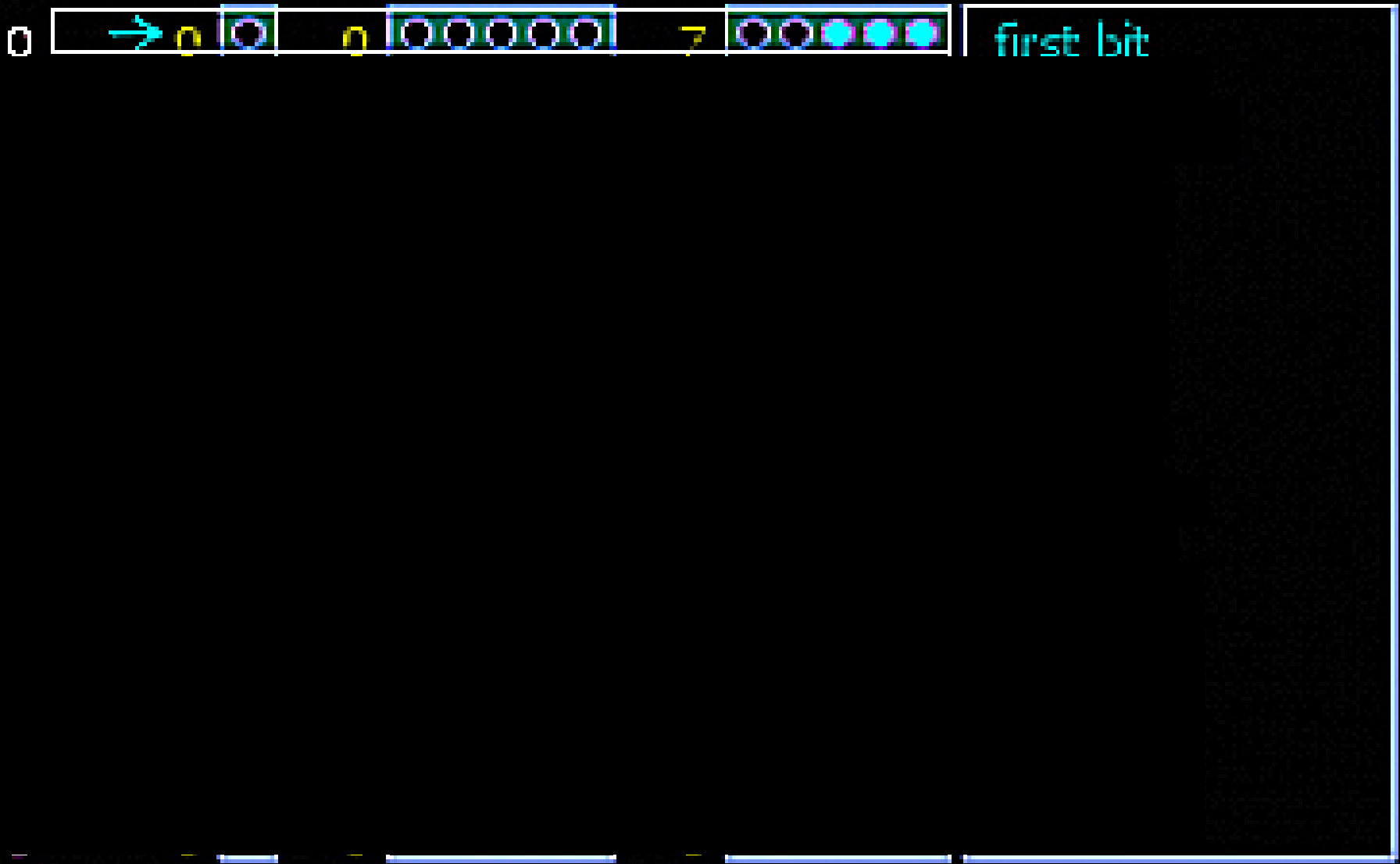
Scientists have discovered that the human brain inherently uses Bayesian inference.

This is a statistical method combining prior knowledge with new evidence, to interpret visual stimuli.



# Intelligence





8 bits = 1 byte

# ROMANS 1:22, 25

**22 Professing to be wise,  
they became fools,**

**25 who exchanged the truth  
of God for the lie, and  
worshipped and served the  
creature rather than the  
Creator, who is blessed  
forever, amen.**

# Characteristics and Actions

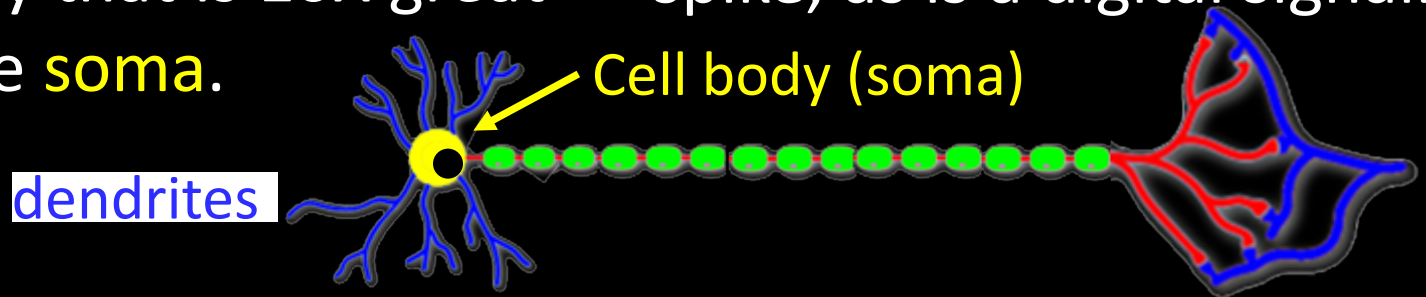
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# Phenomenal Processing Speed

It was originally thought that all processing takes place in the soma.

Electrical activity in **dendrites** is a combination of analog and digital activity that is 10X greater than in the **soma**.

Electrical activity in the soma is an all or nothing spike, as is a digital signal.



This results in computational capability that operates at warp speed, more than 100 times faster than was previously thought to be the case.

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# Optimal Energy Efficiency

C7



Metabolizes 20% of basal energy expenditure, requiring only  $\approx 10$  watts to function.

A robot brain with the same capacity as the human brain would require at least 10 megawatts, the output of a . . .



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# Petabyte Level Memory Capacity

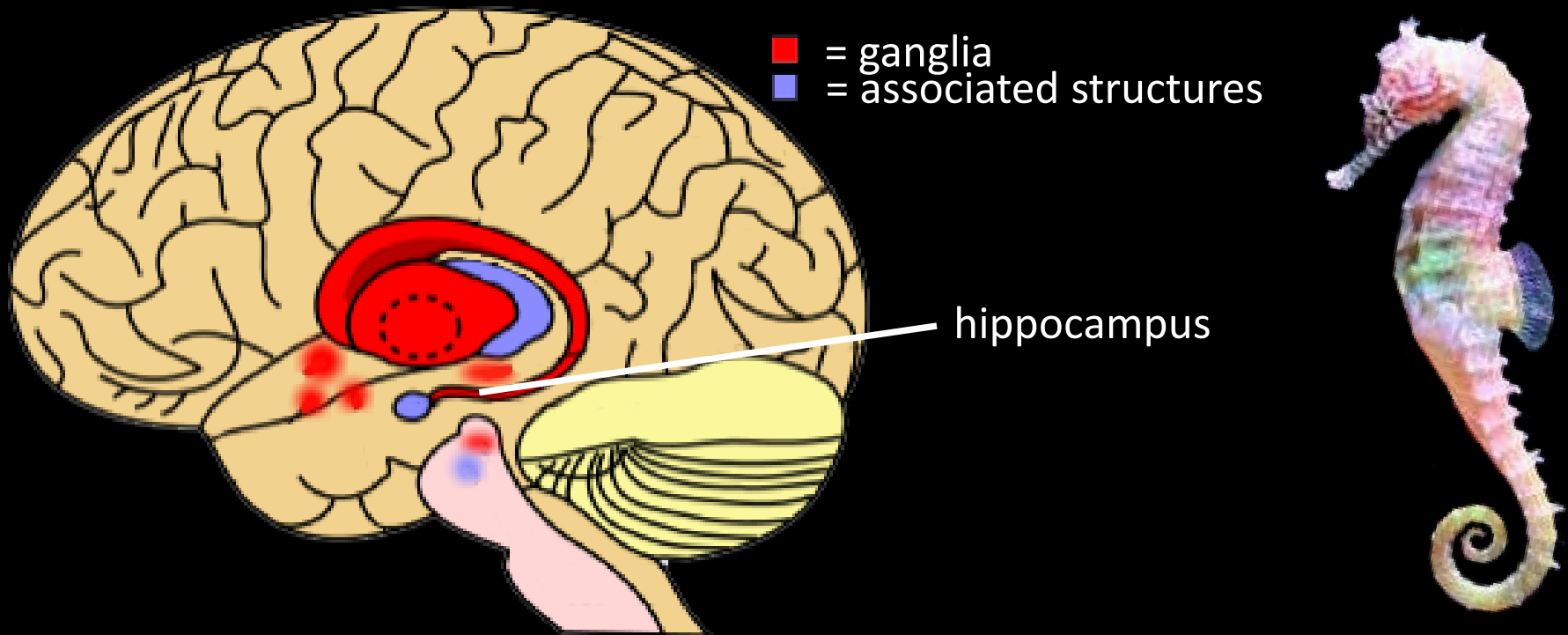
It has been discovered that the memory storage of the human brain is 10X > previously thought, to at least a petabyte,  $10^{15}$  bytes. A petabyte is a million gigabytes.



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# How Memories Are Stored



The sequential unfolding of specific sleep rhythms coordinates memory consolidation while humans are asleep.

**Awake with  
mental activity**



**Beta  
14-30 Hz**

**Awake and  
resting**



**Alpha  
8-13 Hz**

**Sleeping**



**Theta  
4-7 Hz**

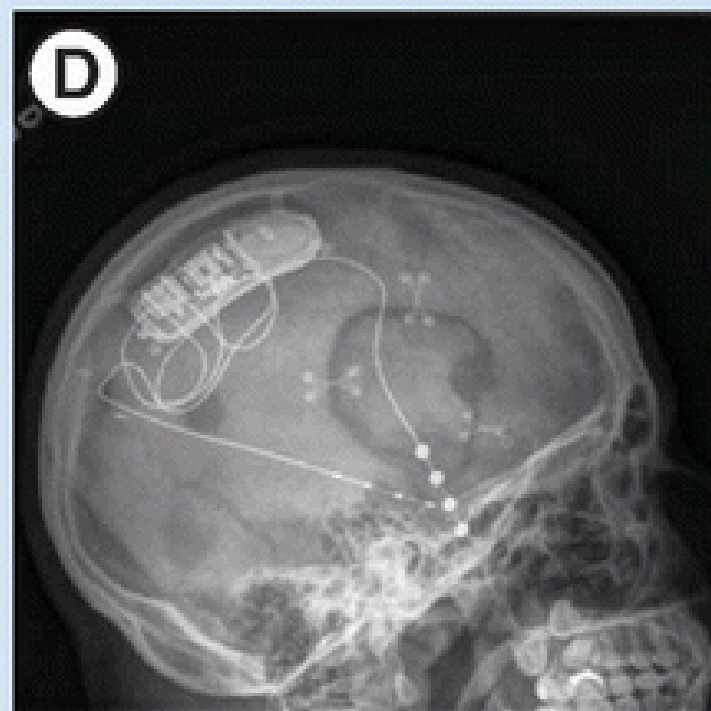
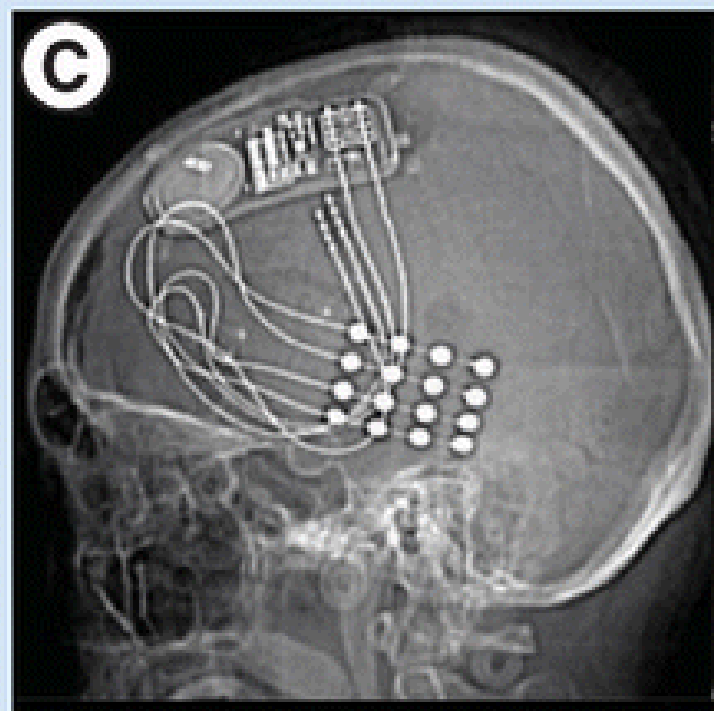
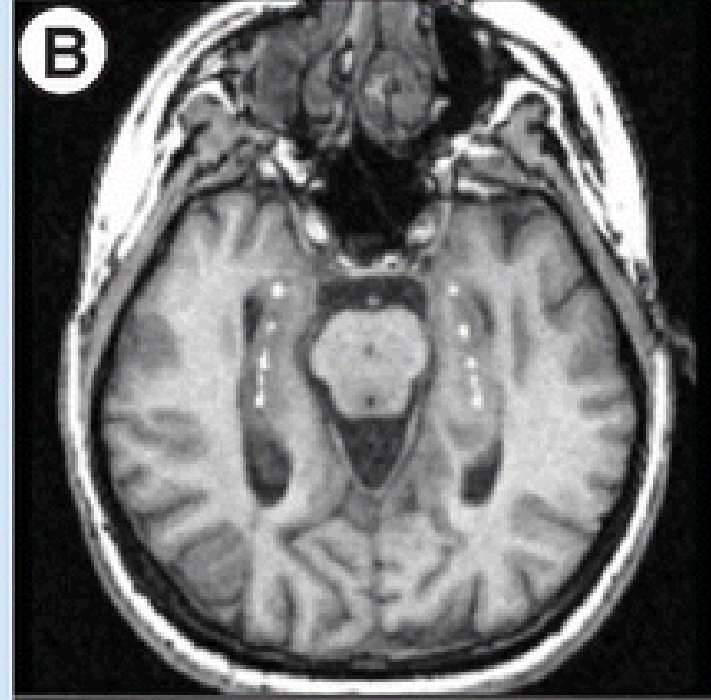
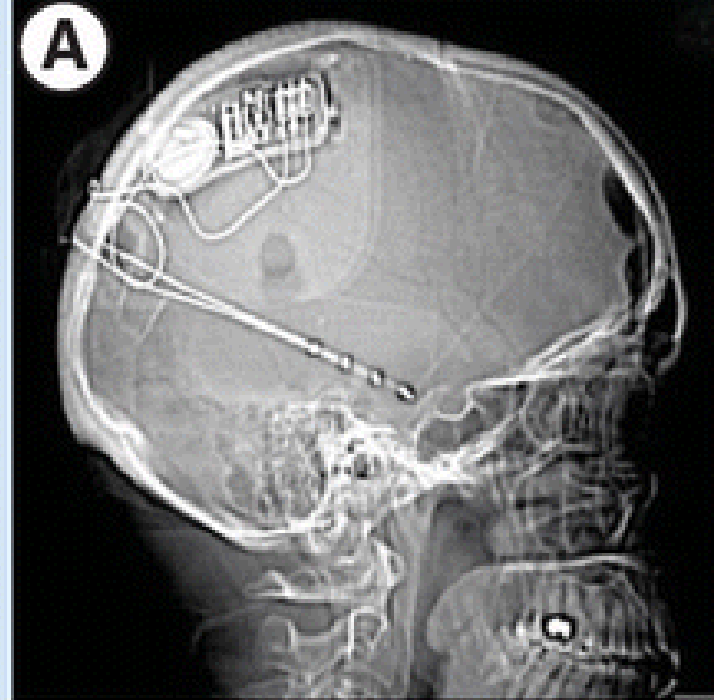
**Deep sleep**



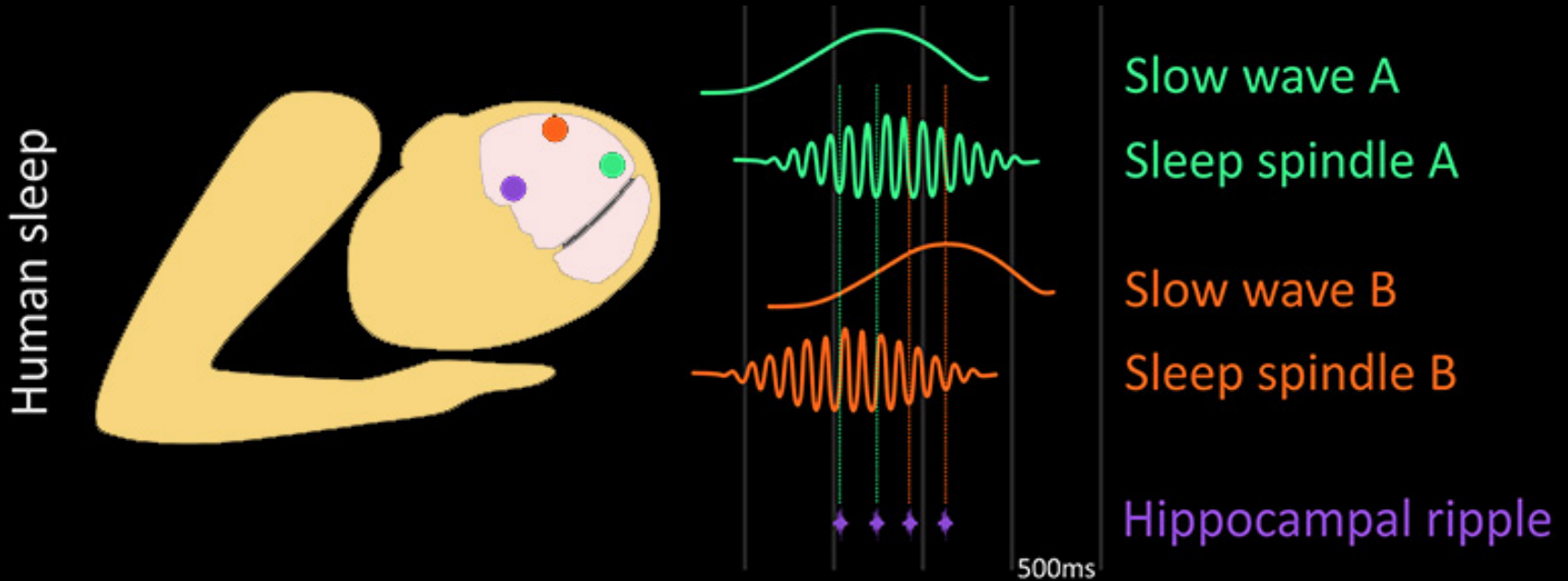
**Delta  
< 3.5 Hz**







While the patients were sleeping, their sleep rhythms and neuron firing rates were recorded. These showed that firing rates and neural communication are indeed orchestrated by slow oscillations, spindles and ripples.



This demonstrates the activity of filing away memories while sleeping by using internal machinery of brain rhythms to increase firing rates to a point where new synapses can be forged.

Boundary cells fire when new events happen, such as if we see someone walking into a room.



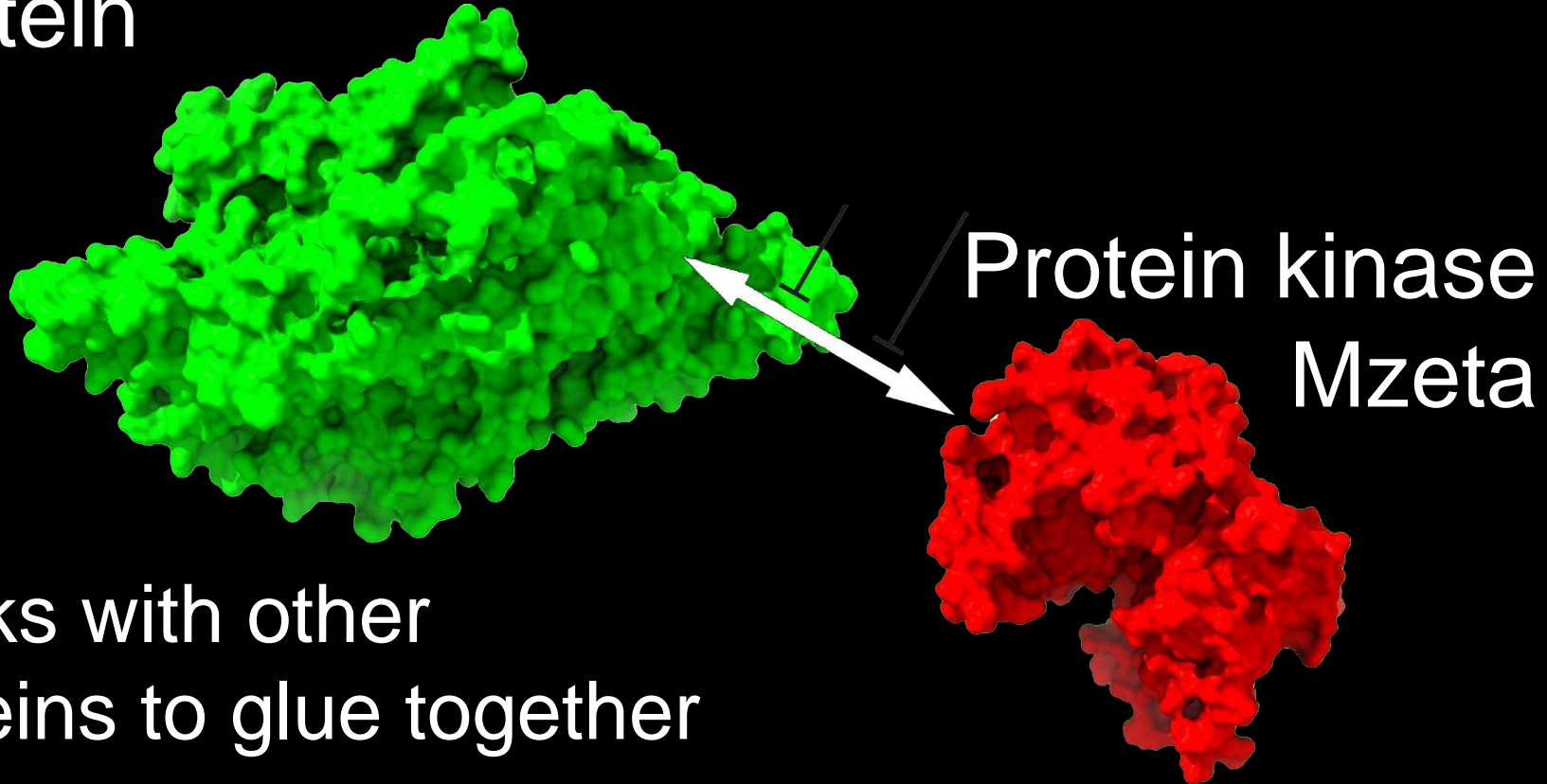
Event cells record a memory when there is a peak in the activity of both boundary and event cells, which is something that only occurs following a hard boundary.

Time cells place a sort of time stamp on memories as they are being formed. That allows us to recall sequences of events or experiences in the right order.



JUNE 26, 2024

KIBRA = Kidney and  
brain expressed  
protein



Works with other  
proteins to glue together  
memory synapses,  
especially long term.

Maintains KIBRA

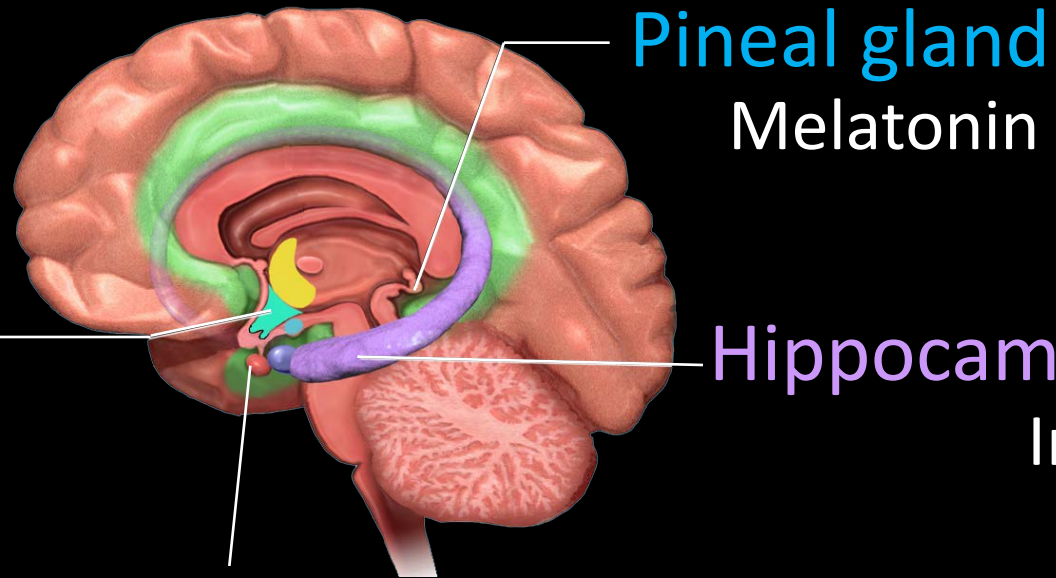
# EPHESIANS 2:4-5

**4 But God, who is rich in mercy, because of His great love with which He loved us, 5 even when we were dead in trespasses, made us alive together with Christ (by grace you have been saved),**

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# Master Secreter of Hormones



**Pineal gland**  
Melatonin

**Hippocampus**  
Irisin

**Hypothalamus**

Thyrotropin-releasing hormone  
Dopamine  
Growth hormone  
Somatostatin  
Gonadotropin-releasing hormone  
Corticotropin-releasing hormone  
Oxytocin  
Vasopressin-ADH

**Pituitary gland**  
**Anterior pituitary**

Growth hormone  
Thyroid stimulating hormone  
Adrenocorticotrophic hormone  
Follicle stimulating hormone  
Luteinizing hormone  
Prolactin

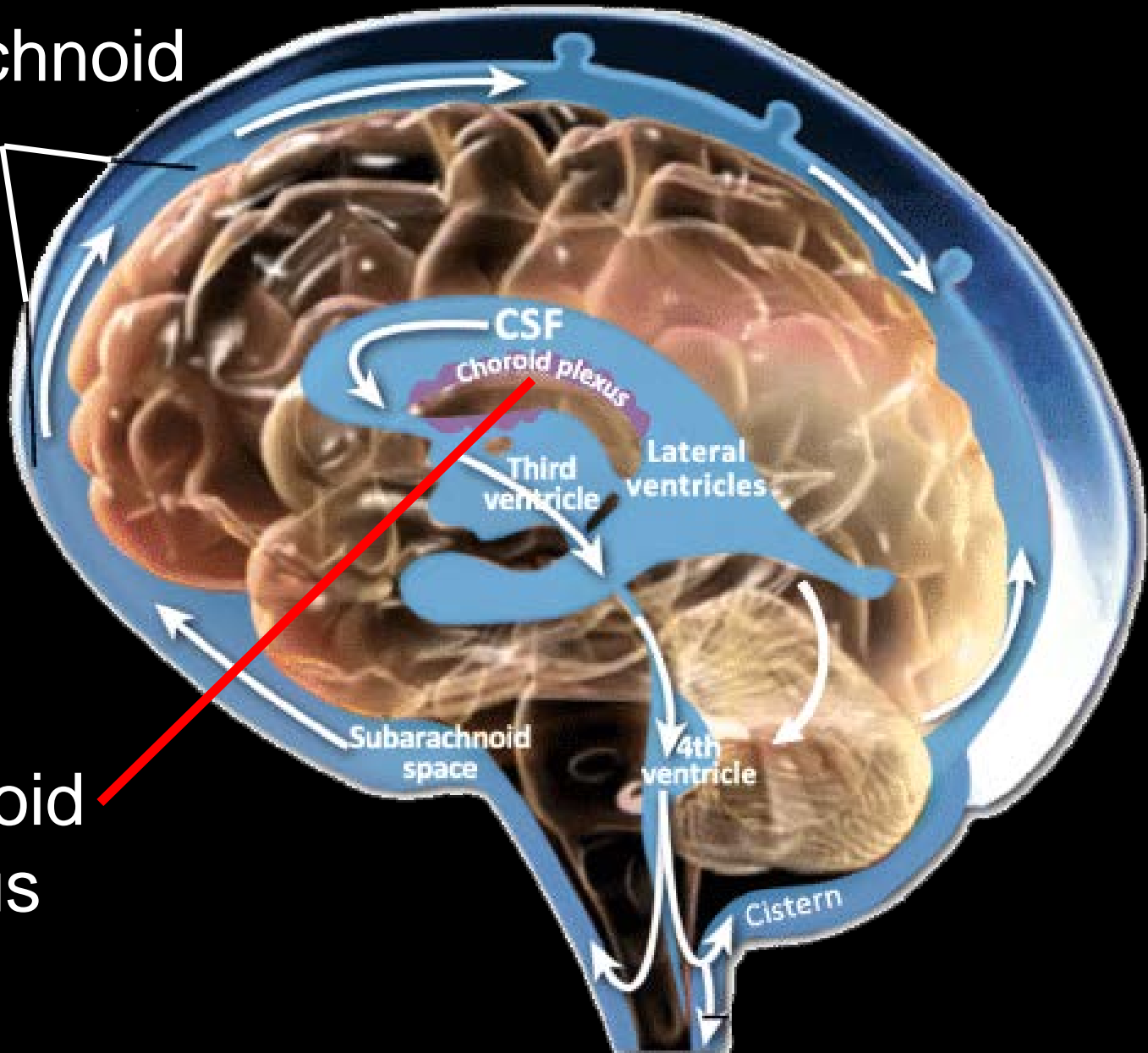
**Intermediate Pituitary**

Melanocyte stimulating hormone

**Posterior pituitary**  
Oxytocin and  
Vasopressin-ADH  
stored

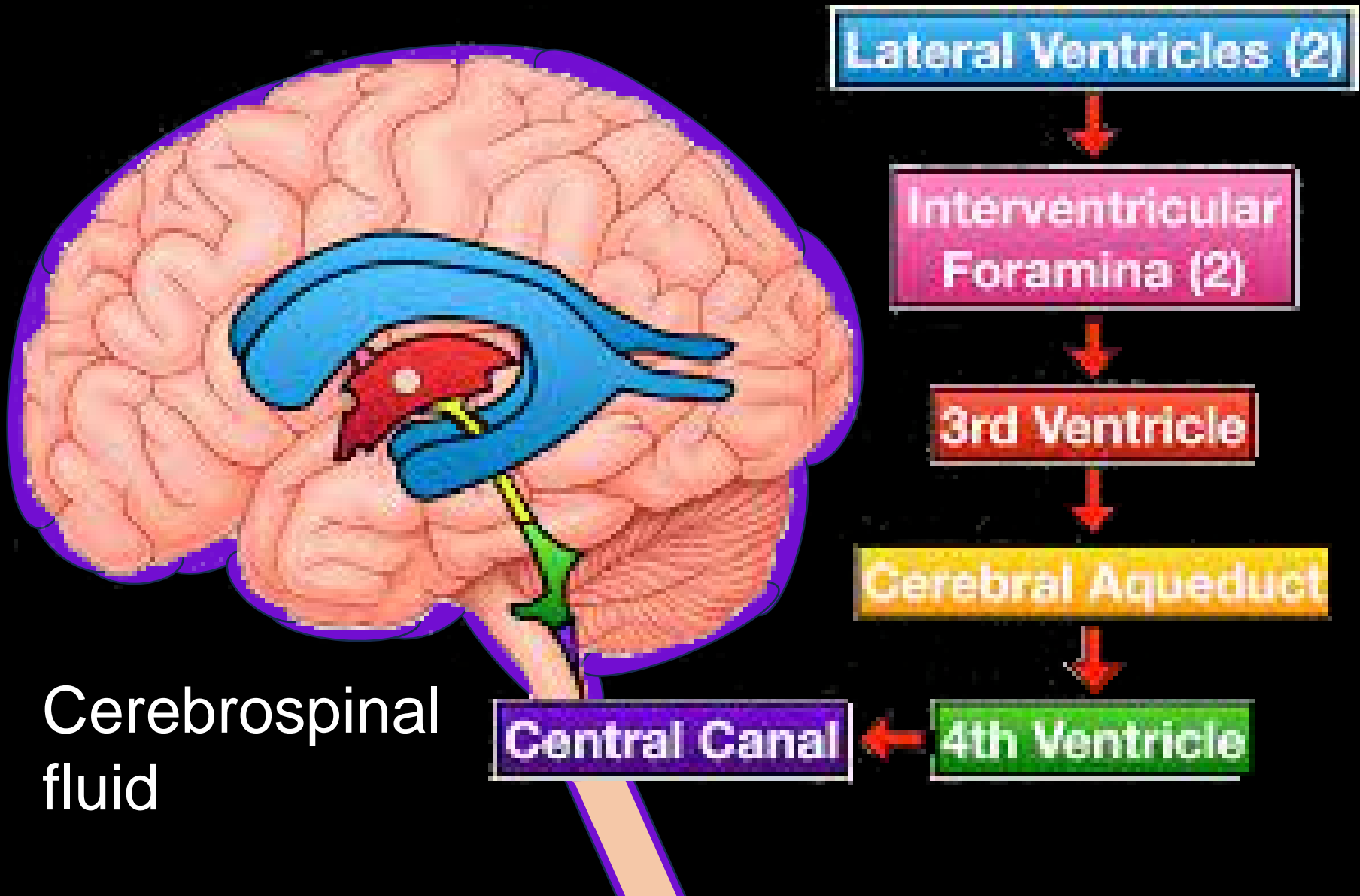
# Master Secretor of Cerebrospinal Fluid

Subarachnoid space



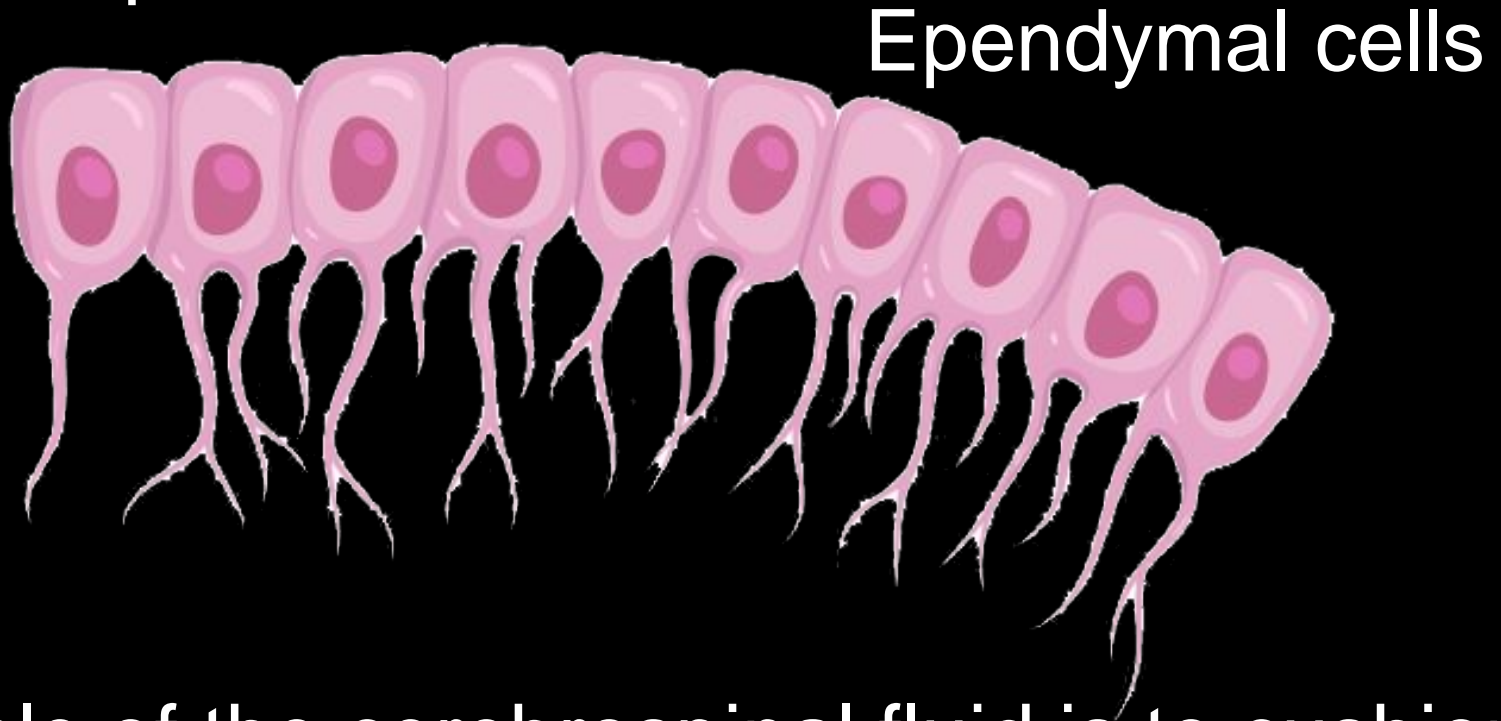
Choroid plexus

# Master Secretor of Cerebrospinal Fluid



# Master Secretor of Cerebrospinal Fluid

In the choroid plexus these cells secrete the cerebrospinal fluid.



The role of the cerebrospinal fluid is to cushion the brain and spinal cord and to provide nutrients to the cells it is in contact with.

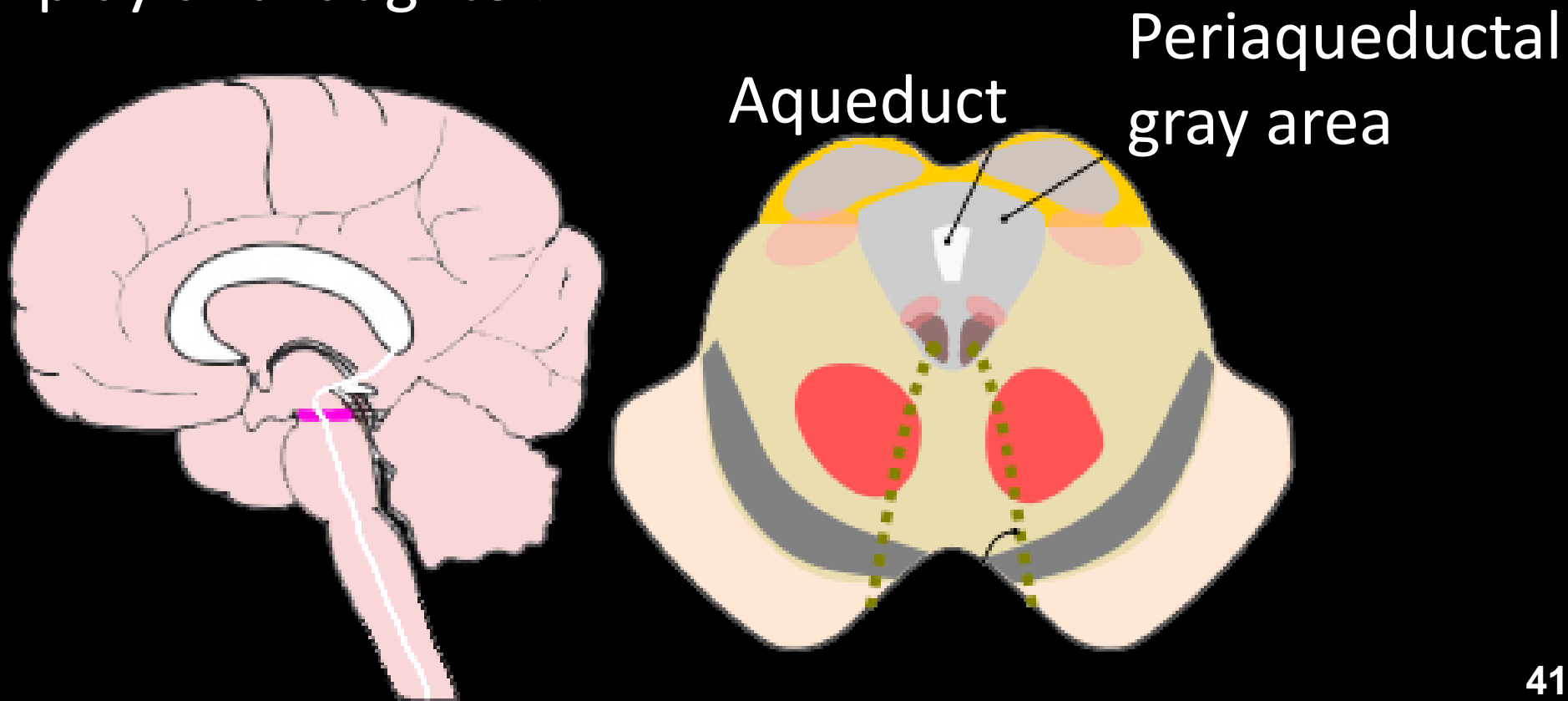
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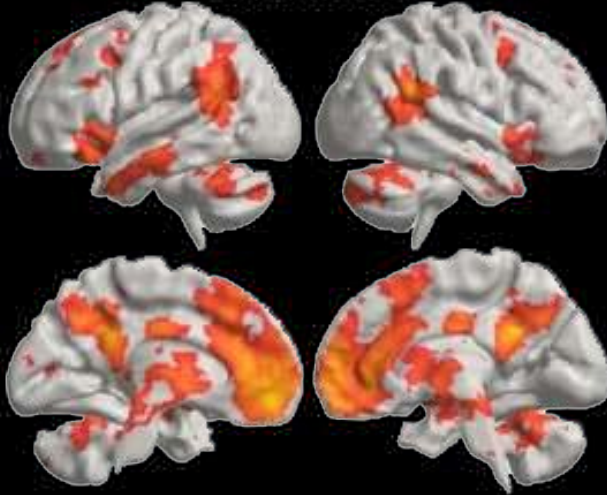
# Where We Play and Laugh and Love

The periaqueductal gray area plays a critical role in autonomic function, motivated behavior and behavioral responses to threatening stimuli, and play and laughter.

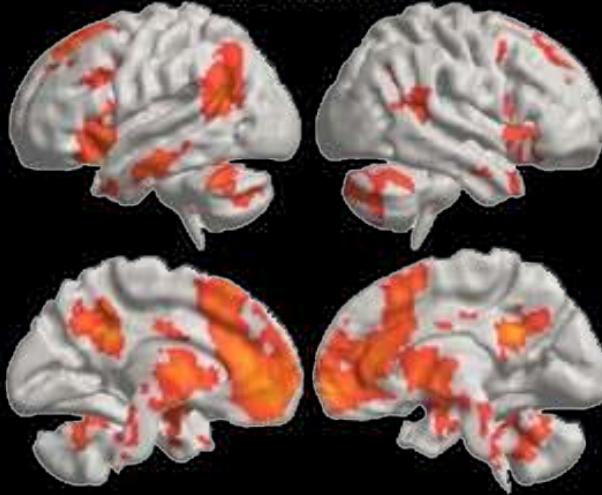


# Where We Play and Laugh and Love

Romantic love



Parental love



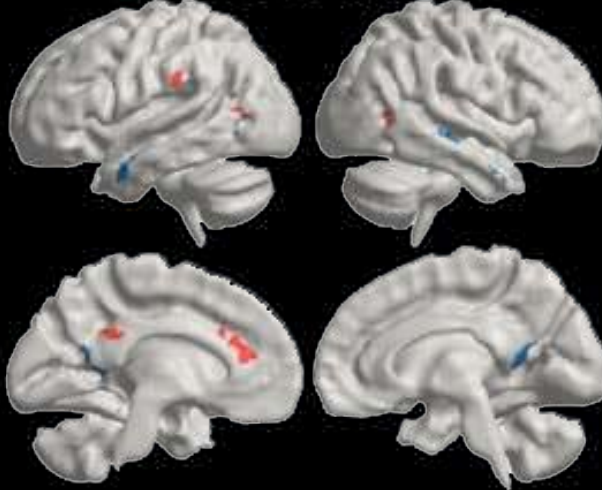
Love for a friend



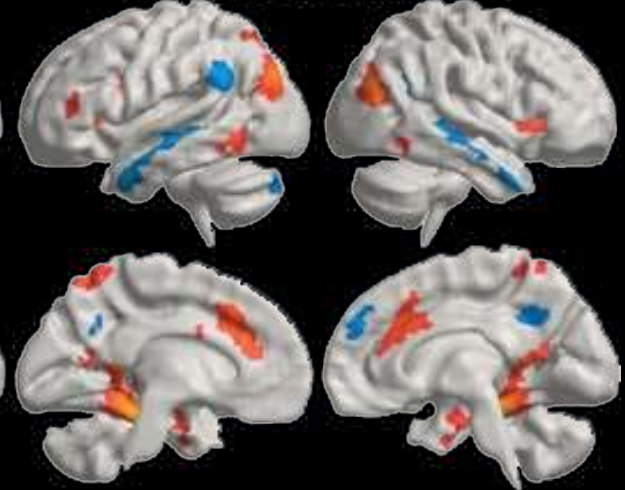
Love for a stranger



Love for a pet



Love for nature



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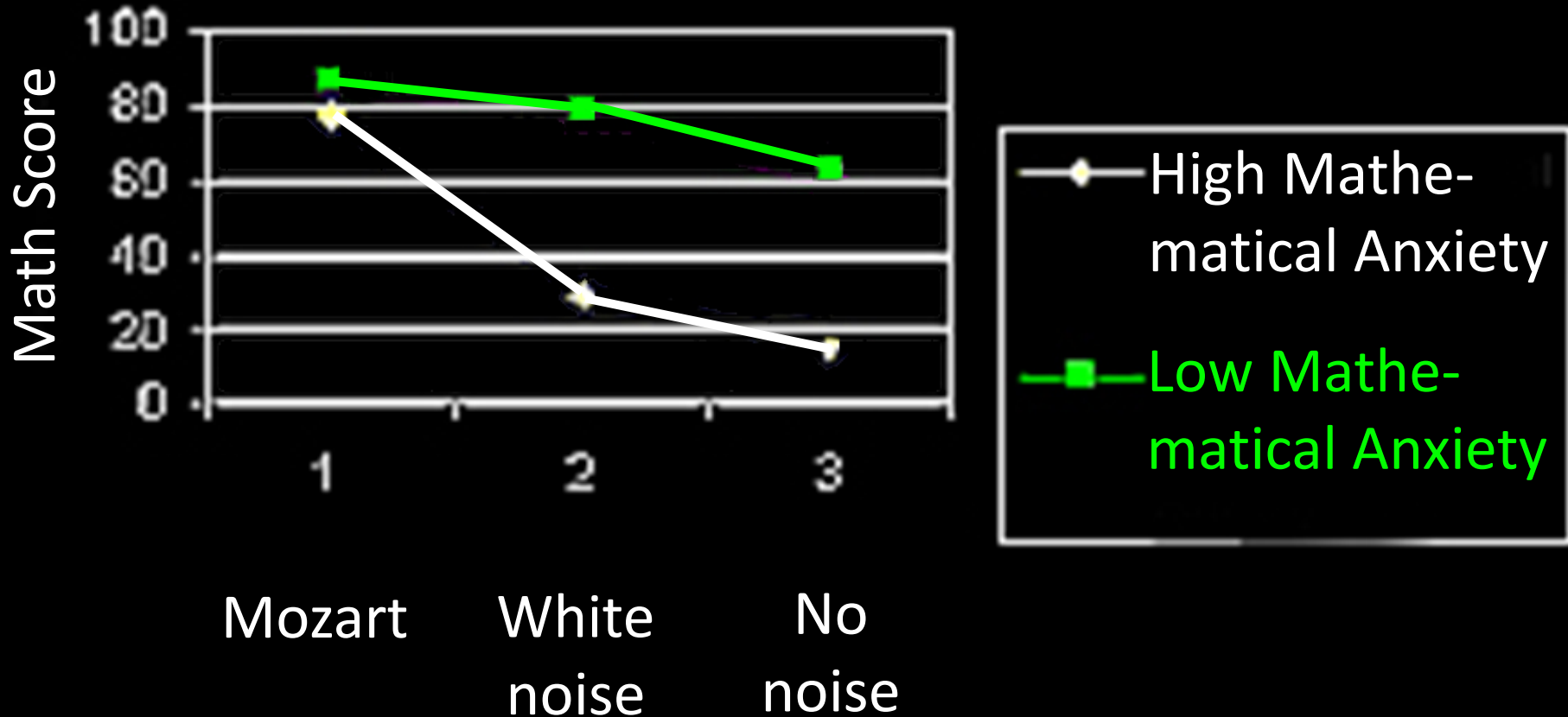
# Sonata for Two Pianos in D major, K.448/375a

1. Allegro con spirito

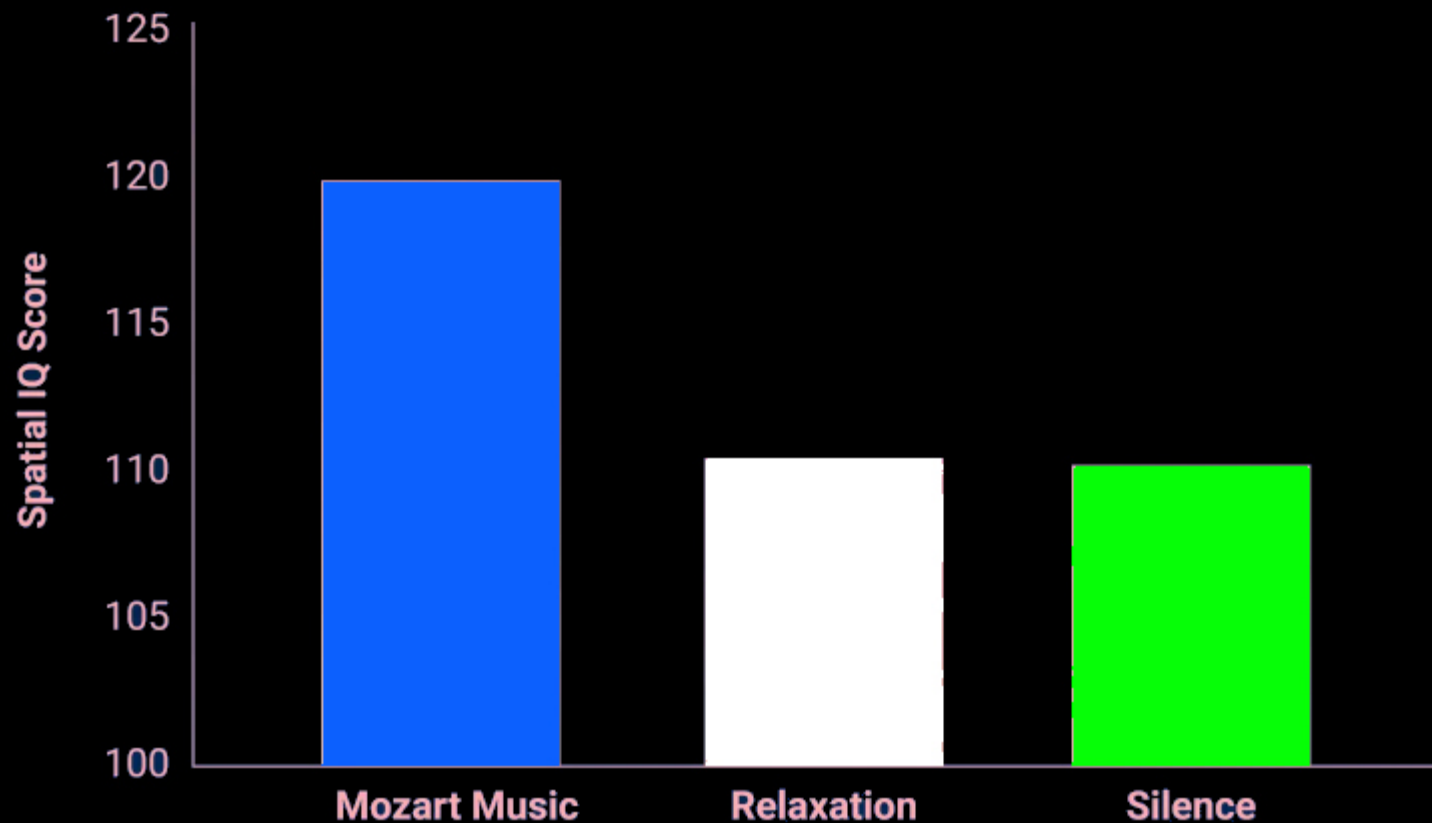
W.A. Mozart

The image displays a musical score for the first movement of a sonata for two pianos. The score is written in D major (two sharps) and common time (C). It is divided into two systems, each containing two staves for the two pianos. The first system is labeled 'Piano' on both staves. The second system is labeled 'Pno.' on both staves. The music features a variety of rhythmic patterns, including eighth and sixteenth notes, and rests. Trills (tr) are marked above several notes. A triplet of eighth notes is indicated with a '3' and a slur. The score concludes with a final cadence in the right hand of the second system.

# The Mean Scores of the Math Performance Test



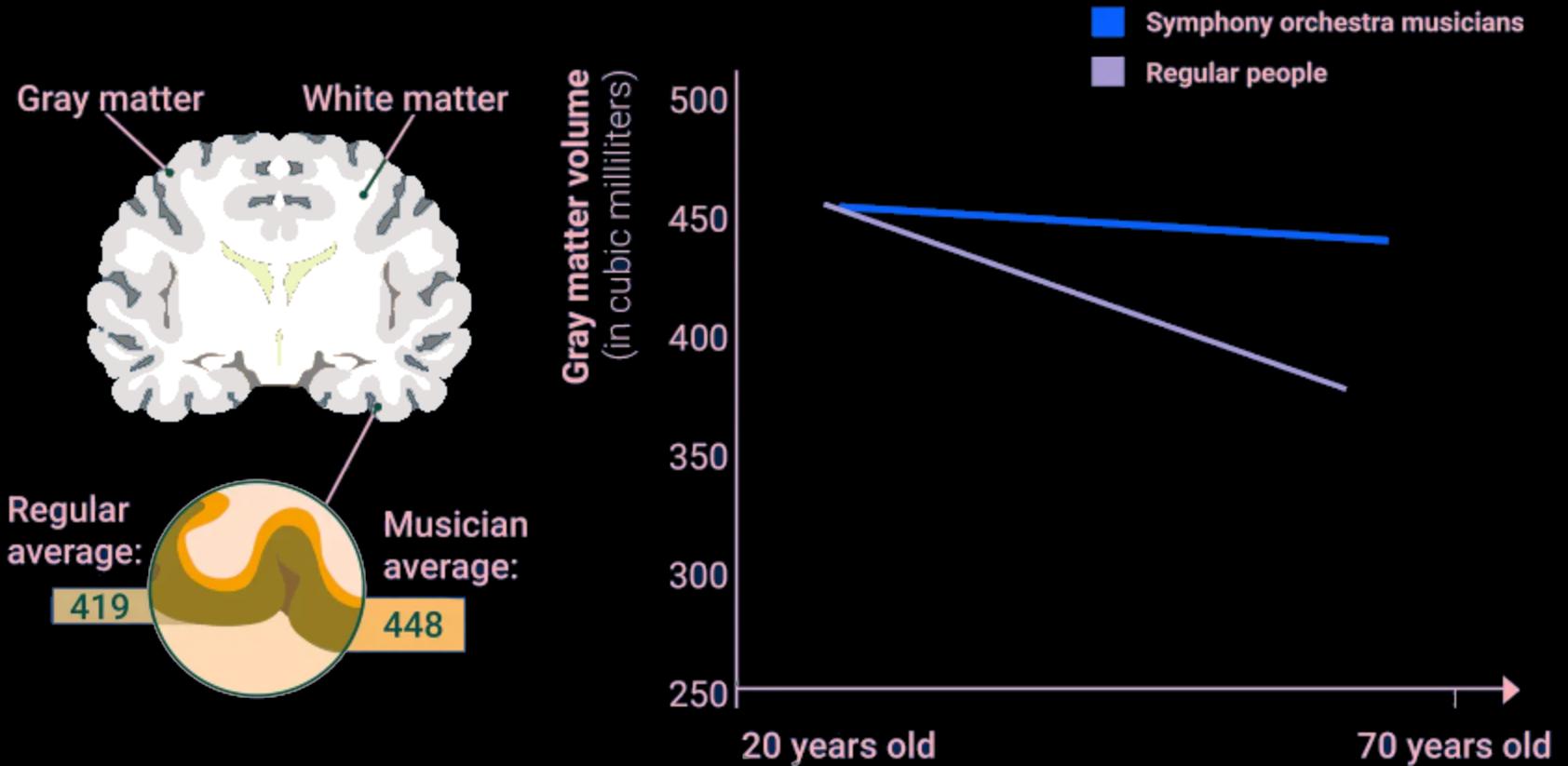
## Mozart Music Significantly Increases Spatial IQ Score





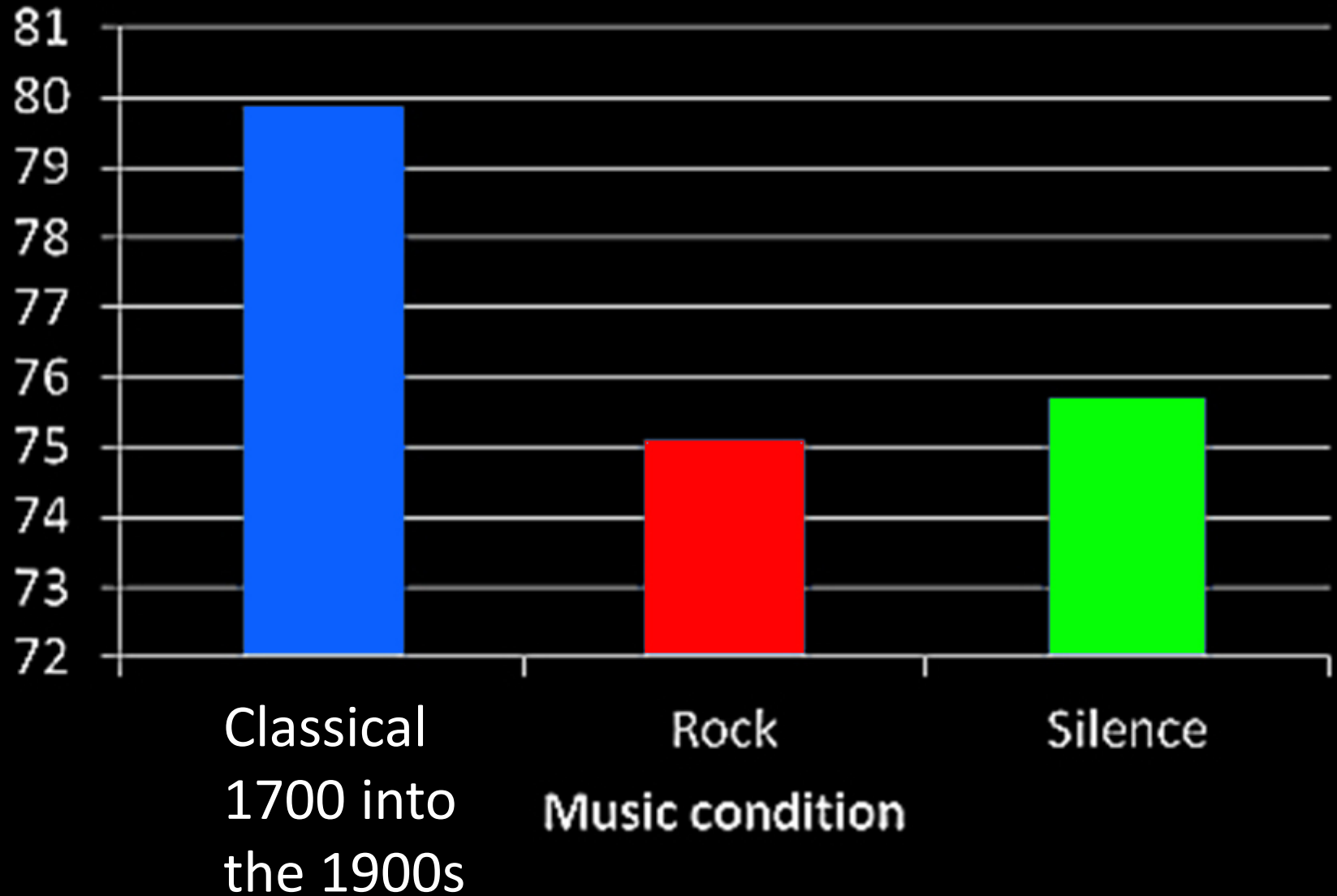
# Orchestra Musicians' Gray Matter Volume

## High, Barely Declines With Age

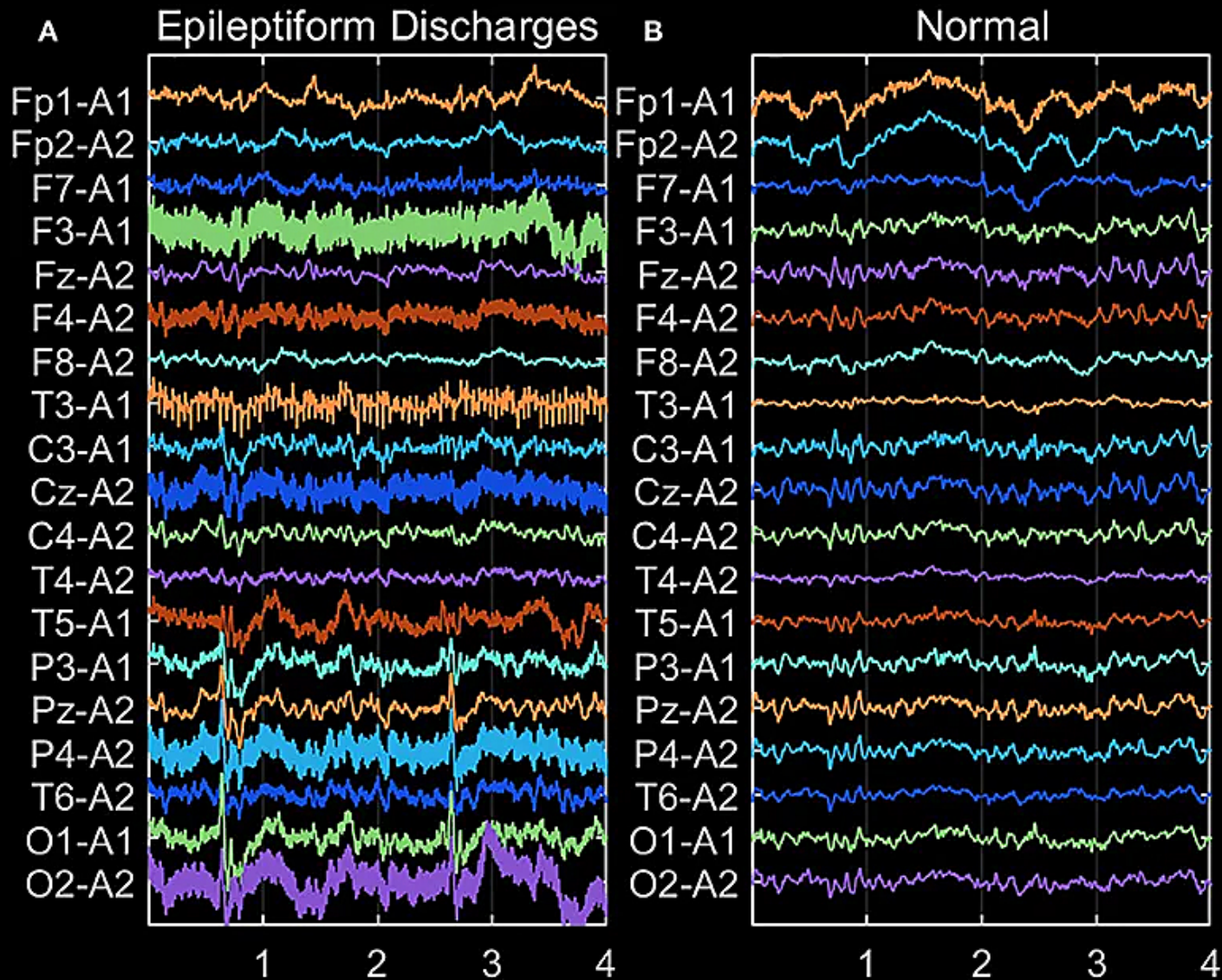




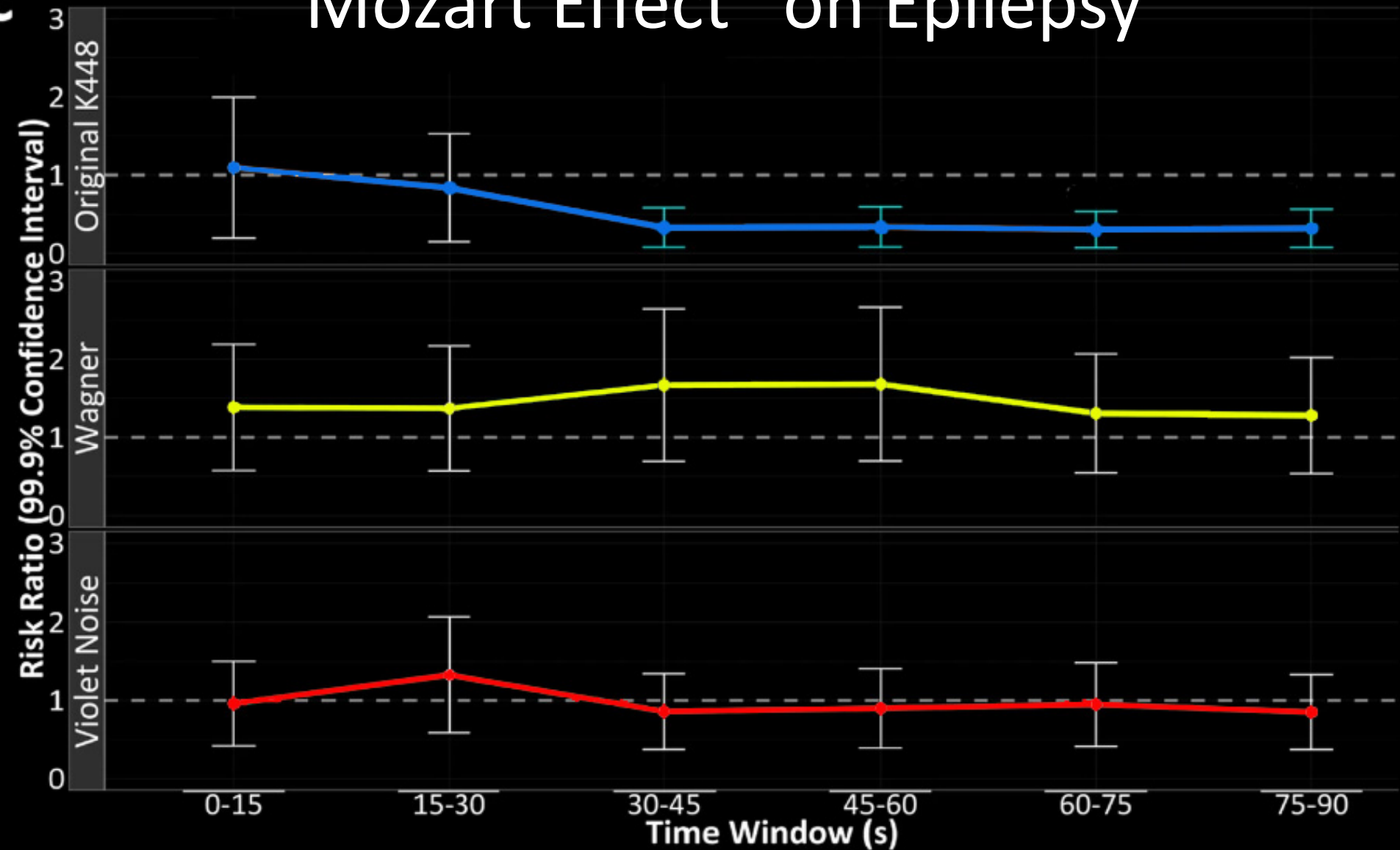
# The effect of background music genre on cognitive processing ability.



# “Mozart Effect” on Epilepsy



# “Mozart Effect” on Epilepsy



# Sonata for Two Pianos in D major, K.448/375a

1. Allegro con spirito

W.A. Mozart

The image displays a musical score for the first movement of a sonata for two pianos. The score is written in D major and common time (C). It is divided into two systems, each containing two staves for the two pianos. The first system shows the initial measures, featuring a forte (f) dynamic and a trill (tr) in the right hand of both pianos. The second system begins at measure 6, marked with a '6' above the first staff. The notation includes various musical symbols such as trills, triplets, and slurs, indicating complex rhythmic and melodic patterns. The score is presented in a clear, black-and-white format, typical of a printed musical score.

# Piano Sonata in C major

No.16 K.545

Wolfgang Amadeus Mozart

*Allegro.*

The musical score is presented in two systems. The first system begins with a treble clef and a common time signature. The right hand part starts with a series of eighth notes, followed by a trill marked 'tr'. The left hand part consists of a steady eighth-note accompaniment. The second system continues the piece, featuring a trill in the right hand and a crescendo in the left hand. The score ends with a fermata and a final chord.

© [www.youtube.com/user/TheGreatRepertoire](http://www.youtube.com/user/TheGreatRepertoire)

## Köchel Verzeichnis

# Music Characteristics

Natural rules

Structure

Harmony

Proportion

Balance

Mathematical logic

## Classical

Wide ranges of

Rhythm

Dynamics

Tempo

Longer length

## Popular/Rock

Narrow ranges of

One rhythm

Can be deafening

One tempo

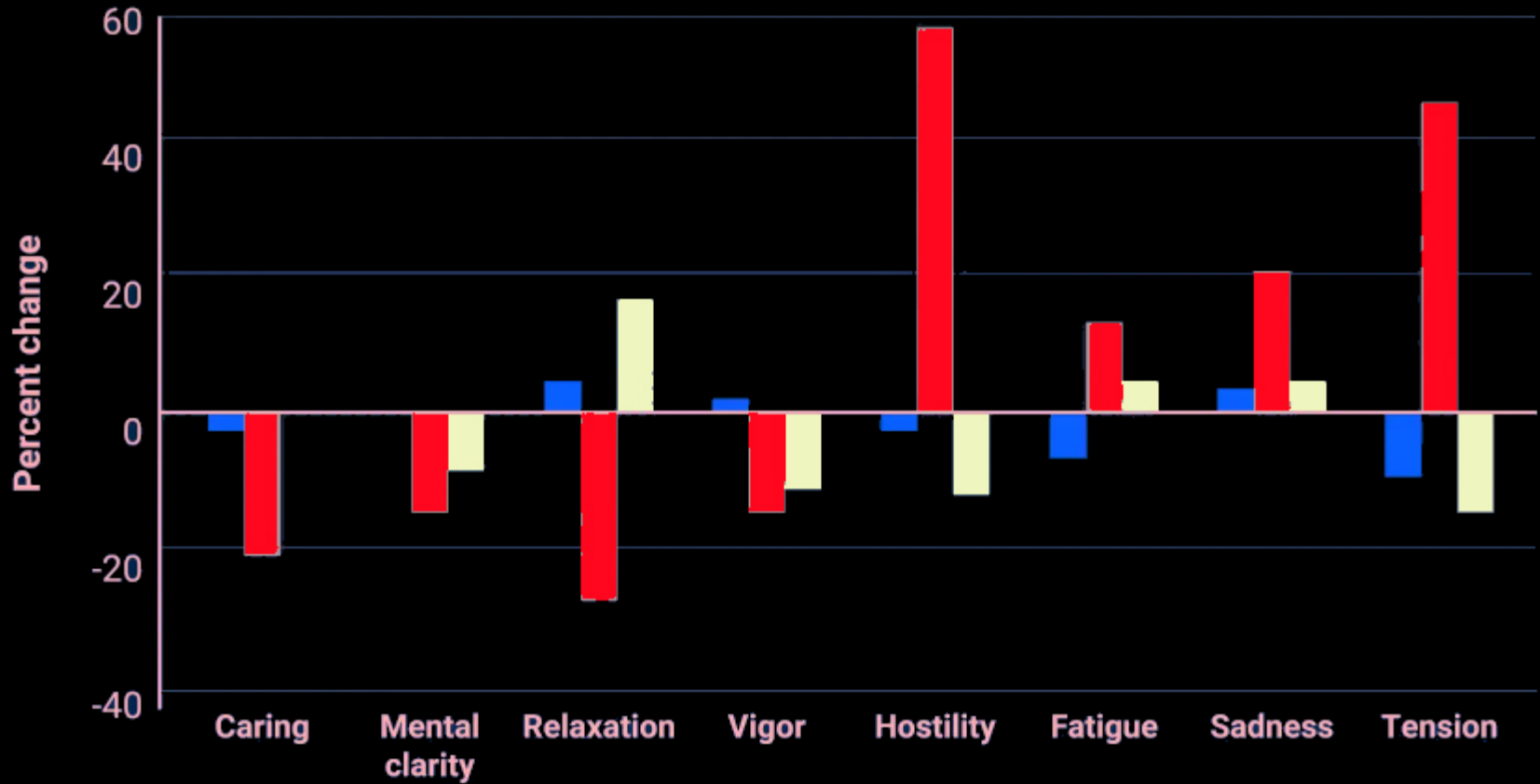
Short, repetitive



# Emotional and Mental Changes

## After Listening to Classical, Rock, and New Age Music

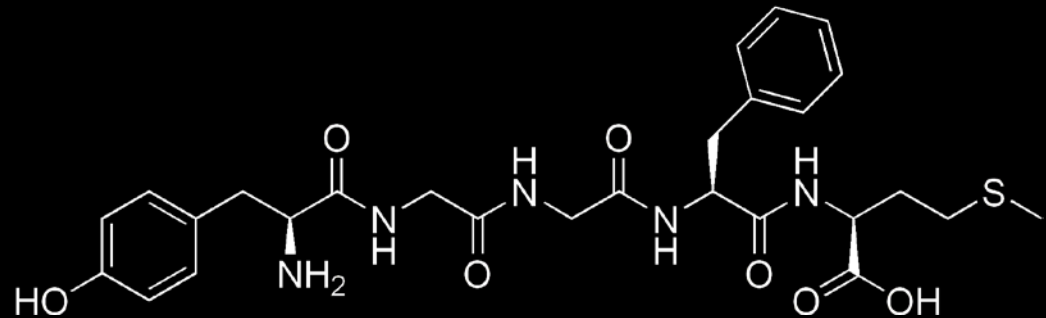
- Classical music
- Rock music
- New age music



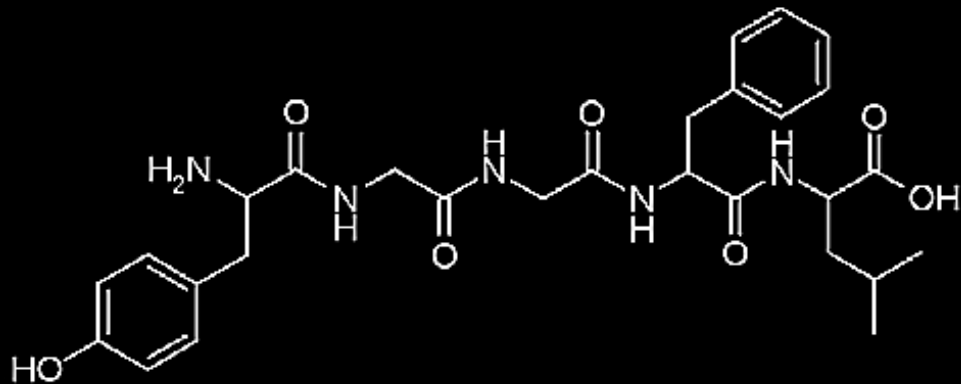


Music stimulates the brain's secretion of:

Endorphins



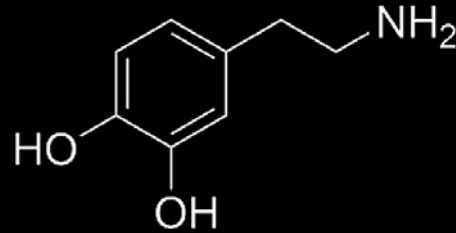
Enkephalins



# Music stimulates the brain's secretion of:

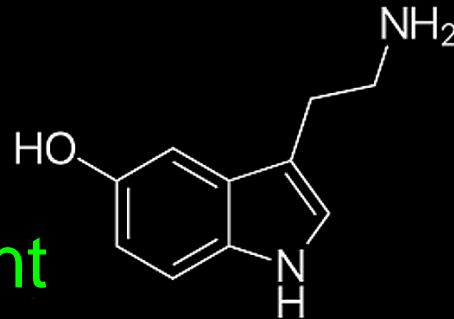
Dopamine

Pleasure



Serotonin

Antidepressant



Oxytocin - "Love hormone"

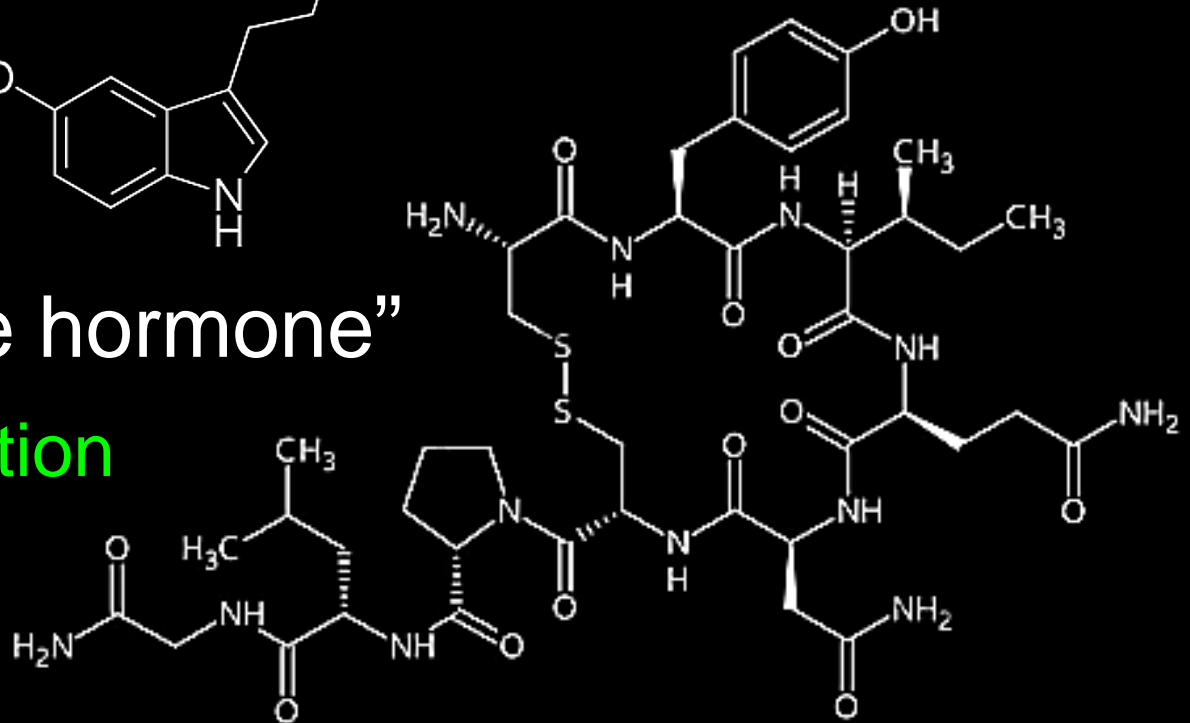
Uterine contraction

Milk secretion

Antistress

Anti-inflammatory      Antioxidant

Relaxation, trust, and overall psychological stability.



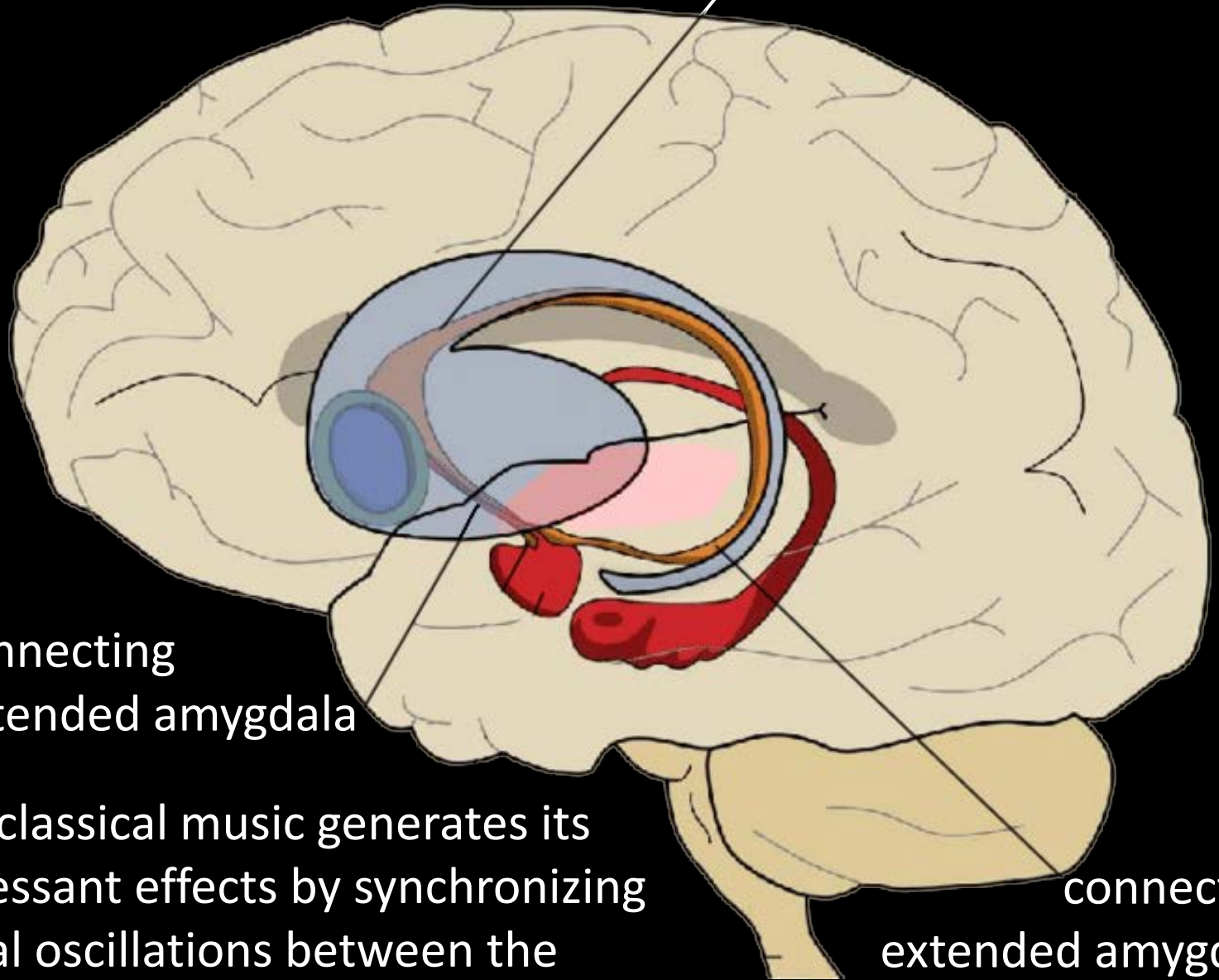
bed nucleus of the stria terminalis

auditory  
cortex

connecting  
extended amygdala

Western classical music generates its antidepressant effects by synchronizing the neural oscillations between the auditory cortex and this rewards circuit.

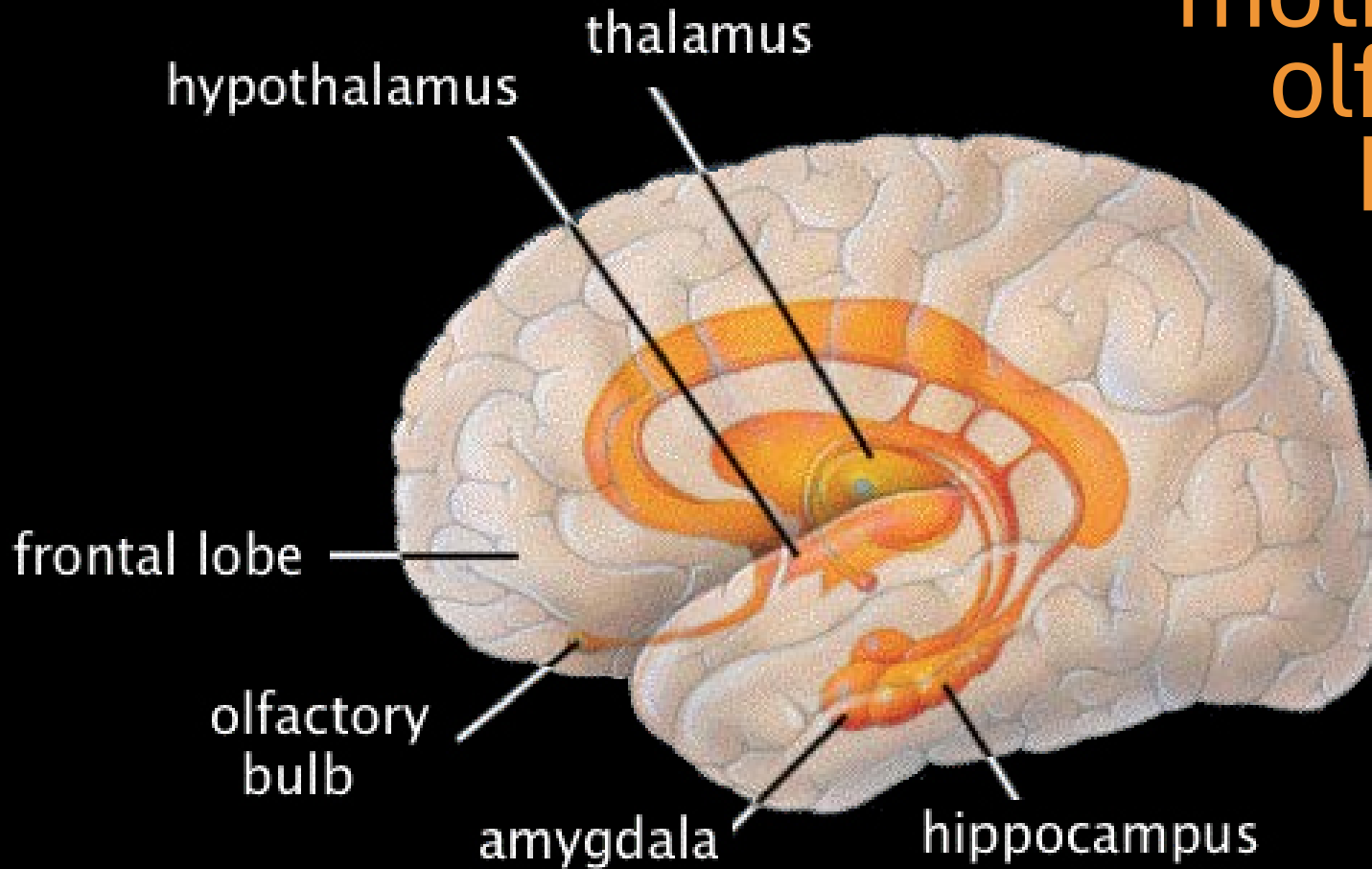
connecting  
extended amygdala



# Limbic System

Memolbe

Memory  
emotion  
motivation  
olfaction  
behavior

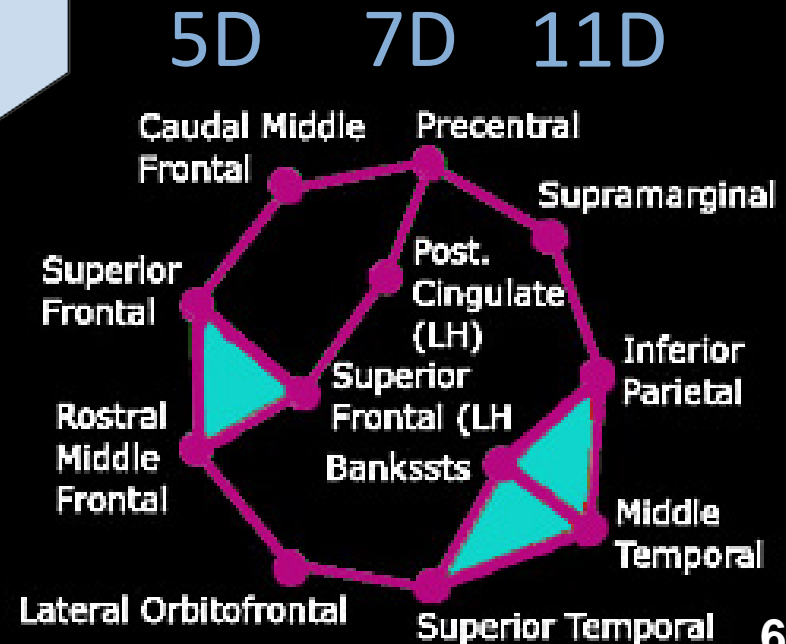
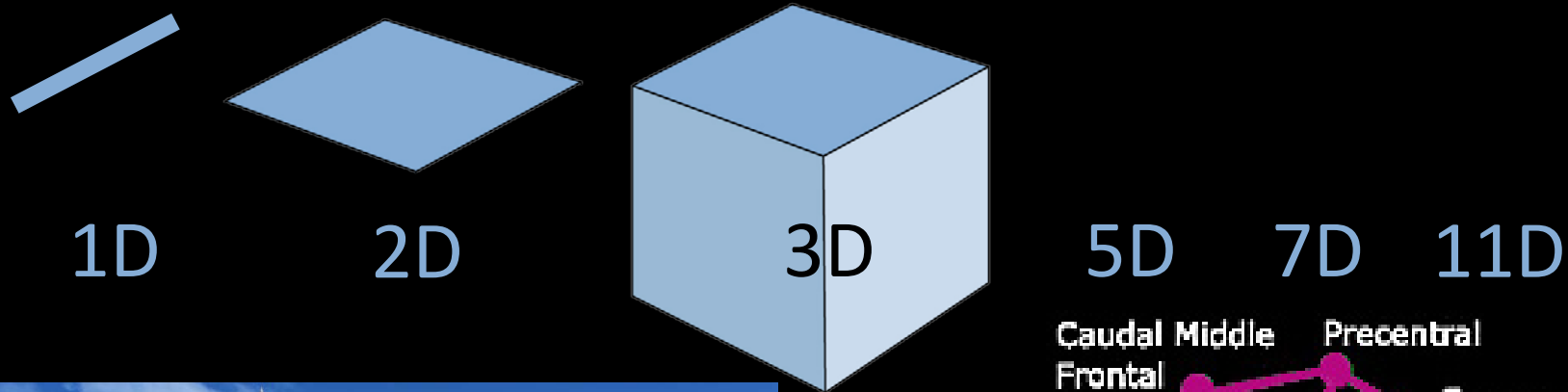


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# Multidimensional Processing

The link between structure and information processing in the human brain is completely different than in computers.

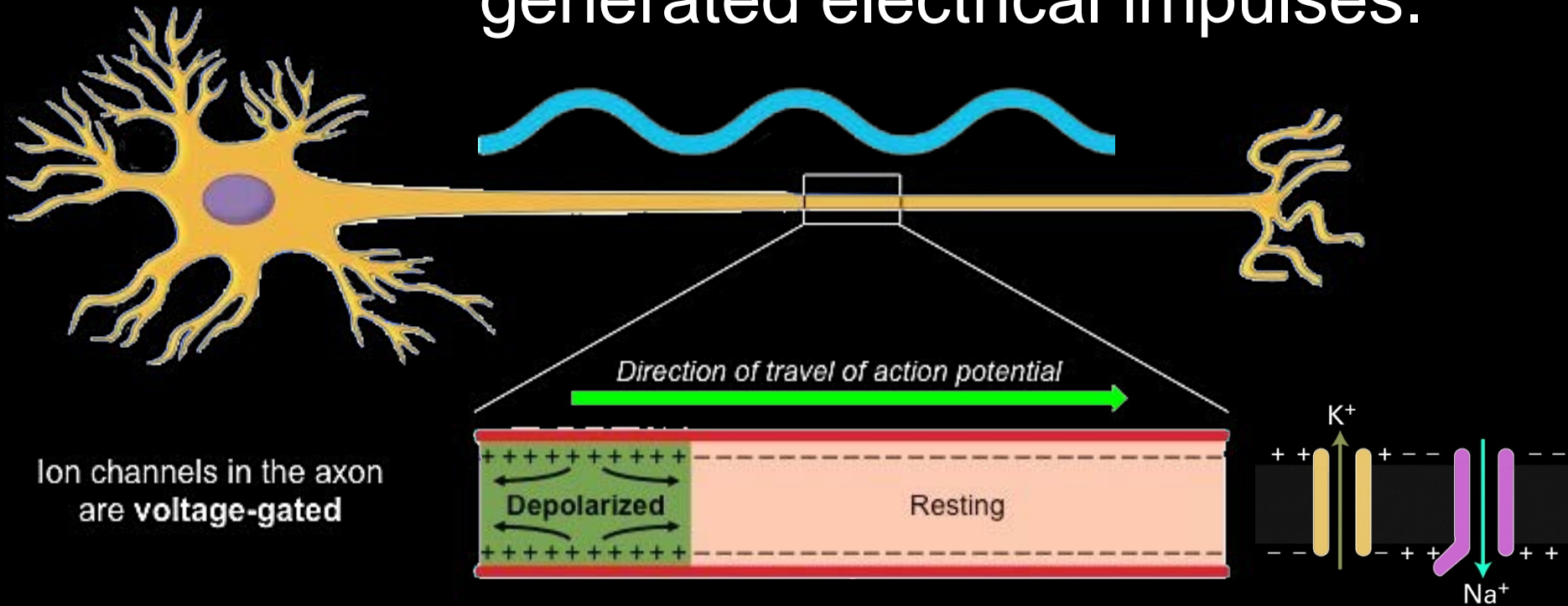


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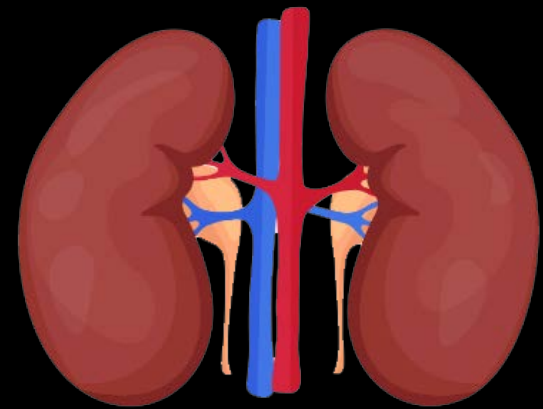
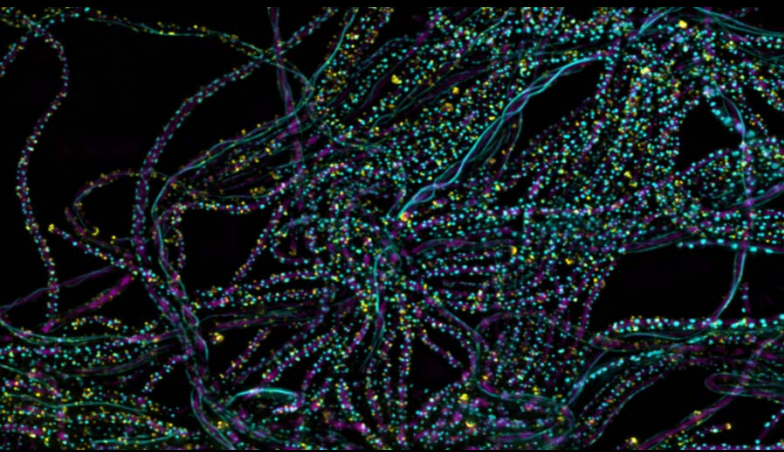
# Biophoton Brain Communication

The brain uses chemically generated electrical impulses.

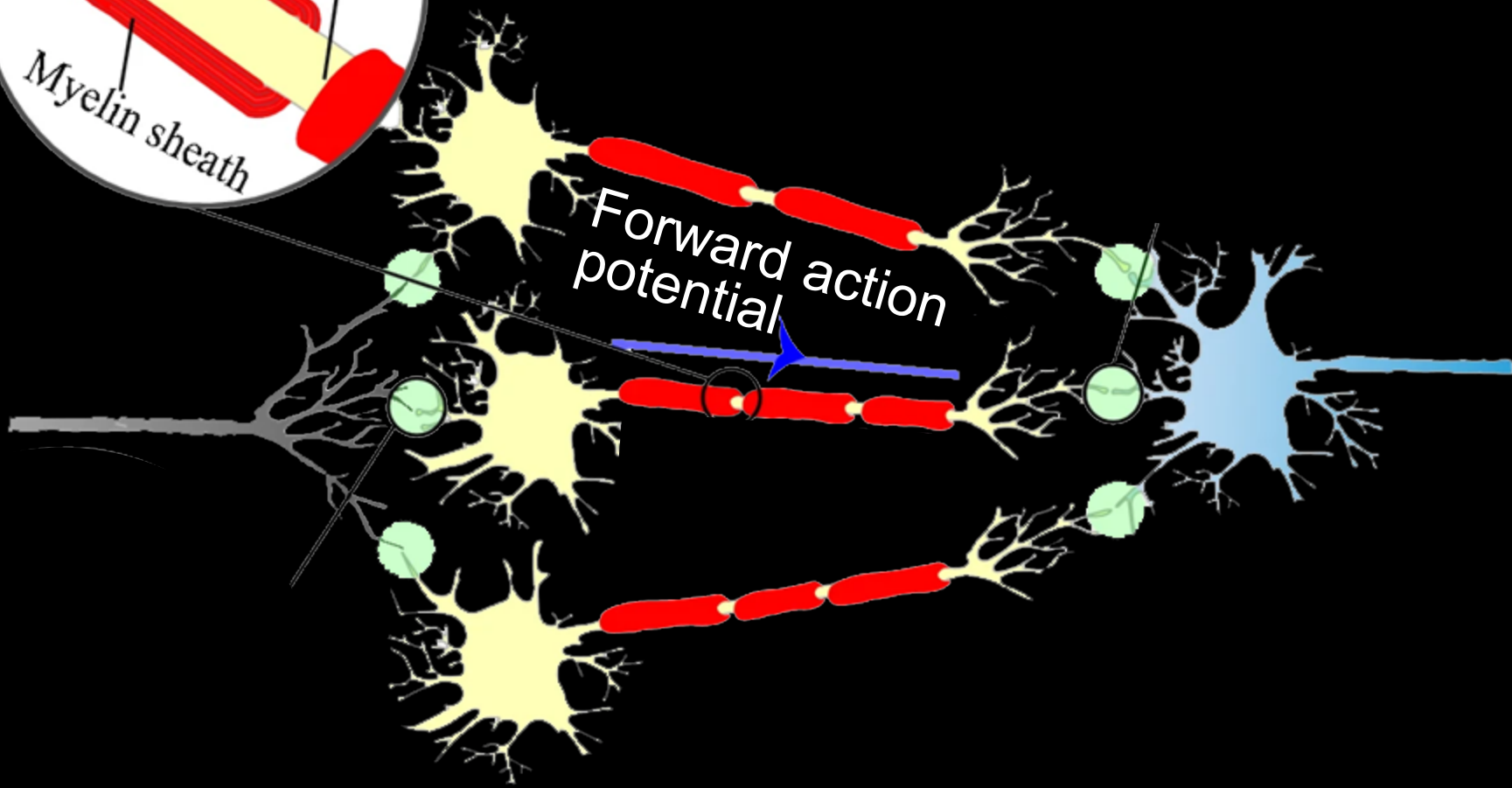
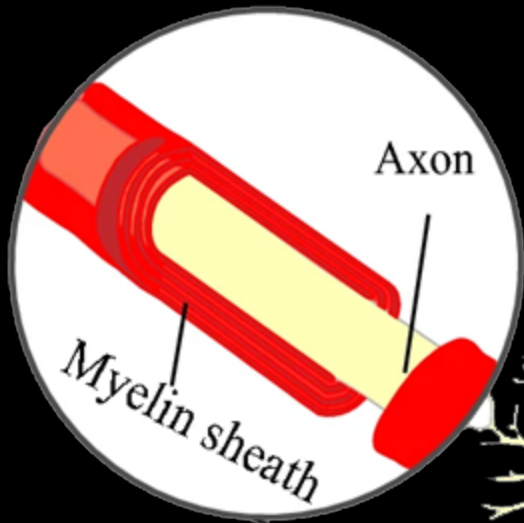




And now there is a lot of evidence that organisms use biologically generated photons to communicate as well.



One proposal is feedback in the brain in the neurons themselves:



**Another explanation is that since photons travel much more quickly than molecules or ions, distant parts of the brain can act in unison since signals are literally travelling at the speed of light, and explains the warp speed at which the brain functions.**

# Potential modes of biophoton network communication and repair among neurons.

Biophoton producing neuron

mitochondrion

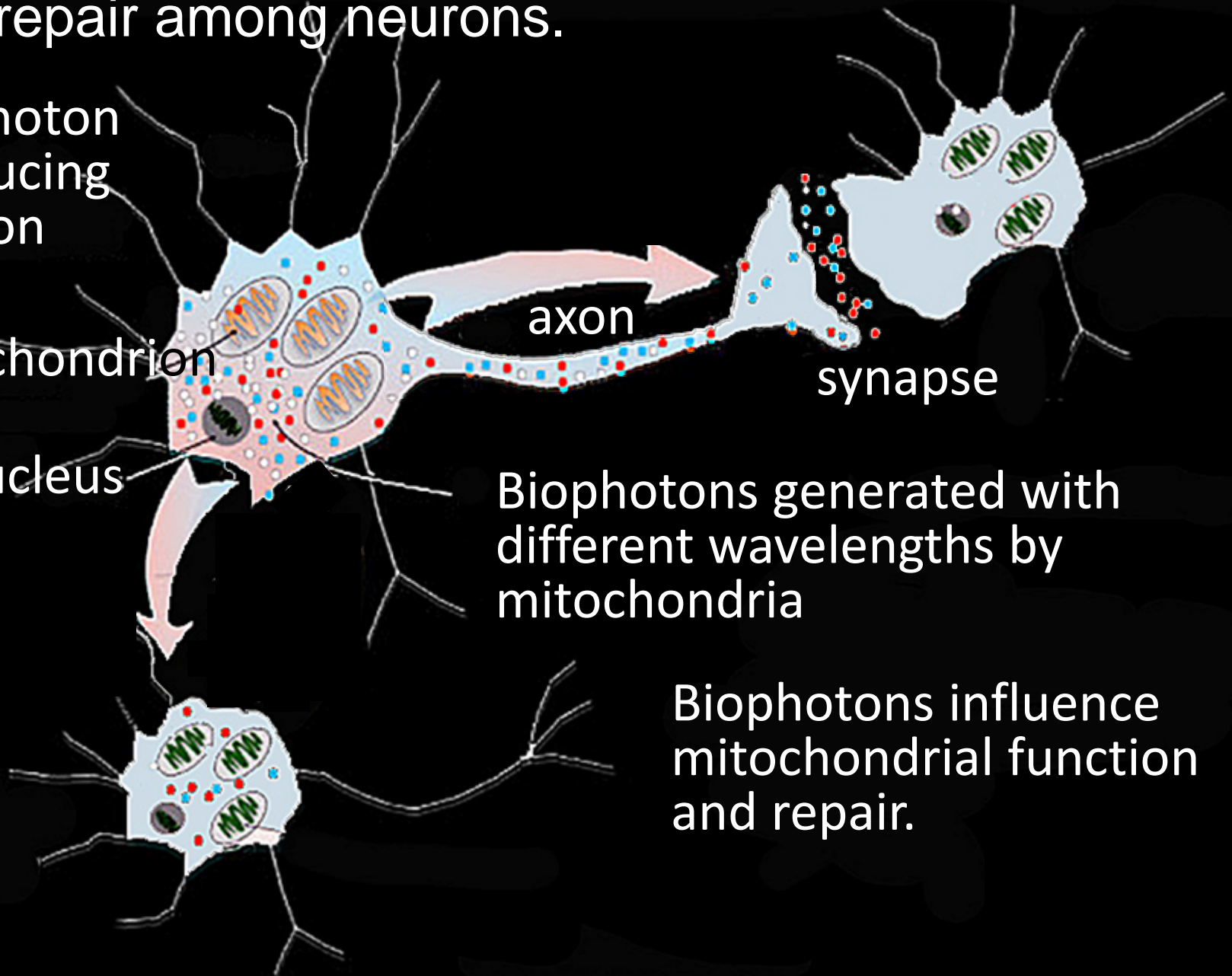
nucleus

axon

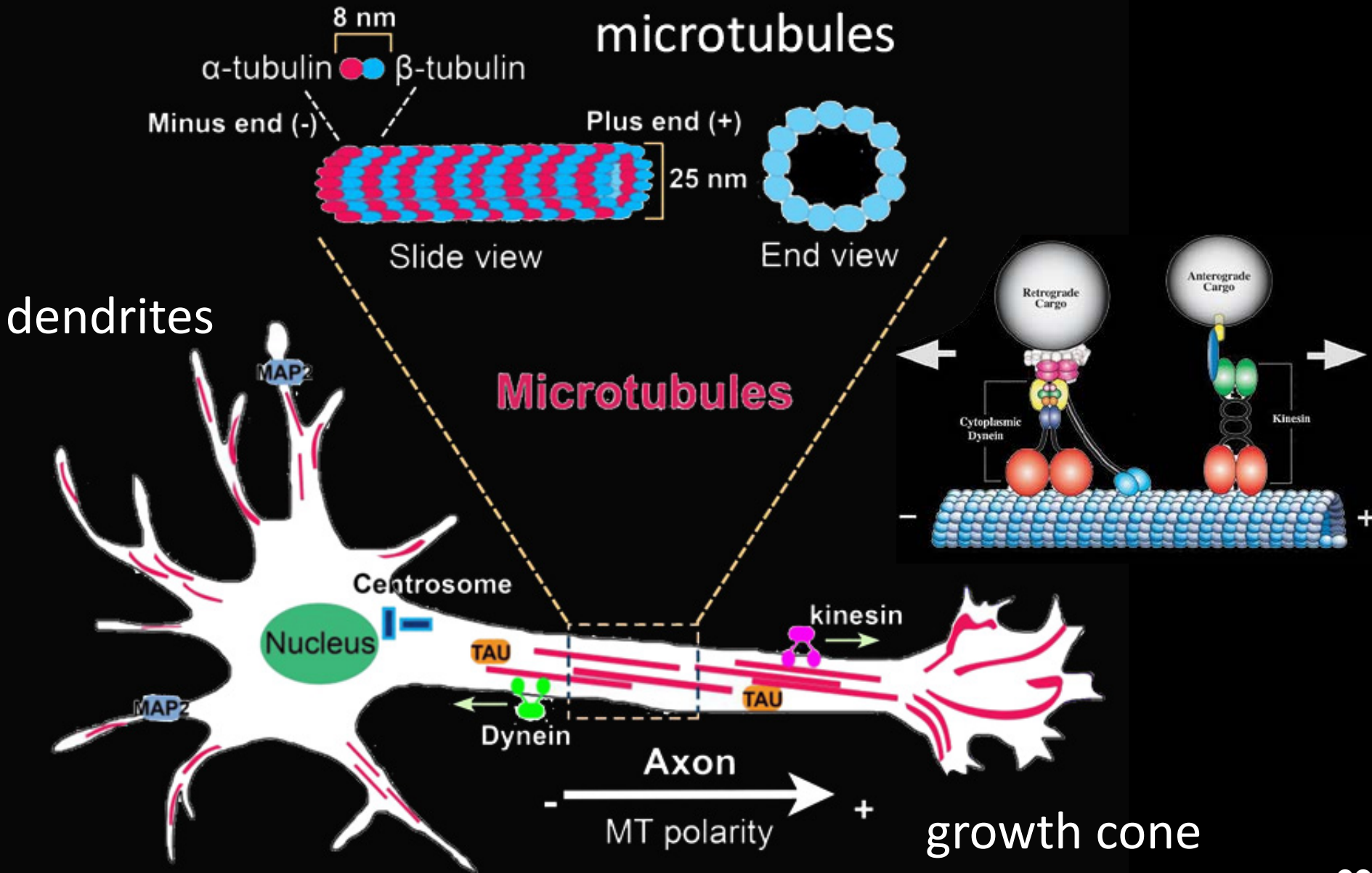
synapse

Biophotons generated with different wavelengths by mitochondria

Biophotons influence mitochondrial function and repair.

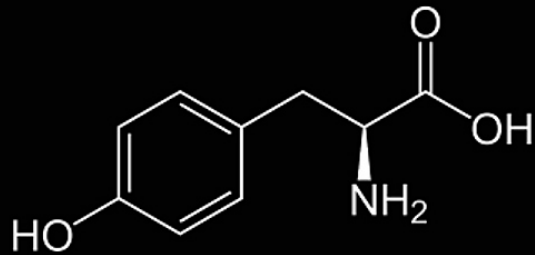


# Photon microtubule pathway in axon



# Photon light-sensitive molecular pathway

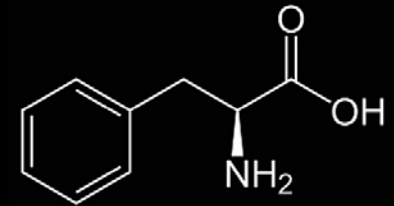
These amino acids are light-sensitive.




Tyrosine



Tryptophan

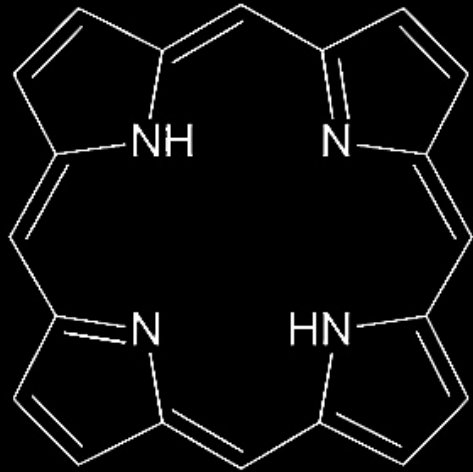


Phenylalanine

They are components of proteins, in this context think of the  $\alpha$    $\beta$  tubulin dimers that make up the microtubules.



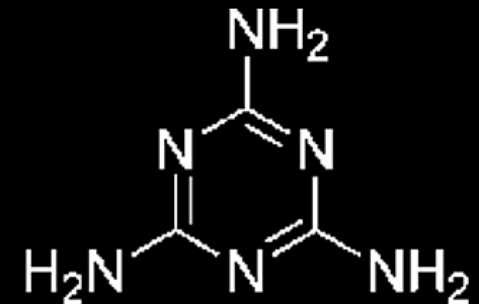
# Photon light-sensitive molecular pathway



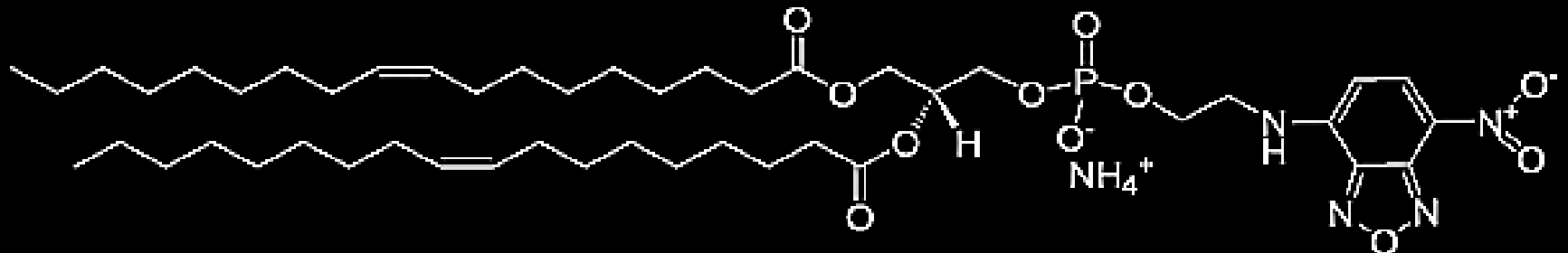
Porphyrin ring



Flavinic ion



Pyridinic rings



1,2-dioleoyl-sn-glycero-3-phosphoethanolamine-N-(7-nitro-2-1,3-benzoxadiazol-4-yl) (ammonium salt)



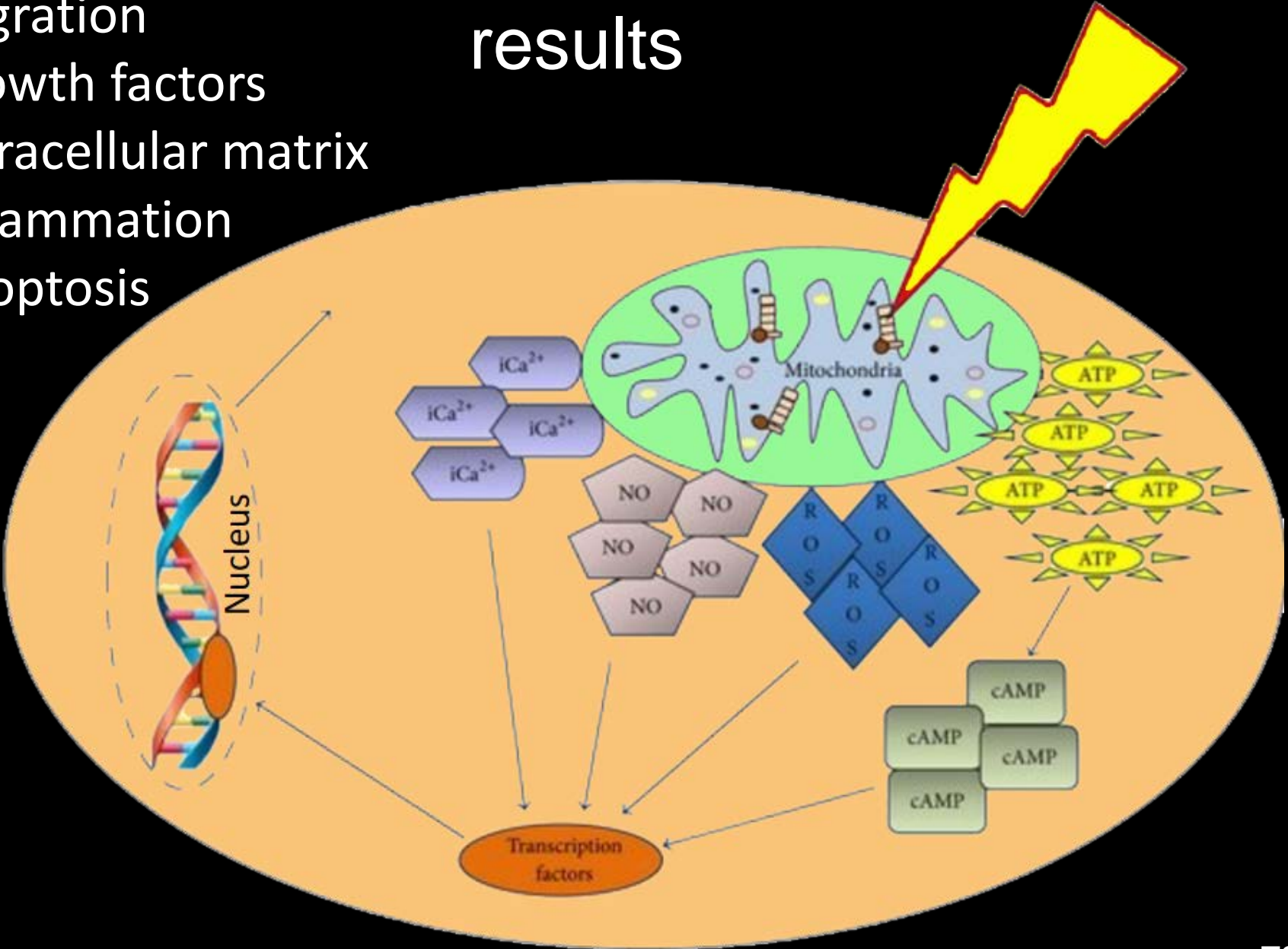
<https://www.youtube.com/watch?v=Gx-wrprplol>

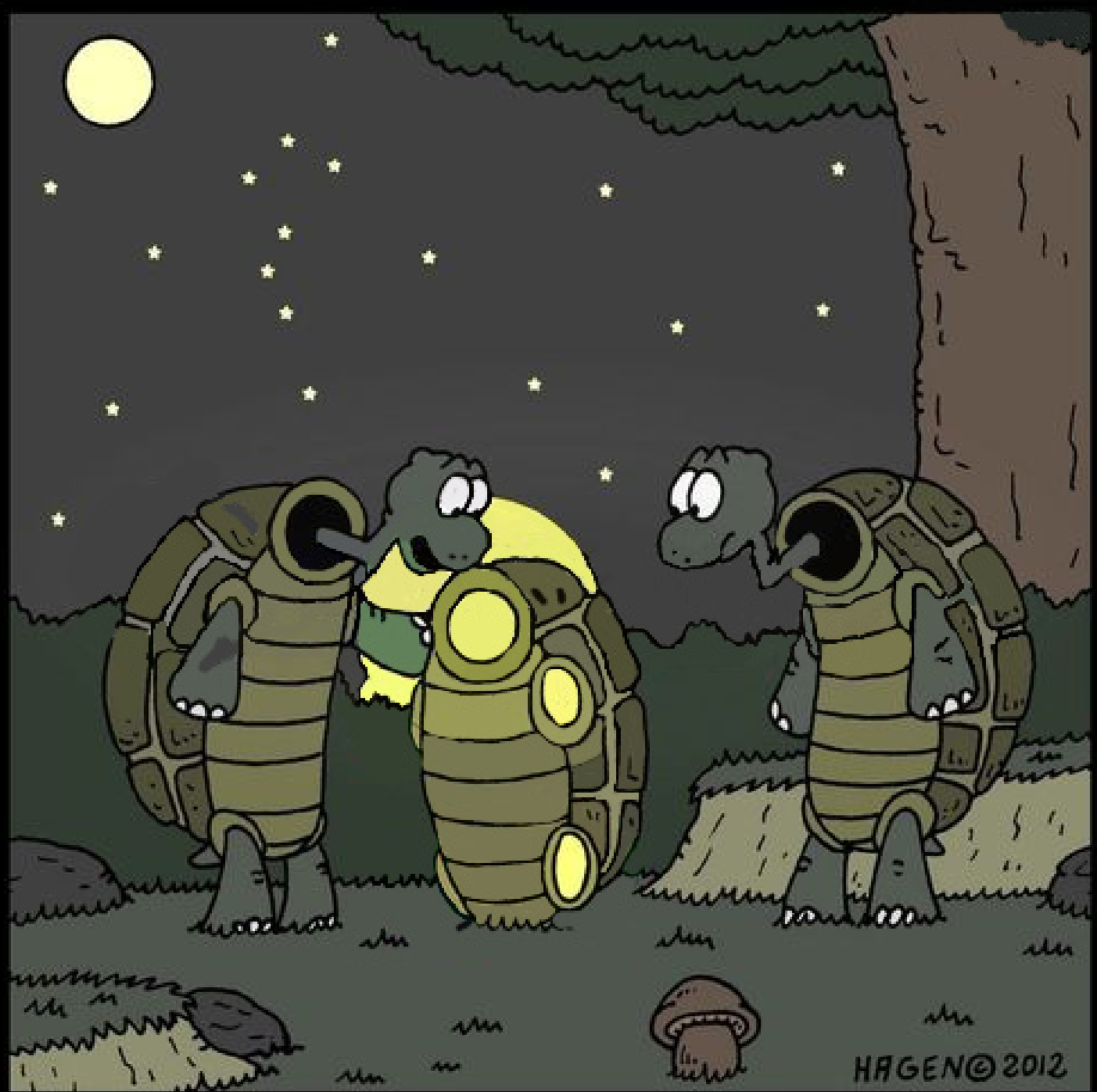
World champion stone skipper



# Photon communication results

- ↑ Proliferation
- ↑ Migration
- ↑ Growth factors
- ↑ Extracellular matrix
- ↓ Inflammation
- ↓ Apoptosis





“Yes, the lights are on, but nobody’s home.”

HAGEN © 2012

# Characteristics and Actions

1. Perfect Optimization
2. Vast Computational Power
3. Phenomenal Processing Speed
4. Optimal Energy Efficiency
5. Petabyte Level Memory Capacity
6. How Memories Are Stored
7. Master Secretor of Hormones and CSF
8. Where we Play and Laugh and Love
9. The “Mozart Effect”
10. Multidimensional Processing
11. Biophoton Brain Communication

# ROMANS 12:2

**And do not be conformed to this world, but be transformed by the renewing of your mind, that you may prove what is that good and acceptable and perfect will of God.**

# **Scripture Series**

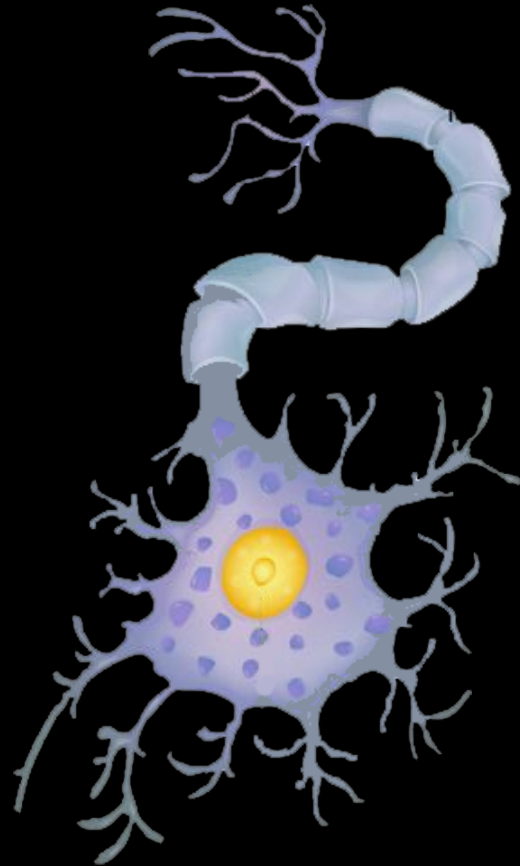
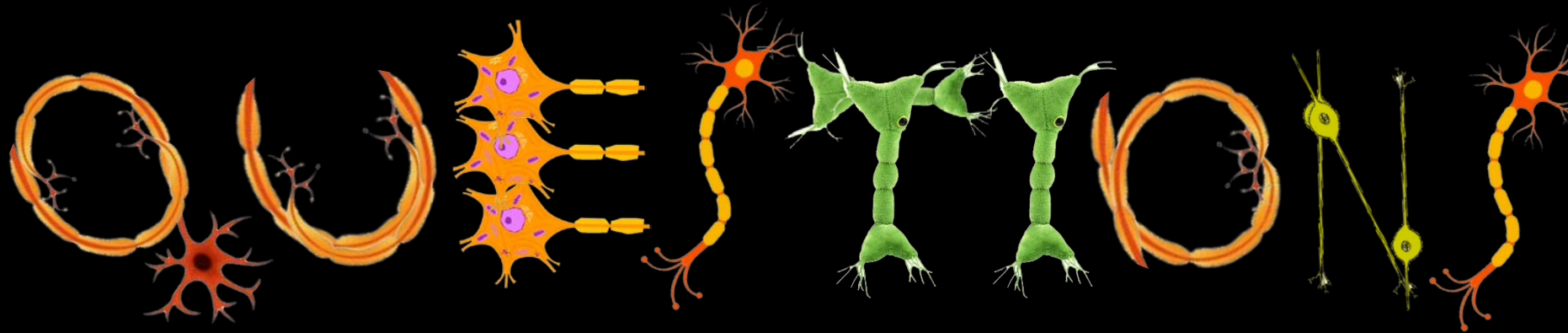
## **Genesis 1-11**


**[www.AzOSA.org](http://www.AzOSA.org)**

**Click on Resources**

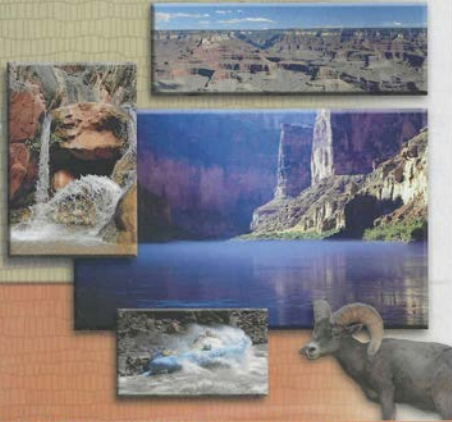
**Click on PowerPoint**

**Select a language**






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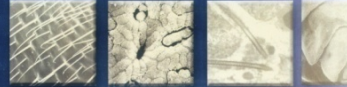


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The anatomy of light production  
in the firefly: *Photinus pyralis*




  
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Answering Life's Four Essential Questions



 CREATION SERIES 6

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This is the first volume of a trilogy that is focused on the first eleven chapters of Genesis. It is historical biblical fiction, combining the patriarchs in scripture with fictional characters to flesh out on a more personal basis how this history unfolded. It is exceedingly well written. It can be ordered on Amazon.

