AI and Deep Learning

(Lecture 2)

Yung-Cheol BYUN, Jeju National Univ.

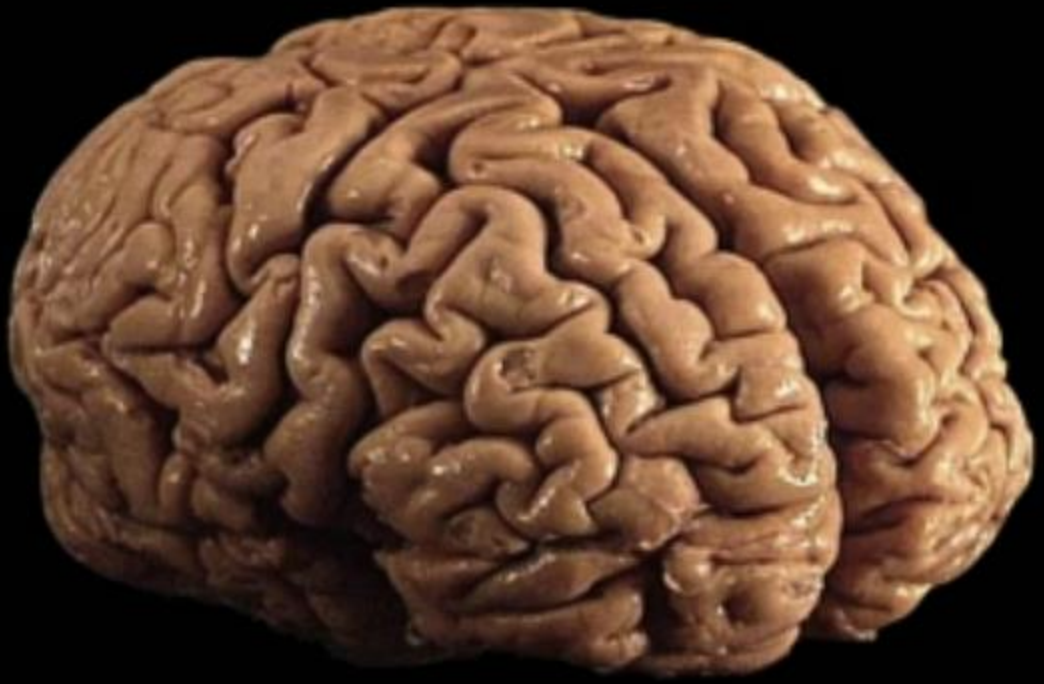
Agenda

- Artificial Intelligence
- Brain and Neurons
- Learning
- Regression
- Deep Neural Networks
- CNN
- RNN
- Unsupervised Learning
- Reinforcement Learning
- AI Applications

컴퓨터가 잘하는 것,
사람이 잘하는 것

Now,
machines do better
than human
in almost areas

How can machines get AI?



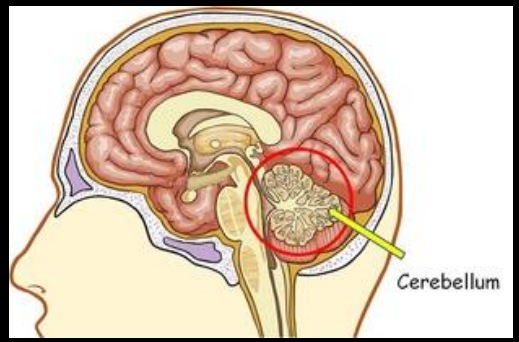
What happens inside the human brain?

Neuroanatomist

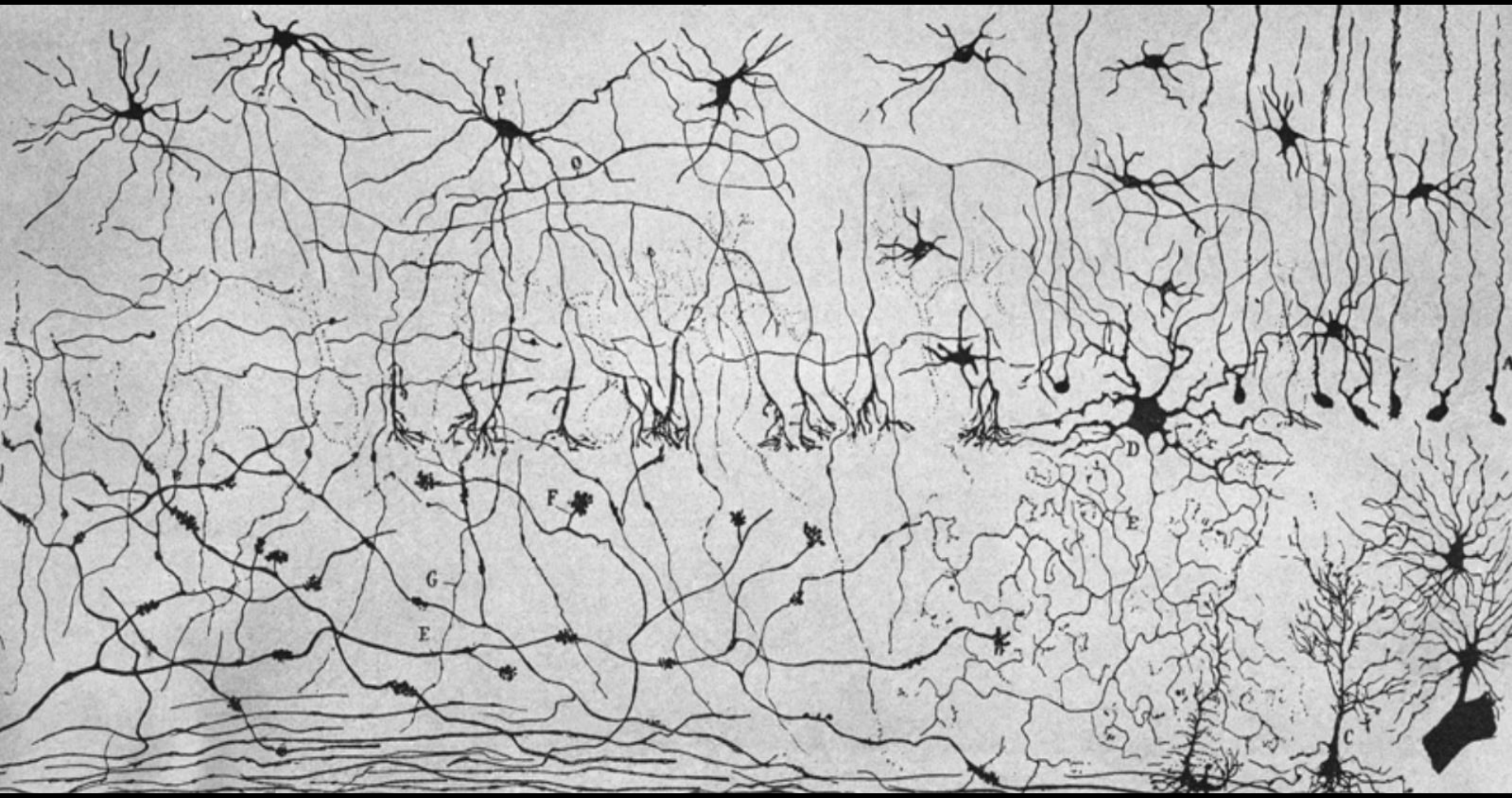
신경해부학자

산티아고 라모 니 카할, 스페인

세레벨럼 : 척추돌물 두개골 뒤쪽에 있는
뇌의 일부분, 근육 운동을 조절함.



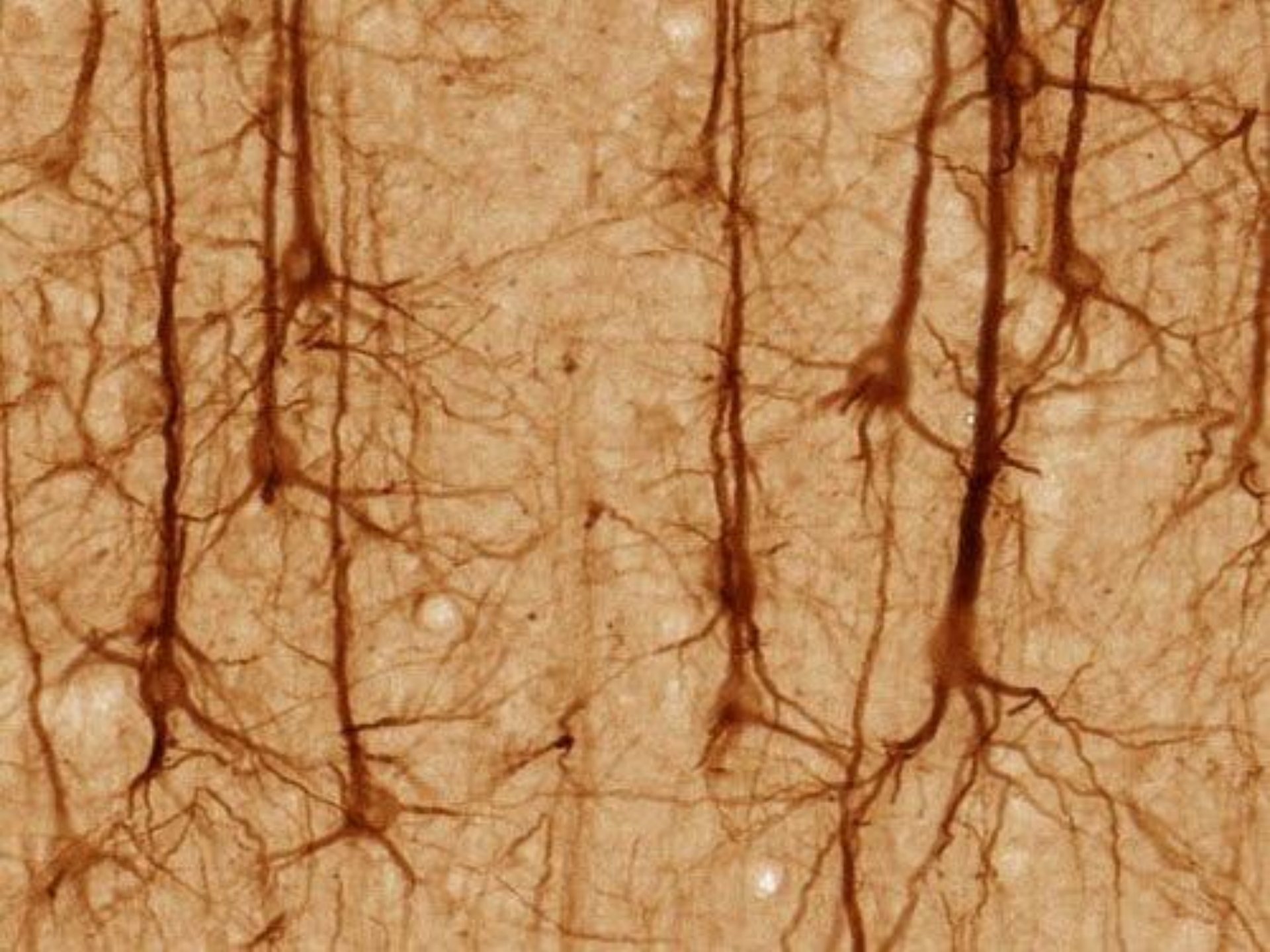
Neurons in a bird's brain



Ramón y Cajal's drawing of the neurons in a bird's cerebellum – a part of the brain.

Brain of Human


1
2
3
4
5
6
7

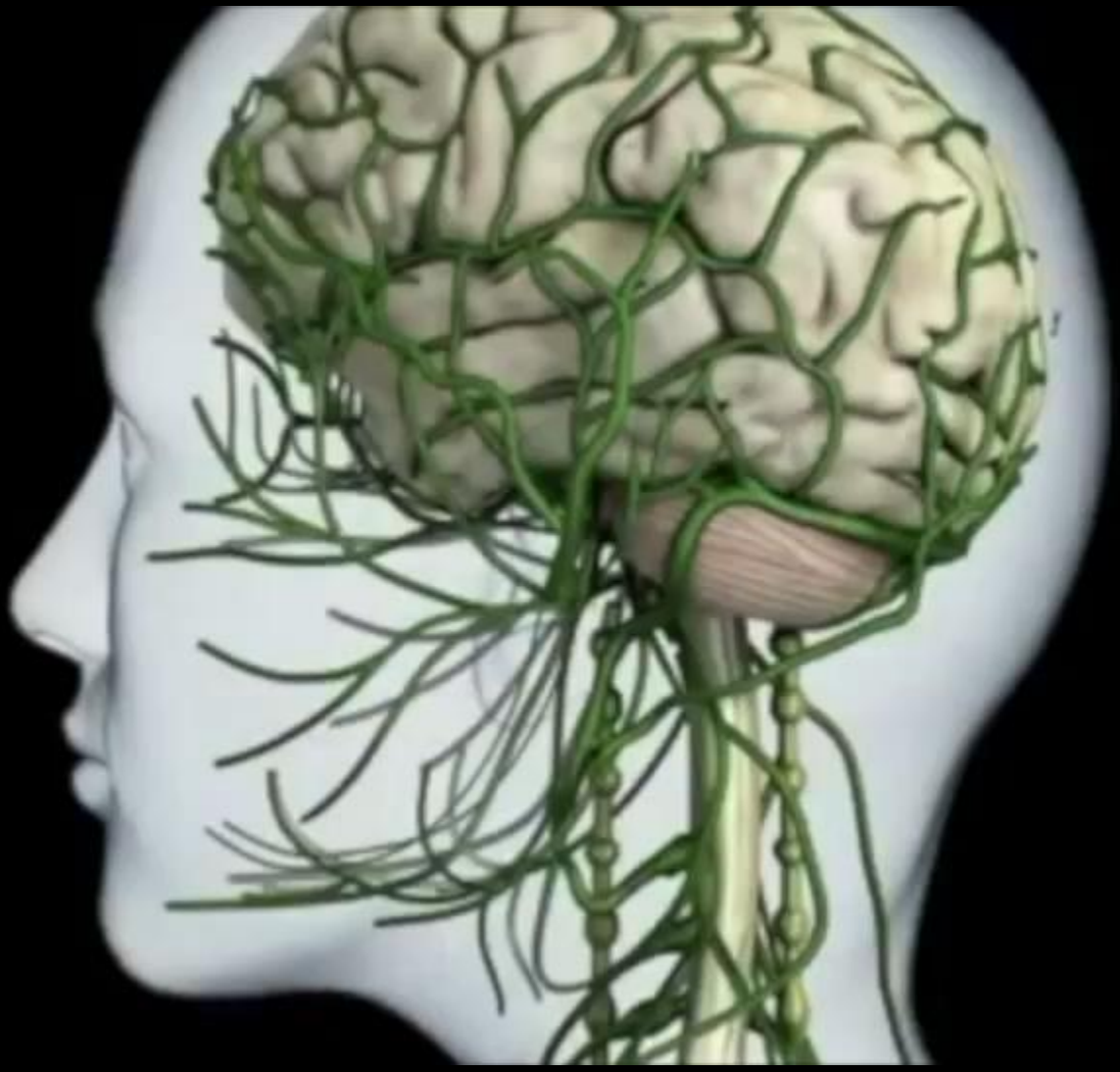


{1,000억 개 뉴런}

100 billion neurons

more than the
number of stars
in the universe

So, what happens inside?

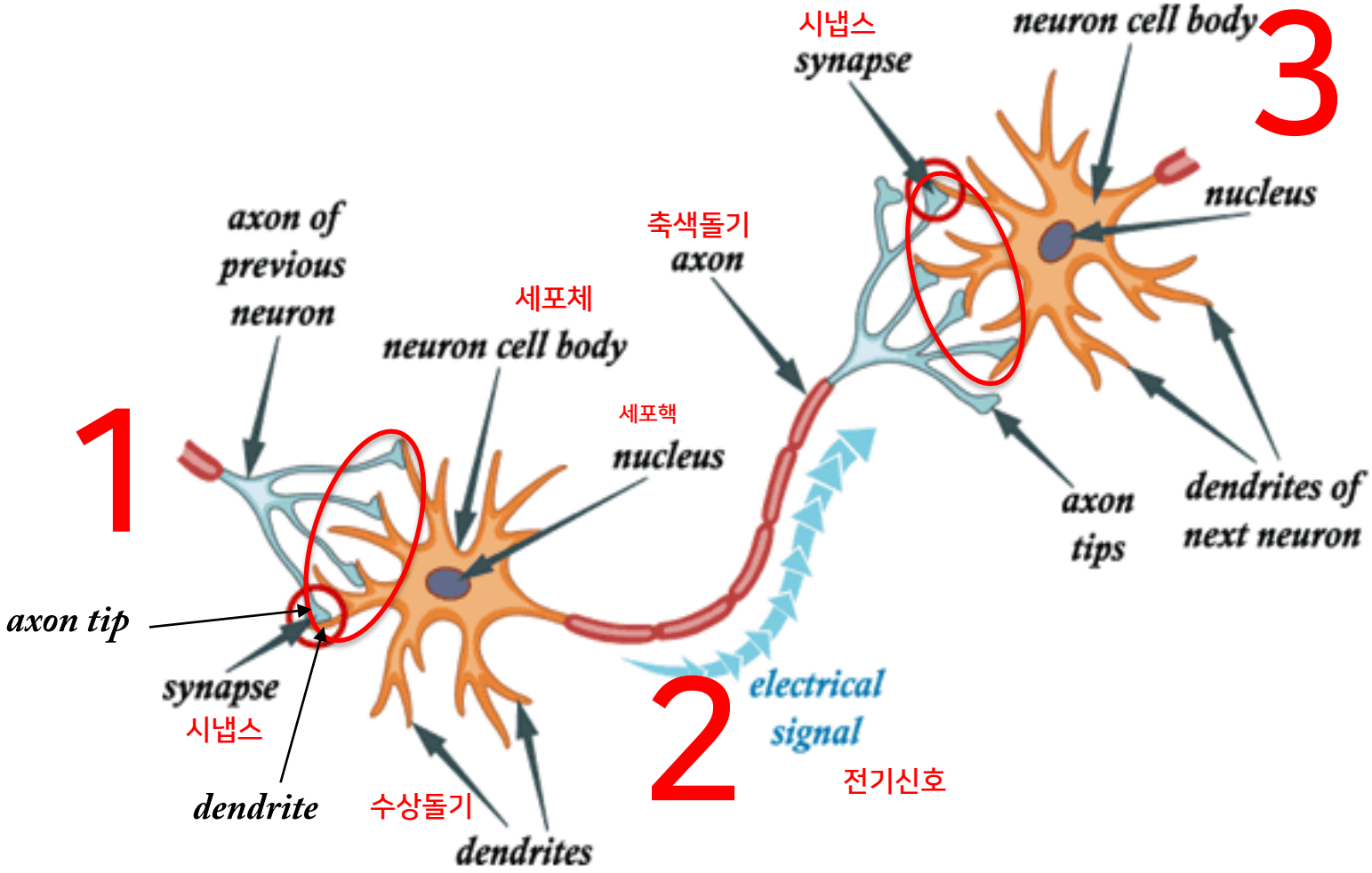


From a DVD that comes with the illustrated medical atlas, The Human Brain, DK Publishing UK.

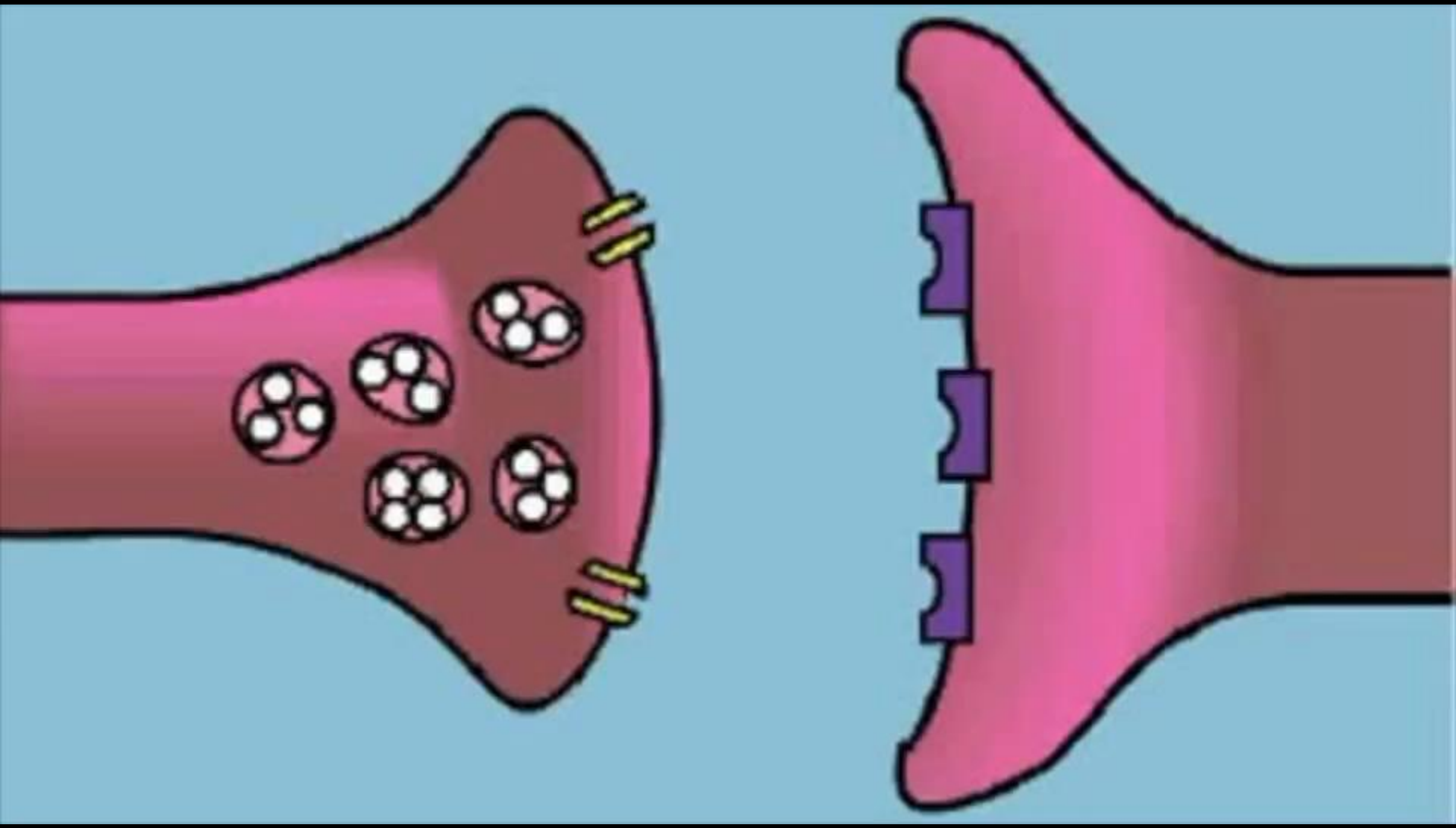
뉴런은 ON 혹은 OFF

- Signal or no signal
- 매우 단순

뉴런이 연결된 모습


시냅스
synapse
neuron cell body
3
nucleus
축색돌기
axon
axon of
previous
neuron
세포체
neuron cell body
세포핵
nucleus
1
axon
tips
dendrites of
next neuron
axon tip
synapse
시냅스
dendrite
수상돌기
dendrites
2
electrical
signal
전기신호

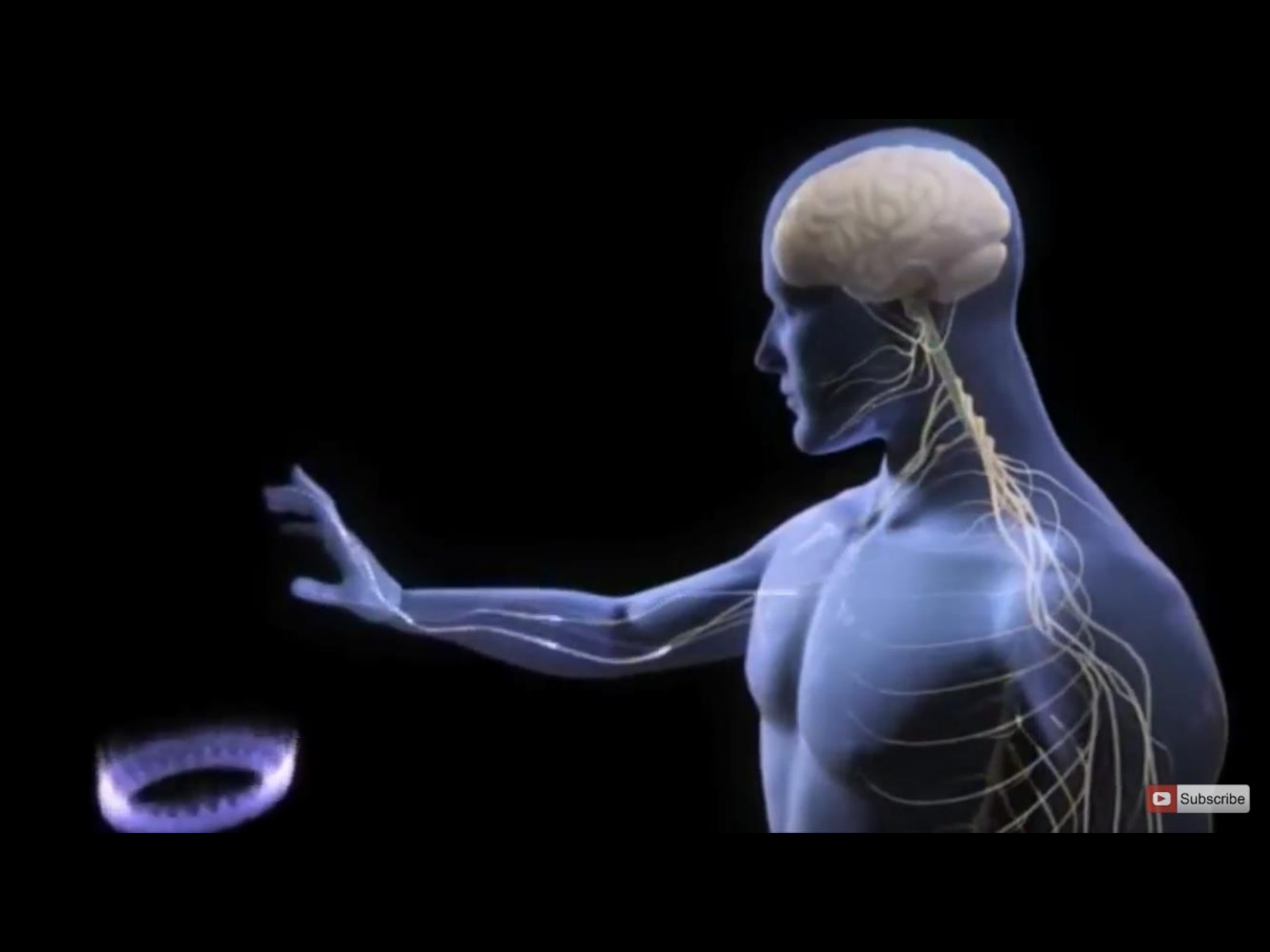
연결부위(시냅스)에서 어떤 일이...

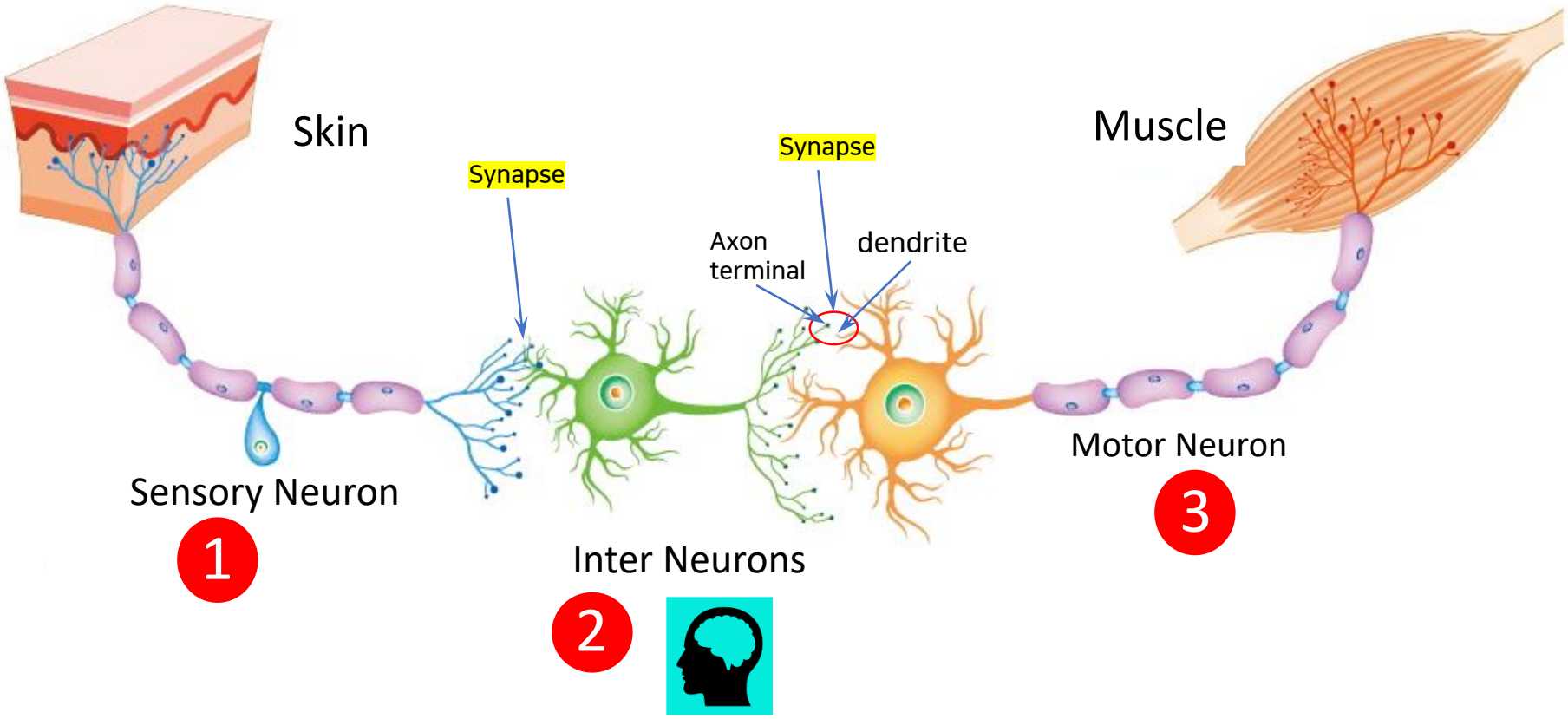


시냅스를 통한 신호 전달 시뮬레이션

A brain in a supercomputer | Henry Markram

우리가 하는 모든 일,
우리 몸(뇌)에 흐르는
전기신호로 가능


Subscribe


Skin
Synapse
Synapse
Muscle
Axon terminal
dendrite
Sensory Neuron
1
Inter Neurons
2
Motor Neuron
3

인간의 고차원 기능은
단순한 뉴런의 수많은
연결로 가능하다.

하지만,
연결만 되었다고 되나?
고차원 기능, 어떻게 가능한가?

학습(Learning)

요 약

- 뇌와 뉴런
- 뉴런의 연결과 시냅스
- 뉴런 동작 원리
- 학습과 연결