

AI and Deep Learning

뇌와 뉴런

Jeju National University

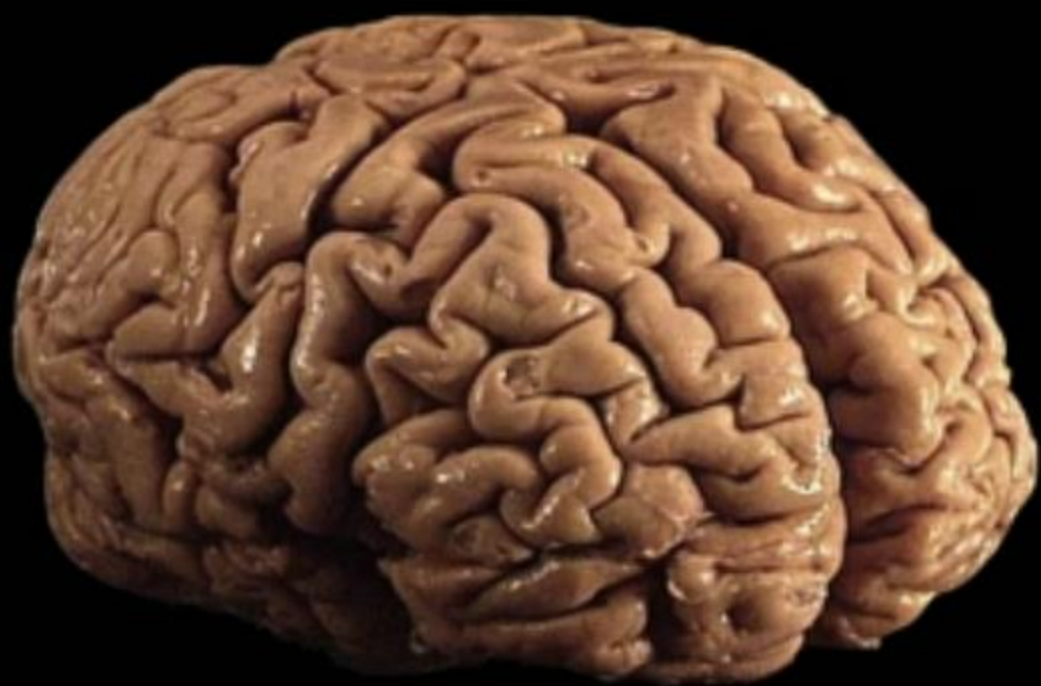
Yung-Cheol Byun

```
c:\W>git clone https://github.com/yungbyun/clecturenote.git
```

컴퓨터가 잘하는 것,
사람이 잘하는 것

Now,
machines do better
than human
in most areas with AI

How can machines
get Intelligence(AI)?



Agenda

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

Supervised
Learning

What happens inside
the human brain?

Neuroanatomist

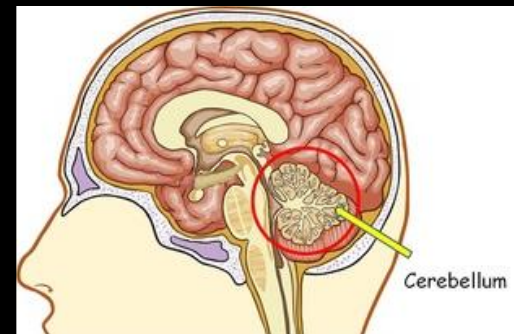
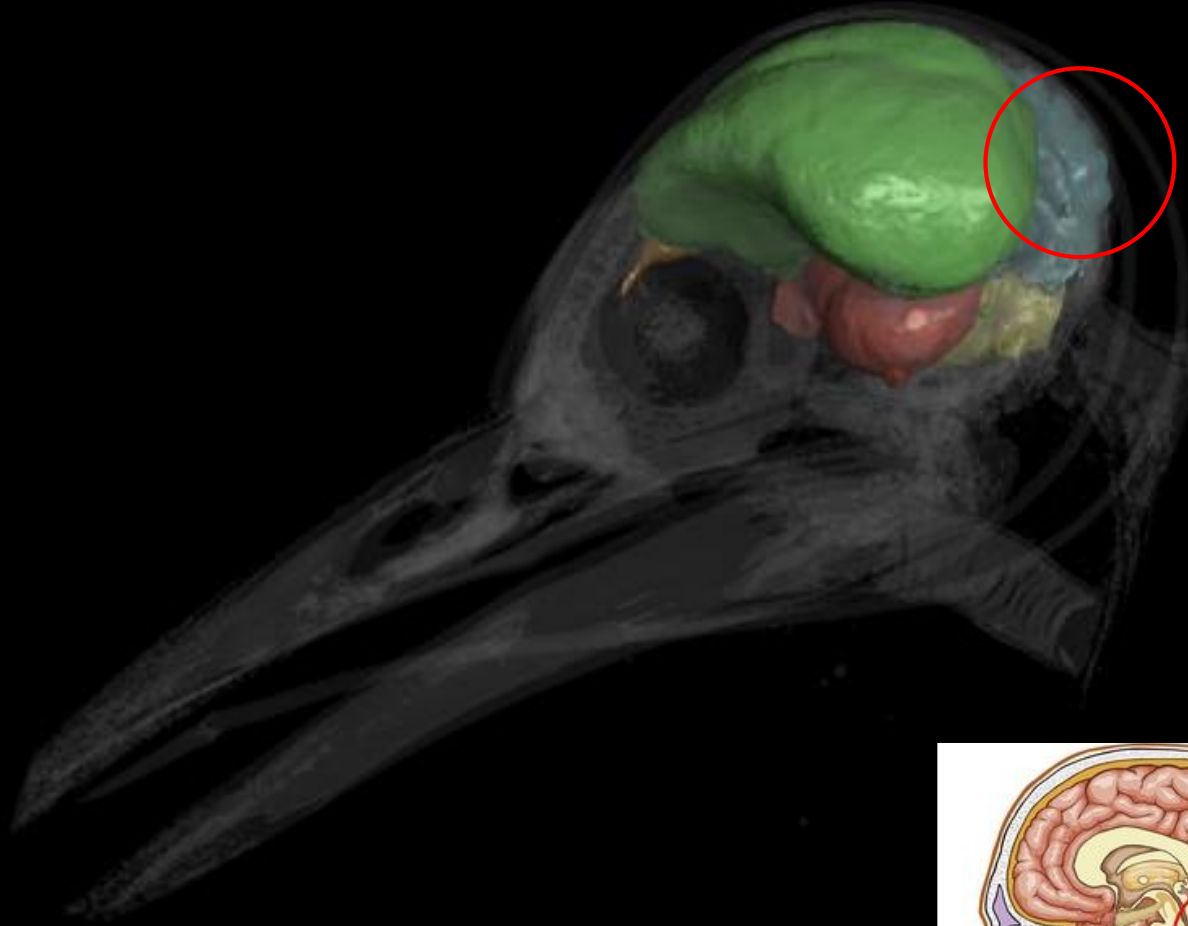
신경해부학자



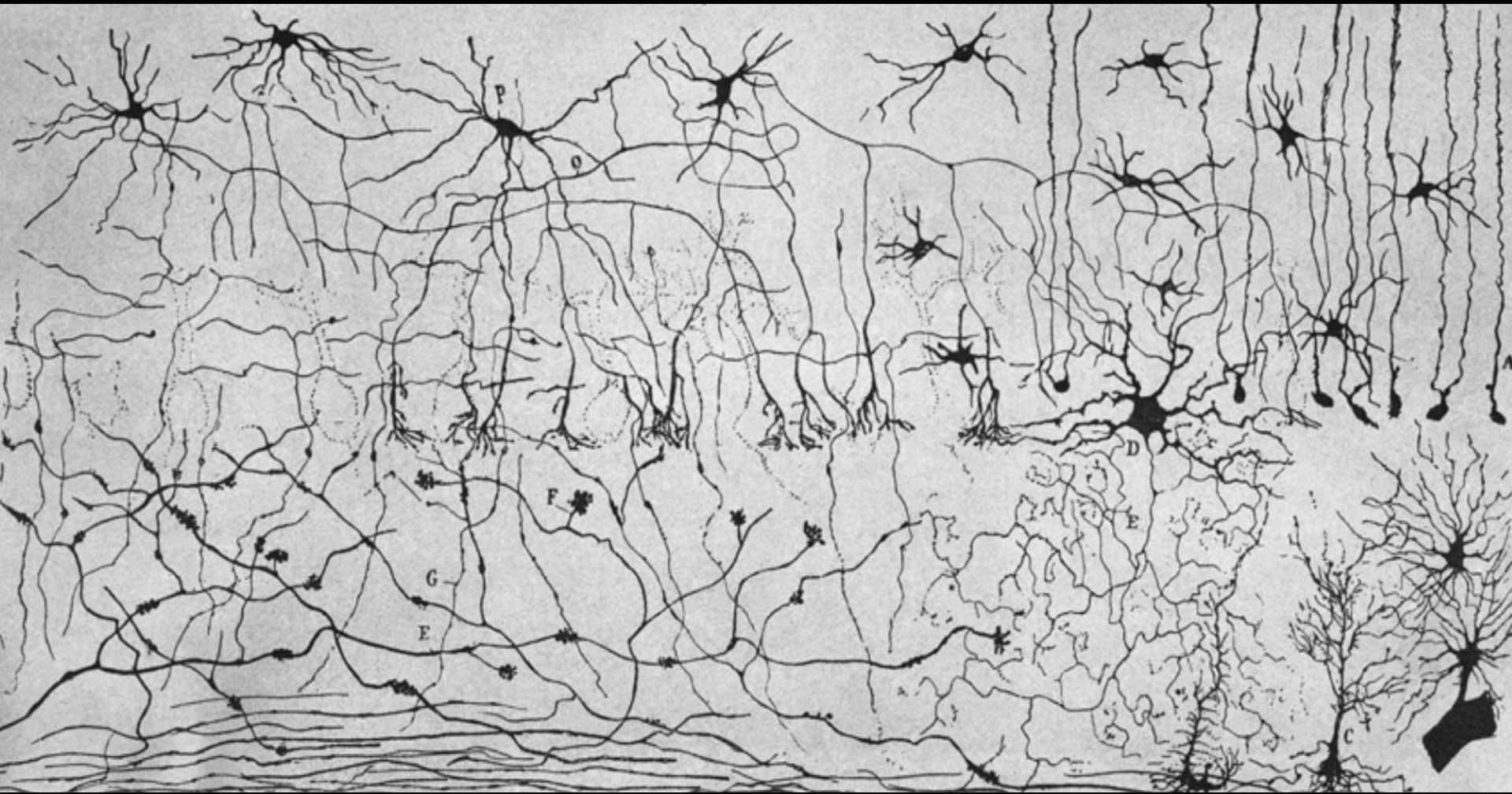
Santiago Ramón y Cajal, 1852-1934

산티아고 라몬 이 카할, 스페인

세레벨럼(소뇌) : 척추동물 두개골 뒤쪽에 있는
뇌의 일부분, 근육 운동을 조절함.

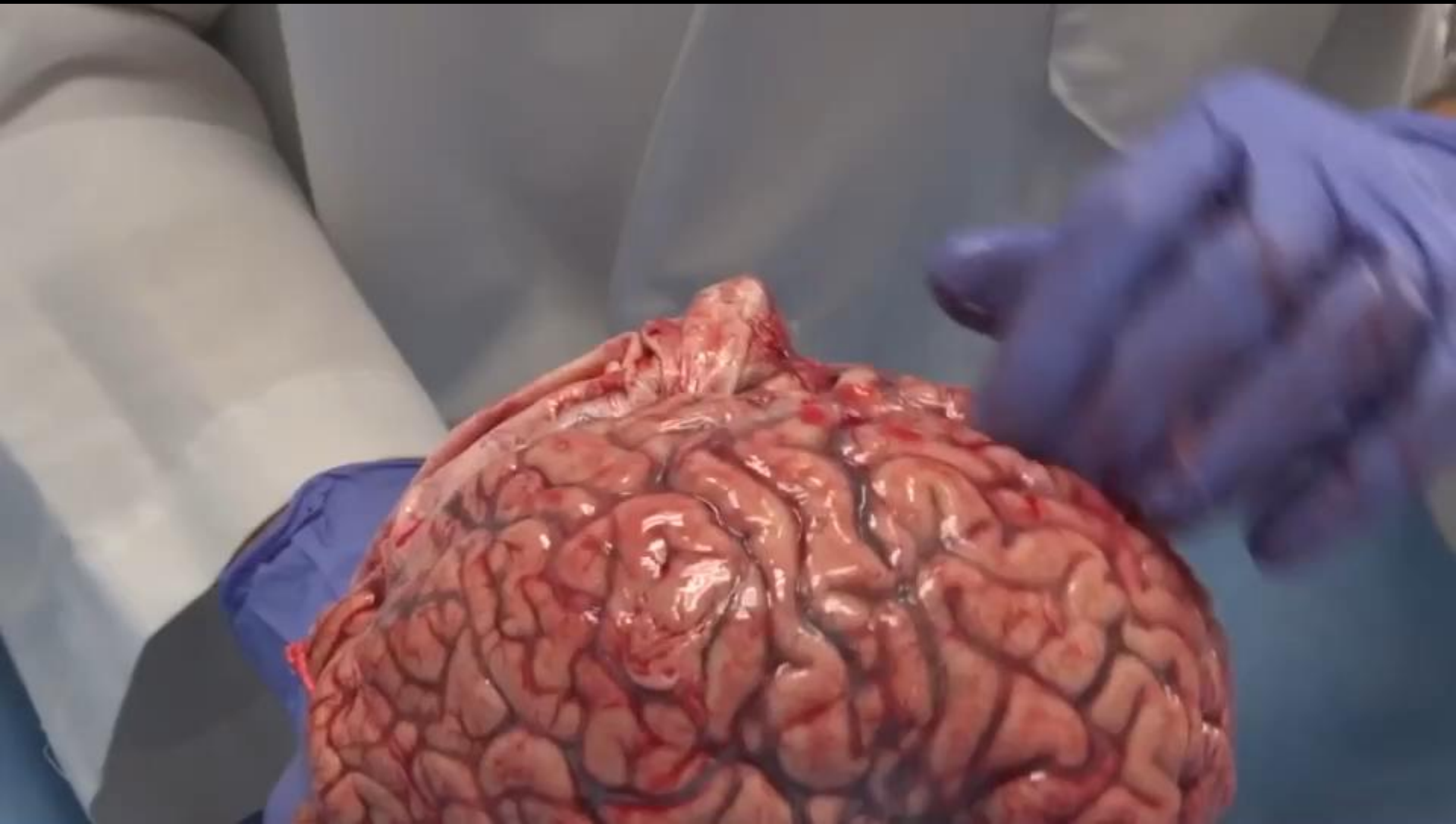


Neurons in a bird's brain

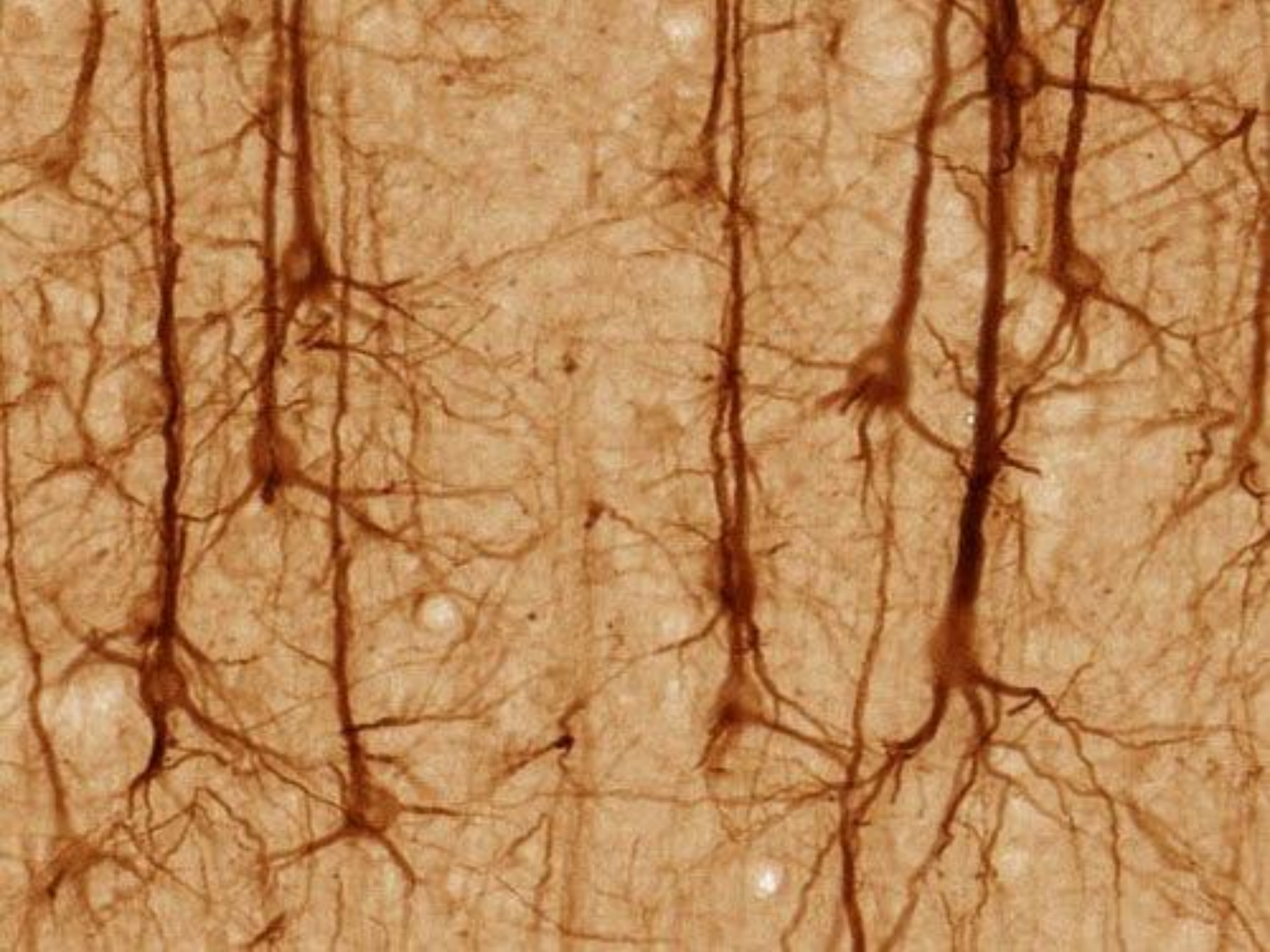


Ramón y Cajal's drawing of **the neurons in a bird's cerebellum** – a part of the brain.

Brain of Human





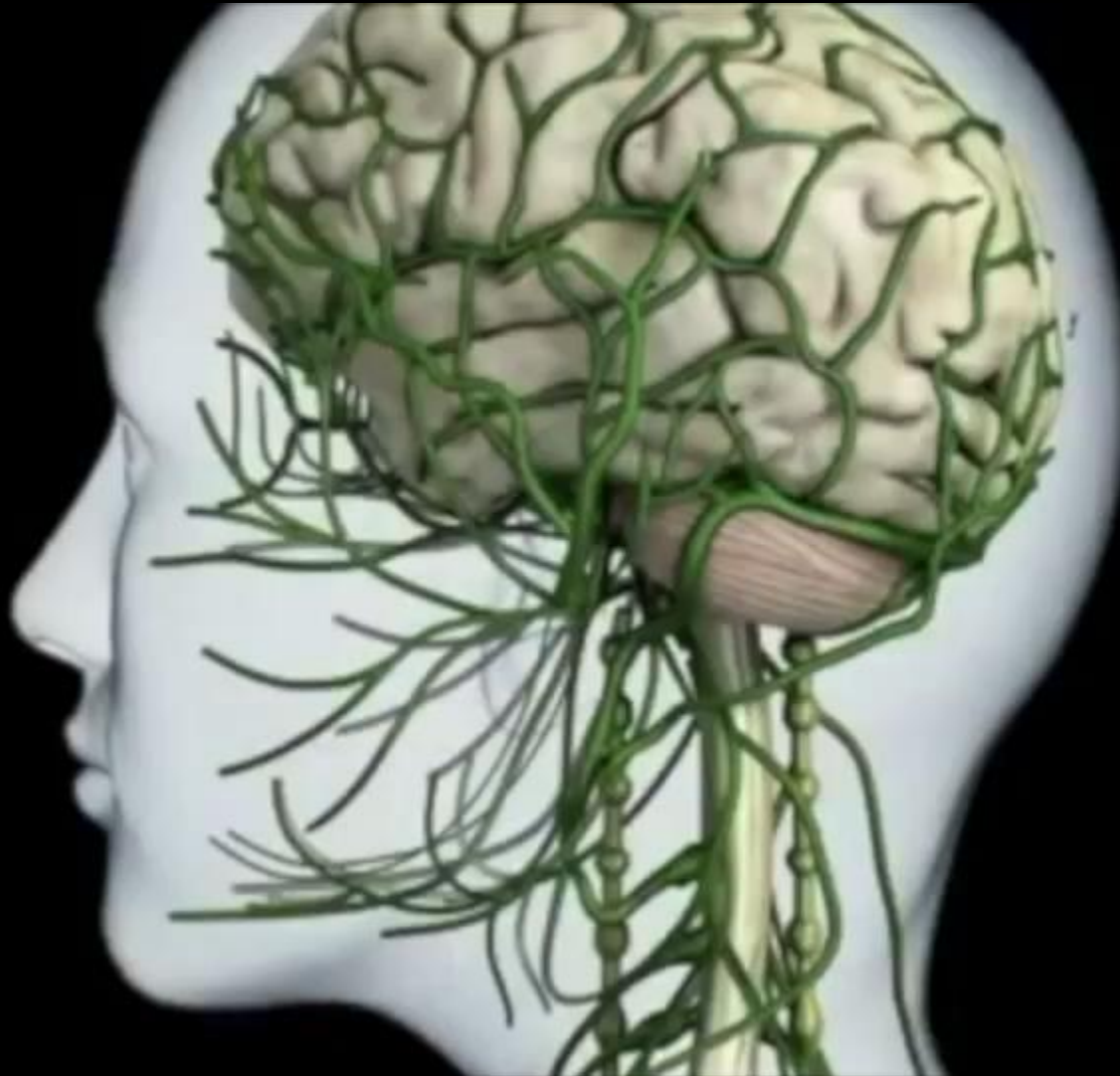




100 billion neurons
more than
the number of stars
in the universe

1,000억 개 뉴런

So, what happens inside?

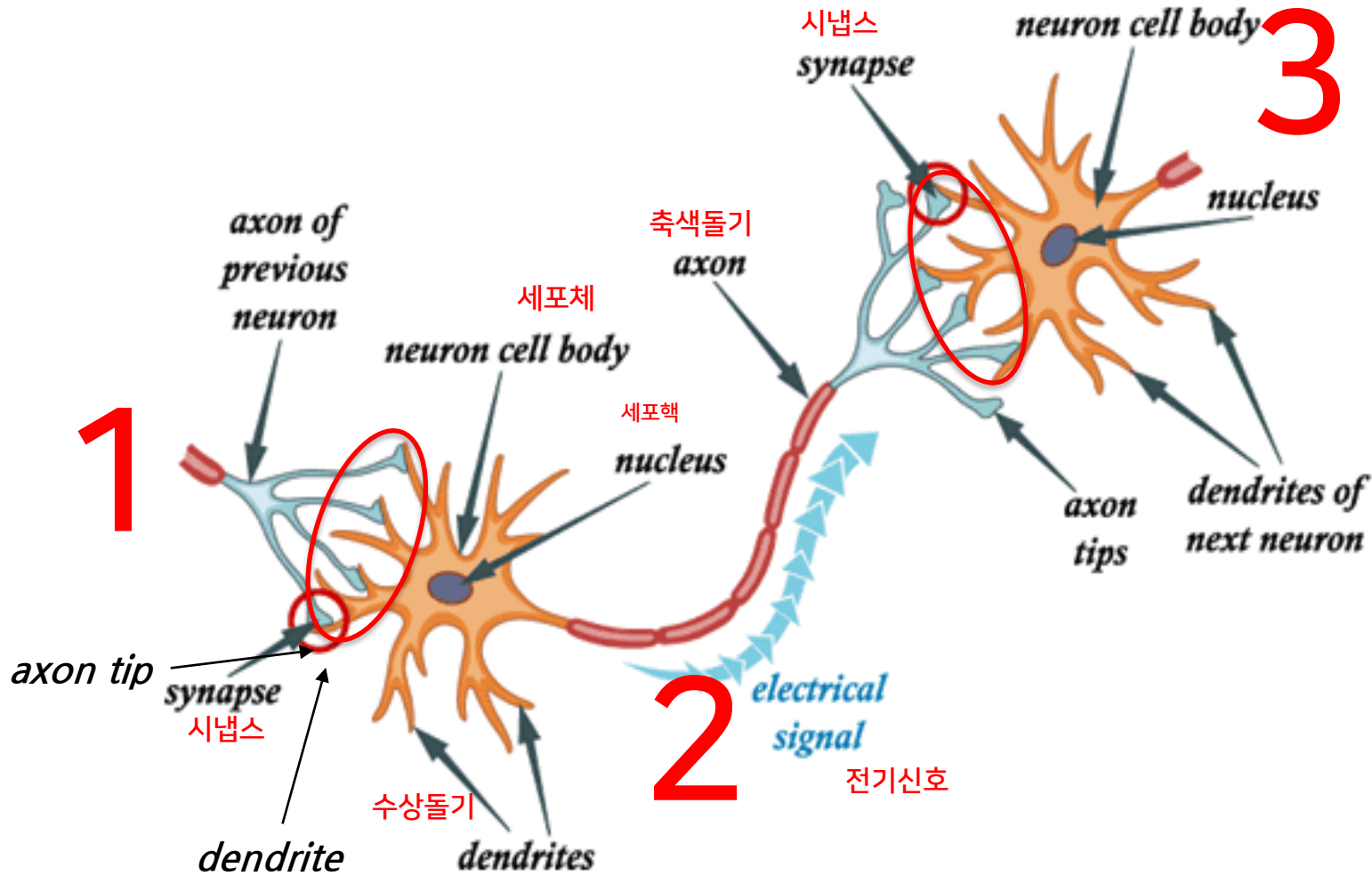


From a DVD that comes with the illustrated medical atlas, The Human Brain, DK Publishing UK.

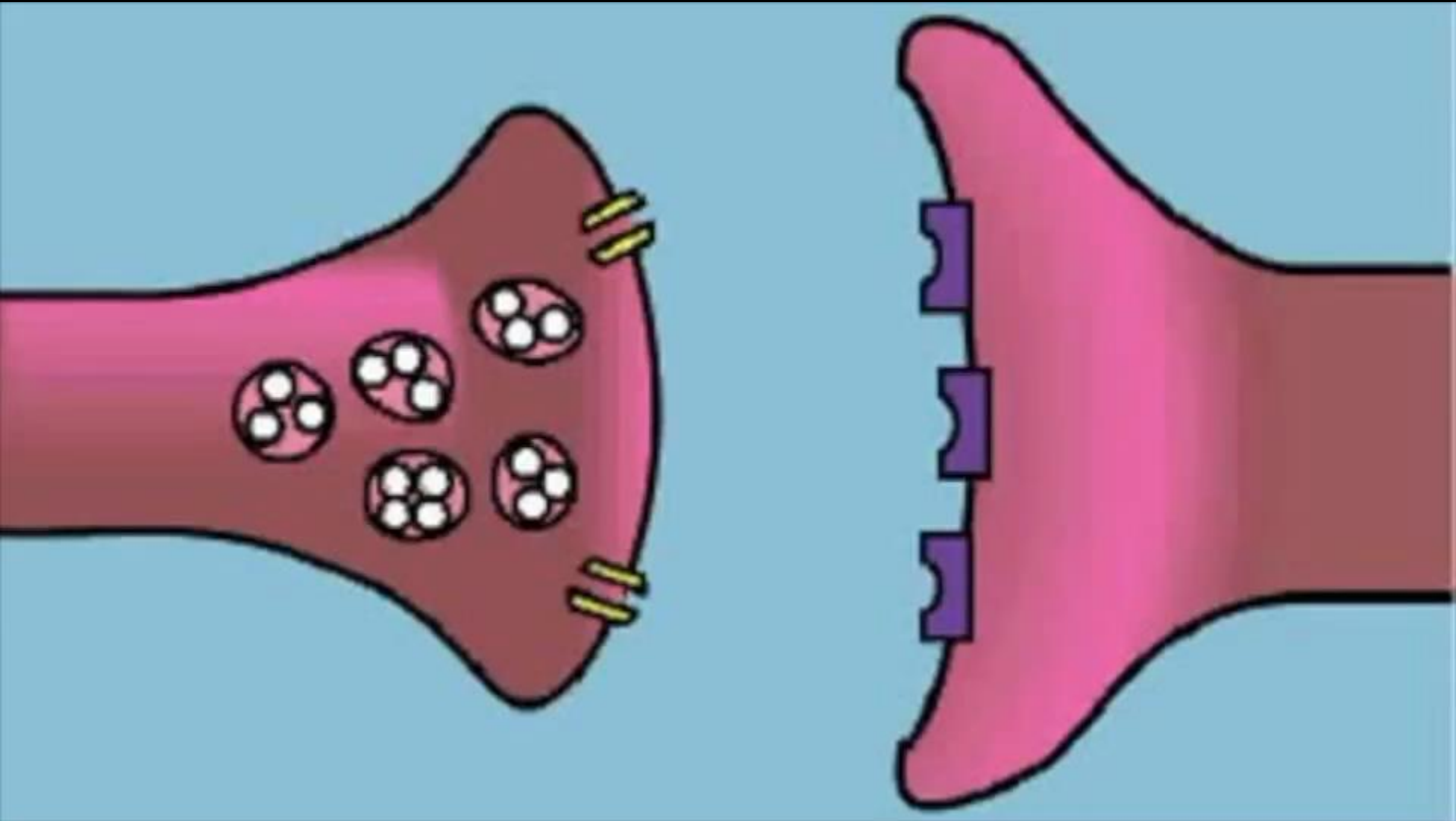
뉴런은 ON 혹은 OFF

- Signal or no signal
- 매우 단순

뉴런이 연결된 모습

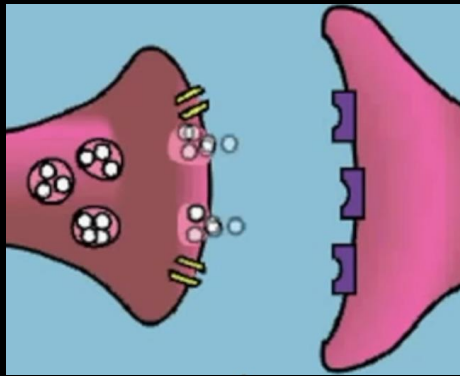


연결부위(시냅스)에서 어떤 일이...



신경전달 물질의 양과
전달되는 신호의 세기

신경전달 물질의 양이



많으면?
적으면?
없으면?

시냅스를 통한 신호 전달 시뮬레이션



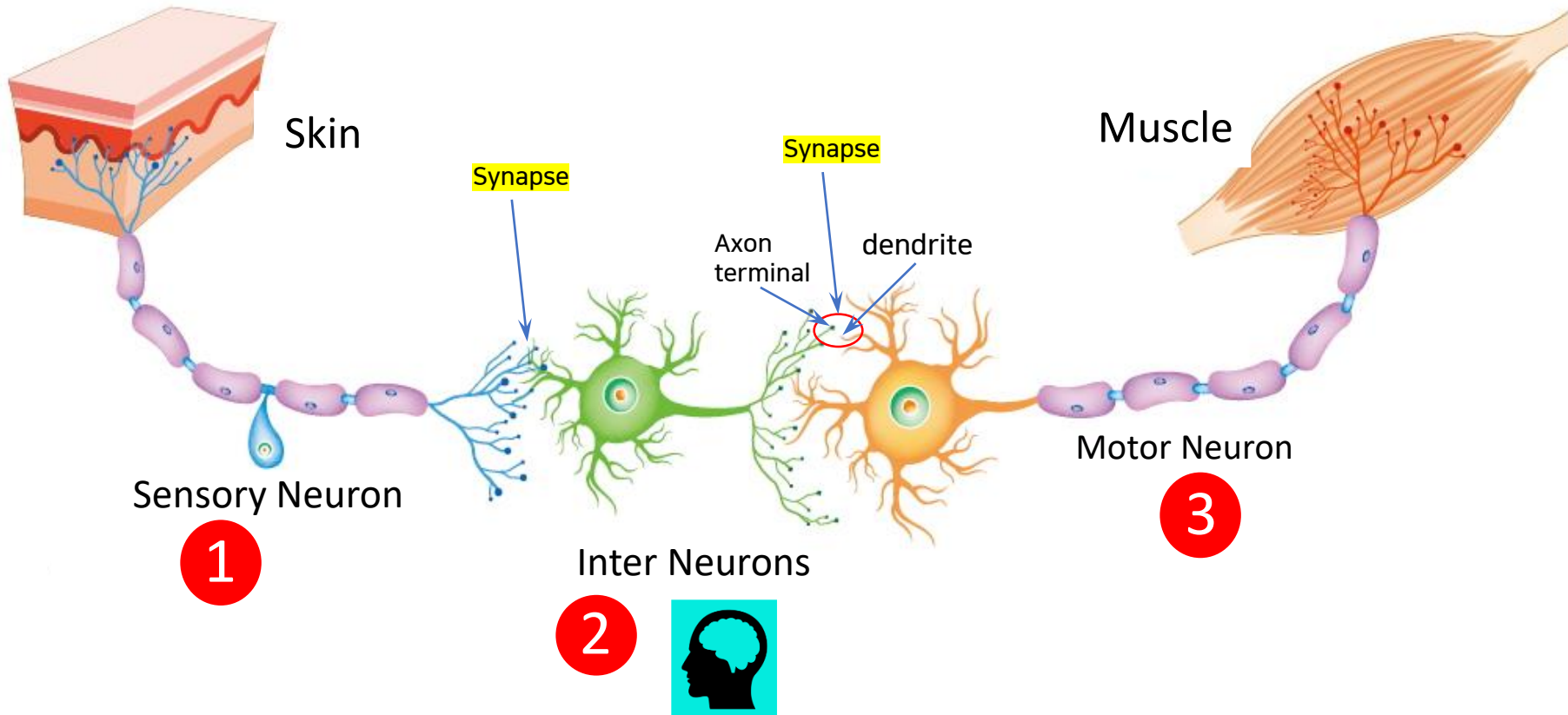
A brain in a supercomputer | Henry Markram

우리가 하는 모든 일,
우리 몸(뇌)에 흐르는
수많은 전기신호로 가능





우리 몸에 있는 엄청나게 많은 뉴런들을 아주 간단히 표현하면..



인간의 고차원 기능은
단순한 뉴런의
수많은 연결로 가능

하지만,
연결만 되었다고 가능?

학습 (Learning)

학습이란 무엇인가?

요약

- 뇌 속에 있는 수많은 뉴런
- 수많은 뉴런의 수많은 연결
- 뉴런 1개의 동작은 굉장히 단순
- 학습이란?