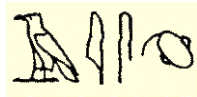


## "What do neuroscientists study? - 신경과학자는 어떤 일을 할까요?"

### What is the nervous system?

- The nervous system is divided into Central and Peripheral Nervous system.
- Central nervous system (중추신경계) refers to our brain and spinal cord and
- Peripheral nervous system (비중추신경계) refers to motor and sensory nerves.
- There are also autonomic nervous system (자율신경계) that governs many biological processes in our body organs automatically.



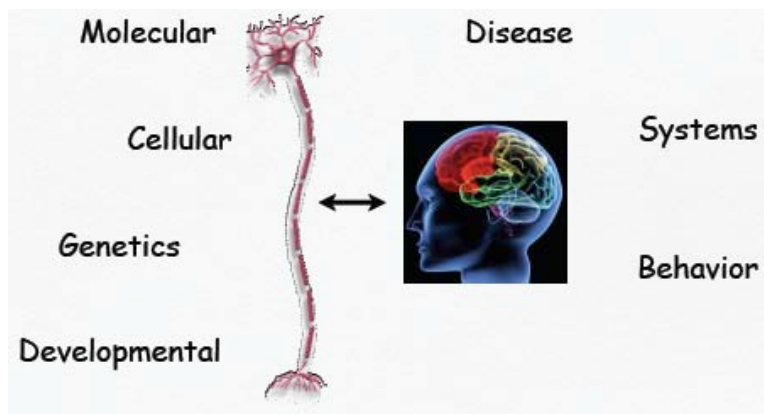
BRAIN was first used in Egyptian papyrus in B.C. 3,000.

[Google search for "Edwin Smith Surgical Papyrus".](#)

### The nervous system has diverse functions:

- Higher order function including cognition, consciousness/unconsciousness, etc. (인지, 의식, 무의식 등등의 고차원 기능)
- Sensory information processing: visual, auditory, touch, smell, and taste. (오감각 기관을 통해서 외부세계의 정보를 처리하는 기능)
- Movement control (몸의 운동기능 조절)
- Emotion (외부상황에 따른 감정생성, 조절)
- Learning and Memory (학습과 기억) *Paying attention helps the memory to be stored for longer period of time!*
- Autonomic nervous system governs many physiological processes including breathing. (자율신경계의 여러 생리기능 조절. 예를 들어 호흡 등등)

### Research areas in Neuroscience: how to study the nervous system?

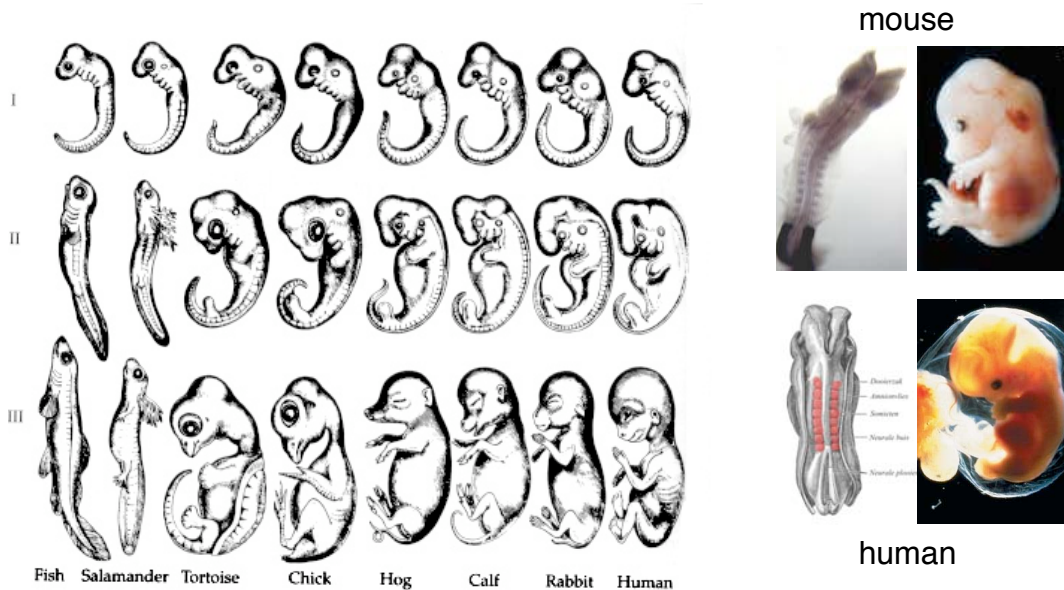


### Careers in Neuroscience

- Basic research: **neuroscientists** in academia (universities) and research institutes -neuroanatomist, neurobiologist, neurochemist, neurophysiologist, neuropsychologist, neuroradiologist, psychophysicist, etc.
- Clinical neuroscience: neurological surgery, neurologist, neuropathologist, psychologist, psychiatrist, etc.

### My research interests: 신경줄기세포

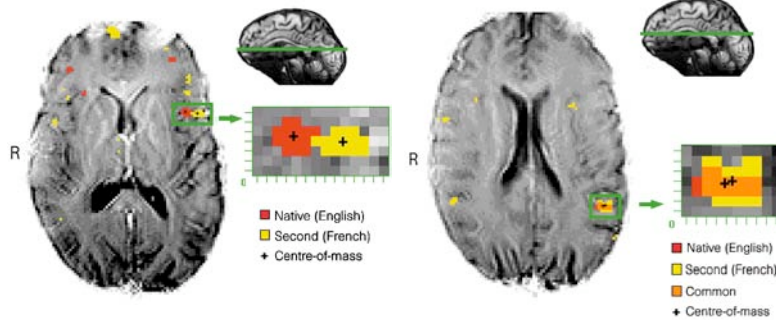
Unlike our skin, hair, bone, etc., the nervous system does not make new cells in adults except in a very limited regions of the brain. Neural stem cells produce new neurons of specific function. My laboratory is interested in how these neural stem cells are regulated and why we need to keep them throughout our lives using mouse as a model system.



Taking advantages of similar developmental processes and genetic make-ups, we use mice as a model system via various genetic manipulation. We can insert and express fluorescent proteins or remove certain gene function in mice.

우리 실험실에서는 신경계에 존재하는 줄기세포가 어떻게 조절되고 또한 왜 이런 줄기세포가 필요한지에 대한 연구를 생쥐를 모델로 하여 연구하고 있습니다. 위에서 보듯이 인간과 생쥐뿐 아니라 여러 종들은 발생과정에서 많은 유사점이 있는데 유전자의 조작이 용이한 생쥐를 사용하여 특정 유전자를 없애거나 형광단백질을 발현시켜서 신경세포에 미치는 영향 등을 살펴볼 수 있습니다.

## Language and brain:



## Distinct cortical areas associated with native and second languages

Karl H. S. Kim, Norman R. Relkin, Kyoung-Min Lee and Joy Hirsch  
Nature 388, 171-174(10 July 1997)

Brain scan on people who are bilingual shows brain regions utilizing two different languages overlap while people who learned the second language later in life utilizes different brain regions to process the native and foreign languages.

대부분의 가정에서 아이들이 학교에 들어가기 전까지는 한국말을 곧잘 하다가 학교를 들어가면서 점점 영어만 쓰려고 하는 경험을 하셨을텐데, 어렸을 때 한국말을 접했었기 때문에 이런 아이들의 뇌는 충분히 두 언어를 잘 구사할 수 있는 환경으로 만들어져 있다고 생각합니다. 한국말을 열심히 쓰도록 도와주세요!

## Useful links:

[www.nih.gov/training.htm](http://www.nih.gov/training.htm)

Look for summer internship positions at NIH. Usually the program is for up to 10 weeks and pays the summer salary. It provides a great entrance point for experiencing laboratory life. It would be best if you prepare your statement of interest and ask a couple of teachers for reference letters well before Christmas so that you can apply on-line by December. Faculties at NIH usually decide by Feb or March, but earlier you get started the better chance you will have. You can also email individual labs for possible internship positions.

<http://faculty.washington.edu/chudler/neurok.html>

"Neuroscience for Kids": this site contains many interesting facts about neuroscience and useful links.