

92. Hippocampus | 해마

1. Hippocampus 해마



The hippocampus is a major component of the brains of humans and other vertebrates척추동물. It belongs to the limbic system대뇌 변연계 and plays important roles in the [consolidation/separation]합병/통합/강화 of information from short-term memory to long-term memory. Neural plasticity was

first discovered to occur in the hippocampus and has often been studied in this structure. The mechanism is widely believed to be one of the main neural mechanisms [which/by which] memory is stored in the brain.

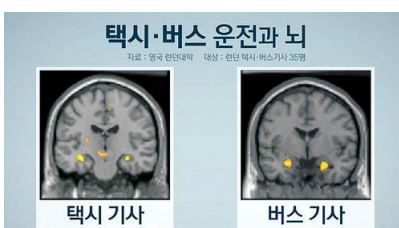
2. Hippocampus and Spatial ability 해마와 공간능력



Damage to the hippocampus leads to trouble [forming/formed] new memories of the time or location of an event. Impaired blood flow and subsequent직후 lack of oxygen, [occurring/occurred] in a stroke뇌졸중, is one way the hippocampus can be damaged. Among the crucial중요한/결정적인 cells in the hippocampus [is/are] the so-called place cells장소세포. These cells, now famous due to Nobel prize, help

[determine/determining] [spatial공간적인/temporal시간적인] location and allow navigation from one place to another. They contain information about direction and [period/distance]. Place cells장소세포 allow an animal to construct a map of the environment and its location within it. The hippocampus thus allows an animal to make decisions on the basis of [period/distance] and direction towards desired바래진 goals, such as food, or away from [desirable/undesirable] objects, such as a predator. Brain scans have shown that London taxi drivers have a(an) [enlarged/diminished] hippocampus compared to non-taxi driver colleagues, thanks to the [spatial/temporal] abilities necessary to do their job.

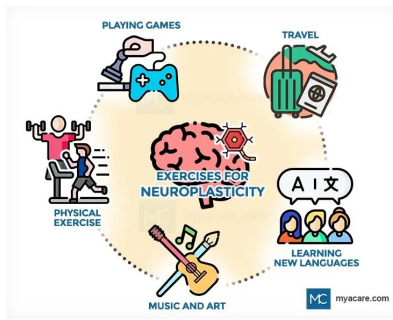
3. Hippocampus and Taxi Driver 해마와 택시기사



In 1999, Eleanor Maguire conducted *fMRI scans*뇌의 특정 부위가 활동할 때 혈류 변화(주로 BOLD 신호)를 측정해 기능적 뇌활동을 영상으로 확인하는 검사 on London taxi-drivers and compared them with the brain scans of others. In contrast with non-taxi drivers, experienced taxi drivers had a greatly [enlarged/diminished] hippocampus - that part of the

brain that specializes 전문화되다 in **[retreating/retrieving]** 회상하다/기억해낸다/끄집어낸다/회수하다 **[spatial/temporal]** representations 표현/설명/묘사. On its own, that finding proved nothing; theoretically, people born with larger hippocampi could have innately better **[spatial/temporal]** skills and therefore be more likely to become taxi-drivers. **What made Maguire's study so striking** 놀라운 **[is/being]** that she then correlated the size of the hippocampi directly with each driver's experience: the longer the driving career, the **[larger/smaller]** the hippocampus. That strongly suggested that **[spatial/temporal]** tasks **[be/were]** actively changing cabbies 택시기사' brains. 'These data,' concluded Maguire dramatically, 'suggest that the changes in hippocampus **[be/are]** **[innate/acquired]**.'

4. Neuroplasticity 뇌가소성



Neuroplasticity refers to the remarkable capacity of the human brain to remodel, adapt, and structurally rewire its neural architecture throughout an individual's lifespan.

While people used to **[believe/believing]** that the adult brain remained **[static/active]** and **[alterable/unalterable]** after development, contemporary neuroscience has demonstrated that it dynamically configures 형성하다 itself in

direct response to experiential acquisition, **[deliberate/unintentional]** learning, and environmental interaction.

At the cellular level, the synaptic efficacy 효과 between neurons **[diminishes/fluctuates]** in strength depending on **[what/how]** frequently these pathways are engaged. Through repeated stimulation, specific neural circuits undergo structural **[correlation/consolidation]** 강화, effectively **[transacting/transforming]** temporary actions into enduring, long-term memories. This foundational mechanism is summed up 요약하다 by the principle **[which/that]** neurons firing simultaneously **[forgo/forge/forage]** 구축하다 resilient 회복가능한 functional networks.

[Furthermore/However], adult neurogenesis 신경발생 persists predominantly 주로 within the hippocampus for contextual learning and memory consolidation. In the event of trauma, undamaged cortical 피질 regions often **[undergo/undermine]** functional reorganization, compensating for 보상하다 impaired capacities by establishing alternative pathways. Simultaneously, the brain executes 실행하다 *synaptic pruning* 시냅스 가지치기 to systematically eliminate **[overused/underutilized]** connections, thereby **[optimizing/opting]** metabolic efficiency under the "use it or lose it" paradigm. Consequently, consistent practice structurally enables stroke patients **[to regain/regaining]** impaired motor 운동 functions through rehabilitation 재활, allowing individuals **[eliminating/to eliminate]** maladaptive cognitive patterns by actively reinforcing constructive behavioral responses.