Limbic System

• Includes amygdala and hippocampus.
• Collectively involved in emotion, memory, motivation.

Amygdala
• Emotion, responses to aversive stimuli.

Hippocampus
• Formation of long-term memories.

Principal Structures in Limbic System

The Cerebral Hemispheres

Two Views of the Cerebral Hemispheres

Cerebellum
• The part of the brain that controls skilled, smooth movement and bodily balance
• Affects muscle tone and posture
• Effectiveness can be altered via injury or substances

Cerebrum
• Consists of two hemispheres
• Right hemisphere controls the left side of the body (movement and feeling)
• Left hemisphere controls right side of the body (language function)

Corpus Callosum
• Thick band of fibers that connect the hemisphere and allow for transfer of information and synchronization

Cerebral Cortex
Brain Damage

- Hippocampus can regenerate neurons.
- Damaged neurons can sprout new dendrites.
- Damaged neurons can re-establish connections with other neurons.
- Can assume some functions of lost brain cells.
- Axons can regenerate and grow.
- **Plasticity** = brain's ability to reorganize and compensate for brain damage.

Discovering the Brain's Mysteries

EEG Patterns

**EEG and Microelectrode**

- EEG = Electroencephalogram: record of brainwave activity.
- Amplifies a million times the electrical activity occurring in brain.
- Measures 4 types of waves: beta, alpha, theta, delta.
- Microelectrode = tiny wire, can be inserted into a single neuron.

Brain Waves

**Beta Wave**

- Brain wave of 13 or more cycles per second.
- Occurs when individual is alert and mentally or physically active.

**Alpha Wave**

- 8 to 12 cycles per second.
- Occurs when individual is awake but deeply relaxed.

**Theta Wave**

- Slow brain wave.
- During light sleep, trances, just before deep sleep, just before awakening.