Brain Enrichment Findings

- New synaptic connections
- New neural networks
- Larger cell bodies
- Greater dendritic branching
- Enhanced glial production
- Increased quantity of synapses
- Multiple contact areas
- Increased neurogenesis at multiple brain sites

Brain Enrichment Environments

1.

2.

3.

4.

Chronobiology

Infradian
Circadian
Diurnal/Nocturnal
Ultradian
BRAIN WAVE STATES

**Gamma** - 25-100 Hz [40Hz typical].
- Binds conscious perception

**Beta** – 13-30 Hz.
- Active, alert, concentration

**Alpha** – 9-13 Hz.
- Relaxed focus, light trance, enhanced serotonin production

**Theta** – 4-8 Hz.
- Trance-like state; enhanced catecholamine aids retention of learning

**Delta** – 1-3 Hz.
- Dreamless sleep; HGH produced

**REM** – Rapid Eye Movement; dreaming

THE SECOND BRAIN

- Gut brain/Enteric Nervous System
- Unmediated direct experience
- Operates directly/indirectly with cranial brain
- More neurons exist in the intestines than in entire spinal column
- Enables independent perceptions, learning, memory, & behavior

Michael Gershon, M.D., The Second Brain