

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**

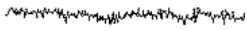
Brain Enrichment Environments

- 1.
- 2.
- 3.
- 4.

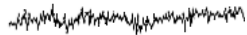
Chronobiology

- Infradian
- Circadian
- Diurnal/Nocturnal
- Ultradian

BRAIN WAVE STATES



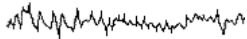
Gamma - 25-100 Hz (40hz typical).
Binds conscious perception



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



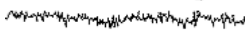
Alpha - 9-13 Hz. Relaxed focus, light trance, enhanced serotonin production



Theta - 4-8 Hz. Trance-like stat; 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*
