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City of Industry, CA 91748
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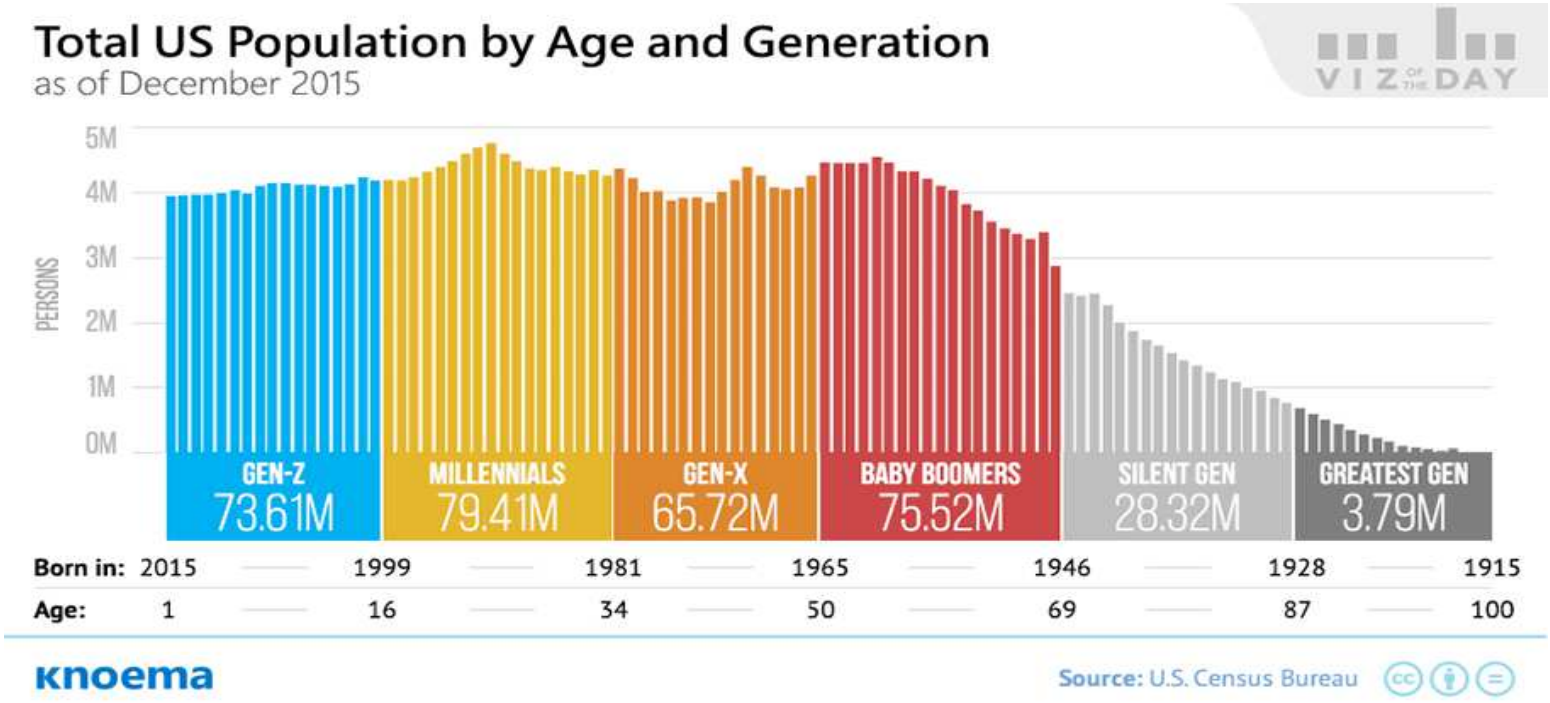
The First Senior Moment on Record . . . .

And that's what happened to the dinosaurs!

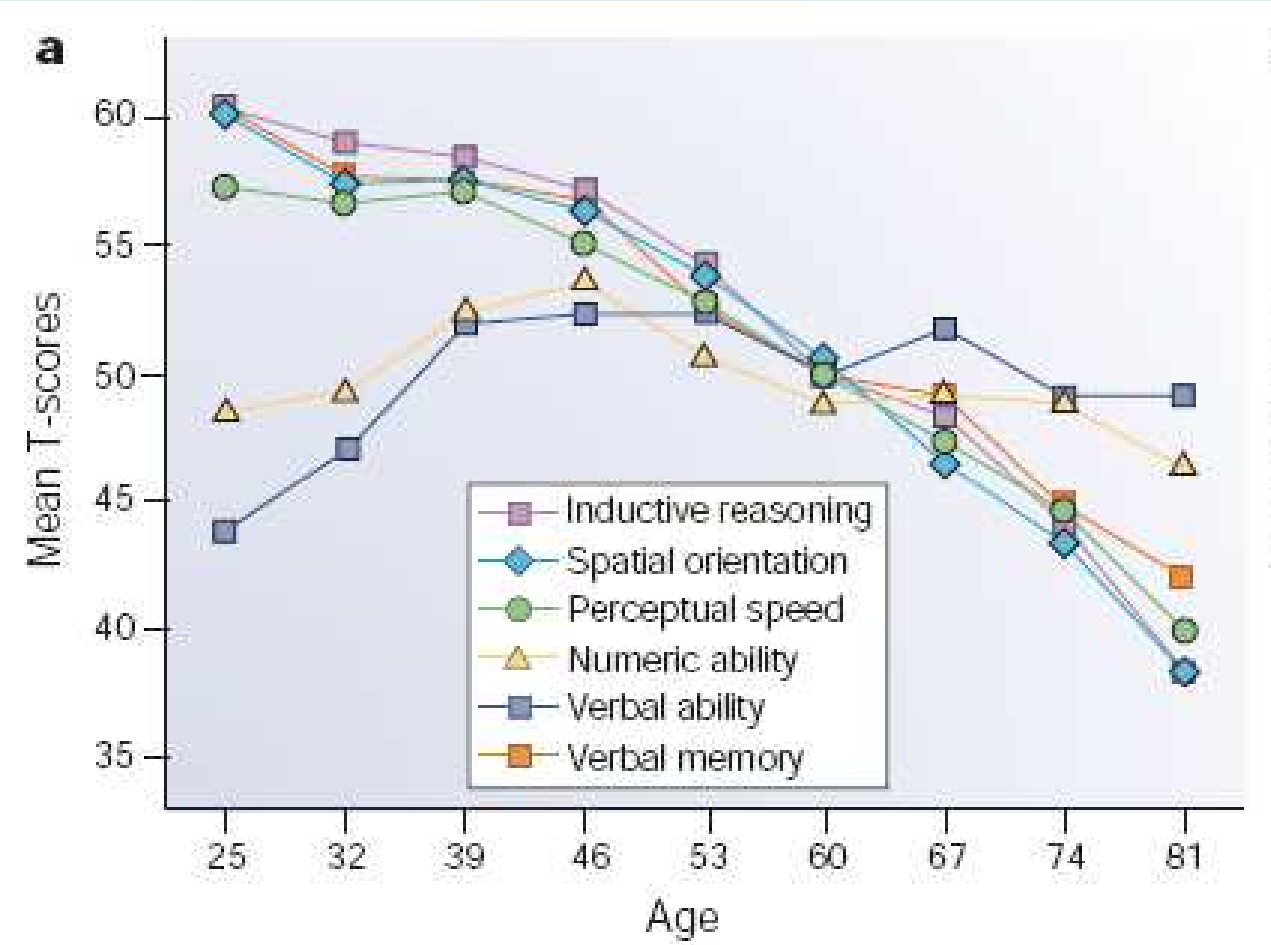
The Baby Boomer Population

(50 YEARS +)



- **75MM**
- **Fastest growing segment of U.S. population**

Functional changes during aging



(Schaie, 1996)

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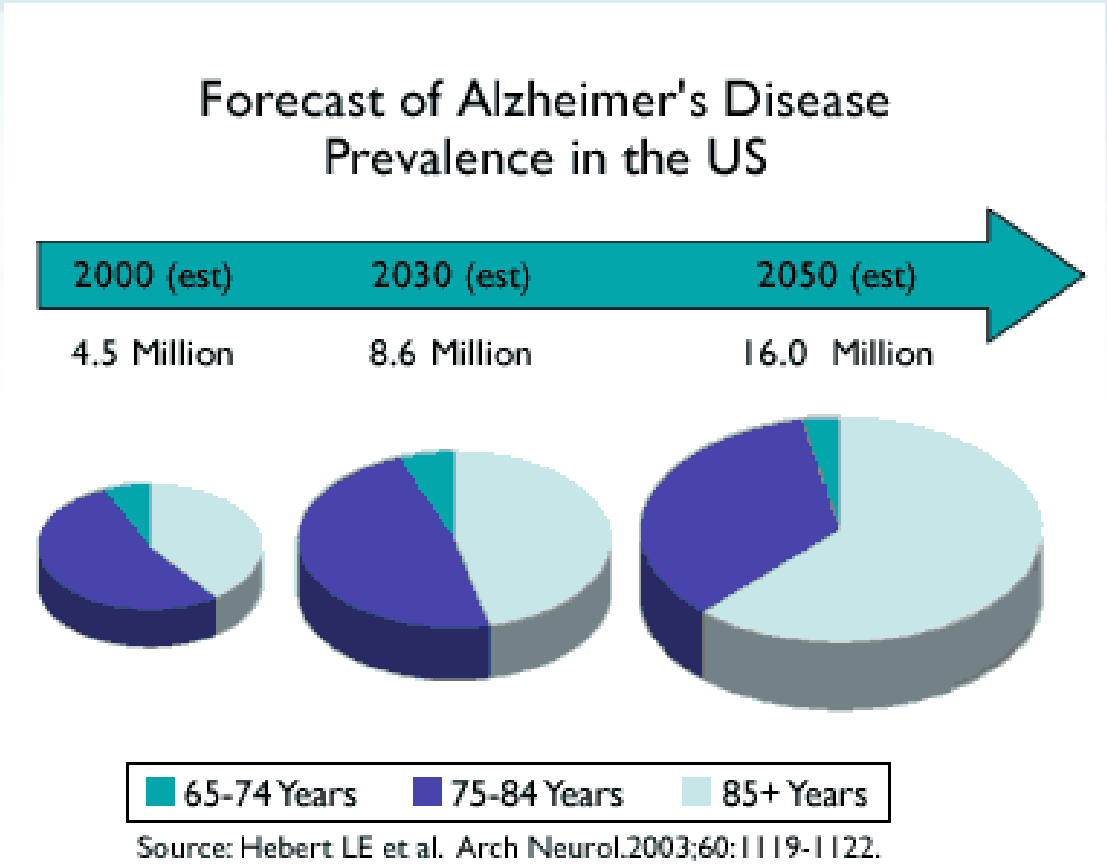
Decline in Memory and Cognitive Functions is Increasing



Source: Hebert LE et al. Arch Neurol.2003;60:1119-1122.

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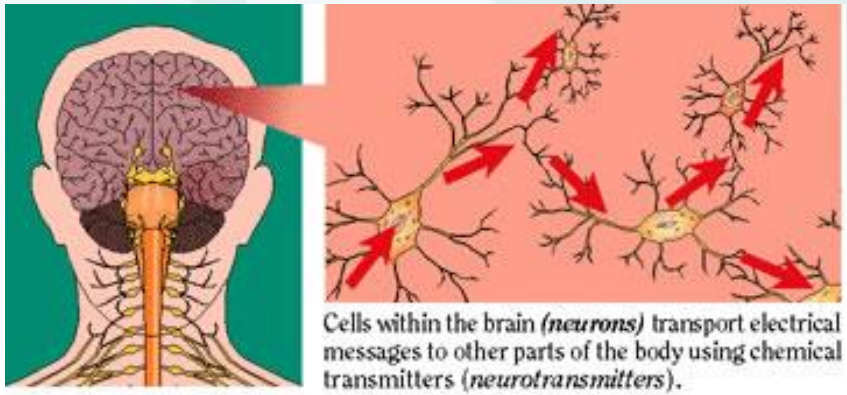
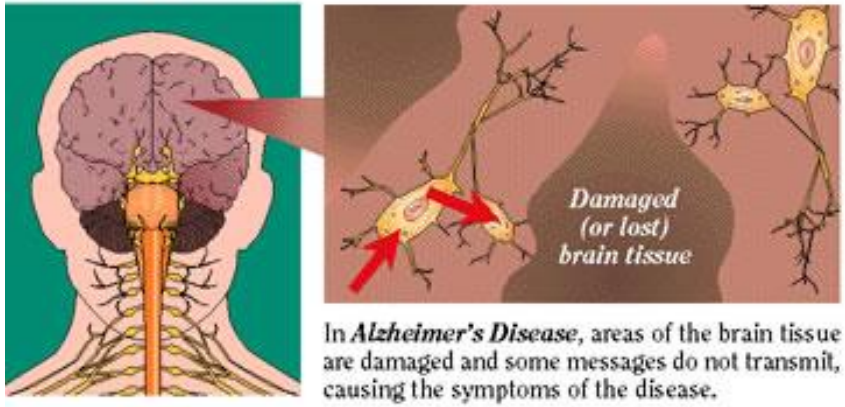
Brain Dysfunction in Alzheimer's disease



Cells within the brain ***(neurons)*** transport electrical messages to other parts of the body using chemical transmitters ***(neurotransmitters)***.



In ***Alzheimer's Disease***, areas of the brain tissue are damaged and some messages do not transmit, causing the symptoms of the disease.

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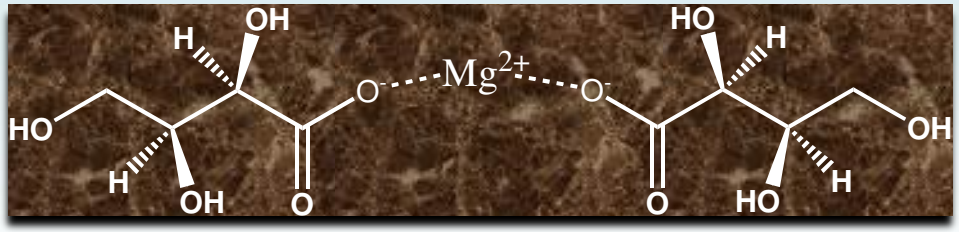
Current Alzheimer's Treatment

Cholinesterase inhibitors (Aricept, Cognex, Exelon, Razadyne).
Cholinesterase inhibitors help increase the levels of acetylcholine in the brain. These drugs may slow the progression of symptoms for about half of people taking them for a limited time, on average 6 to 12 months.

NMDA-type glutamate receptors blocker (Namenda).
Namenda works by a different mechanism than other Alzheimer's treatments; it is thought to play a protective role in the brain by regulating the activity of glutamate.

Introducing Magtein™



Mg threonate (Magtein)

- **Magnesium L-threonate**
- **Macro mineral**
- **Patented and trademarked**
  - **8 awarded US patents (others pending) with PCT**
- **Next key compound for cognitive health, mental calm and stress relief.**

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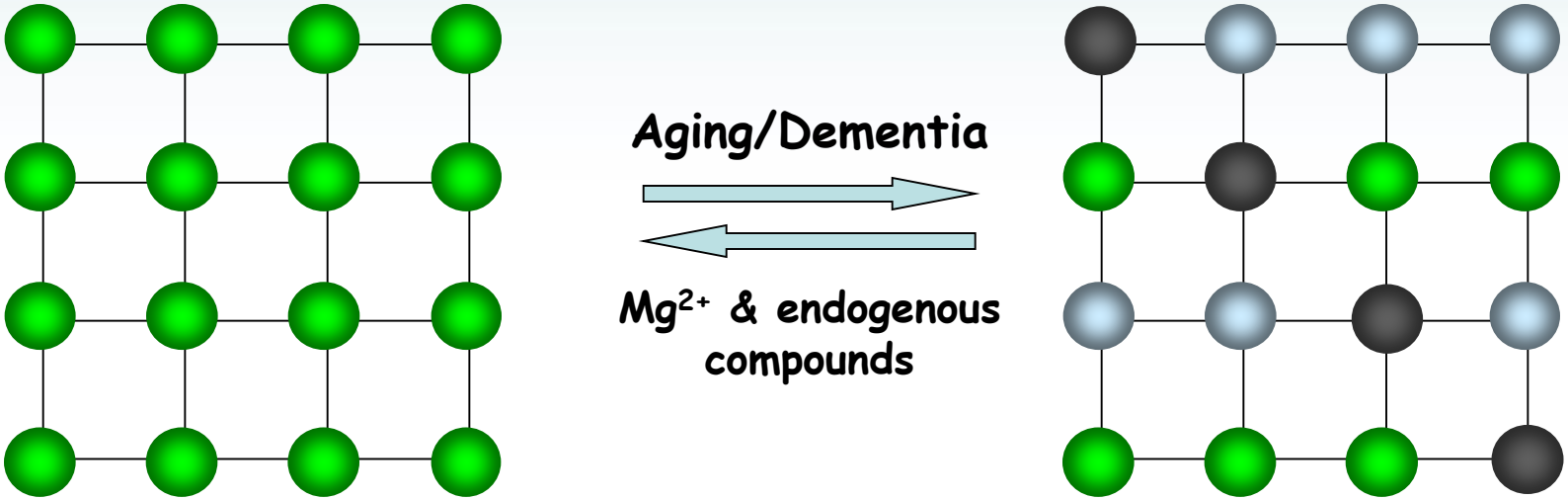
Enhancement of synaptic plasticity and density by elevating $[Mg]_o$

Young

Old



(Liu & Tsien, Nature, 1995)
(Tang et al, Nature, 1999)
(Liu, Nature Neurosci 2004)
(Slutsky et al, Neuron 2004)
(Nathan et al, J Neurosci, 2007)

Neuron

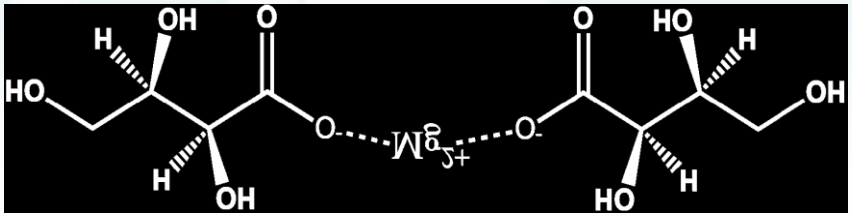
Cell PRESS

Enhancement of Learning and Memory by Elevating Brain Magnesium

Neuron, *Volume 65, Issue 2*, *28 January 2010*, *Pages 165-177*,

Magtein

— A Revolutionary Treatment for Cognitive Decline and Alzheimer's Disease at its Root Cause



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LIVE SCIENCE

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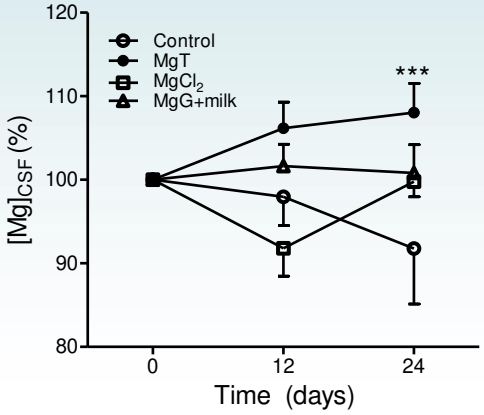
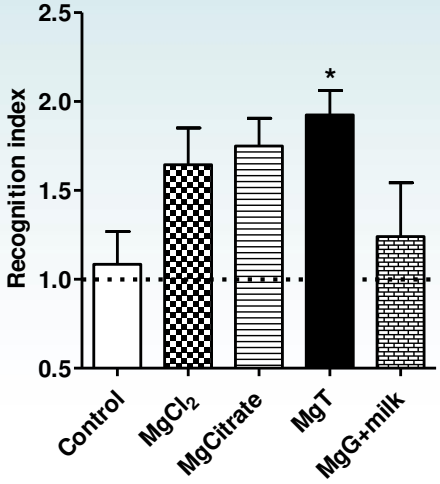
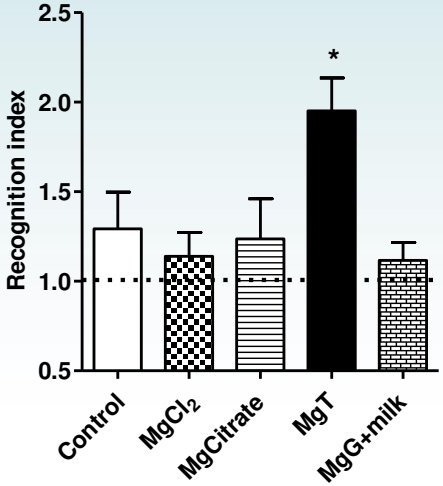
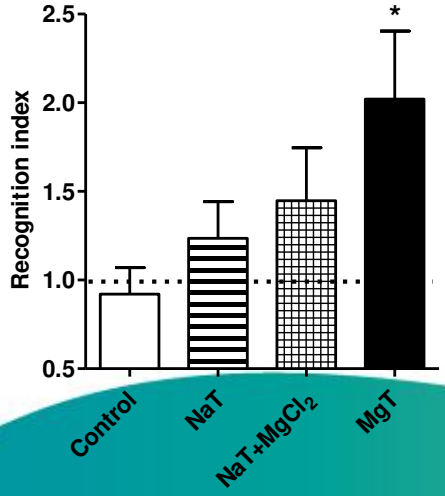
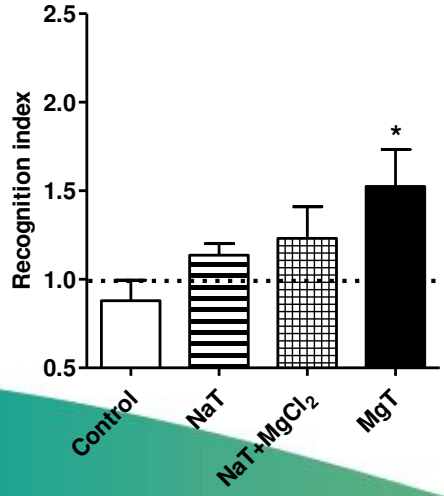
Effect of Various Mg^{2+} Compounds on $[Mg2+]_{CSF}$ and Recognition Memory











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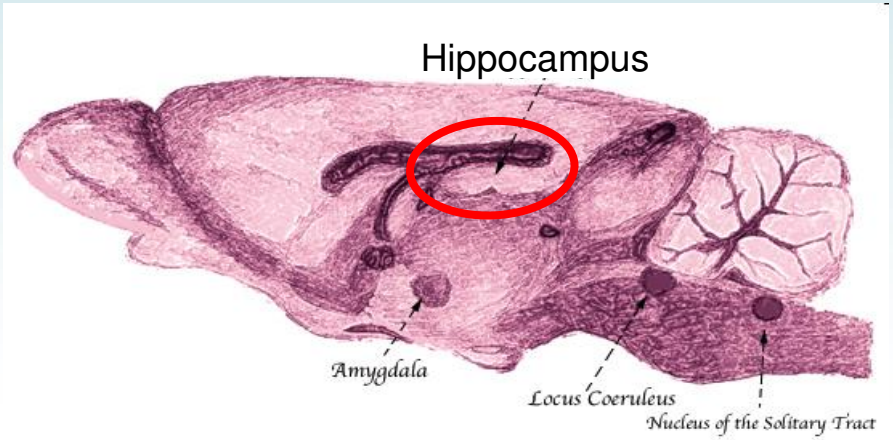
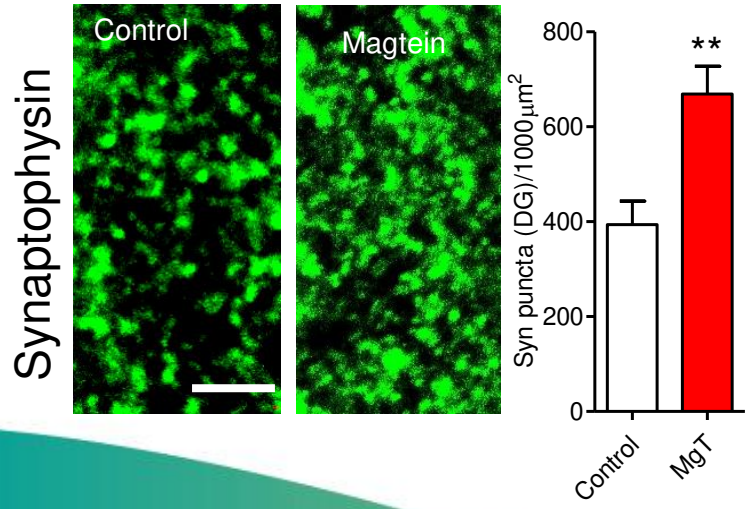
(Slutsky et al, Neuron 2010)

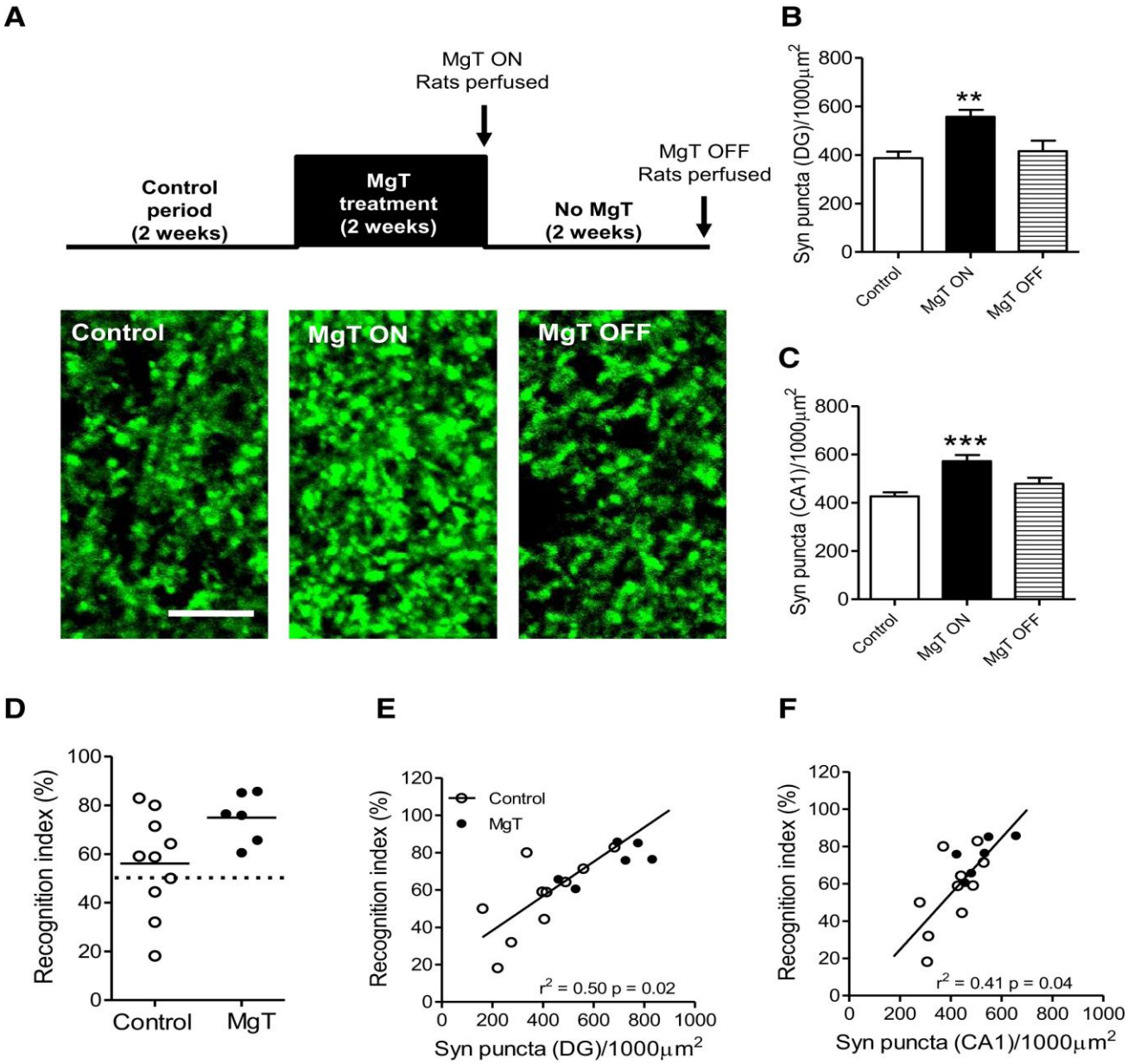
Elevating brain Magnesium enhances synaptic plasticity in the hippocampus



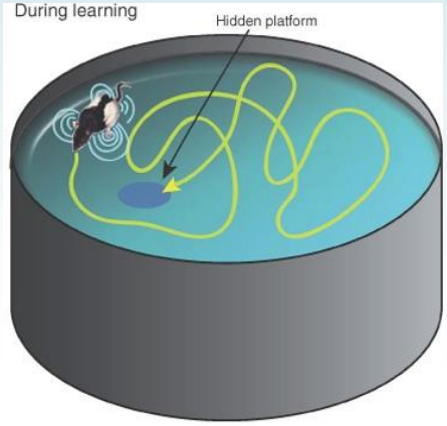


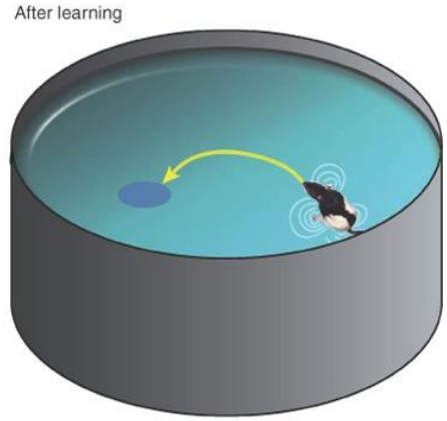
(Slutsky et al, Neuron 2010)

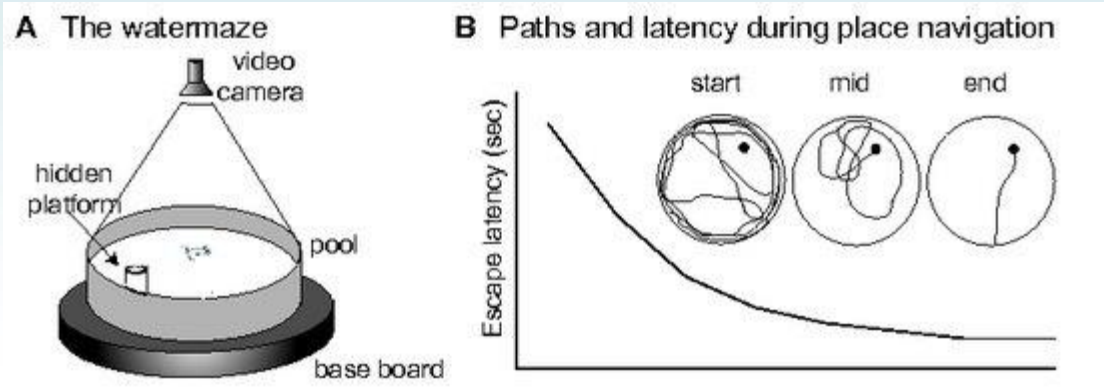
Figure 8. Correlation among Magtein Treatment, Synaptic Bouton Density, and Memory



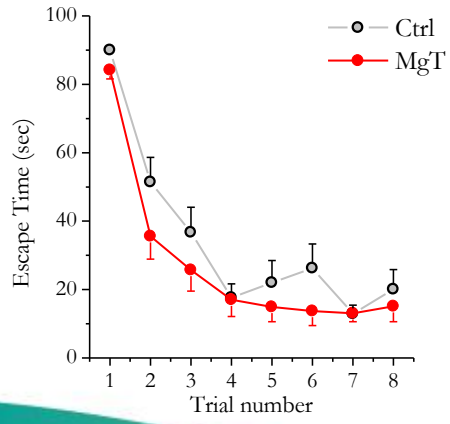
Magtein enhances learning in water maze test



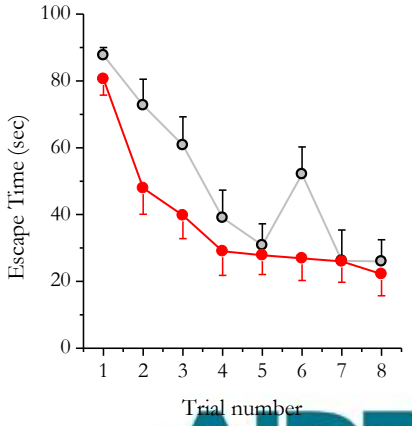




3 month rats



22 month rats



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Elevating brain magnesium lead to Enhancement of learning and memory in young and aging rats

Memory type	2-3 months	9-11 months	17-22 months
Working memory	Enhanced	Enhanced	Enhanced
Short-term memory	Enhanced	Enhanced	Enhanced
Long-term memory	Enhanced	Enhanced	Enhanced

(Slutsky et al, Neuron, 2010)

Susumu Tonegawa ----

MIT Biologist and 1987 Nobel Prize Winner

“This study not only emphasizes the importance of adequate dietary magnesium, but also indicates the benefits of magnesium-based medicine in addressing aging-related memory decline”

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Neuron

Cell PRESS

Highlights of 2010:

Three most downloaded articles from Neuron

- Marshel et al. Targeting Single Neuronal Networks for Gene Expression and Cell Labeling In Vivo

- **Slutsky et al. Enhancement of Learning and Memory by Elevating Brain Magnesium**

- Urgesi et al. The Spiritual Brain: Selective Cortical Lesions Modulate Human Self-Transcendence

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Can we use Magtein

to prevent

Neural Degenerative problems?

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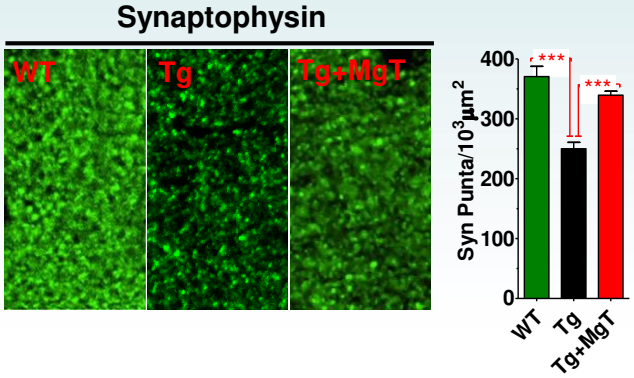
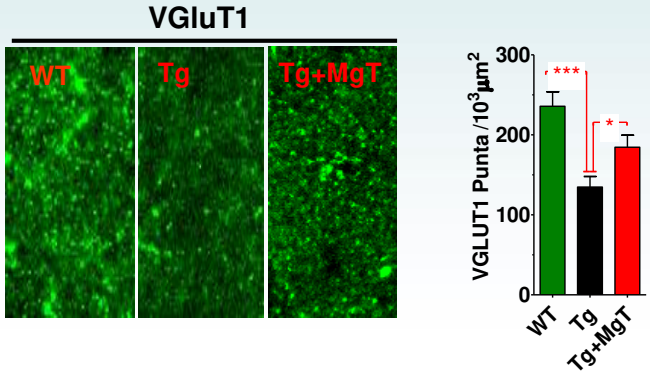
Prevention of synapse loss in AD mouse by elevation of brain Mg^{2+}

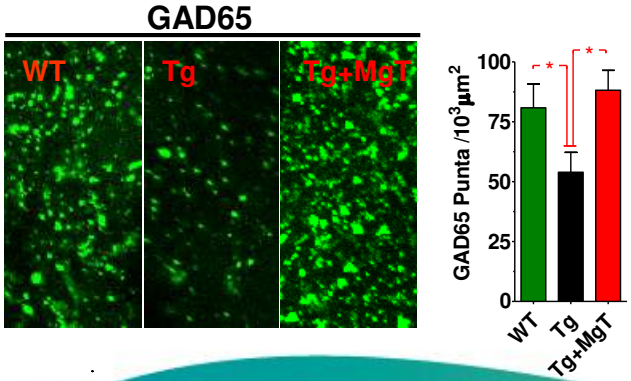
Total synapse



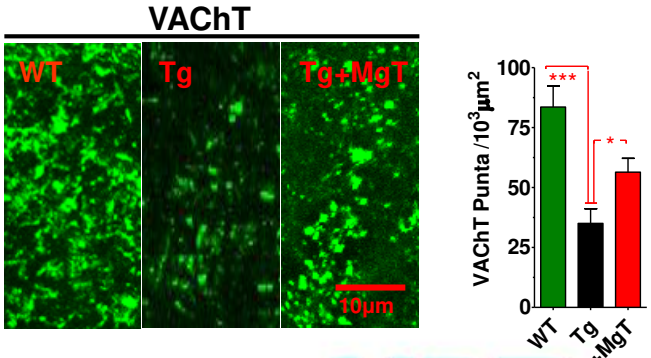
Glutamatergic



GABAergic



acetylcholinergic



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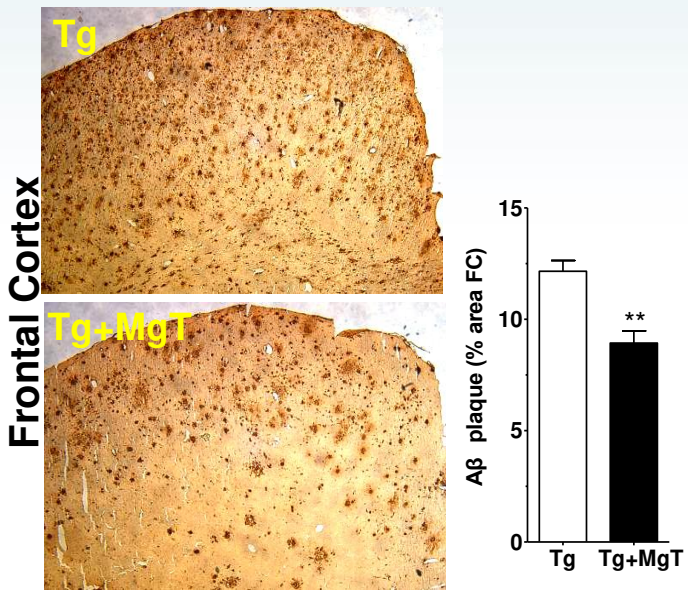
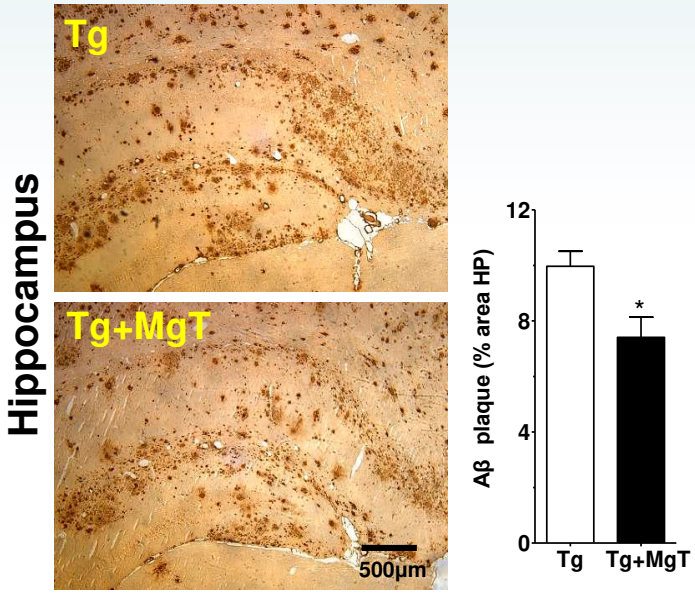
Reduction of amyloid plaques, in AD mouse with Magtein treatment





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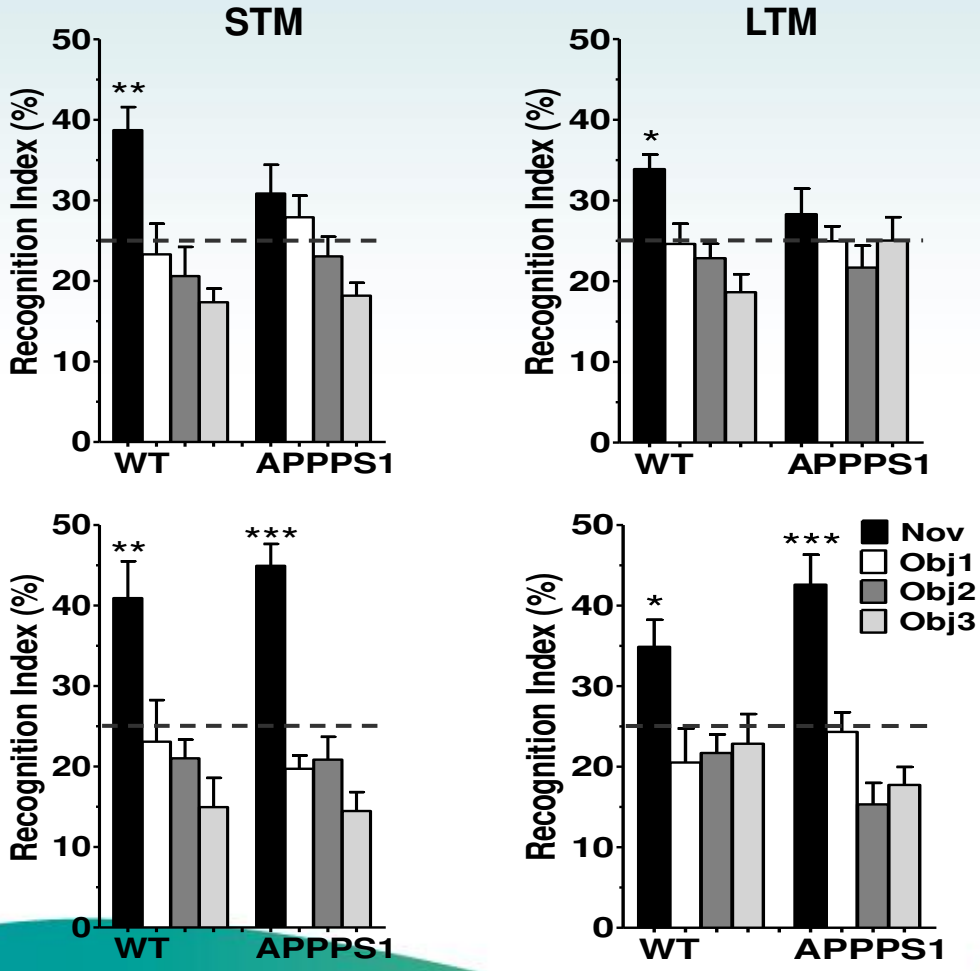
Reversal of memory deficit in end-stage of AD mice



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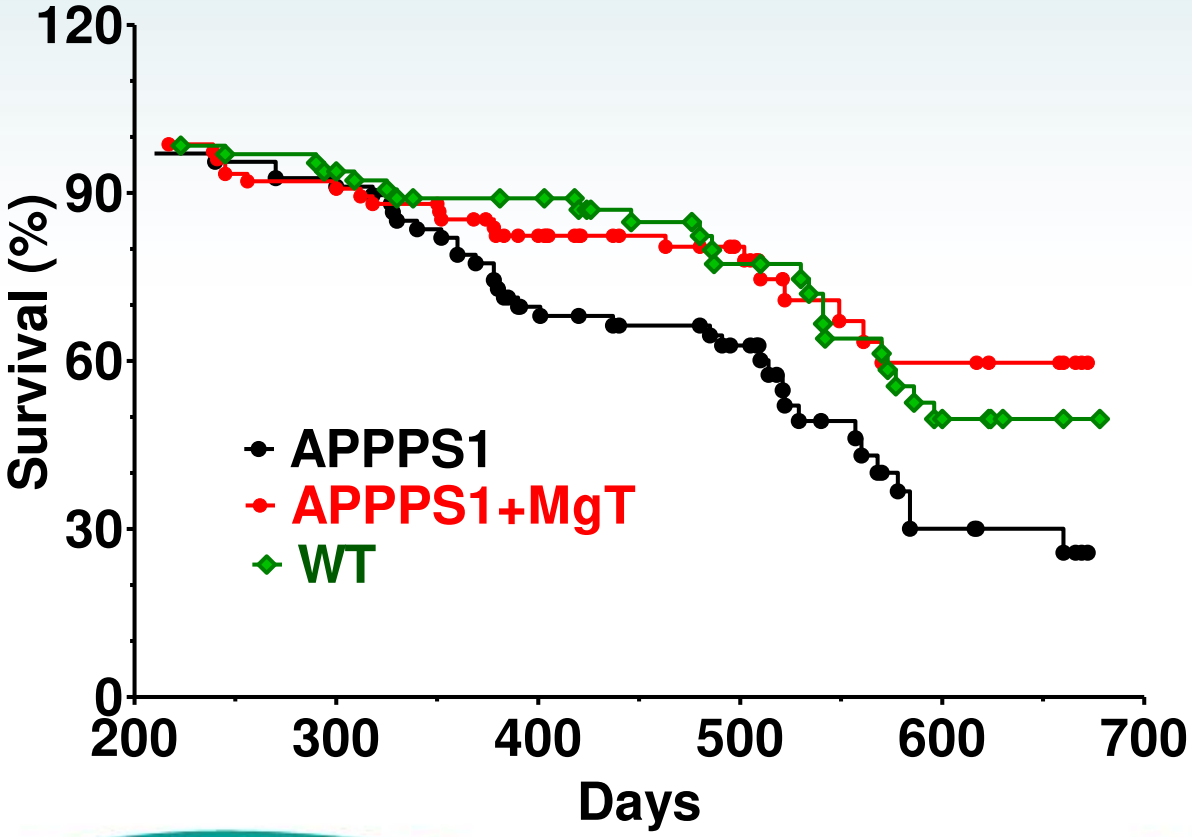
MgT increases lifespan of AD mice



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Mental Calm and Stress Relief

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Human Clinical Study

A RANDOMIZED, DOUBLE-BLIND, PARALLEL GROUP, PLACEBO-CONTROLLED CLINICAL TRIAL EVALUATING SAFETY AND EFFICACY OF MAGTEIN™ ON

1) BODY MAGNESIUM STATUS,
2) MEMORY AND COGNITION

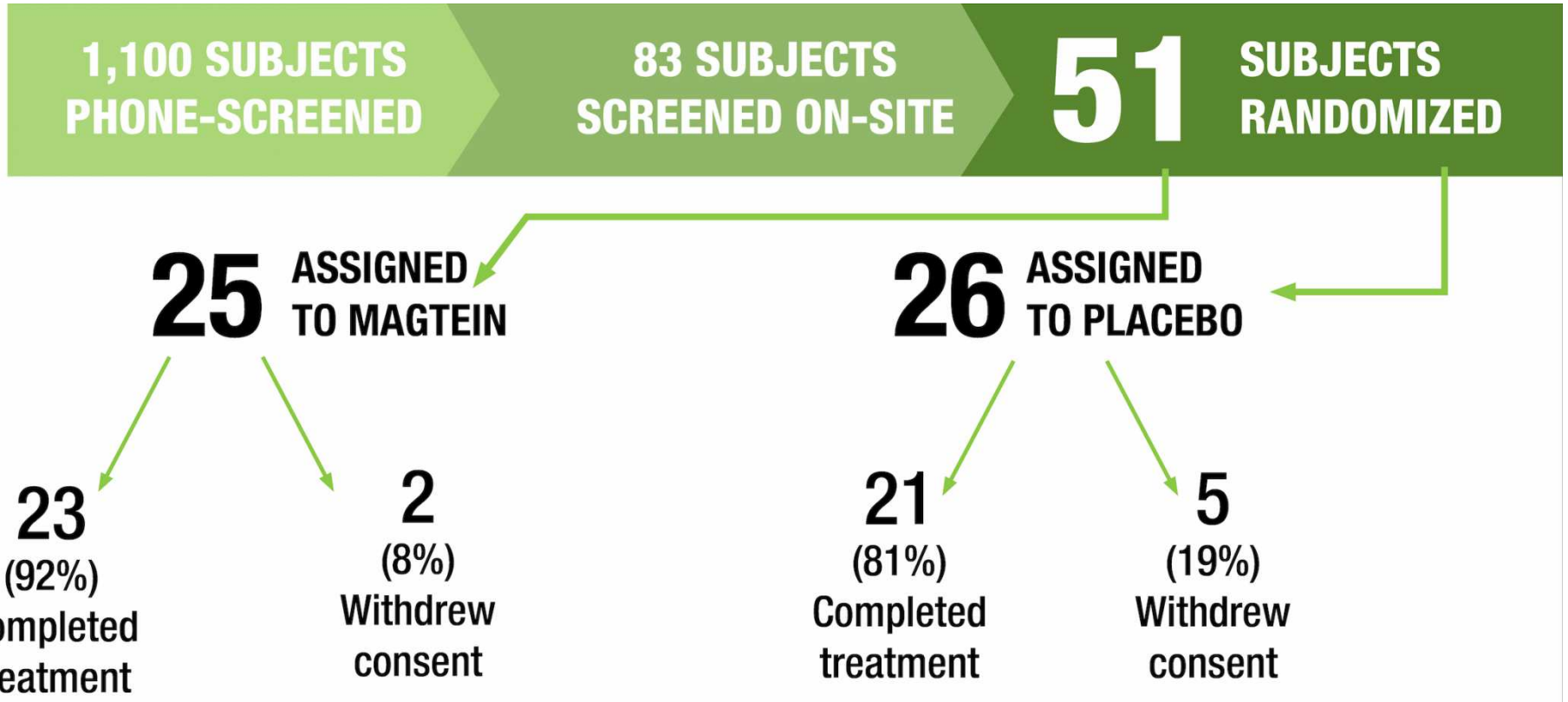
Human Clinical Design

Major Inclusion Criteria:

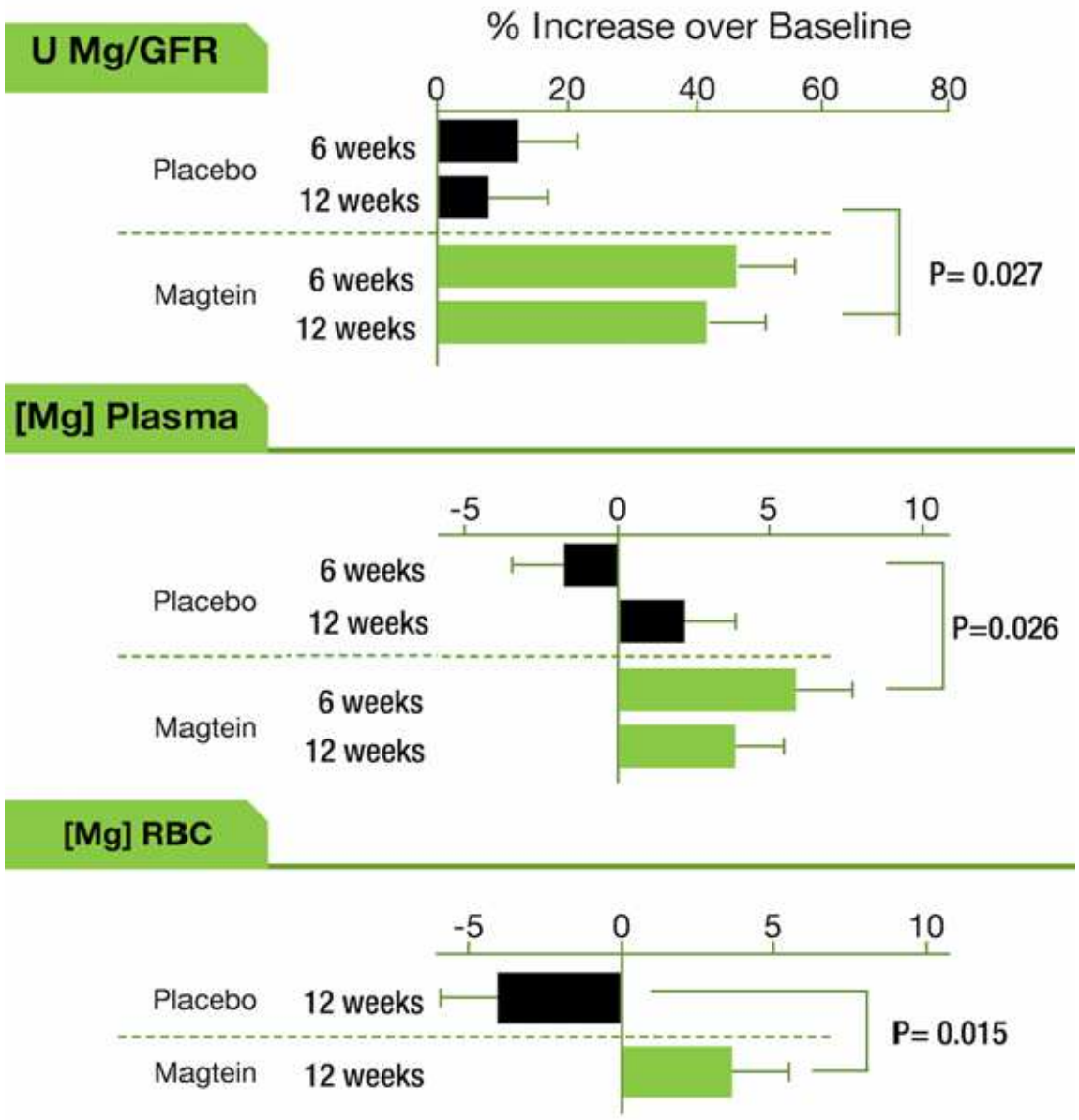
- Subject is aged 50 to 70 years
- Subject weighs between 50 and 100 kg.
- For subjects ≥ 50 and < 70 kg, 1.5 g/day of Magtein.

  For subjects ≥ 70 and ≤ 100 kg, 2 g/day of Magtein.
- Subject complains of having memory problems, anxiety and sleep problems,
- Subject scores ≥ 24 on the Mini-Mental State Examination (MMSE) for the purpose of ruling out dementia and Alzheimer's disease
- 50 Participants evaluated at day 0, 6 weeks and 12 weeks
- Collaborations with CRO, Ohio University and Dr. Liu

Fig.1 Study Assignment and Outcomes.



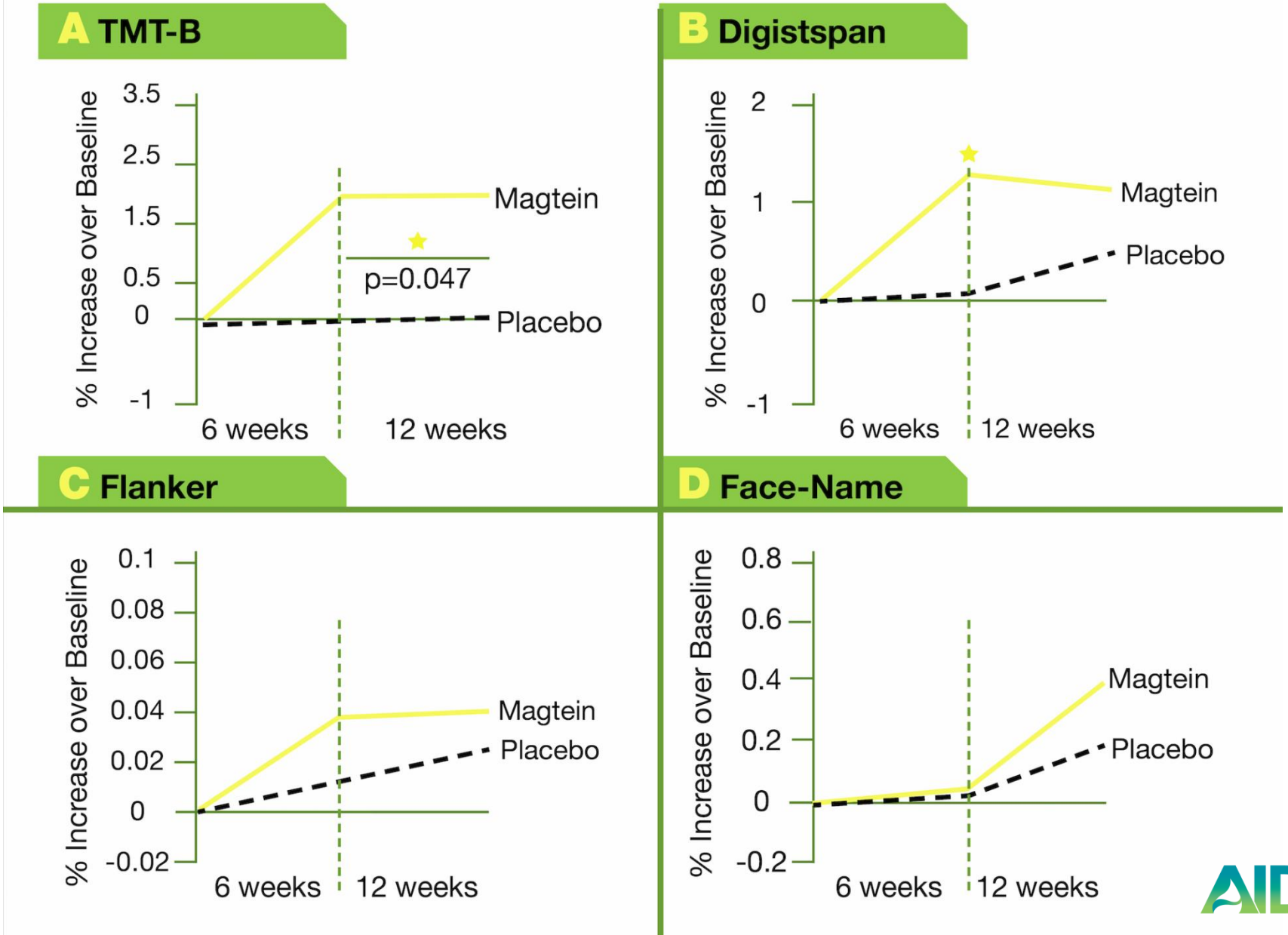
Increase in body Mg^{++} levels after Magtein supplementation



The Effects of Magtein on Memory and Cognitive

• TMT-B,	Executive Function
• Digitspan,	Working memory
• Flanker,	Attention
• Name-Face Association,	Episodic Memory

Figure 2. Cognitive endpoints change from baseline for Magtein and Placebo



Composite score

- $\bar{Z}$ = average of

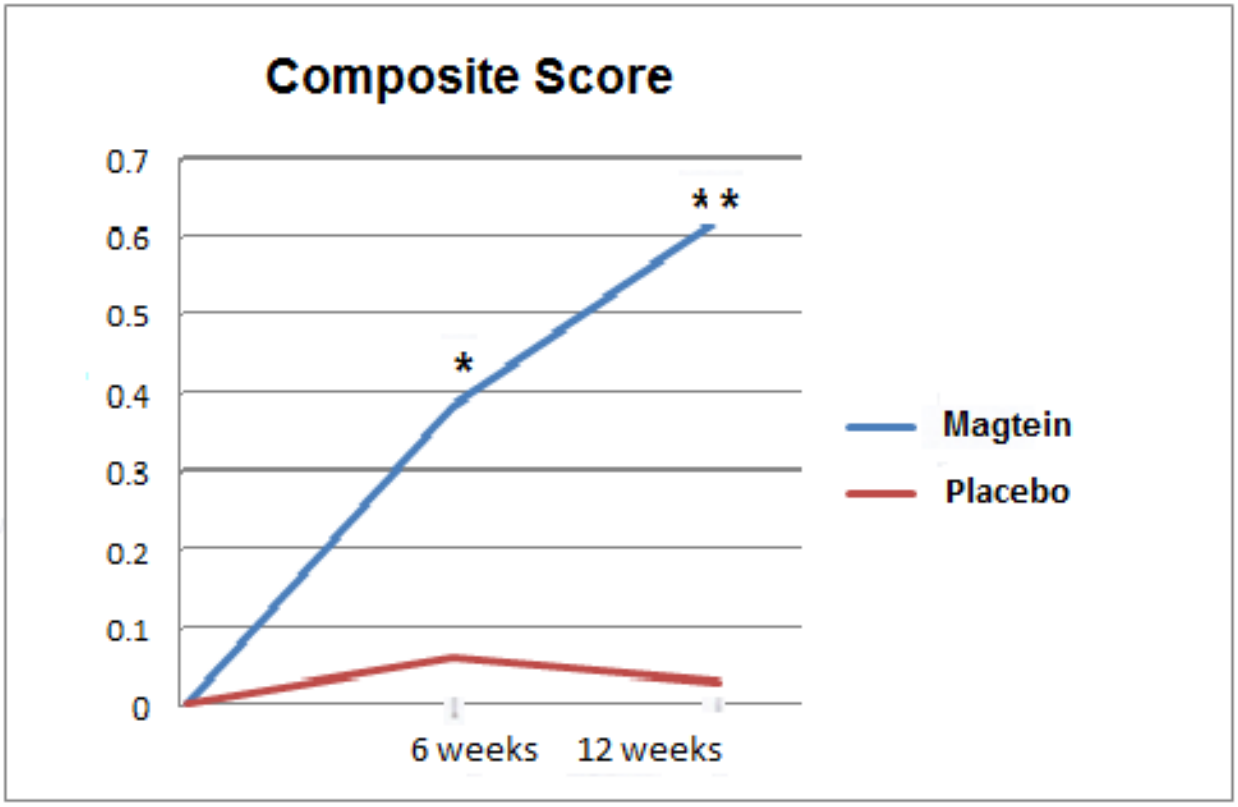
  Z (Executive function)

  Z (Working memory)

  Z (Attention)

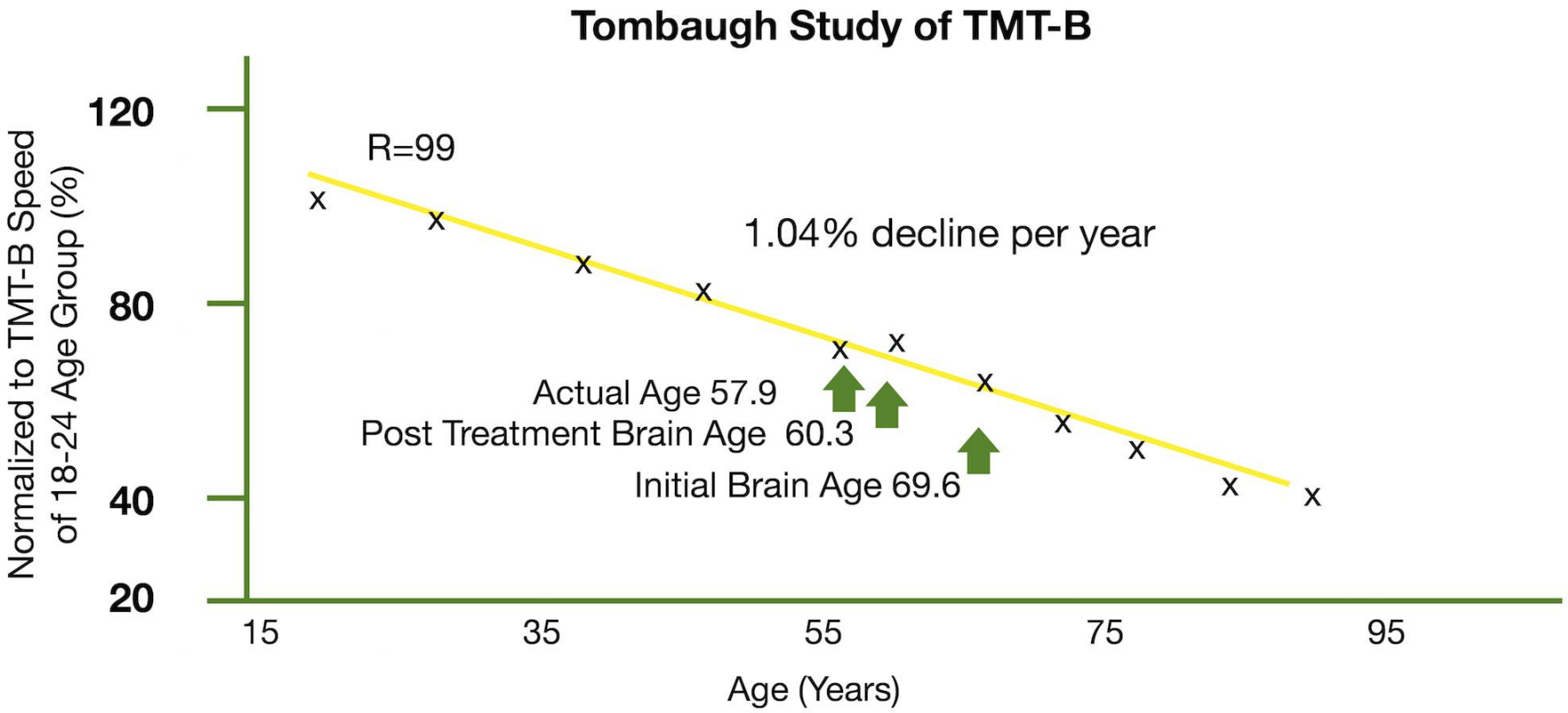
  Z (Episodic memory)

Composite score



* P<0.05 * * P<0.01

Magtein Reverse Brain Age



Tombaugh TN (2004) Trail Making Test A and B: Normative data stratified by age and education. *Arch Clin Neuropsychol* **19**, 203-214.

Results:

	Magtein	Placebo	Difference Between Groups
Magnesium Intake	+	-	+
Memory	+	-	+

Regulatory Status

USA:

FDA GRAS: Obtained

Other countries: Different stages of application.

Questions and Answers