

"From dietary supplements to
digestive health: New ideas about
brain health"

Brain TLC

November 2014

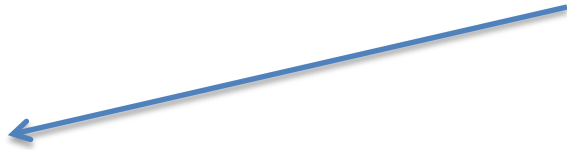
What is dementia?

What is dementia?

- Dementia = any acquired brain condition that interferes with the ability to think and to carry out routine daily functions

What is dementia?

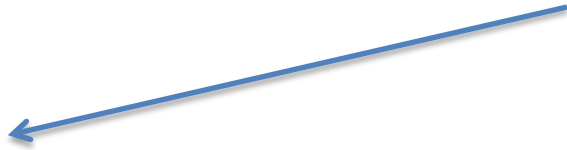
- Dementia = any acquired brain condition that interferes with the ability to think and to carry out routine daily functions



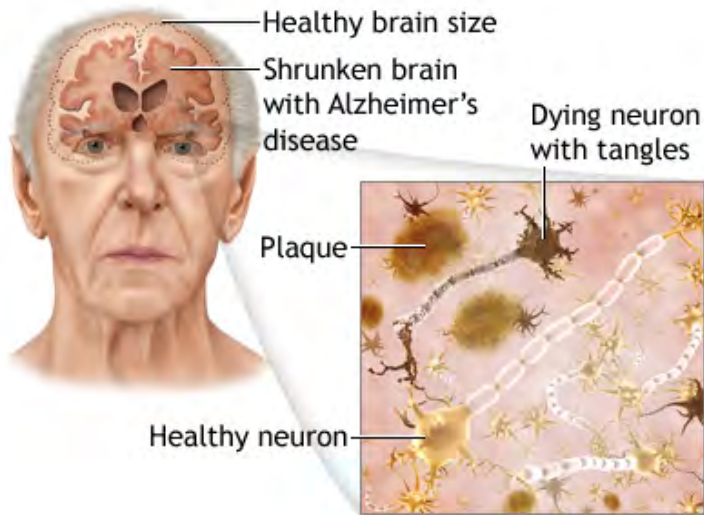
Alzheimer's disease = the most common cause of dementia, characterized by "plaques" and "tangles" in brain

What is dementia?

- Dementia = any acquired brain condition that interferes with the ability to think and to carry out routine daily functions

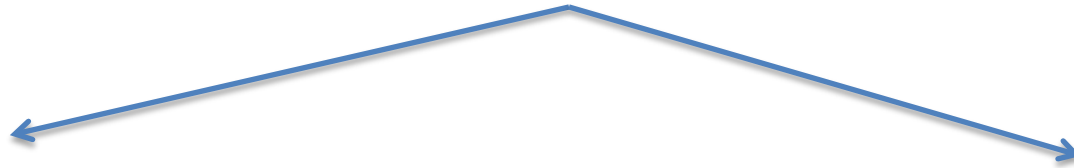


Alzheimer's disease = the most common cause of dementia, characterized by “plaques” and “tangles” in brain



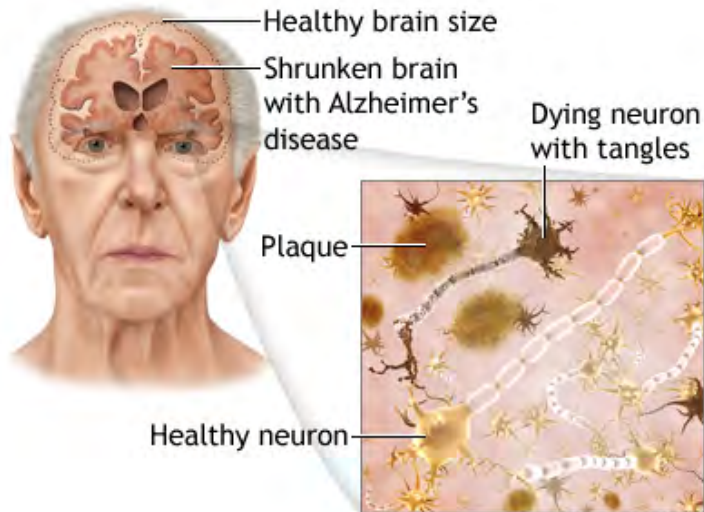
What is dementia?

- Dementia = any acquired brain condition that interferes with the ability to think and to carry out routine daily functions



Alzheimer's disease = the most common cause of dementia, characterized by "plaques" and "tangles" in brain

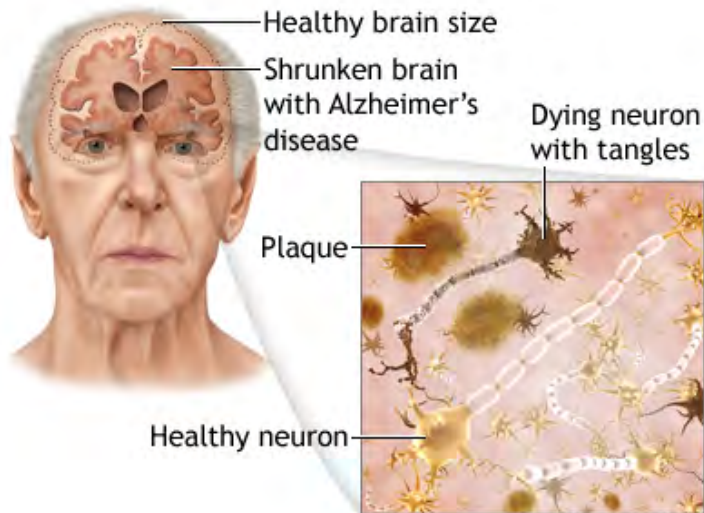
Dementia due to multiple strokes = "Vascular dementia"



What about dementia without amyloid?

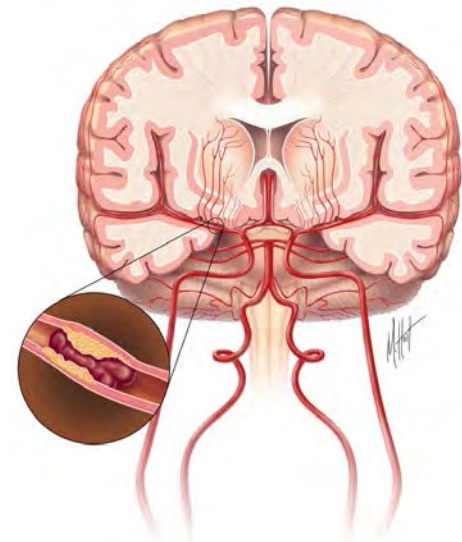
- Dementia = any acquired brain condition that interferes with the ability to think and to carry out routine daily functions

Alzheimer's disease = the most common cause of dementia, characterized by "plaques" and "tangles" in brain



ADAM

Dementia due to multiple strokes = "Vascular dementia"



Where can we learn about non-amyloid dementia?

- “The Nun Study”



Brain Infarction and the Clinical Expression of Alzheimer Disease

The Nun Study

JAMA. 1997;277:813-817

Type and Location of Infarct	Proportion Demented (No. Demented/No. at Risk)	Multivariate-Adjusted Odds Ratio for Dementia (95% CI)
1-2 Lacunar infarcts in basal ganglia, thalamus, or deep white matter	0.93 (14/15)	20.7 (1.5-288.0)
≥1 Large infarcts in lobes of neocortex	0.75 (9/12)	6.7 (0.9-48.3)
No brain infarcts	0.57 (21/37)	...

*All 61 participants met the neuropathologic criteria for Alzheimer disease. Variables adjusted were age at the

Nun study-conclusion

- The two groups of patients with equivalent numbers of Alzheimer “plaques” and “tangles”.
- Only the patients who also had strokes showed signs of dementia.
- So... strokes promote the “expression” of dementia

How do you prevent strokes?

- Don't smoke
- Exercise
- Control weight
- Control blood pressure
- Control cholesterol
- Control blood sugar

How do you prevent strokes?

- Don't smoke (no clinical trial needed)
- Exercise (no clinical trial needed)
- Control weight (no clinical trial needed)
- Control blood pressure (no clinical trial needed)
- Control cholesterol (no clinical trial needed)
- Control blood sugar (no clinical trial needed)

Can we design a study for stroke-related dementia?

Nutrient biomarker patterns, cognitive function, and MRI measures of brain aging



G.L. Bowman, ND, MPH
L.C. Silbert, MD, MCR
D. Howieson, PhD
H.H. Dodge, PhD
M.G. Traber, PhD
B. Frei, PhD
J.A. Kaye, MD
J. Shannon, PhD, MPH
J.F. Quinn, MD

Correspondence & reprint
requests to Dr. Bowman:
bowmang@ohsu.edu

ABSTRACT

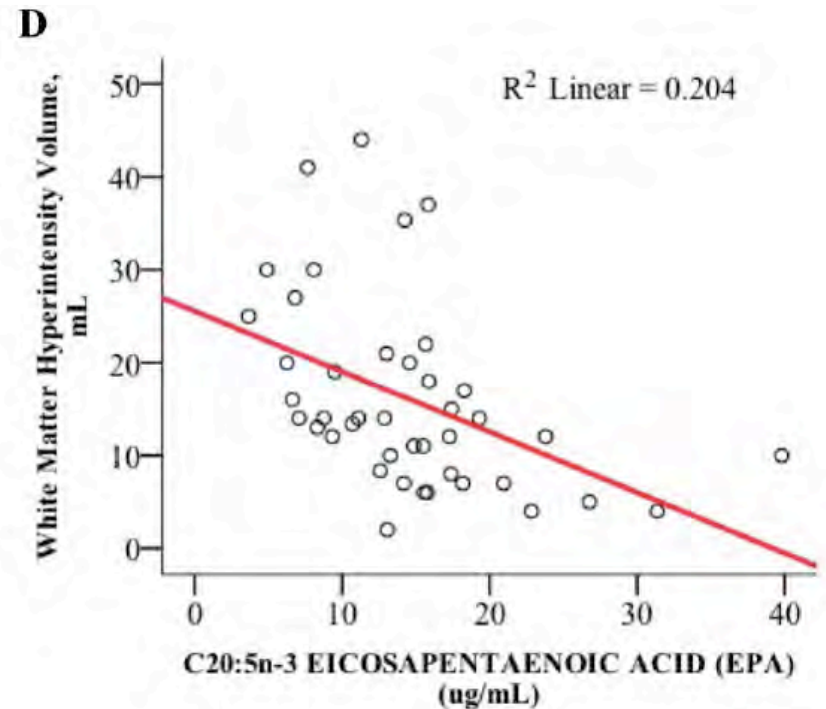
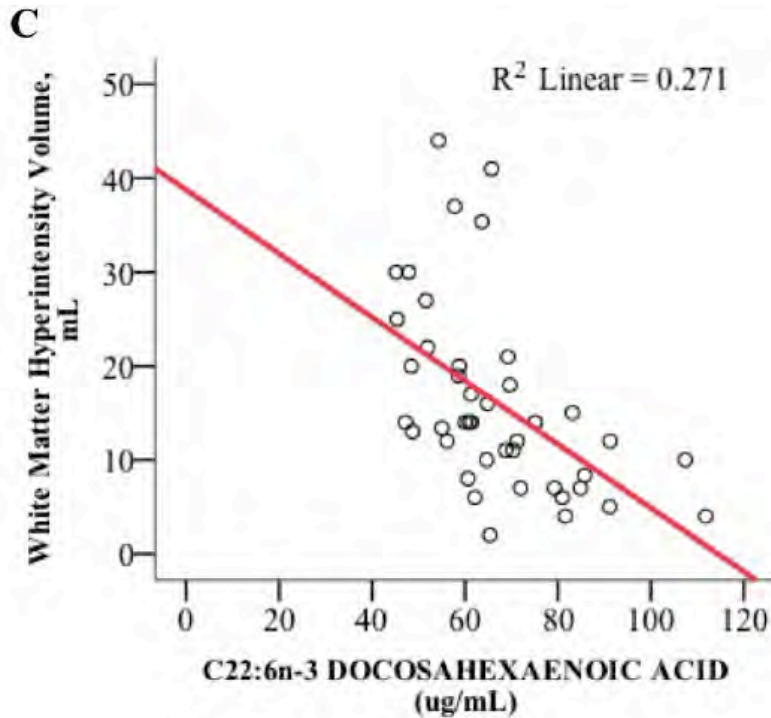
Objective: To examine the cross-sectional relationship between nutrient status and psychometric and imaging indices of brain health in dementia-free elders.

Methods: Thirty plasma biomarkers of diet were assayed in the Oregon Brain Aging Study cohort ($n = 104$). Principal component analysis constructed nutrient biomarker patterns (NBPs) and regression models assessed the relationship of these with cognitive and MRI outcomes.

Results: Mean age was 87 ± 10 years and 62% of subjects were female. Two NBPs associated with more favorable cognitive and MRI measures: one high in plasma vitamins B (B1, B2, B6, folate, and B12), C, D, and E, and another high in plasma marine ω -3 fatty acids. A third pattern characterized by high trans fat was associated with less favorable cognitive function and less total cerebral brain volume. Depression attenuated the relationship between the marine ω -3 pattern and white matter hyperintensity volume.

Conclusion: Distinct nutrient biomarker patterns detected in plasma are interpretable and account for a significant degree of variance in both cognitive function and brain volume. Objective and multivariate approaches to the study of nutrition in brain health warrant further study. These findings should be confirmed in a separate population. *Neurology*® 2012;78:241-249

Low omega 3's -> sick blood vessels



- Do omega 3's reduce dementia risk by keeping brain blood vessels healthy?

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)



Brain MRI scan to determine if WMH present

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)



Brain MRI scan to determine if WMH present



Insignificant WMH on MRI scan

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)



Brain MRI scan to determine if WMH present



Insignificant WMH on MRI scan



Not eligible

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)



Brain MRI scan to determine if WMH present



Insignificant WMH on MRI scan

Significant WMH on MRI scan



Not eligible

NIH-sponsored dementia prevention study:

Individuals over age 80 who do not have a dementia



Memory test to confirm no dementia (MCI OK)



Brain MRI scan to determine if WMH present



Insignificant WMH on MRI scan



Significant WMH on MRI scan



Not eligible



Fish oil vs placebo for 3 years

Currently recruiting for this study:

- 80 years or older
- Must be able to have MRI scans
- Not taking fish oil or omega 3 supplements

If interested:

- Contact Rachel Ross:
- 503-494-7798
- rosra@ohsu.edu

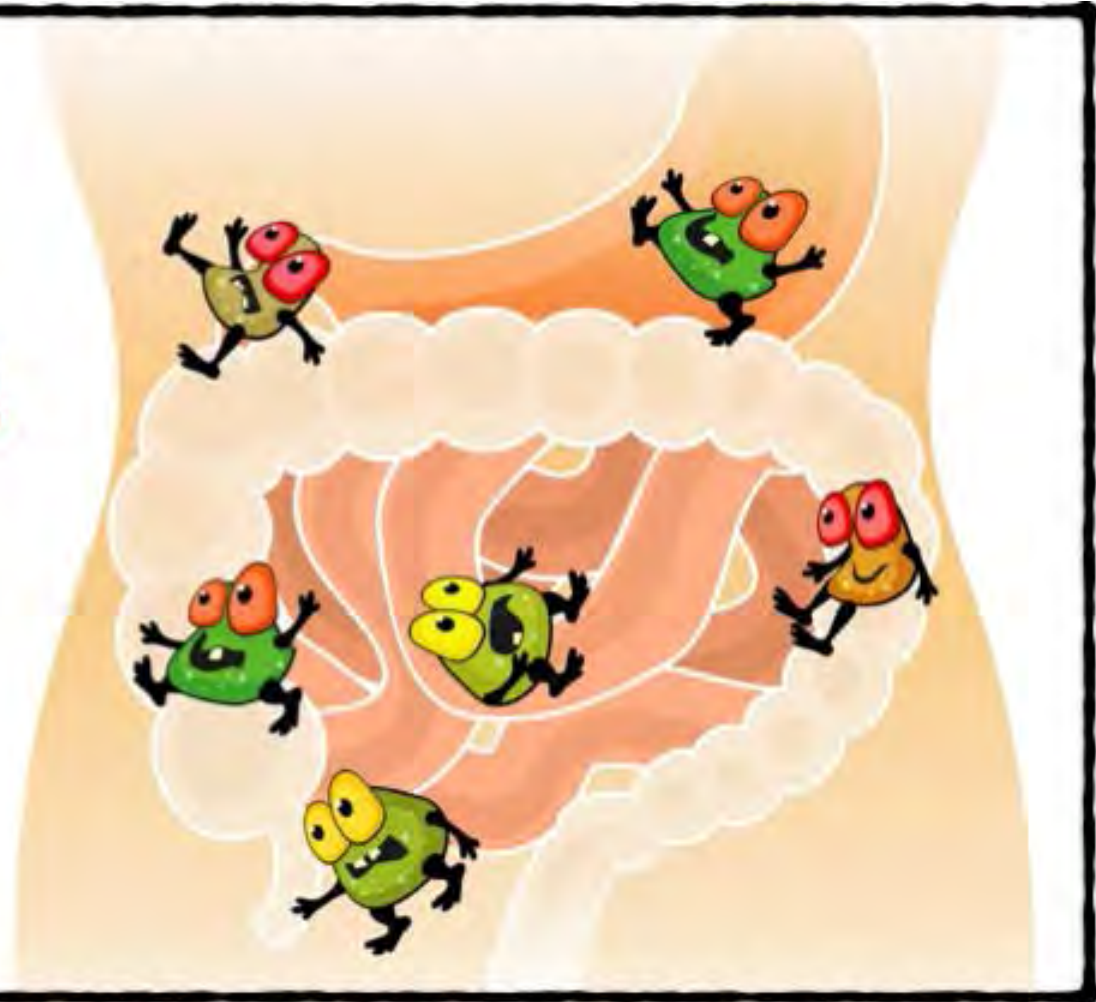
Questions about the fish oil study?



Shifting gears:

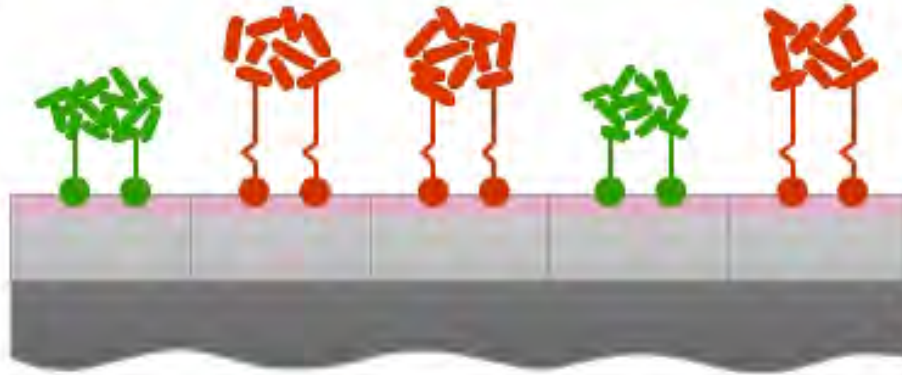
- Digestive health and the brain:
 - Digestive health depends on “good” bacteria
 - Balance of “good” and “bad” bacteria in intestines is altered by antibiotic use
 - Evidence that gut bacteria affects the brain is beginning to accumulate

Are Your
Gut Bacteria
Healthy?

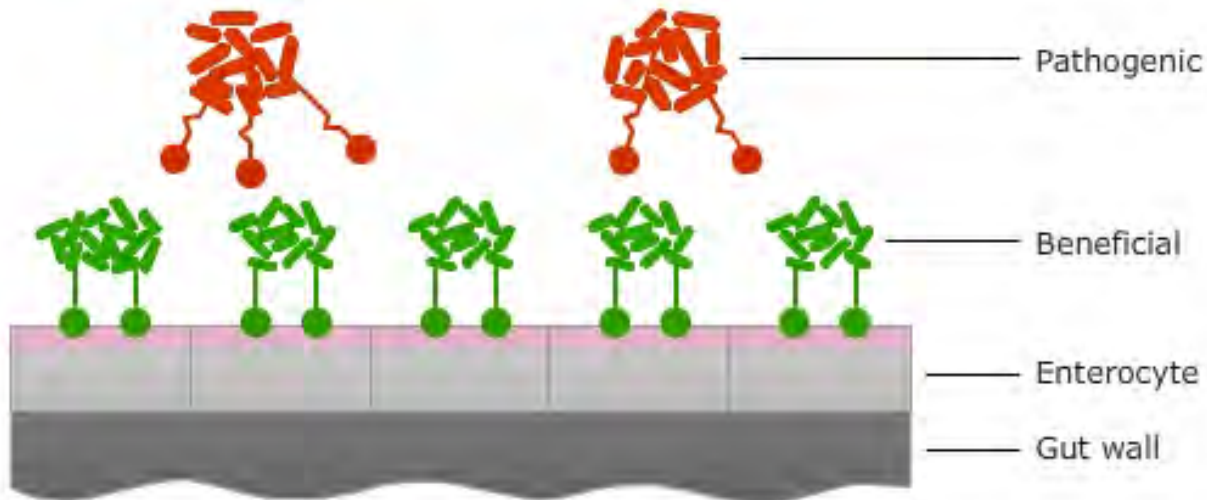


www.ohlardy.com

1 Diagram of pathogenic bacteria acquiring attachment sites.



2 Diagram of PROBIOTIC bacteria competing for and securing attachment sites.



Good vs bad gut bacteria

- Antibiotics can disturb the balance.
- *C. difficile* is an overgrowth of bad bacteria leading to a significant acute illness.
- *C. difficile* is traditionally treated with another antibiotic, but the latest trend is to replace the good bacteria: “probiotics”

Wellness.com on probiotics:

Probiotics appear to be safe for most people without side effects; however, the potential for serious adverse consequences exists in some instances. Probiotics are contraindicated for critically ill patients and individuals with a compromised immune system due to disease or chemotherapy. In particular, probiotics are dangerous for patients with severe pancreatitis.

Donald McGee



Dr. Donald McGee is the Founder of Wellness.com, a Board Certified M.D., graduated from Mt Sinai School of Medicine in New York, and has an accredited PhD in Health Studies from Saybrook Institute in San Francisco. He is also a Diplomate of the American Board of Emergency Medicine as well as a Fellow of the American ...

[View Full Profile](#)

Wellness.com on probiotics:

If you are considering probiotics for either preventive or treatment reasons, first consult your primary care physician. Confirmed health benefits depend on specific strains and dosages. Also, remember that dietary supplements are not regulated like drugs in the U.S. Supplement manufacturers, however, may use a voluntary certification program through ConsumerLab. Look for the CL Seal of Approval on a supplement product's packaging for confidence that it's passed

Donald McGee



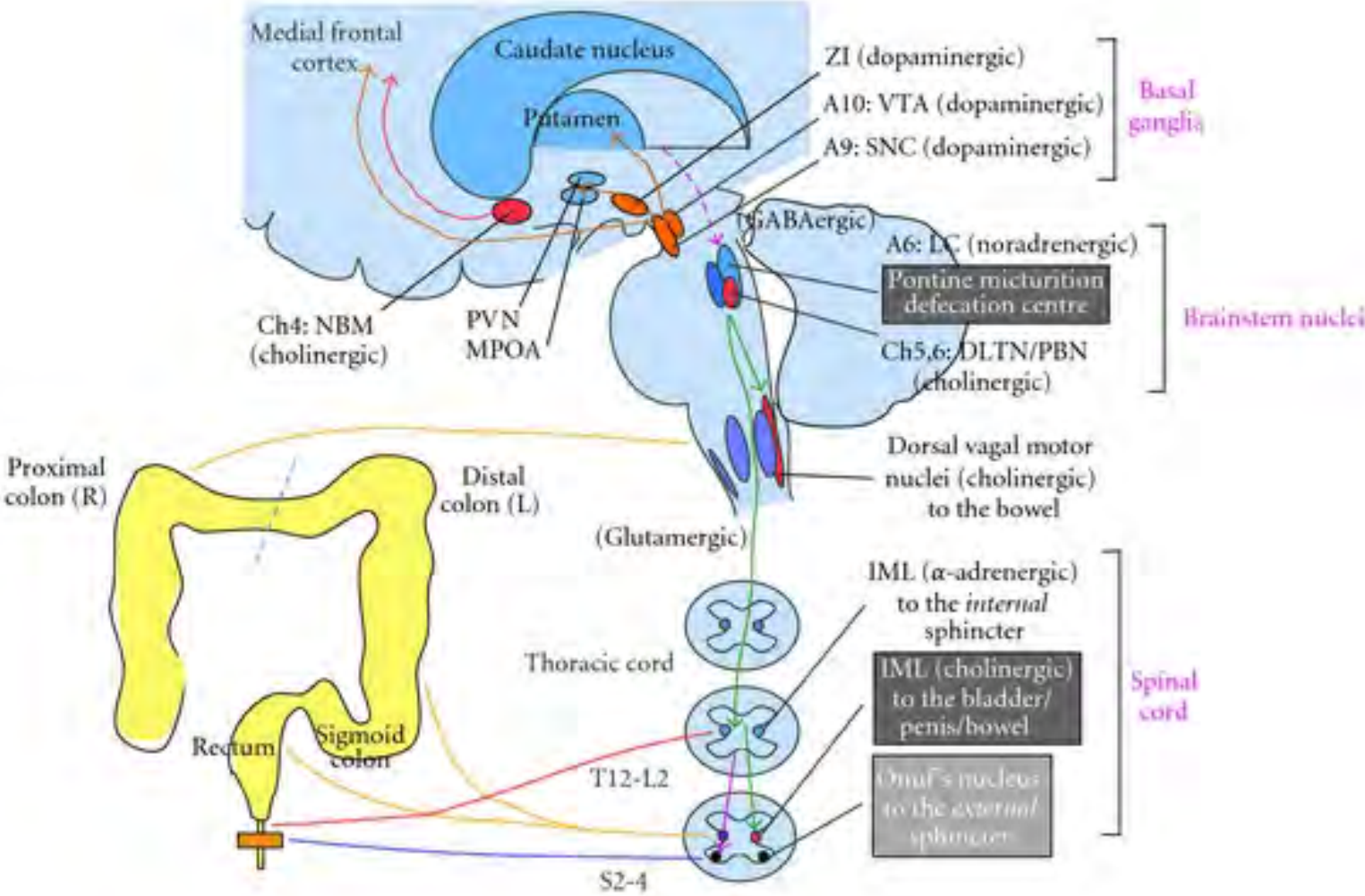
Dr. Donald McGee is the Founder of Wellness.com, a Board Certified M.D., graduated from Mt Sinai School of Medicine in New York, and has an accredited PhD in Health Studies from Saybrook Institute in San Francisco. He is also a Diplomate of the American Board of Emergency Medicine as well as a Fellow of the American ...

[View Full Profile](#)

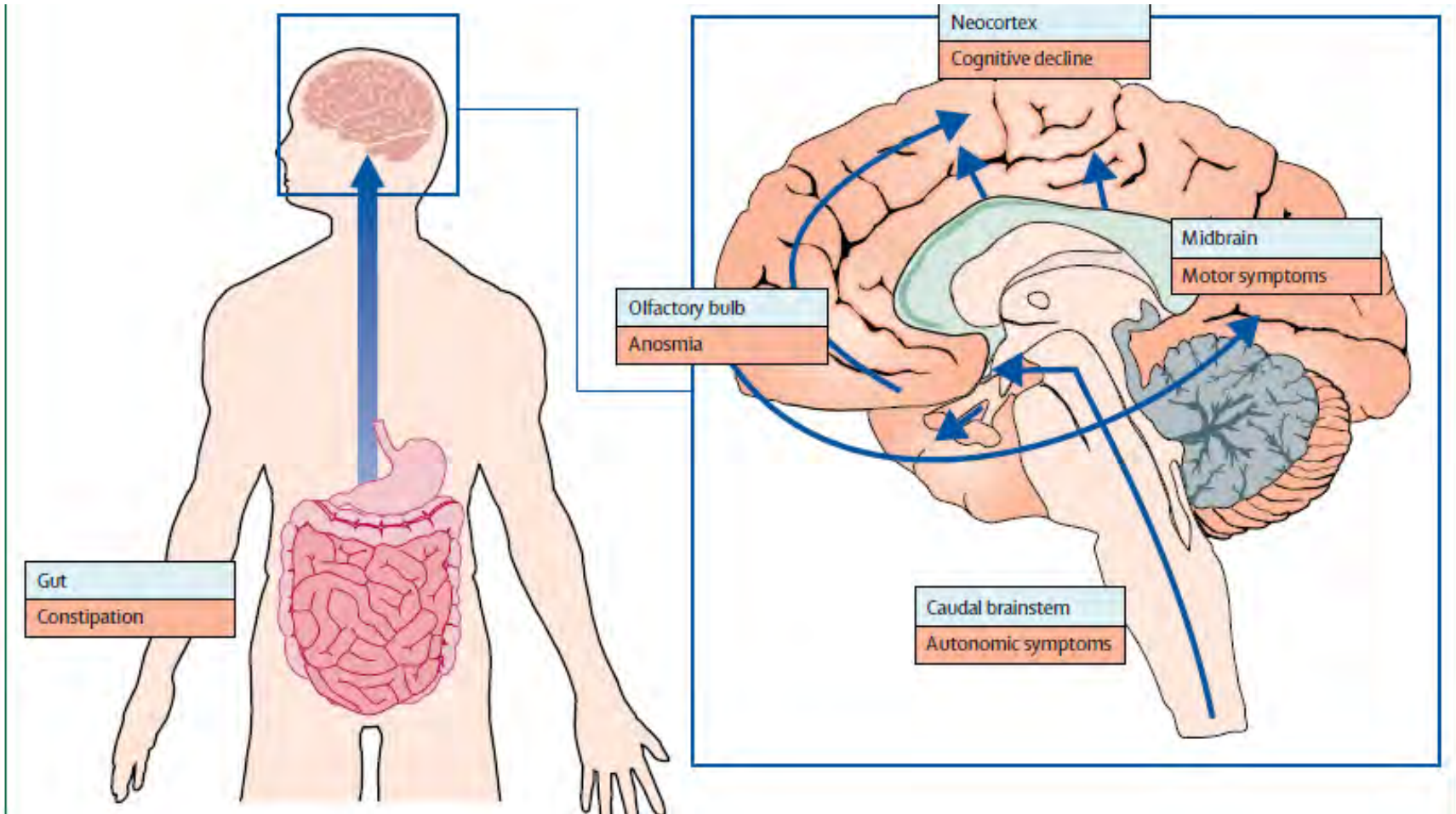
Shifting gears:

- Digestive health and the brain:
 - Digestive health depends on “good” bacteria
 - Balance of “good” and “bad” bacteria in intestines is altered by antibiotic use
 - Evidence that gut bacteria affects the brain is beginning to accumulate

Gut-brain connection



Gut-brain connection



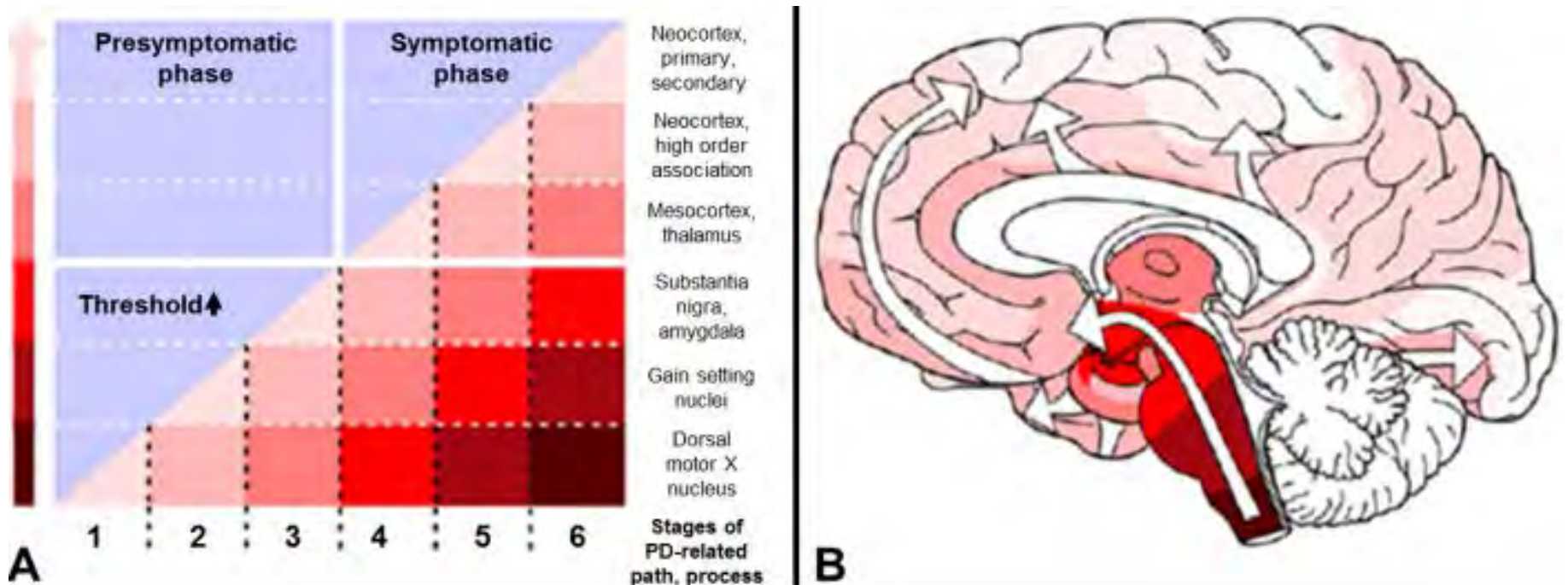
Gut bacteria-brain connection: preliminary evidence:

- MRI-defined brain connections vary depending on gut bacteria composition (Emeran Meyer, UCLA)
- Gut bacteria from anxious mice can make other mice anxious (Stephen Collins, McMaster University, Ontario)
- Cutting the nerve from gut to brain reduces the effects of gut bacteria (John Cryan, University College Cork)
- Gut bacteria produce novel neurochemicals (Mark Lyte, Texas Tech)

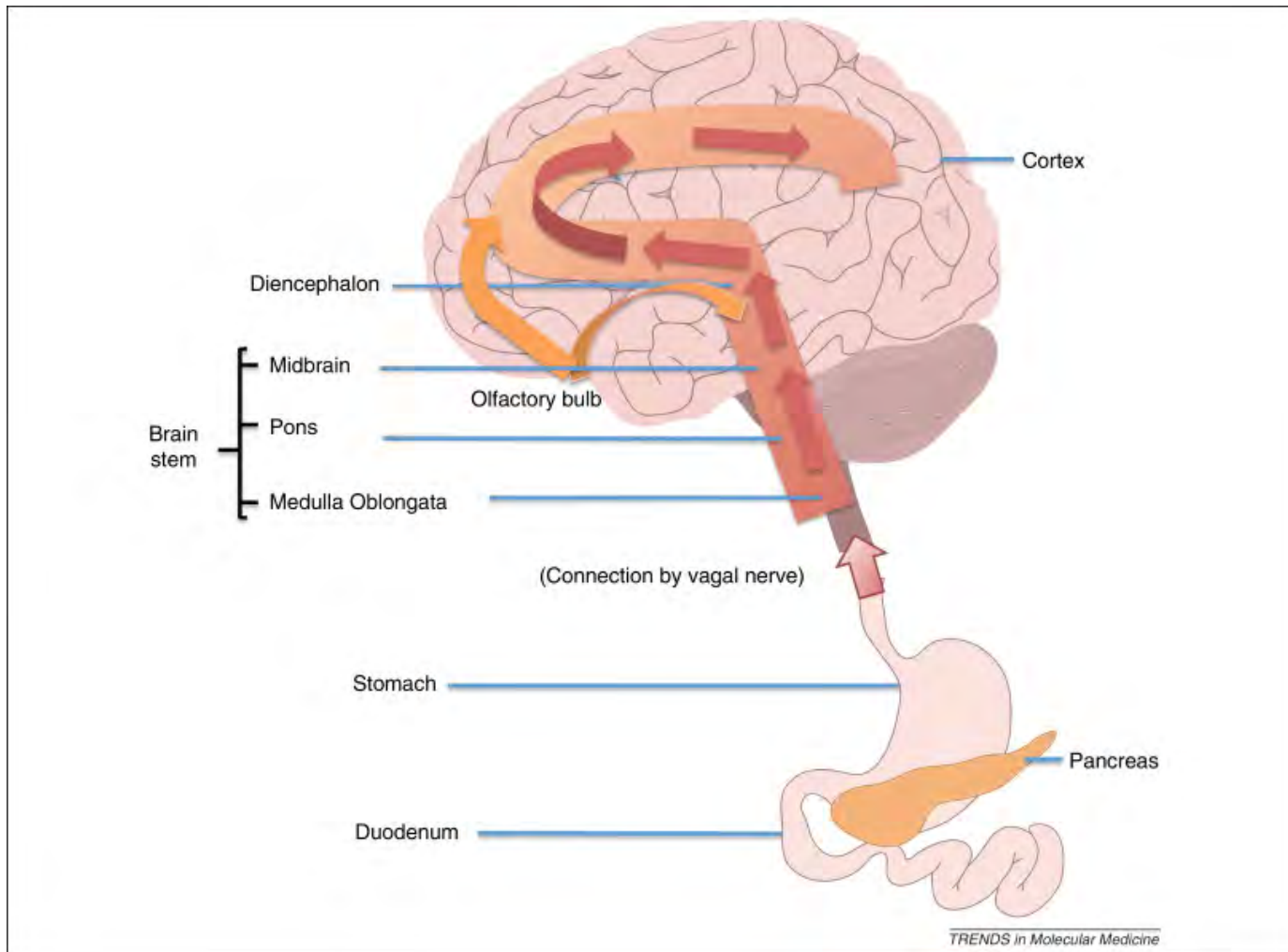
Gut bacteria-brain connection: preliminary evidence:

- Probiotics improve behavior in mouse model of autism (Paul Patterson, Cal Tech)
- Probiotics being tested for effects on bipolar disorder (Faith Dickerson, Baltimore)
- Probiotics may affect anxiety in people (Mayer and Kirsten Tillisch, UCLA)

Parkinson's disease first appears in the brain at the connection to the gut:



Parkinson's disease may start in the gut:



Study of gut bacteria and Parkinson's disease

- Will compare gut bacteria composition in Parkinson's disease and in healthy control subjects.
- Participation occurs at home:
 - 1) Small stool sample collected with a q-tip from soiled toilet paper and placed in a mailing envelope
 - 2) 20 minute questionnaire also sent in the mail.

Study of gut bacteria and Parkinson's disease

- Awaiting approval from human subjects committee
- Will contact Registry participants via email/phone to ask about participation

Questions about the “gut microbiome” study?



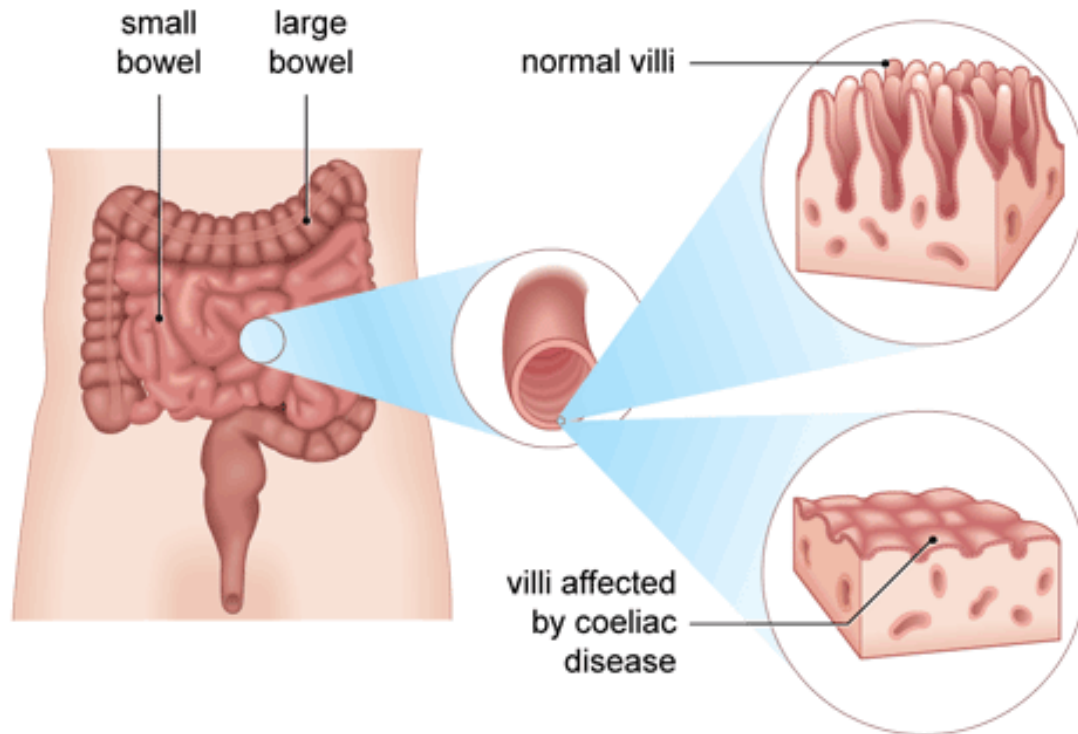
Gluten sensitivity and the brain

- Classic view of gluten sensitivity
- Recent revisions, including role of gluten/grains in brain health

Gluten sensitivity: classical view

- Gluten is a component of grain
- “celiac disease” is a rare condition in which patients have atrophy of a portion of their gut due to an immune reaction to gluten
- Symptoms are weight loss and malabsorption of vitamins and other nutrients
- Can test for blood for antibodies against gluteins, but definitive diagnosis is biopsy of small intestine

Gluten sensitivity: classical view



The areas of the bowel affected
by coeliac disease



www.bupa.com

Gluten sensitivity: classical view

- Rare instances of neurological effects of celiac disease / gluten sensitivity
- “gluten ataxia” due either to malnutrition or to auto-immunity directed at the brain.
- Regardless: Treatment is a gluten-free diet

Gluten sensitivity- revised view:

- Prior diagnostic criteria was too rigid
- “gluten sensitivity” is more common than biopsy prove-able celiac disease
- Gluten sensitivity should be more widely diagnosed when people present with GI, neurologic, or other symptoms
- Gluten-free diet should be more widely embraced

Gluten sensitivity-revised view:

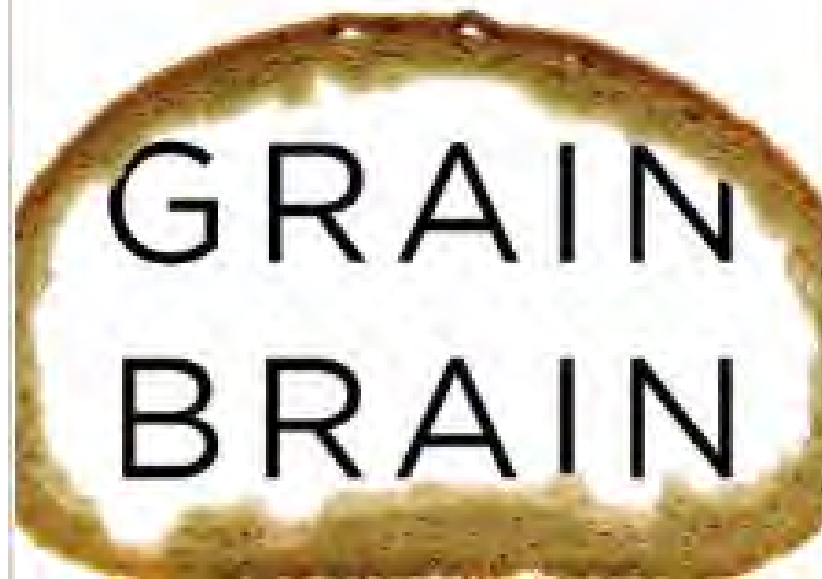


#1 NEW YORK TIMES BESTSELLER

"An invaluable approach to our most fragile organ!"

—MEHMET OZ, MD

*The Surprising Truth About Wheat, Carbs,
and Sugar—Your Brain's Silent Killers*



DAVID PERLMUTTER, MD

Author of The Better Brain Book

WITH KRISTIN LOBERG

Grain-brain author

- Dr Perlmutter is a board-certified neurologist
- His books have done very well, he has a free-standing health center in Florida, and he has won several awards.
- His ideas about grain and brain function are outside the mainstream

Atlantic Monthly-December 2013

"I also find it sad that because his book is filled with a whole bunch of nonsense, that's why it's a bestseller; that's why we're talking."

"You're only being a good scientist," Katz said, "if you say, 'I'm going to try to read the literature in as unbiased a manner as I possibly can, see where it leads me, and then offer the advice that I have based on that view from an altitude.' I don't see that going on here, and again, I think it's kind of sad because I think the public is being misled."

"I also find it sad that because his book is filled with a whole bunch of nonsense, that's why it's a

Atlantic Monthly-December 2013

/ we're talking."

"I also find it sad that because his book is filled with a whole bunch of nonsense, that's why it's a bestseller; that's why we're talking. Because that's how you get on the bestseller list. You promise the moon and stars, you say everything you heard before was wrong, and you blame everything on one thing. You get a scapegoat; it's classic. Atkins made a fortune with that formula. We've got Rob Lustig saying it's all fructose; we've got T. Colin Campbell [author of *The China Study*, a formerly bestselling book] saying it's all animal food; we now have Perlmutter saying it's all grain. There's either a scapegoat or a silver bullet in almost every bestselling diet book."

Atlantic Monthly-December 2013

is.

much LDL is bad for you. We do not have reason to believe that gluten is bad for most people. It does cause reactive symptoms in some people.

Peanuts can kill some people, but that does not mean they are bad for everyone. I agree with Katz that the diets consistently shown to have good long-term health outcomes—both mental and physical—include whole grains and fruits, and are not nearly as high in fat as what Perlmutter proposes.

Atlantic Monthly-December 2013

This Is Your Brain on Gluten

JAMES HAMBLIN | DEC 20 2013, 8:30 AM ET

I hope people don't give up on nutrition science, because there is a sense that no one agrees on anything. An outlier comes shouting along every year with a new diet bent on changing our entire perspective, and it's all the talk. That can leave us with a sense that no one is to be believed. The scientific community on the whole is not as capricious as the bestseller list might make it seem.

Questions about the gluten sensitivity and the brain?



Other studies currently recruiting:

- “A4” prevention trial: cognitively healthy, age 65-85, 3 year study
- Merck: mild to moderate Alzheimer’s
- Contact:
- 503-494-7615
- Adresearch@ohsu.edu

Participants Needed for an NIH Funded Exercise Research Project

Organization: Oregon Research Institute

Eligibility: older adults 65 years and older who

- have a history of falls past year
- are under active (<60 minutes of moderate intensity exercise per week)
- have a medical clearance to participate

Intervention: 2 times per week for 6 months

- **Group Multimodal Exercise** involving strength, balance, flexibility, and aerobic exercises
- **Stretching**
- **Tai Ji Quan**

Participants Needed for an NIH Funded Exercise Research Project

Location: Tualatin Senior Center. More future classes will be set up in other sites within Portland Metro area in coming years

Class time: Monday and Wednesday afternoons, beginning on October 20.

All Classes are FREE

Please Call: 503-542-5205

Questions?

