

# Nutrition, Lifestyle, Supplements That Support People with MS

**Kaytee Boyd**

B Sc, B Phed, CHEK III

The Boyd Clinic

Integrative Nutritionist

**facebook/IG:** The.Boyd.Clinic

[www.TheBoydClinic.co.nz](http://www.TheBoydClinic.co.nz)

© All right reserved 2020



## **Dr Swank ~ 1940's**

- Decrease fat to <15 gm sat fat daily
- decrease red meat and oily fish, increase white fish
- High drop-outs, no benefits shown

## **George Jelinek's overcoming MS (OMS) dev 1999**

- Similar to Swanks. But combo of lifestyle as well as dietary modifications:
- omega 3 fish oil or flaxseed + vitamin D

## **The Best Bet Diet**

- No dairy, legumes, gluten, refined sugar, eggs or yeast.

**Wahls protocol 2000** - nutrient-rich paleo diet high in vitamins, minerals, antioxidants, and essential fatty acids helped reduce her symptoms.



# Top things that always come up:

- What am I supposed to eat?
- No dairy, no gluten, right?
- Can I have coffee and alcohol?
- What foods and supplements are best?
- Is lifestyle really important?



# Nutrition is the KEY

Medical s  
therapy a  
the most

**We cannot**

nal  
max of

**rything!**



# Follow an anti-inflammatory diet that's:

- high in nutrient-dense fruits and vegetables
- low in fats (processed to be solid) - **up for debate!**
- keeps red meat to a minimum \* - **up for debate!**
- low in grain and dairy (gluten and casein)

Autoimmune diseases involve inflammation, many theories on the potential positive effects diet may have on the disease are based in decreasing inflammation in the body and improving neuronal health.



# Wheat and dairy products could play a huge role in MS disease progression.



Going gluten free in non-celiac autoimmune diseases: the missing ingredient. [Expert Review of Clinical Immunology](#). Volume 14, 2018 - Issue 11  
Trends in gluten research and its relationship to autoimmune and allergic diseases. Edward J.Ciaccio, GovindBhagat, Suzanne K.Lewis, Peter H.Green. *Informatics in Medicine Unlocked*. , 2016, Pages 7-14  
L.M. Sollid. Coeliac disease: dissecting a complex inflammatory disorder. *Nat Rev Immunol*, 2 (2002), pp. 647-655  
The immune recognition of gluten in coeliac disease. R. Cicciocioppo, A. Di Sabatino, G.R. Corazza. *Clin Exp Immunol*, 140 (2005), pp. 408-416




- Increases human intestinal permeability (G)
- Inflammatory, oxidative (G + D).

**More immunogenic (G + D).**







 Save  Like  Send ...

PureWow

## How to Eat Clean for a Whole Entire Week



Article from  
PureWow

[Read it](#)









# “Heritage” & “heirloom” plant varieties

Farmers used organic farming methods and ensured **HEALTHY**

**NUTRIENT RICH SOIL**

Rotated crops for the health of the soil

They shared, traded, stored seed from one season to the next



**Heirloom are likely to  
be momentarily  
more nutritious than  
newer varieties.**

Higher and higher  
yields = "hybrid"





**In NZ there are a number of well-known deficiencies within our soils:**

- **Zinc**
- **Selenium**
- **Iodine**
- **Boron**
- **Chromium**

**...if the nutrients we need are not in the soil, then they cannot be in our food.**

**So much of our food is depleted.**





# Omega-3 fish oils

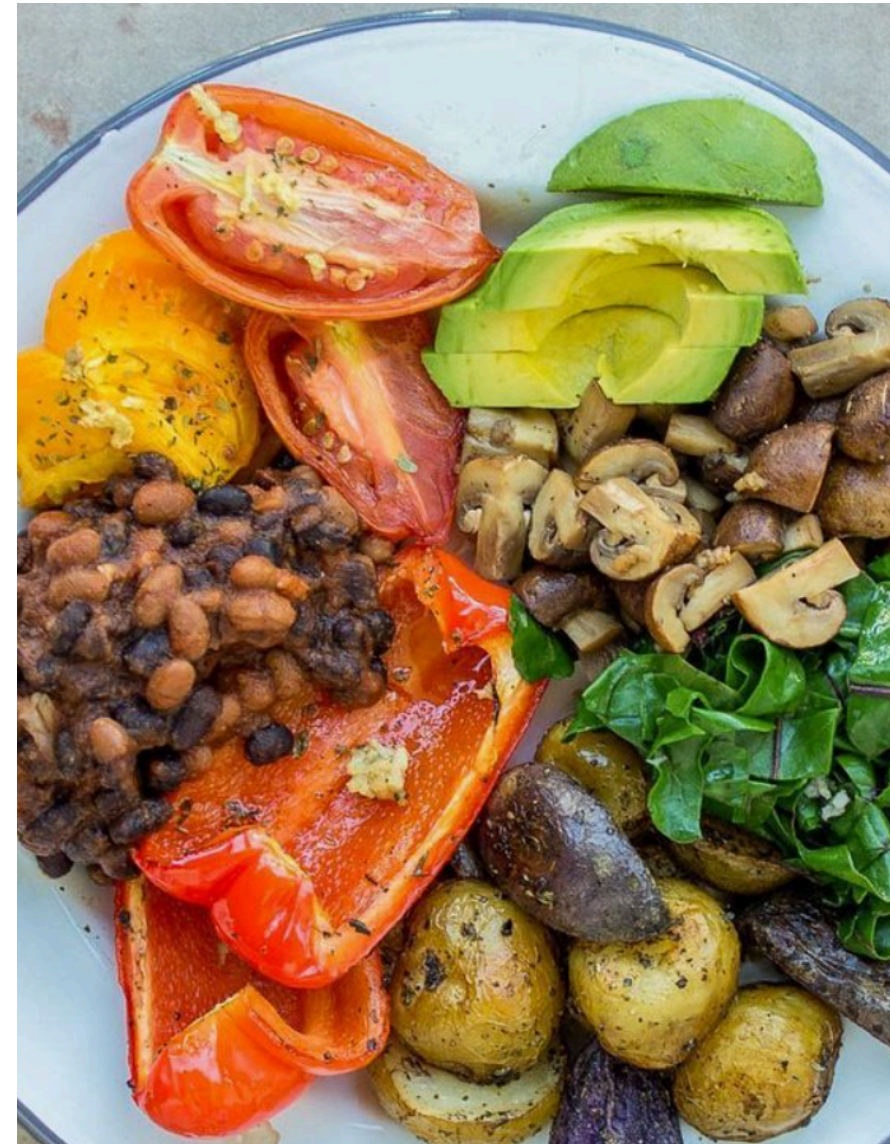
- Some studies found those with MS had **low blood levels**
- Decrease **inflammation** and certain immune reactions
- In large placebo-controlled study **decrease in relapse** and disability progression **1989**
- Fatty fish, salmon, mullet, kahawai, sardines, herring, anchovies, mackerel.
- **Supplement form:** fish oil, krill oil, cod liver oil, and algal oil (a vegetarian source that comes from algae).
- Flaxseed oil and flaxseeds, chia and walnuts

**Cheapest  
zinc, c**

**n, folate,  
ement"**







## Meal Suggestions:

Remember, this plan is JUST a guide, not a rule book. It does not have to be perfect. You will still get amazing benefits in all your organ systems and functions, even if you do not follow it to the T!

Breakfast Options:	Lunch or Dinner Options:	Snacks Options:
Smoothie bowl	Quinoa salad with steamed fish	<ul style="list-style-type: none"> <li>- Green apple &amp; almond butter</li> <li>- Nuts or pumpkin seeds (¼ cup max)</li> <li>- Fresh fruit or baked apple slices with cinnamon</li> <li>- Dark chocolate ~ 2-4 cubes - 1 row</li> <li>- Chia seed pudding + add stevia</li> <li>- Seed crackers with herb spread or hummus</li> <li>- Chopped veggies &amp; hummus</li> <li>- Raw matcha slice (YUM!)</li> <li>- Turmeric tea</li> <li>- Bone broth</li> <li>- Smoothie from options</li> <li>- Left-over quinoa/cauli sushi rolls</li> </ul>
Paleo muesli & coconut yogurt with stewed apple & cinnamon	Large salmon or sardine salad - think salad nicoise (olives, capers, boiled egg, chopped veggies) + tones of greens	
Paleo toast (gluten free loaf - five loaves) with avocado, tomato, sprouts + olive oil	Poached egg & quinoa salad Or Roast veggies with rocket salad + chicken or fish	
Chia seed pudding + blueberries	Mushroom tacos or vegetarian option	
Poached eggs & veggie hash with spinach & mushrooms	Roasted cauliflower with fried egg on top with massive side of greens	















## Beet + Berry Smoothie Bowl - serves 1

- 1-2 cup frozen or fresh berries
- ½ cup red beetroot, diced small {approximately 1 medium sized beet}
- 1/2 banana**
- ¼ cup ground flax seeds
- 2 handfuls greens {kale, collard greens, silverbeet, beetroot leaves, spinach}
- ½-1 cup unsweetened almond milk (nut milk)
- 1 scoop protein powder (pea, hemp, rice based)

Blend all of the ingredients until smooth.  
Top with additional garnishes.



## Cinnamon Raisin Cacao Smoothie Bowl - serves 1

- 1 C frozen blueberries
- 1¾ cups unsweetened almond "milk"
- 1 tablespoons flaxseed meal
- 1 tablespoon raisins
- 1 teaspoon ground cinnamon
- 1 pinch salt
- ¾ teaspoon pure vanilla extract

Blend all of the ingredients until smooth. Top with additional garnishes.



## Paleo Muesli & coconut yogurt with fresh fruit

### Brands examples:

- Pure Delish
- Ceres Super Good Muesli
- Clean Paleo

### Plus:

1-2 Tbsp coconut yogurt  
Big splash of nut milk  
Sliced fresh fruit



## Kumara Toast

1 Tbsp Almond butter,  
1 Tbsp pumpkin and sunflower seeds  
Handful of sliced berries

Toast in a sandwich press, smear almond (or any nut butter except peanut), lay blueberries and nuts on top. YUM





## **Tropical Green Smoothie** - serves 1

1 handful of mint  
1 C coconut water or filtered water  
1 x slice whole lemon (skin included)  
1/2 C chopped pineapple  
1 large handful of leafy greens (not kale)  
Ice if needed

Pop all ingredients in a blender and wizz till smooth.



## **Creamy Green Smoothie bowl** - serves 1

1/2 avocado  
1 C chopped pineapple or 1 frozen banana, chopped  
1/2 tsp spirulina or wheatgrass powder  
2 cups of spinach (or other leafy green)  
1 cup coconut water (or plain water)  
2 Tbsp flaxseed oil

### **Toppings**

1 kiwi fruit, peeled and sliced, 1/2 cup blueberries, 1/4 cup coconut flakes, 2 tbsp sunflower seeds

(add coconut cream to this recipe and 1 scoop protein powder - pea for fullness)

Add all smoothie bowl ingredients to a high-powered blender and blend until thick and creamy. Pour into a bowl and top with kiwi, blueberries, coconut and sunflower seeds.





## Roasted Carrots And Red Onions With Fennel And Mint - serves 8

Toasting the seeds and nuts in oil forms the base of a complex vinaigrette.

1 kilo small carrots (about 2 bunches), peeled, cut into 3-inch pieces  
 2 large red onions, each cut through root end into 8 wedges  
 1 fennel bulb, cut into ½-inch wedges  
 4 tablespoons olive oil, divided  
 Quality salt, freshly ground pepper  
 2 tablespoons raw sunflower seeds  
 1 teaspoon coriander seeds, coarsely chopped  
 1 pinch of crushed red pepper flakes  
 ½ teaspoon Hungarian hot paprika  
 2 tablespoons apple cider vinegar  
 1 tablespoon fresh lemon juice  
 2 tablespoons torn mint leaves

Preheat oven to 180°. Place carrots, onions and fennel on rimmed baking sheet. (Make sure to give them plenty of room, which is key to roasted veggies with nicely browned edges.) Drizzle vegetables with 2 Tbsp. oil, dividing evenly; season with salt and pepper. Roast, tossing occasionally, until golden brown and tender, 20–25 minutes for carrots and 35–45 minutes for onions and fennel. Let cool.

Meanwhile, cook sunflower seeds, coriander seeds, Aleppo pepper, paprika, and remaining 2 Tbsp. oil in a small skillet over medium heat, stirring often, until oil is gently bubbling around seeds and spices are fragrant (be careful not to burn), about 2 minutes. Let cool. Stir in vinegar and lemon juice; season vinaigrette with salt and pepper.

Combine roasted carrots, fennel, and onions onto the same baking sheet, drizzle vinaigrette over, and toss to coat well; transfer to a platter. Just before serving, re-toss vegetables to pull up any dressing that may have settled at the bottom of the platter and scatter mint over top. **This is fabulous with fresh snapper.**



## Rosemary chicken & avocado salad

- serves 2

250g boneless, skinless chicken breasts  
salt and pepper  
1 tablespoon coconut or olive oil  
2 tablespoons minced fresh rosemary  
6 cups spring greens and/or butter lettuce  
1 bunch watercress  
1 cup cherry tomatoes, halved  
1 large avocado, thinly sliced

### rosemary vinaigrette

2 teaspoons dijon mustard  
1/4 cup olive oil  
1/4 cup red wine vinegar  
1 teaspoon minced fresh rosemary  
salt and pepper

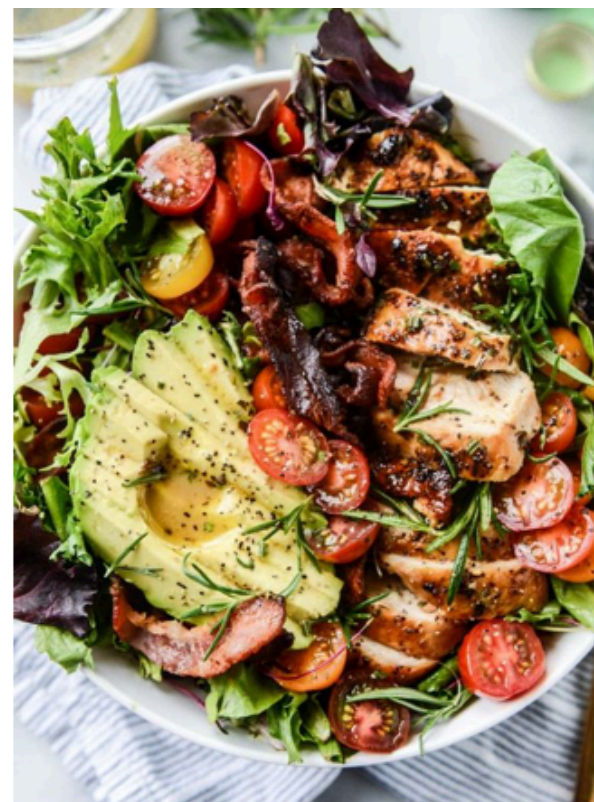
directions:

Season the chicken with salt and pepper. Cover with the rosemary. In the skillet, over medium-high heat, add the chicken and cook until golden and crisp on both sides, about 5 to 6 minutes per side. Remove the chicken and let sit for a moment while you assemble the salad, then slice it.

Toss the greens with the watercress and the tomatoes. Top with the sliced chicken, the bacon and the avocado. Drizzle with the rosemary vinaigrette!

### rosemary vinaigrette

Whisk together the mustard, oil and vinegar. Whisk in the rosemary and a pinch of salt and pepper.





Recommendations for cruciferous vegetables have not been established.





## Sardines & avocado

- 1 x tin sardines in olive oil or spring water
- 1 carrot, grated or chopped
- 1 tomato
- 2 huge handfuls of rocket, radicchio, spinach or any other dark leafy green you can find
- Handful of fresh basil or parsley, ripped
- 1/2 avocado, sliced
- Big handful of left-over roast vegetables (throw under the salad)
- 1 glug of olive oil & squeeze of fresh lemon

Throw everything together, add the oil and lemon juice and enjoy!



## Vegetable Cauliflower Rice + Quinoa Sushi

This is the best recipe!! We will have this on the FaceBook page so you can instantly have access to it.

Great as a lunch or dinner option!

<https://www.simplyquinoa.com/vegetable-cauliflower-rice-quinoa-sushi/> check out this also: [LINK](#)



# Cauliflower + Mushroom Risotto

This creamy cauliflower risotto is the perfect low carb side dish. It's so rich and delicious, you won't believe it's grain-free.

## Ingredients

- **1 Tbsp butter**
- 250 gm mushrooms chopped
- 2 cloves garlic minced
- Salt and pepper to taste
- 350 gm riced cauliflower (the frozen version works just as well as the fresh, no need to thaw) can grate it
- 1/4 cup dry white wine
- 1/4 to 1/2 cup chicken broth
- **2 to 4 tbsp heavy cream - coconut cream**
- Copious amounts of grated parmesan cheese (about 1/2 cup to start, add more as desired)

## Instructions

1. In a large saute pan, heat butter over medium heat until melted and hot. Add chopped mushrooms and garlic and sauté until mushrooms are tender and just turning golden brown. Season with salt and pepper.
2. Reduce heat to medium low, add cauliflower, and toss to coat in the butter. Add white wine and cook until the liquid has bubbled away. Add broth a few tbsp at a time, stirring frequently and letting it evaporate each time.
3. When cauliflower is becoming tender, add a little more broth and a few tbsp of cream. Cover with a lid and continue to cook, allowing the cauliflower to steam, until tender (adding a bit more broth and/or cream if needed).
4. Stir in the parmesan and add any additional salt and pepper to taste. Serve with additional grated parmesan as desired.

## Recipe Notes

Serves 4 as a side dish. Each serving has 5.24 g NET CARBS.

How long this recipe takes depends on whether you use frozen or fresh cauliflower rice.





## Herb Spread

2 big handfuls of herbs (parsley, basil, dandelion etc)  
4-6 big handfuls of leafy greens (kale, silverbeet, collard greens etc)  
1/2 whole lemon  
2 juiced lemons (zest first and add, then juice)  
2-3 glugs of olive oil  
1 avocado (or not)  
Salt & pepper to taste if desired

Wizz... and throw into some old jam jars (GREAT on EVERYTHING)



## Seed Crackers

1/2 cup	Sunflower seeds
1/2 cup	Pumpkin seeds
1/4 cup	Sesame seeds
1/4 cup	Poppy seeds
1/4 cup	Linseed / flaxseed
1/4 cup	Chia seeds

1/2 tsp Salt

1 cup Water

1 serving Flaky sea salt, to sprinkle

Heat oven to 170C. Place all the seeds and the salt in a bowl, pour in water and mix to combine. Leave for 15 minutes for the chia and flax seeds to soften and bind everything together.

Tip out on to a baking paper-lined oven tray and spread out as thin as possible (around 4mm thick) and sprinkle with some flaky sea salt. Bake for 30 minutes.

Remove from the oven and slice into crackers, then return to the oven to cook for another 20-30 minutes until crisp and golden. Remove to a rack to cool then store in an airtight container.



# Medicinal plants:



**These are foods which 'talk to our genes'.  
As we learn more about prescribing nutrigenomic  
substances with powerful clinical 'upstream' effects, we  
are reminded that these are the medicines of Nature.**



# **Preserving the benefits of vegetables**

Here are a few tips that will help you get the most benefits from eating all those great cancer-fighting vegetables:

- **Eat at least 50% raw fruits (max 2 a day) and vegetables 3-6 cups a day.**
- **When cooking vegetables, steam until just tender using a small amount of water.**
- **Wash all fruits and vegetables before consuming.** Choose organic produce if possible, grown without the use of pesticides.


**Don't charcoal your meats!!**

# Coffee significantly interacts with vitamin D receptor – a study in mice looked at this and stated a 70% decrease in VDR function with coffee... not sure how much yet

## Caffeine metabolism



Caffeine is one of the most popular and widely used stimulant drugs in the world. Some individuals consume caffeine daily, while others rarely use it at all. Research has shown that doses of caffeine over 300 mg is unhealthy and can be damaging to the brain, and puts significant stress on the heart, liver, and kidneys. Those who are slow metabolisers of caffeine are at a higher risk for organ damage. For example, the average half-life of caffeine in a 20 year old male is 4-6 hours. A female's caffeine half-life is 8-12 hours in contrast to a pregnant female whose caffeine half-life is nearly doubled at 18-22 hours.

CYP1A2 genetic test result			
Gene and SNP ID	Genotype	Indicator	Result and Interpretation
CYP1A2 rs762551	AC		<b>SLOW caffeine metabolism based on this CYP1A2 genotype.</b> This genotype is associated with an increased risk of hypertension and heart attack when caffeine consumption exceeds two cups of coffee per day. Please review the action steps and comments in relation to this result.

### What does this CYP1A2 genetic test result mean?

This individual has inherited the risk allele associated with slow caffeine metabolism based on this CYP1A2 genotype.

#### ACTION STEPS and comments:

- Reduce caffeine consumption if it exceeds more than two cups of coffee per day since there is increased risk of hypertension and heart attack with increased consumption of caffeine.
- Caffeine is found in many food and drink products. Reviewing the consumption of caffeinated products may be useful in assessing the individuals overall caffeine intake.



# Beginners guide for getting more plant-based foods in your diet

Start the day with filtered water and lemon juice or apple cider vinegar & supplements/probiotics

**Breakfast:** Vegetable juice or green smoothie to start the day, turmeric or herbal tea

Add berries, raw nuts & seeds, coconut, cinnamon & chia seeds

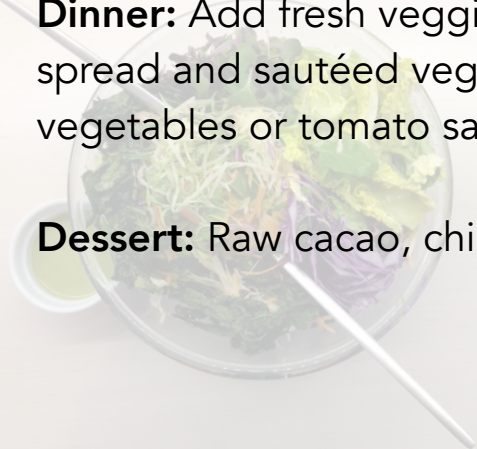
- Smoothie with everything piled in, try something new each day/week (see recipes for ideas)
- Veggie stack with herbs & olive oil, raw chopped nuts and free-range organic eggs
- Soup with toasted chia seed or seed bread

**Lunch:** Aim for 4-6 vegetables/sprouted foods - purple, red, orange, yellow, green. Eat a big salad filled with your favorite beans, peas, sprouted grains (buckwheat or sprouts) or other combo of veggies. Cabbage, spinach and kale as a base instead of protein. Always with quality oils.

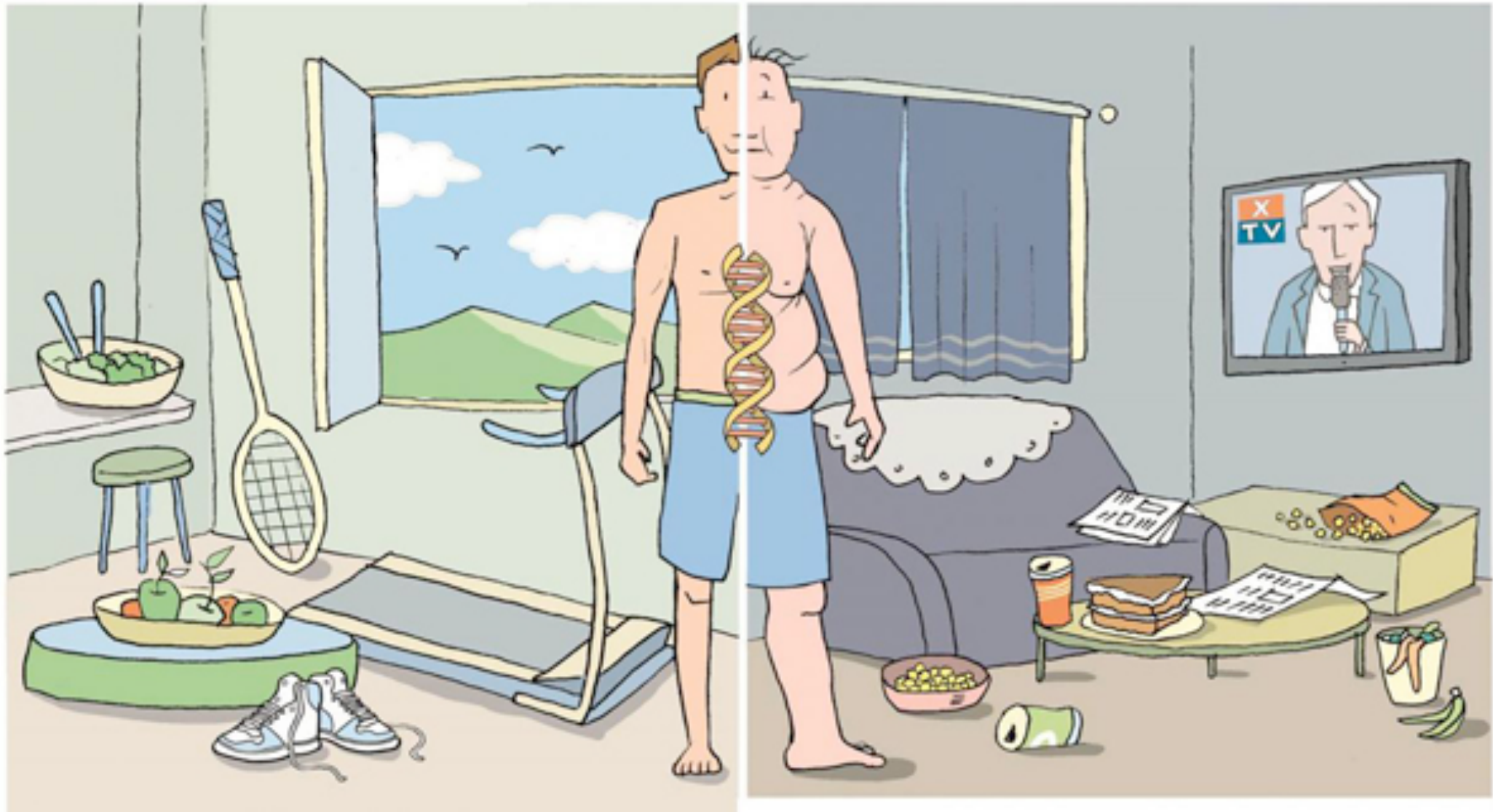
**Snacks:** Fresh fruit limited if possible to one or two max a day. Keep it high in vegetables. Raw veggies such as carrots, beetroot, cucumbers, peppers, etc. and green herb spread. Keep trail mix made with raw nuts, seeds, and berry & chia seed mix

**Dinner:** Add fresh veggies to your favorite quinoa or buckwheat dish. Top a steamed broccoli with herb spread and sautéed veggies and avocado, or with salsa. Replace creamy pasta sauces, with sautéed vegetables or tomato sauce **made with healthy olive, hemp, borage and black cumin seed oil.**

**Dessert:** Raw cacao, chia & almond pudding. Berries with chopped nuts & coconut cream pudding.



# Genetics - food's influence...



Toxicol Lett. 2012 March 7; 209(2): 154–160. doi:10.1016/j.toxlet.2011.12.002

Lichtenstein et al., 2000

Ibarluzea et al., 2004

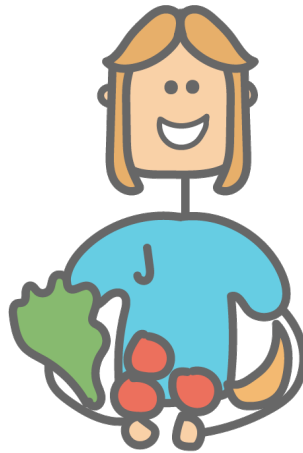
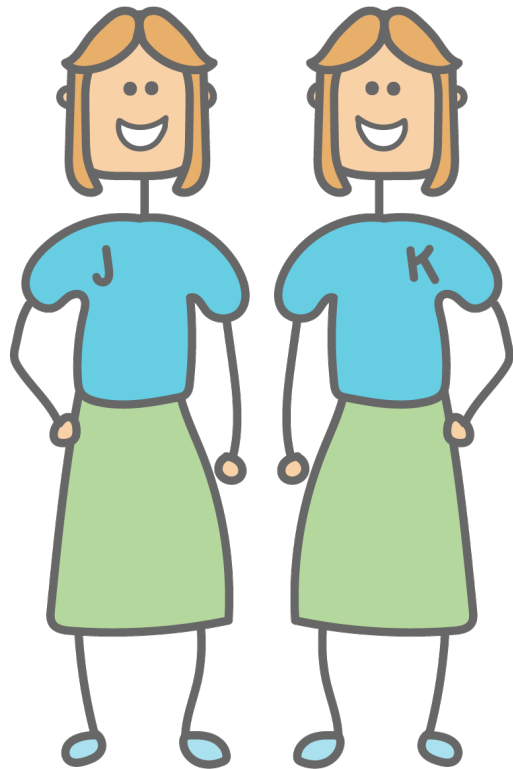
Genetic Variants Regulating Immune Cell Levels in Health and Disease, Valeria Orrù, Maristella Steri, Gabriella Sole, Edoardo Fiorillo 12, Serena Sanna, Francesco Cucca. **Cell.** VOLUME 155, ISSUE 1, P242-256, SEPTEMBER 26, 2013



# Factors contributing to health expectancy decline...

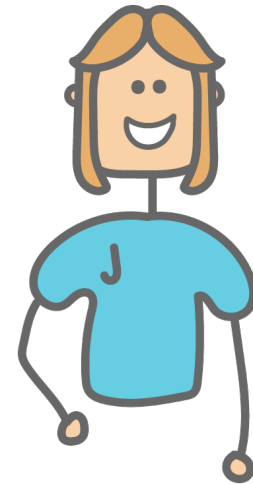
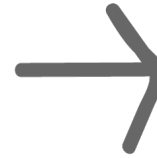
## Jennifer & Karen

Identical twins born with genes that absorb fats twice as fast as the average person



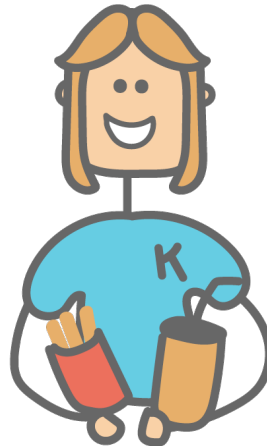
## Jennifer

Eats healthy low fat food



## Jennifer

obesity genes not triggered



## Karen

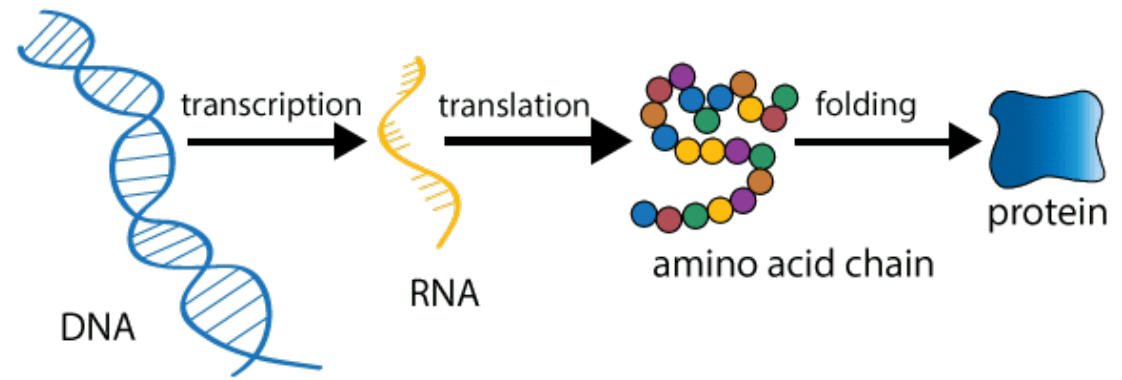
Eats fatty unhealthy food



## Karen

obesity genes triggered

# Genetics



**Stress and inflammation = adaptive processes that have evolved to protect us from threatening or challenging events.**

When stress is very severe, or when it never stops and we don't have good coping mechanisms, it becomes a health risk.

Chronic stress not only affects our brain by **altering connectivity and function**, but also affects us on a genetic level.

“the inability to recover from a stressful event because it was too prolonged or too intense, and has now led to chronic inflammation.



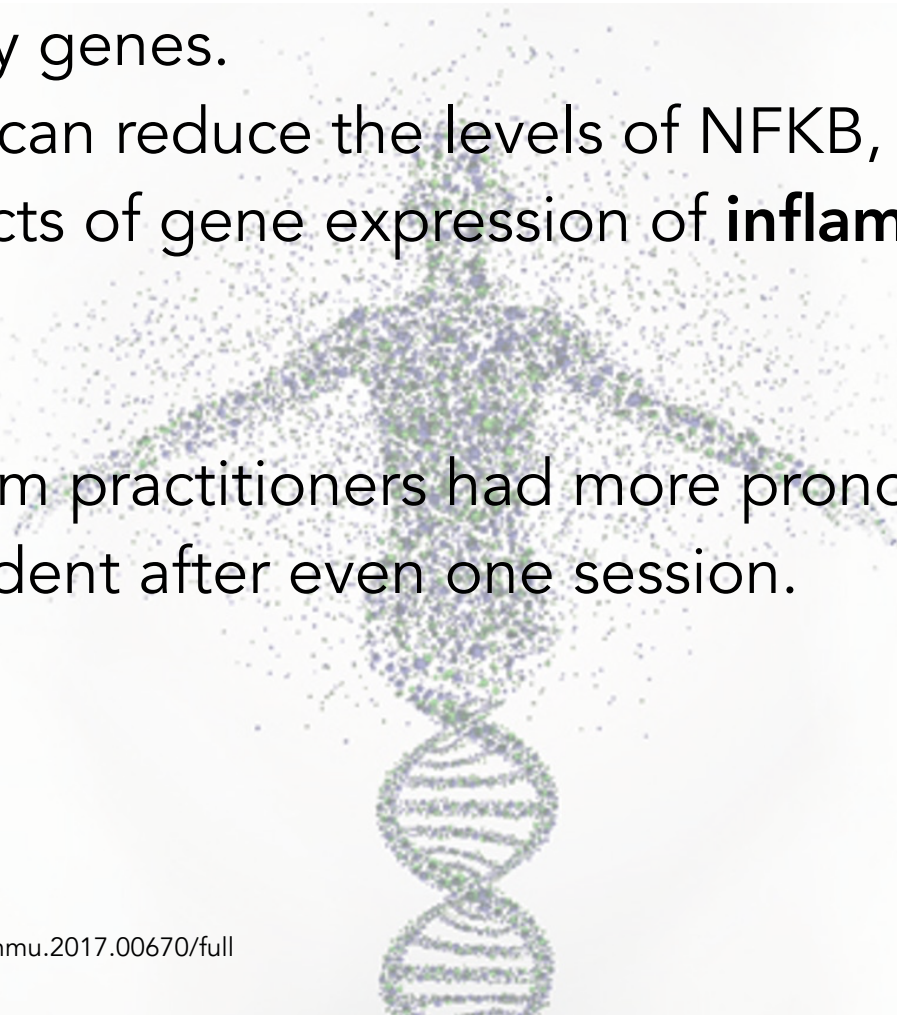
# Lifestyle

**Meditation** 'turns on' **genes** that improve **our** body's resiliency and reduce **our** vulnerability to disease.

AND inflammatory genes.

- Meditation (etc) can reduce the levels of NFkB, therefore reversing the effects of gene expression of **inflammation** caused by chronic stress.

Although long term practitioners had more pronounced results, **changes** were evident after even one session.



# Lifestyle

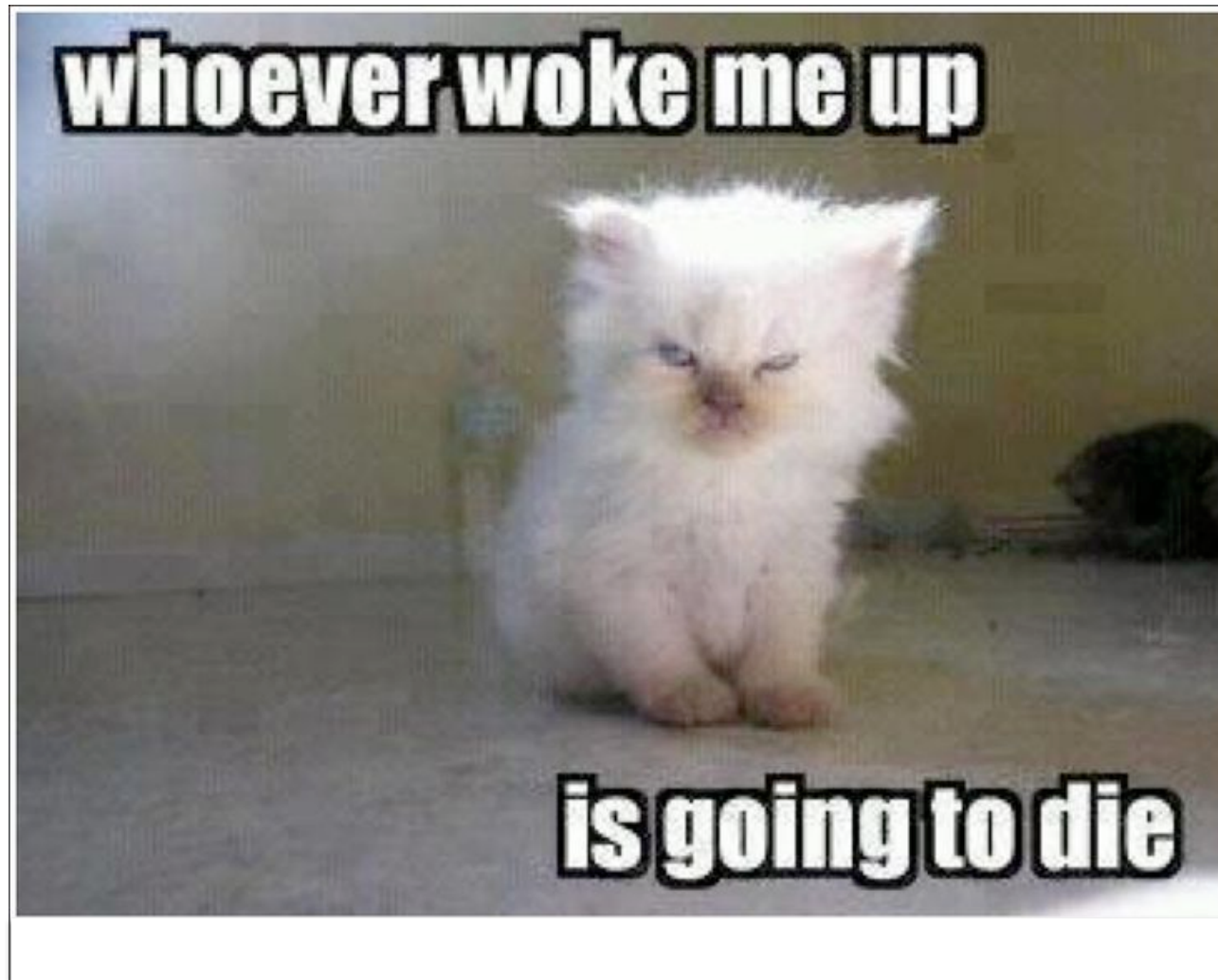
## Studies included:

- mindfulness
- yoga
- Tai Chi
- Qigong
- Breath regulation





**Sleep deprivation is also considered a “stress”**



## Treating sleep problem in MS

Additional support for addressing sleep problems as an underlying cause of fatigue is more recent findings that effective treatment of sleep problems actually results in reductions in self-reported fatigue and sleepiness in MS. More specifically, in a controlled, non-randomized clinical study, Cote et al. evaluated 62 individuals with MS and referred those suspected of having a sleep disorder for evaluation and treatment at a sleep disorder clinic. Of the 39 (63%) who were diagnosed with a sleep disorder, 21 were treated and 18 were not. Treatment consisted of sleep hygiene advice and then further treatment, which was dependent on the nature of the sleep disorder and included continuous positive airway pressure (CPAP) or other position devices for sleep apnea; treatment of exacerbating factors (e.g., iron or B12 deficiency) and/or pramipexole for RLS; clonazepam for REM behavior disordered sleep; and cognitive behavioral therapy for insomnia. Three months follow-up revealed a significant improvement in fatigue as well as sleepiness, subjective sleep quality, depression, pain, and quality of life among those who were treated. Those not treated did not demonstrate such improvement (39). In another study, progressive muscle relaxation was also shown to improve sleep quality and reports of fatigue in a sample of 32 individuals with MS (47). More specifically, the average score of the fatigue severity scale (48) decreased from  $5.75 \pm 0.95$  (a score above the recommended cutoff of 4) to  $3.81 \pm 1.30$  ( $p < 0.001$ ). Finally, Veauthier et al.

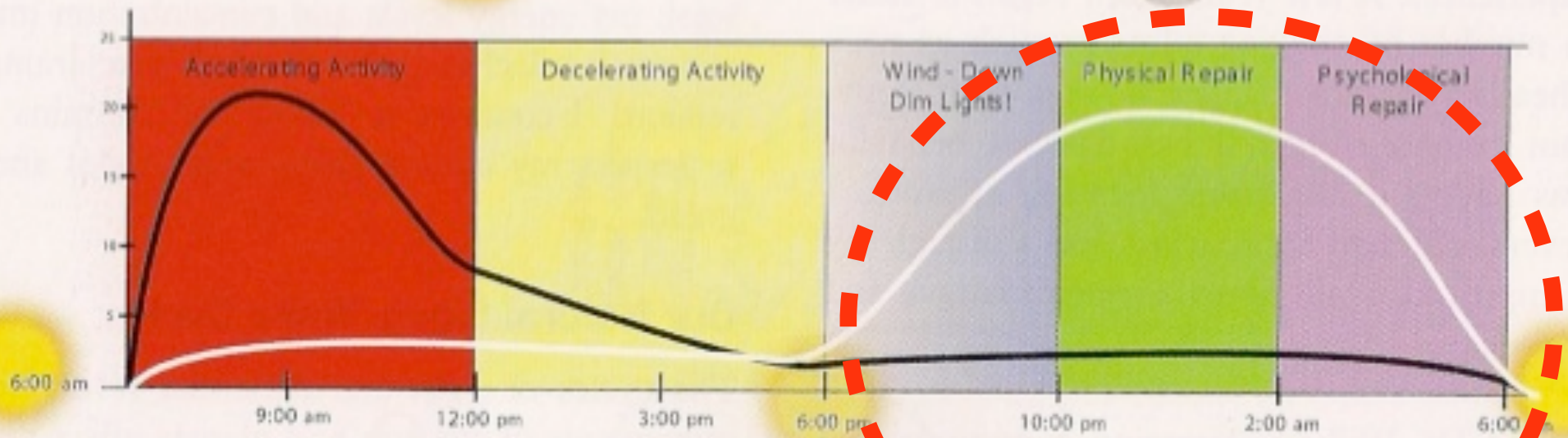
921

378



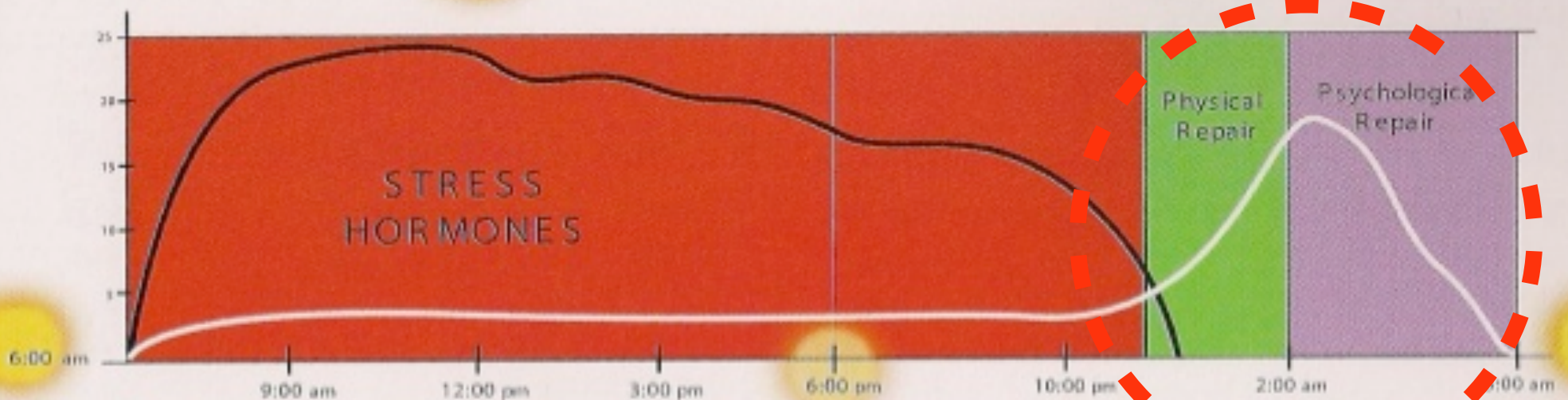
Mid-day

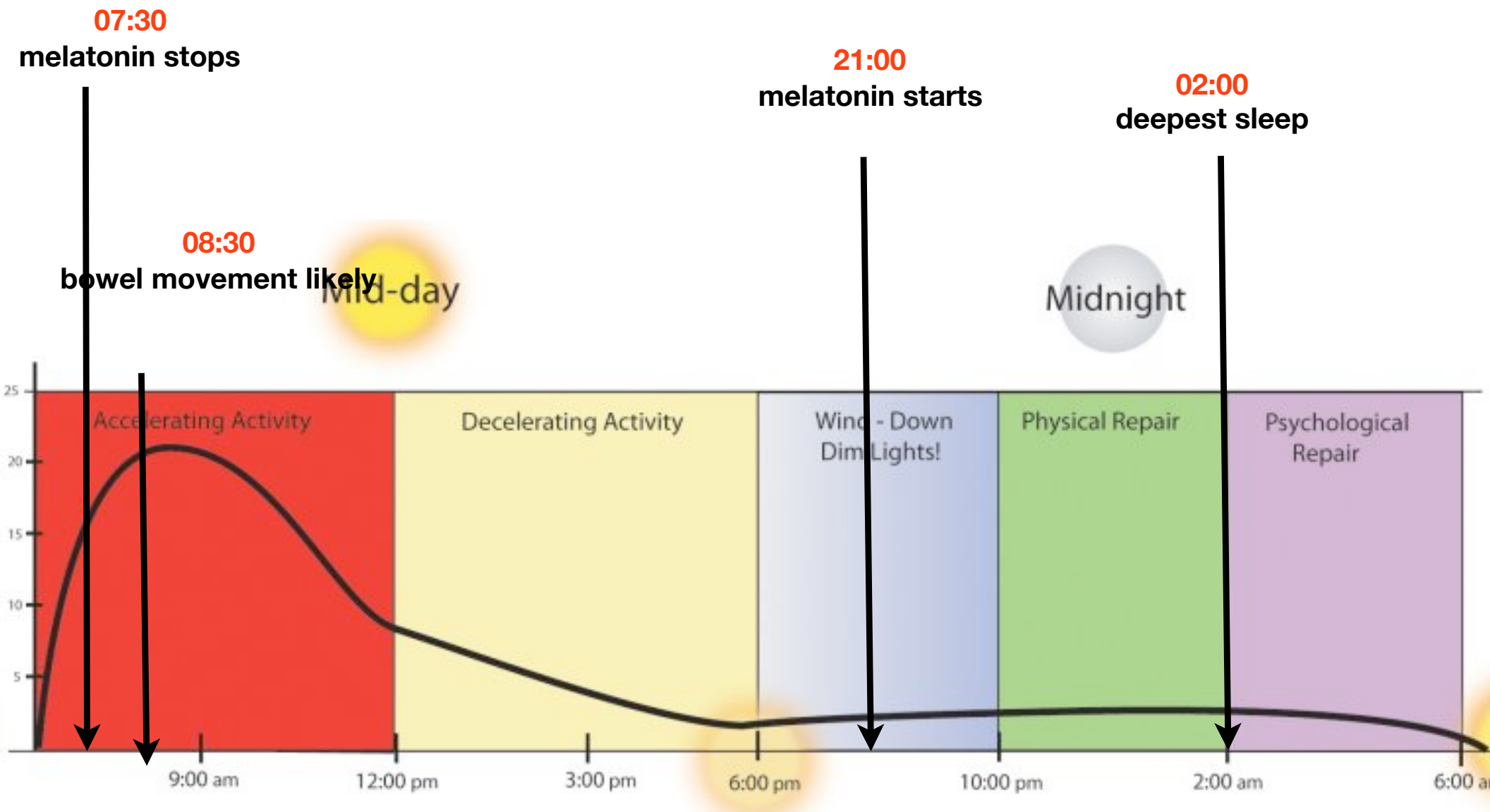
Midnight



Mid-day

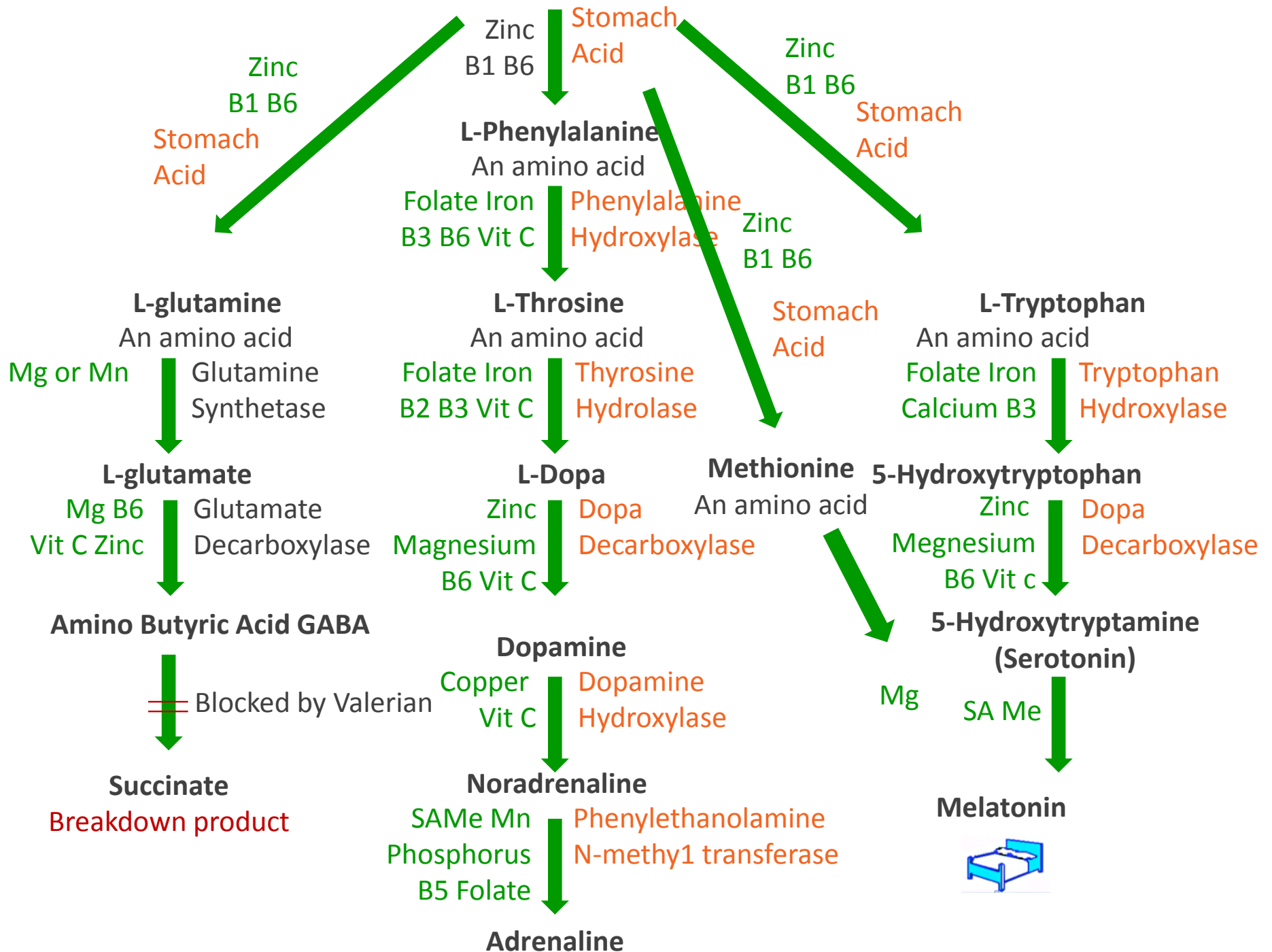
Midnight







# Proteins



# To improve the body's healing power:

- A **diet** with ample amounts of vitamins and minerals, antioxidants, and natural protective substances found in **plants**.
- Enough **rest** and **recovery** and **stress reliance** strategies.
- This includes **SLEEP**! Sleep clears toxins in the brain, liver...
- **Low** exposure to **toxins** and heavy metals.
- Get rid of **candida**, **gut** issues, **food allergies** and intolerances.
- Ensure good daily **bowel** movements!
- Regular body-movement (**exercise**).
- **Laugh** daily and **love yourself**.
- **Cut sugar** (effects immune function too!).





## ESOPHAGUS

### MAJOR BACTERIAL GENERA

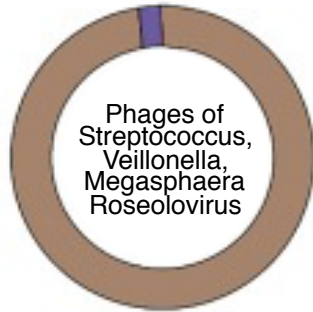
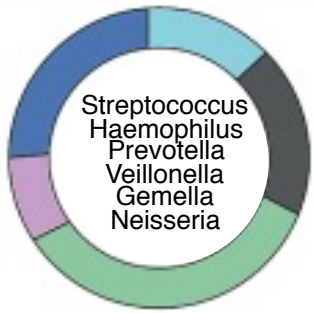
Streptococcus  
Prevotella  
Veillonella  
Rothia  
Gemella

## STOMACH

### MAJOR FUNGAL GENERA

Candida  
Phialemonium

## ORAL CAVITY



## SMALL INTESTINE

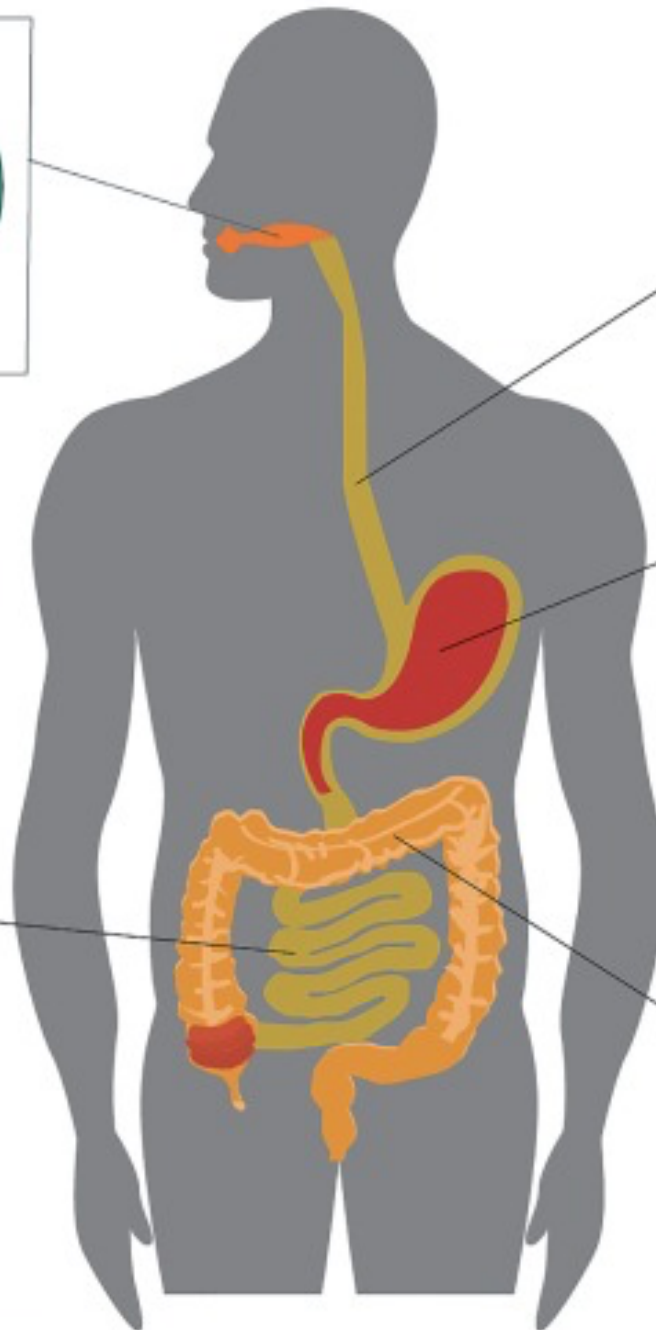
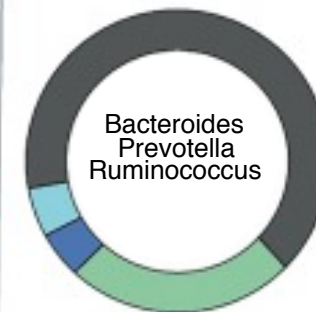
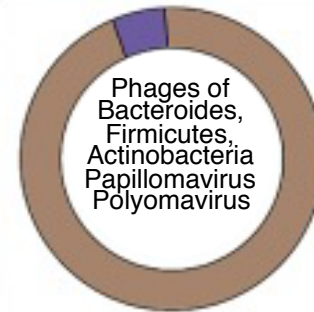
### MAJOR BACTERIAL GENERA

Bacteroides  
Clostridium  
Streptococcus

### MAJOR FUNGAL GENERA

Candida  
Saccharomyces

## LARGE INTESTINE



## Bacteria:

- Actinobacteria
- Bacteroidetes
- Cyanobacteria
- Firmicutes
- Fusobacteria
- Proteobacteria

## Eukarya:

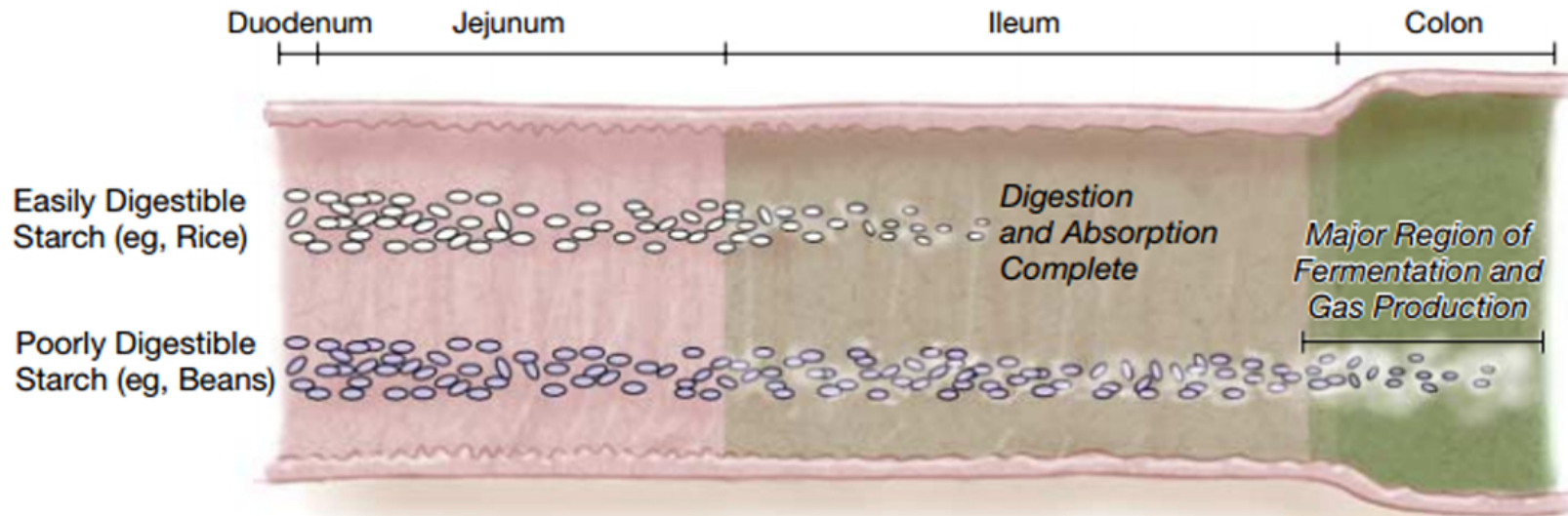
- Ascomycota
- Basidiomycota
- Others

## Viruses:

- Bacteriophages
- Eukaryotic Viruses

# Distribution of Intestinal Bacteria in Normal Gut and SIBO

## A Normal Distribution of Intestinal Bacterial Flora



Bacterial Concentration,  
organisms/mL

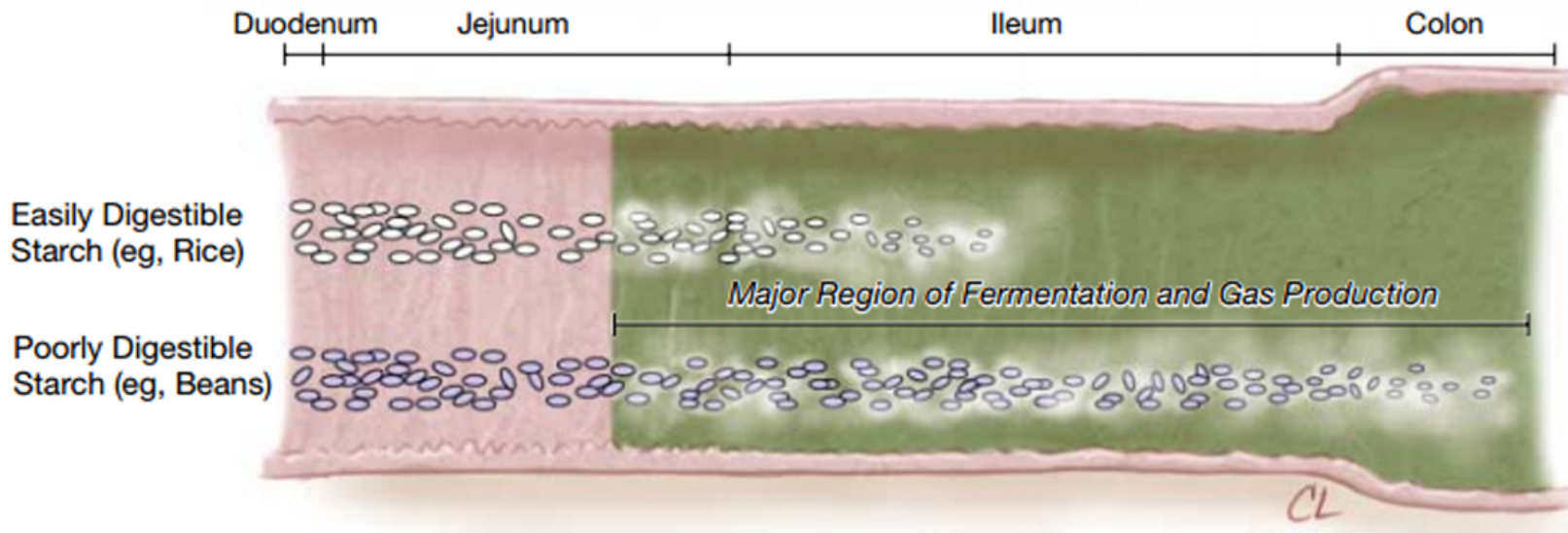
$10^0$

$10^3$

$10^6$

$10^{11}$

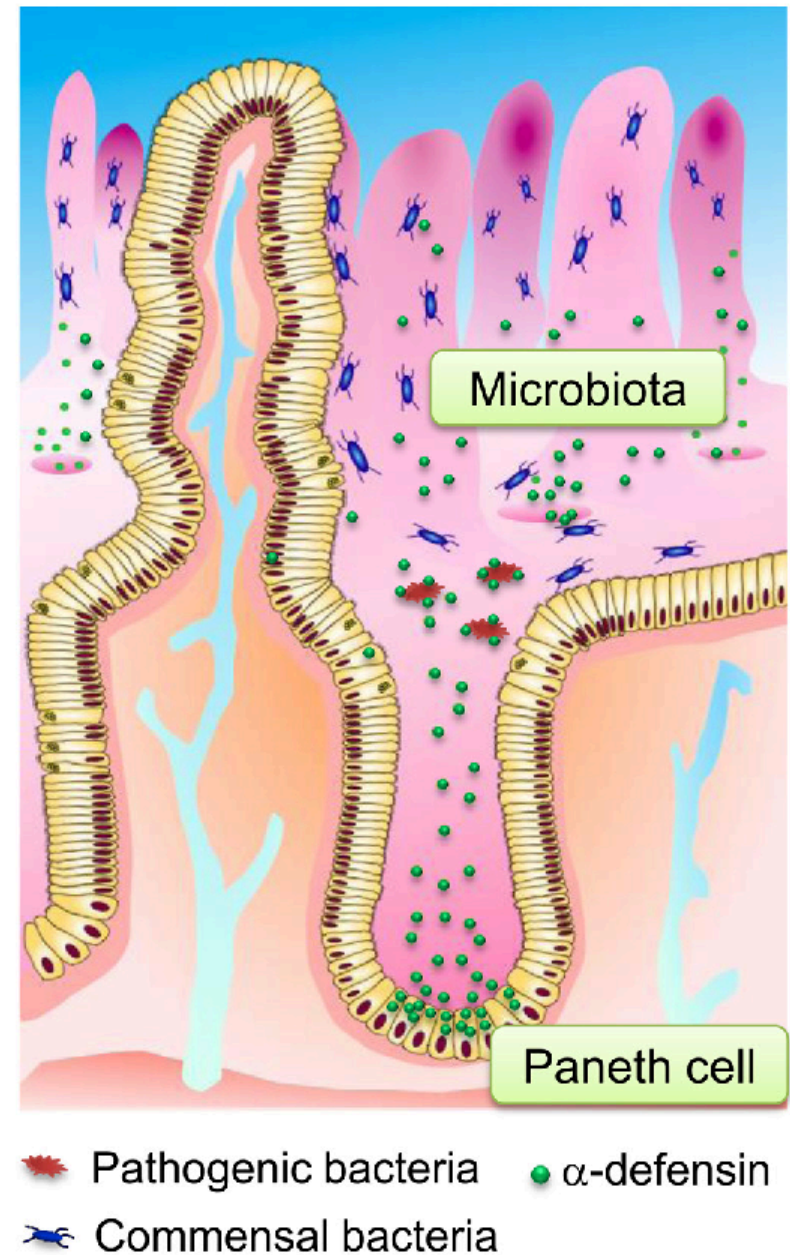
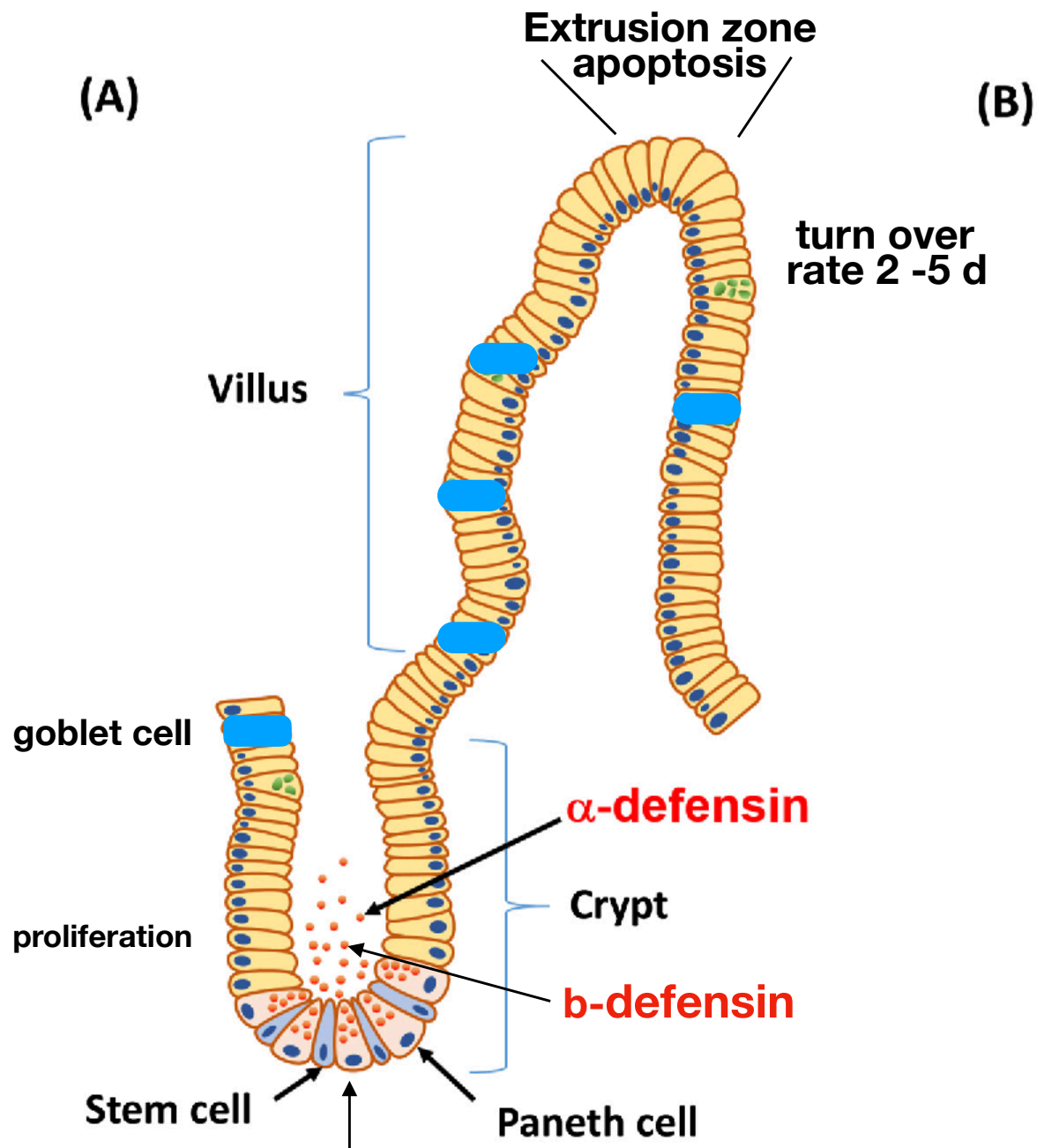
## B Small Intestinal Bacterial Overgrowth







**While research is still underway, scientists do know that the immune system is directly influenced by the makeup of the microbes and bacteria in the gut.**

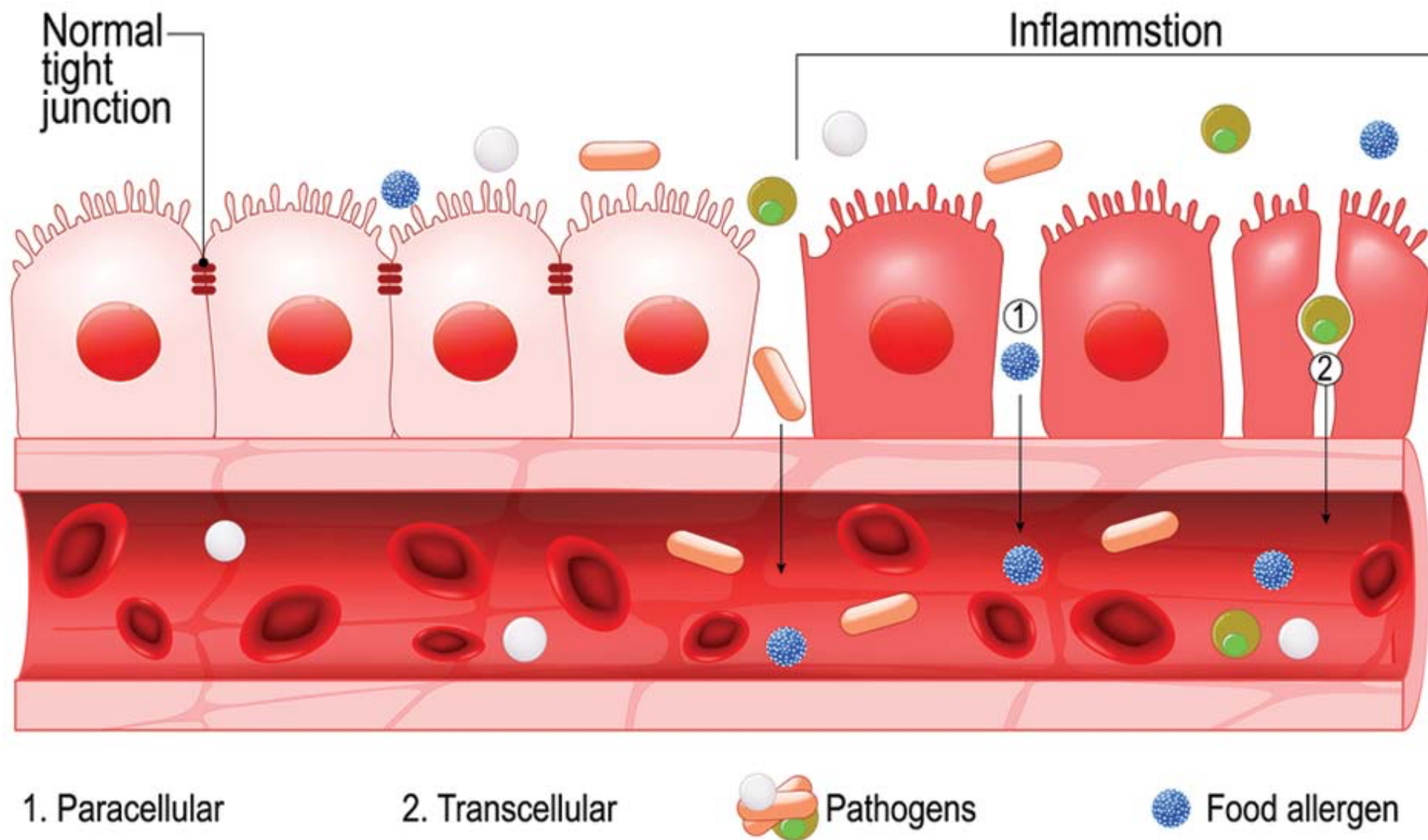


To target the tissues - produce own antimicrobial compounds  
can distinguish between pathogenic and commensal organisms

Feed the gut

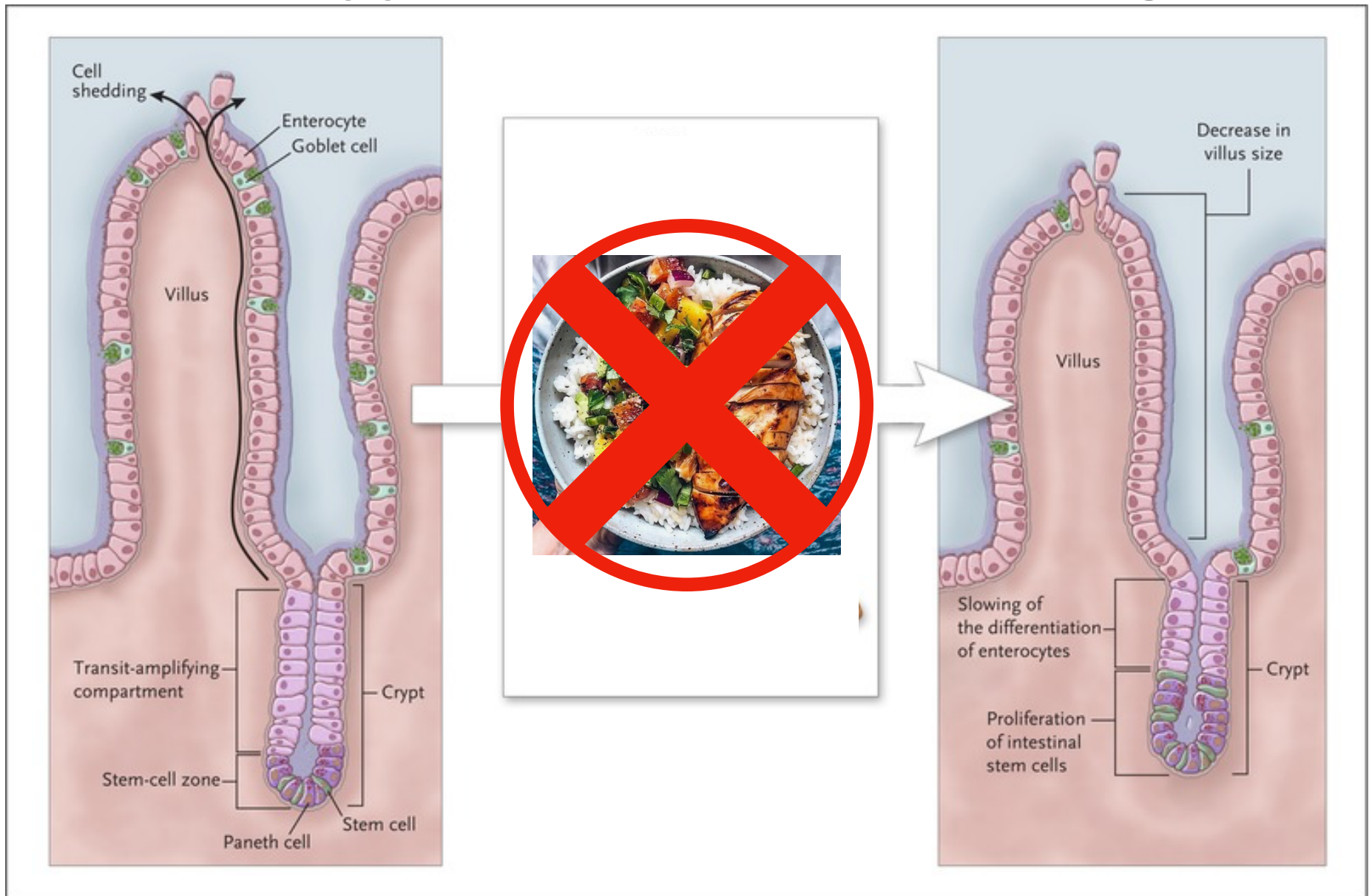


A **leaky gut** has been observed in a number of **autoimmune** diseases including multiple sclerosis.



# Fasting increases stem cells in GIT

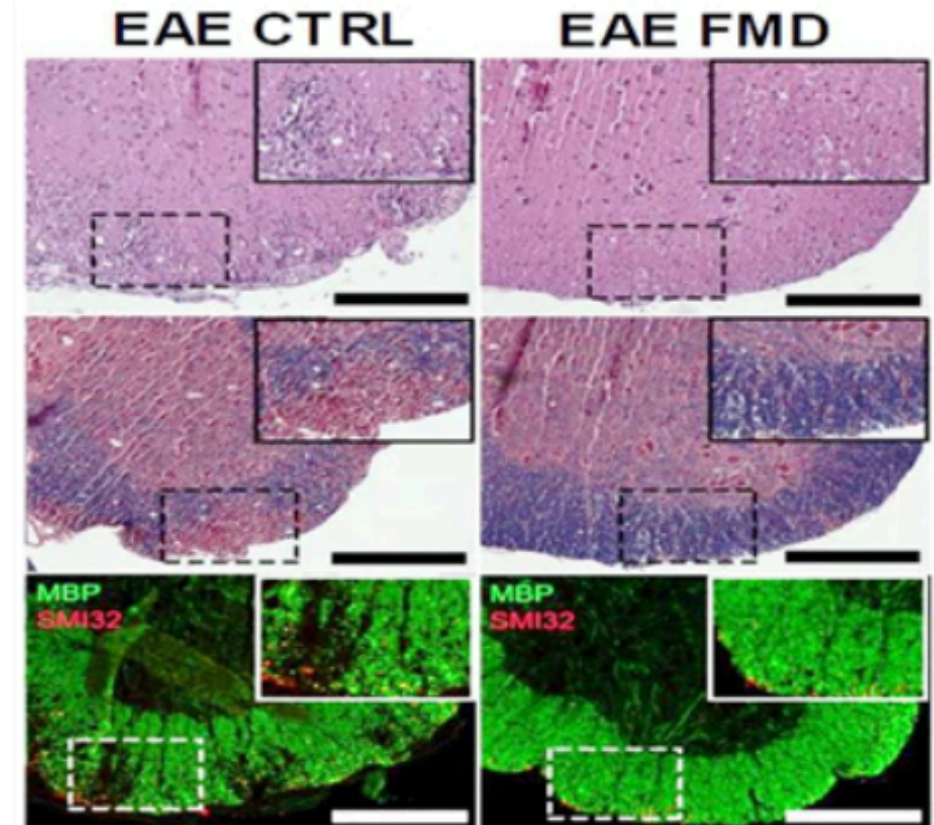
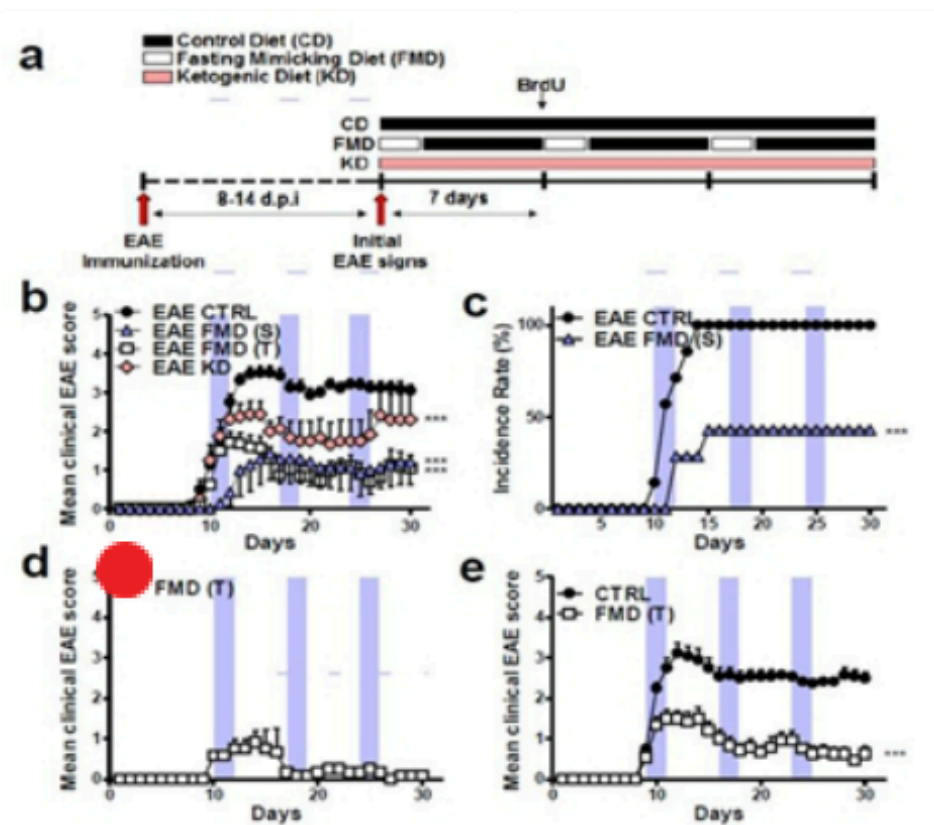
## Does this happen with athletes training fasted?





# Multiple Sclerosis

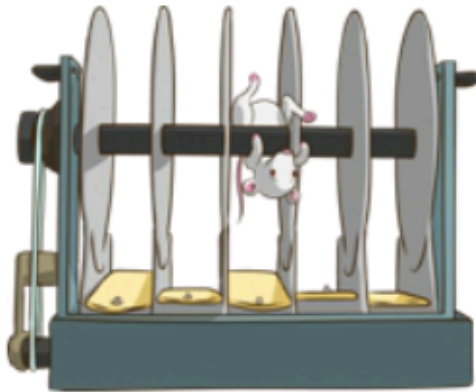
FMD (LFD) 5 day fasting mimicking diet promotes cell regeneration and re-myelination of axons in mice



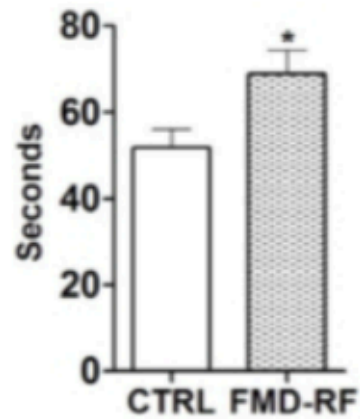
FMD promoted oligodendrocyte precursor cell regeneration and re-myelination in axons in mice

Choi, Y et al. Cell Reports 2016

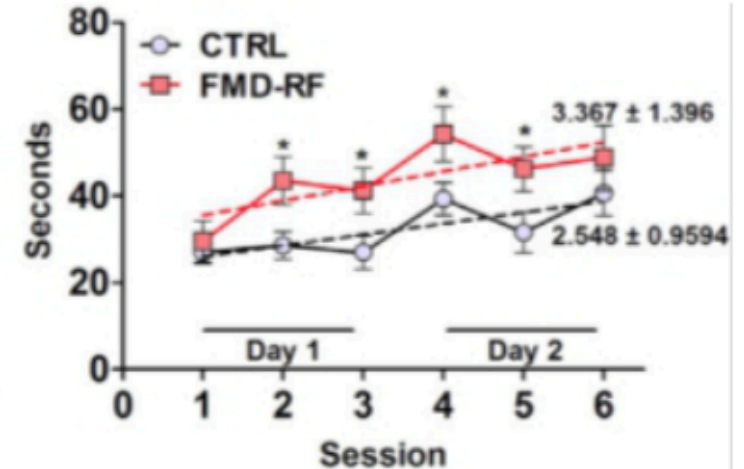
# FMD improves motor coordination and working memory



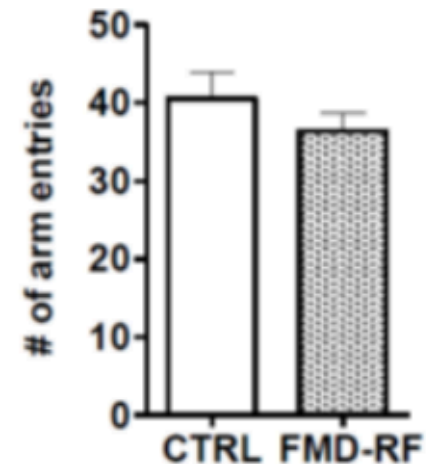
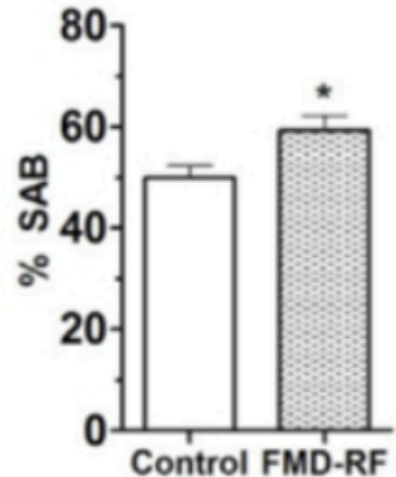
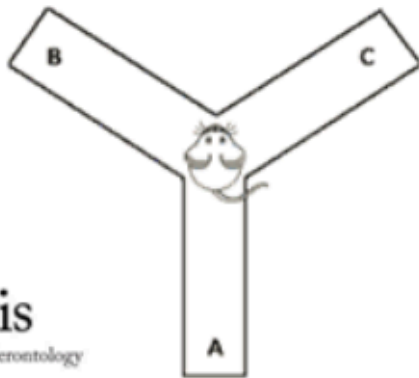
Best rotarod performance score. cohort.



Rotarod performance as linear regression for each cohort.




Spontaneous alternation behavior (SAB) at 23 months.



**USC Davis**  
School of Gerontology



# Ketogenic diet and fasting diet as Nutritional Approaches in Multiple Sclerosis (NAMS): protocol of a randomized controlled study

[Lina Samira Bahr](#), [Markus Bock](#), [Daniela Liebscher](#), [Judith Bellmann-Strobl](#), [Liane Franz](#), [Alexandra Prüß](#), [Dania Schumann](#), [Sophie K. Piper](#), [Christian S. Kessler](#), [Nico Steckhan](#), [Andreas Michalsen](#), [Friedemann Paul](#) & [Anja Mähler](#) 

[Trials](#) **21**, Article number: 3 (2020) | [Cite this article](#)

**6774** Accesses | **3** Citations | **43** Altmetric | [Metrics](#)

“Preclinical data suggest that a KD and a FD may modulate immunity, reduce disease severity and promote remyelination in the mouse model of MS...

However, clinical evidence is lacking. This study is the first clinical study investigating the effects of a KD and a FD on disease progression of MS”.

# Testimonial:

*"I have to say, I am feeling so much better that I have to pinch myself to see if I'm dreaming.*

*After a very busy couple of weeks I expected to have a major flare up this weekend, but nothing, instead I was able to have friends over and go for bike rides with the kids. My daughter even said that it was good to see me being silly and having fun again. Thank you again, this is seriously amazing!"*

**- S M**





The Boyd Clinic

**Thank you for listening!**

**Q & A...**

# Genetically Modified Food

**No regulations of  
testing on humans!**

Europe & NZ, AUS has **labeling** laws



Dr Judy Carman paves the way in this field of research





## **GM foods currently approved for sale in Australia and New Zealand include:**

**Soybean** – Soy foods include soy beverages, tofu, soy oil, soy flour. Products containing soy may include breads, pastries, snack foods, baked products, fried products, edible oil products and special purpose foods.

**Canola** (oilseed rape) – Canola oil. Products made with canola oil may include fried foods, baked products and snack foods.

**Corn** – Corn foods include kernels, oil, corn flour and sugar. Products containing corn may include baked goods, fried foods, edible oil products, confectionery, special purpose foods and soft drinks. **PLEASE NOTE if you are on a gluten-free diet many gluten free products for example pasta contain corn.** Ensure your brand does not therefore contain GE ingredients.

**Potato** – Whole potatoes. Products containing potato may include snack foods, processed potato products and other processed foods.

**Sugar beet** – Sugar beet is processed into sugar which may be used in processed foods.

**Cotton** – Cottonseed oil and linters may be used in vegetable oils, fried foods, baked foods, snack foods, edible oil products and small goods casings.



# Brands that may allow GMO ingredients to contaminate their supply.

Baker's Delight	Kan Tong	Philadelphia
Baiada	Kraft	Ritz
Bonox	Leggo's	Safeway
Burgen	Lindt	Sara Lee
Cadbury	Maggi	Schweppes
CC's	Mainland Dairy	Smith's
Country gold	Mars	SPC Ardmona
Dairy Farmers	Master Foods	Steggles
Dolmio	Milo	Tip Top
Don Smallgoods	Nestle	Toblerone
Fonterra	Noble Rise	Uncle Toby's
Franklins	Oreo	Vegemite
George Weston foods	Pace Farm Eggs	Weight Watchers
Inghams	Pepsi	Woolworths
John West		

DIETARY PROTEIN

B<sub>6</sub> and Zinc

L-PHENYLALANINE

Folic Acid, Magnesium, Manganese, Iron, Copper, Zinc, C

L-TYROSINE

Folic Acid, Magnesium, Manganese, Iron, Copper, Zinc, C

L-DOPA

B<sub>6</sub> and Zinc

DOPAMINE

Vitamin C

NORADRENALINE

B<sub>12</sub>, Folic Acid, Niacin

ADRENALINE

Dopamine pathway

**B<sub>6</sub>:** fish, beef liver and other organ meats, potatoes sunflower seeds, pistachio nuts, tuna

**Zinc:** oysters, red & organ meat, pumpkin seeds, sunflower seeds. Beans, nuts, certain types of seafood (such as crab and lobster), whole grains, fortified breakfast cereals, and dairy products

**Folic acid:** dark leafy greens, asparagus, broccoli, citrus fruits, beans, peas lentils, avocado, okra, Brussels sprouts, seeds & nuts, cauliflower and more.

**Magnesium:** dark leafy greens, nuts, seeds, fish, beans, whole grains, avocados, yogurt, bananas, dried fruit, dark chocolate, and more.

**Manganese:** spices and herbs (cloves and saffron), wheat germ, bran (rice bran, oat bran), nuts (hazelnuts, pine nuts, pecans), mussels, oysters, clams. cocoa powder and dark chocolate, roasted pumpkin and squash Seeds, flax, sesame seeds, and sesame Butter (Tahini) .

**Iron:** pork, poultry, seafood, beans, dark green leafy vegetables, such as spinach, dried fruit (raisins and apricots). Iron-fortified cereals, breads and pastas.

**Copper:** oysters and other shellfish, whole grains, beans, nuts, potatoes, and organ meats (kidneys, liver), dark leafy greens, dried fruits such as prunes, cocoa, black pepper, and yeast.

**Vitamin C:** bell peppers, dark leafy greens, kiwifruit, broccoli, berries, citrus fruits, tomatoes, peas, and papayas.

**B<sub>12</sub>:** fish, meat, poultry, eggs, milk, and milk products

**Niacin:** red meat, fish, poultry, fortified breads and cereals, and enriched pasta and peanuts.

# **Foods derived from plants and animals can both provide protein, but there are some differences.**

- Plant proteins are incomplete (exception: quinoa, buckwheat, hemp)

Vegan diet is low iron, [vitamin B-12](#), and zinc

It is important for vegetarians and vegans to mix their protein sources.

A person's body needs a balance of all 22 types of amino acids to function correctly. The body cannot produce nine of these acids, called essential amino acids. A complete protein source refers to a type of food that contains all nine.

Plant-based proteins have less of an anabolic effect than animal proteins due to their lower digestibility, lower essential amino acid content (especially leucine), and deficiency in other essential amino acids, such as sulfur amino acids or lysine. Thus, plant amino acids are directed toward oxidation rather than used for muscle protein synthesis.



**When an essential amino acid is limiting, all other amino acids will not be properly used for protein synthesis and thus get deaminated and oxidized and then irreversibly eliminated.**  
**Limiting amino acids could, therefore, influence body protein accretion.**

The metabolic fates of amino acids derived from plant and animal proteins are thus different, leading to metabolic differences in peripheral tissues like skeletal muscle.