



Precision Nutrition With Plant-Based Proteins

Joel Fuhrman, M.D.

4 Main Determinants of Longevity Potential

1. Phytochemical concentration in cells
2. Phytonutrient Diversity - G-BOMBS
3. Body Fat percentage- low IR
4. Omega-3 index 5.5 – 9.0

What is a Nutritarian Diet

- A plant rich diet, designed to optimize micronutrient exposure
- This is a vegetable–based diet, utilizing a wide assortment of plant foods to enhance exposure to a vast array of protective bioactive compounds (phytochemicals)
- G-BOMBS (Greens, Beans, Onions, Mushrooms Berries and Seeds are highlighted due to the large amount of research documenting their power to prevent cancer.
- The reduction or elimination of animal products can result in sub-optimal levels of B12, Zinc, Iodine, and EPA DHA. The judicious use of supplements to assure nutritional adequacy in those nutrients assures micronutrient excellence.

G-BOMBS



GREENS



BEANS



ONIONS



MUSHROOMS



BERRIES



SEEDS

Foods for Permanent Weight Loss
and Optimal Health

Dr. Fuhrman's Health Equation

$$H = N / C$$

Health Expectancy = Nutrients / Calories

**FIRST PRINCIPLE
of the Nutritarian Diet**

Slowing the Aging Process

Low-calorie, high-nutrient intake prolongs lifespan

- Enhances cellular repair mechanisms
- Reduces inflammatory response
- Suppresses genetic alterations
- Decreases free radicals
- Inhibits the production of cross-linking agents
- Slows the metabolic rate
- Enhances DNA repair
- Removes toxins, free radicals and AGEs

9 Representative Cases

1. A 58-year-old woman dx grade 2, stage IV non-Hodgkin's lymphoma in 2003. She received no chemo, After four months, she had lost 40 lb, her tumors half the size. After two years, no residual tumor was confirmed by CT scan.
2. 35-year-old man dx with stage IV melanoma in December 2009. Had surgery to remove the primary tumor and biopsy lymph nodes, confirming that the melanoma had spread. In one year all melanoma was gone.
3. 41-year-old diagnosed with testicular cancer in 2012 after 6 years of treatment for ulcerative colitis (UC). Within six months, imaging showed shrinkage of the seminoma, which became undetectable one year later. During this time, he recovered from UC, requiring no further treatments.

More cases

4. Female age 52, dx with stage IV metastatic ovarian cancer in 1997. Her right lung collapsed, with 4 liters of fluid was removed from her chest. The patient was given a poor prognosis in spite chemotherapy. More than 25 years with no reoccurrence.
5. Female age 55 dx in 2016 with JAK2-induced thrombocytosis with splenomegaly and other complications. Her platelet count was approximately 900,000/ μ l. Within nine months, her platelet count dropped to 312,000/ μ l, and she has maintained a normal platelet count since.
6. Female age 46 dx pre-menopausal invasive ductal carcinoma breast cancer in 2010. A 3.7-cm mass was palpable in her left breast. Chemotherapy was given prior to mastectomy and lymph node excision, but no residual tumor was found on pathology after surgery. Cancer-free since.

Cases Continued

7. Female age 68 dx in 1995 with invasive ductal carcinoma, metastatic to the bones with bone scan. Refused chemotherapy. She made a complete recovery in one-year, bone scan cleared, and a repeated bone scan confirmed no cancer. She survived more than 20 years after her initial metastatic cancer diagnosis.
8. 45 female vegan with metastatic ovarian cancer (germ-cell tumor), in 2003 went through chemotherapy with complete remission and no reoccurrence of cancer now – 22 years later.
9. 66 year old male with PSA of 20 in 2011, with biopsy positive for prostate cancer, Gleason score 7. His PSA dropped to 16 in 4 months, 12 in 8 months, and 10 after one year. In year two his PSA was below 5, and then became eventually stayed below 2.5 thereafter. No further evidence of prostate cancer since.

Raw Vegetables and Cancer

Over 300 epidemiological studies showed raw vegetables have the most consistent and powerful association with the reduction of cancers of all types, including stomach, pancreas, colon, breast.

Steinmetz KA et al. J Am Diet Assoc 1996;96(10):1027-39.

Lettuce To The Rescue

Simple Greens Heal The Microbiome

The secret to healing the gut involves a previously unknown enzyme used by bacteria, fungi and other organisms to feed on the unusual but abundant sugar sulfoquinovose -- SQ for short -- found in green vegetables.

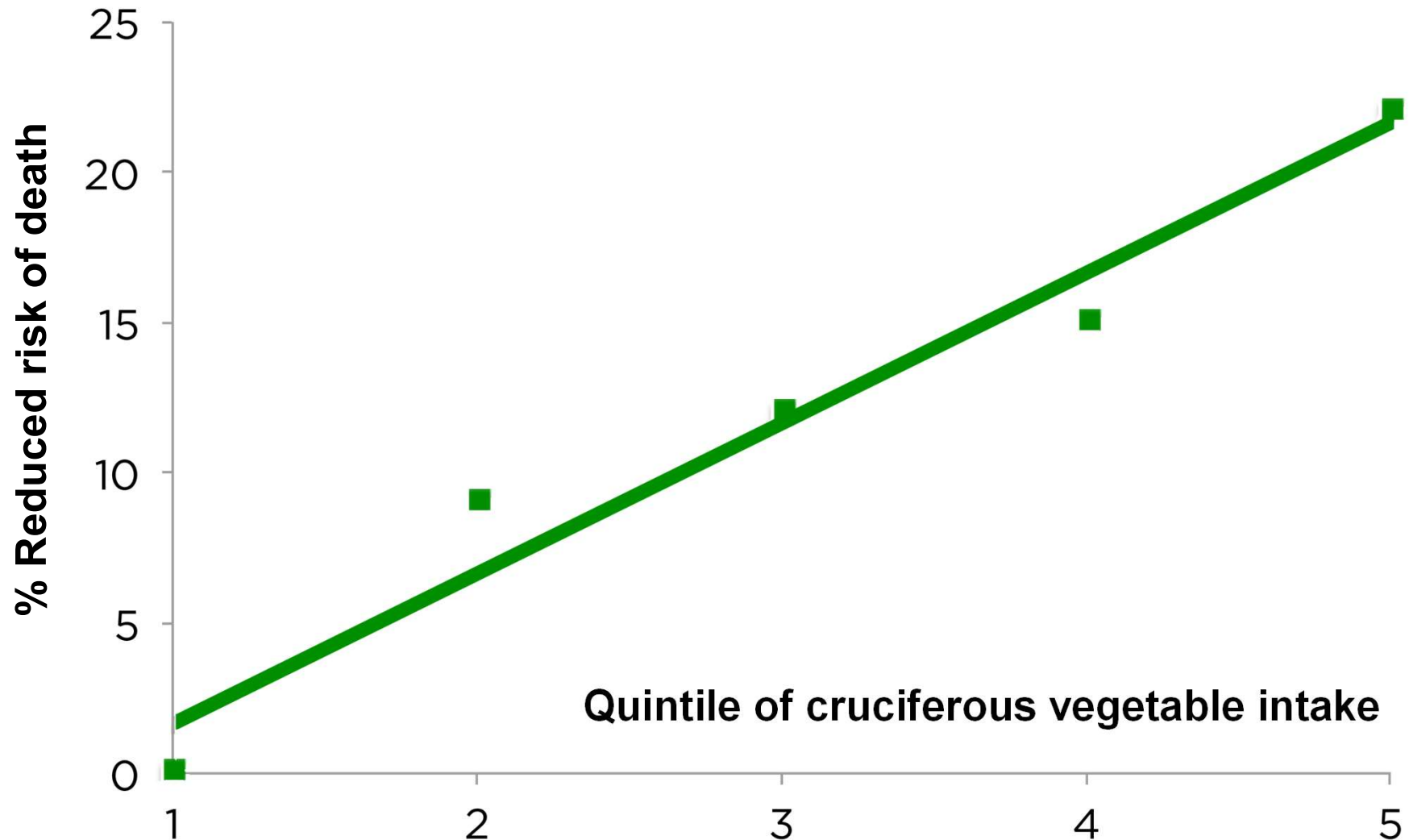
Lettuce lowest in oxalic acid of all greens

Walter and Eliza Hall Institute. "Sweet discovery in leafy greens holds key to gut health."

www.sciencedaily.com/releases/2016/02/160215114005.htm

Cruciferous Vegetables and Longevity

Study of 134,796 Chinese adults



Cancer Promotion

- Saturated Fats – meat and cheese
CD36 “the fat controller”
- Animal Protein – Barbeque
- Glycemic Carbohydrates – white rice, white bread and sweeteners
- Fried foods and fast food

Exogenous lipids promote the growth of breast cancer cells via CD36

Published online on: August 1, 2017 Oncology Reports p 2105-2115

Animal Protein and Death I

- **High Protein Diets that were low in sugar studied.**
- 6000 people age 50 – 65, followed for 18 years
- 4-fold increase risk in cancer deaths, compared to those with lower animal protein intake.
- 75 percent increase in overall death – 18 year period
- 73-fold increased risk of developing diabetes in the higher protein group, compared to the lower protein.

Low Protein Intake is Associated With Major Reduction in IGF-1, Cancer and Overall Mortality... Cell Metab 2014 19(3) 407-417.2014

Animal Protein and Death II

Dietary carbohydrate intake and mortality: a prospective cohort study and meta-analysis. *Lancet Public Health* 2018

25 year median follow up / 6283 deaths

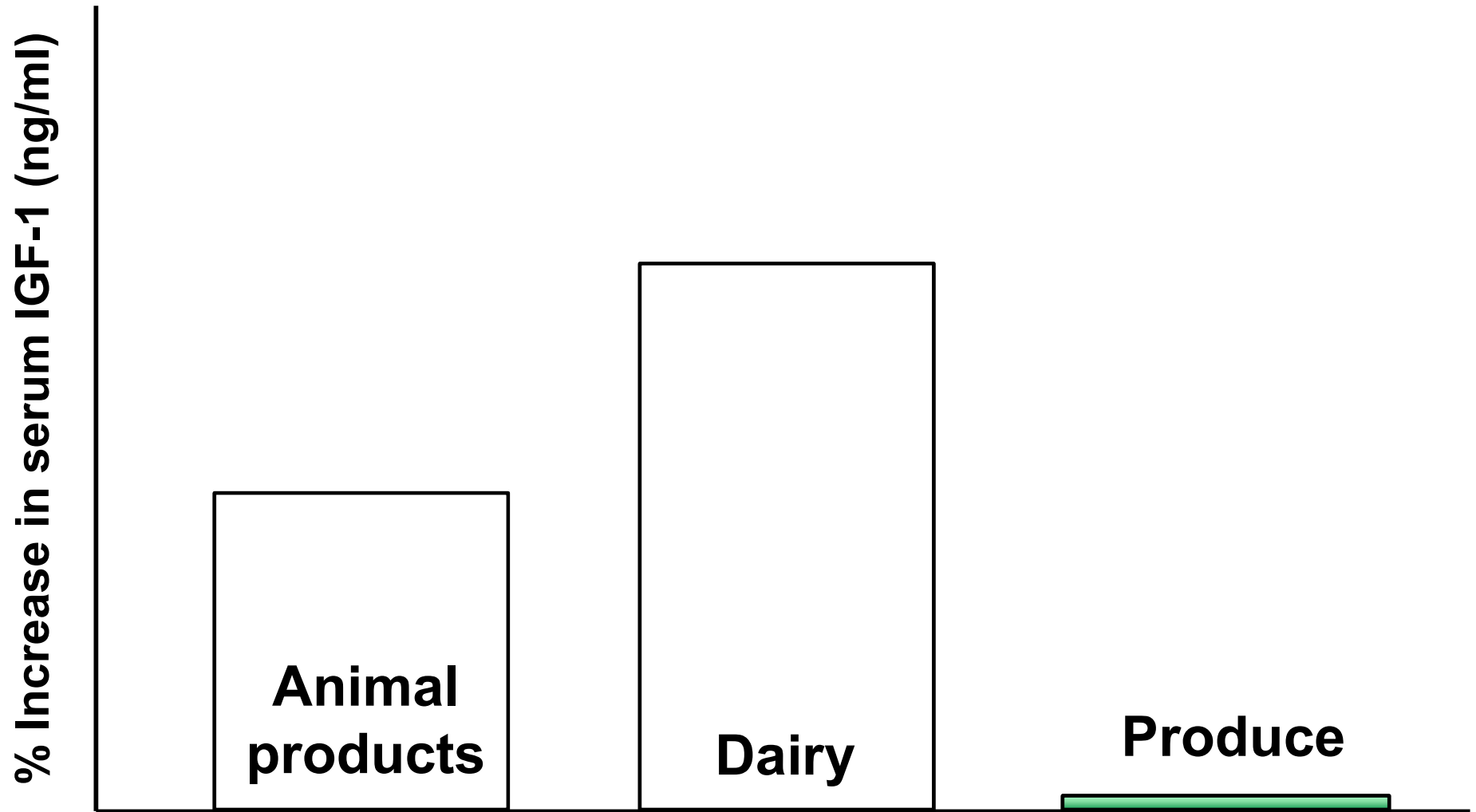
Carbohydrate intake below 30% with most early life deaths.

Dose response →

More animal protein more death

More plant foods longer lifespan

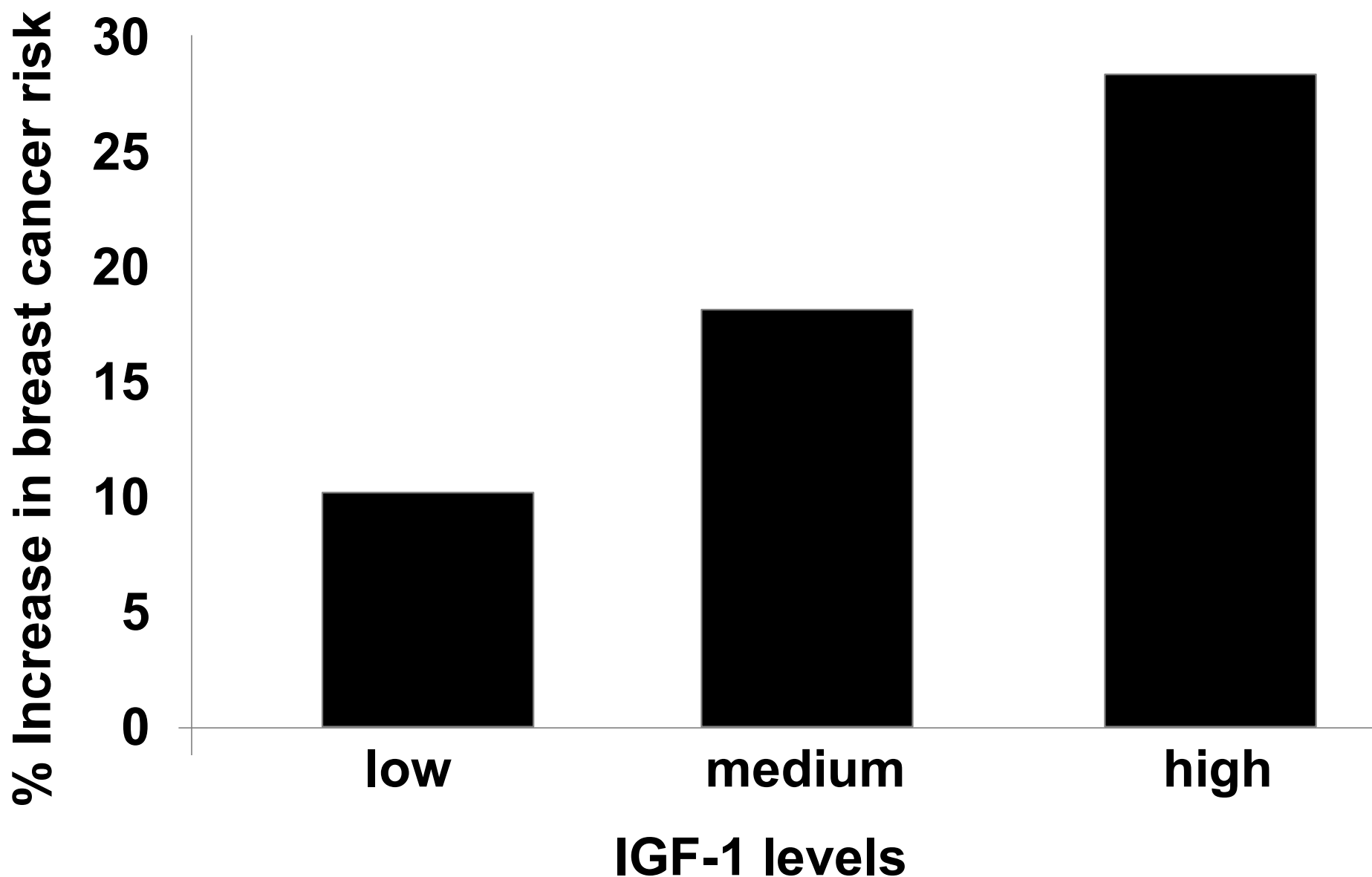
Food and IGF-1



Increase in serum IGF-1 from a 5% increase in calories
from animal/dairy protein

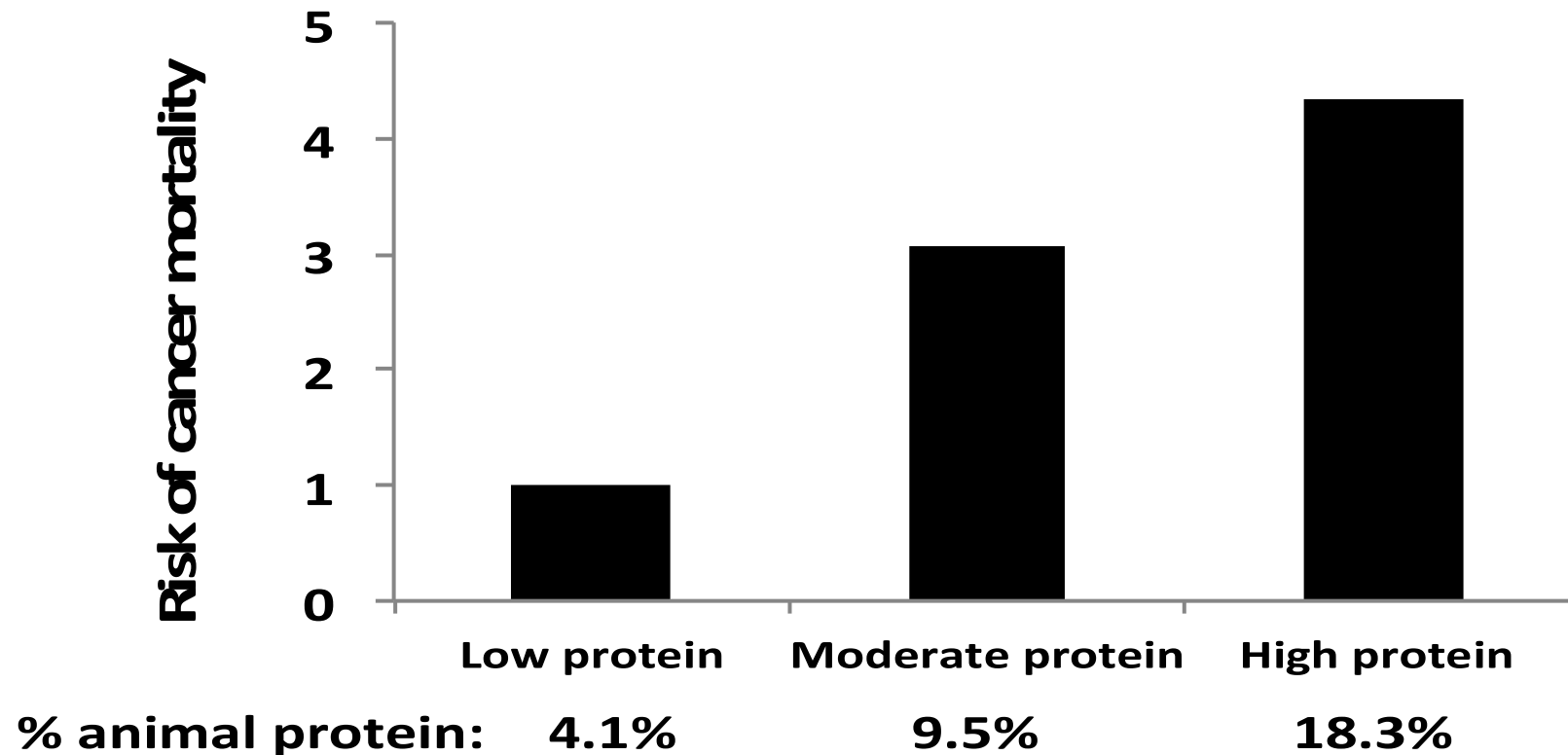
IGF-1 and Breast Cancer:

Pooled data from 17 prospective studies



Protein and Cancer

Animal Protein Intake and Risk of Cancer Mortality



Dietary intake of total, animal, and plant proteins and risk of all cause, cardiovascular, and cancer mortality: systematic review and dose-response meta-analysis of prospective cohort studies. BMJ 2020 Jul 22;370:m2412. © Lee Fuhrman, M.D. All rights reserved.

Insulin-like Growth Factor – 1 (IGF-1)

Low Levels Extend Life Span

- Decreased inflammation
- Reduced oxidative damage
- Stress resistance
- Insulin sensitivity
- Slows aging of the brain

Protein and Lifespan

Song M, et al. Association of Animal and Plant Protein Intake With All-Cause and Cause-Specific Mortality. JAMA Intern Med 2016, 176:1453-1463.

Tharry M, et al. Patterns of plant and animal protein intake are strongly associated with cardiovascular mortality: the Adventist Health Study-2 cohort. Int J Epidemiol 2018.

Seldelmann SB, et al. Dietary carbohydrate intake and mortality: a prospective cohort study and meta-analysis. Lancet Public Health, Aug 18, 2018

Budhathoki S,, et al. Association of Animal and Plant Protein Intake With All-Cause and Cause-Specific Mortality. JAMA Intern Med 2019.

,Protein and Lifespan, More Studies

Huang J, et al. Association Between Plant and Animal Protein Intake and Overall and Cause-Specific Mortality. JAMA Intern Med 2020.

Sun Y, et al. Association of Major Dietary Protein Sources With All-Cause and Cause-Specific Mortality: Prospective Cohort Study. J Am Heart Assoc 2021, 10:e015553.

Naghshi S, et al. Dietary intake of total, animal, and plant proteins and risk of all cause, cardiovascular, and cancer mortality: systematic review and dose-response meta-analysis of prospective cohort studies. BMJ 2020;370:m2412.

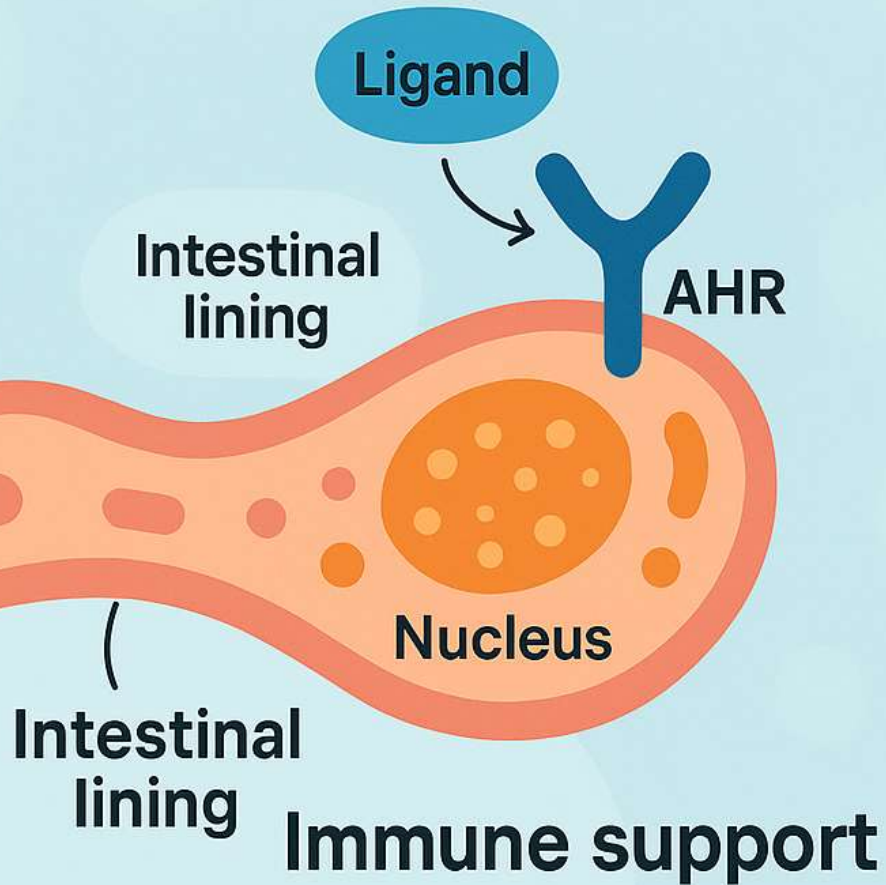
Zhao Y, et al. Low-carbohydrate diets, low-fat diets, and mortality in middle-aged and older people: A prospective cohort study. J Int Med May 03, 2023.

Plant Foods—High in Protein

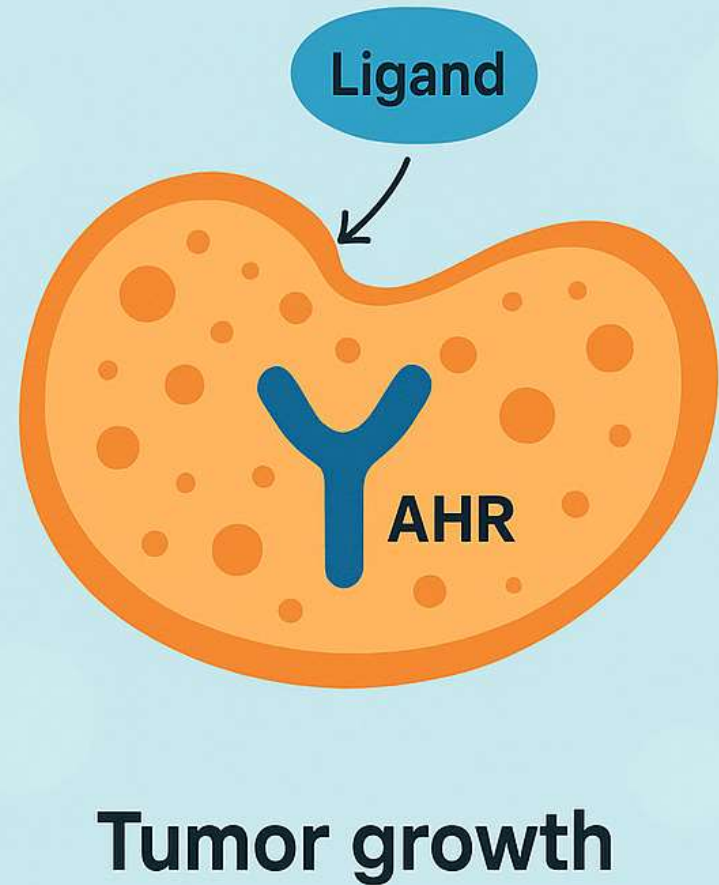
- Lentils and Beans 16 grams per cup
- Edamame 19 grams per cup
- Hemp Seeds 10 grams for 3 tablespoons
- Broccoli 10 grams for 2 cups
- Pumpkin Seeds 13 grams for 1.5 ounces
- Almonds 9 grams for 1.5 ounces

What is AHR?

BENEFICIAL

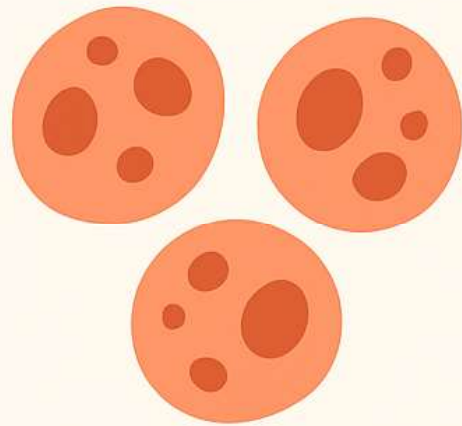


HARMFUL



Cancer and the AHR

Precancerous
and Cancer Cells



Stimulation



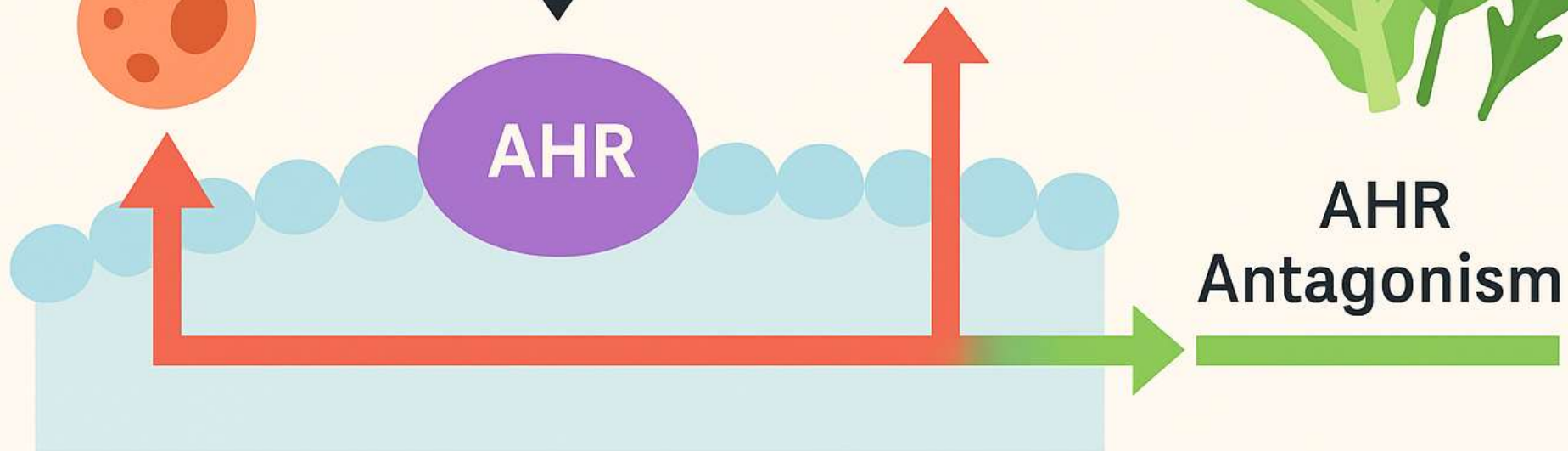
AHR

Tumor
Growth
Metastasis

Plant
Foods



AHR
Antagonism



AHR Activators and Cancer Risks

Dioxins & PAHs (from cooked meats)

High methionine & tryptophan in diet

Tryptophan → Kynurenine

Kynurenine suppresses immune defense

Dialing up the risk with animal protein

Flavonoids block conversion of Tryptophan to Kynurenine

- Kaempferol → lettuce, spinach, arugula
- Quercetin → onions, parsley, fennel, sage
- Luteolin → lettuce, radicchio, peppers, artichokes
- Indole-3-Carbinol → cruciferous greens
- EGCG → green tea

6 unique PMFs in citrus skins and membranes
(PolyMethoxylated Flavones)

What about keto diets for cancer ?

Researchers found that the ketogenic diet-induced metastasis is dependent on a protein called BACH1.

BACH1 has been linked to enhanced metastatic potential in multiple cancer types.

Plant based and ketogenic diet as divergent paths to address cancer: a review. *Jama Oncol* 2022 8(8) 1201-1208.

An unexpected role for the ketogenic diet in triggering tumor metastasis by modulating BACH1-mediated transcription. *Sci Adv* . 2024 Jun 5;10(23)

What about seafood ?

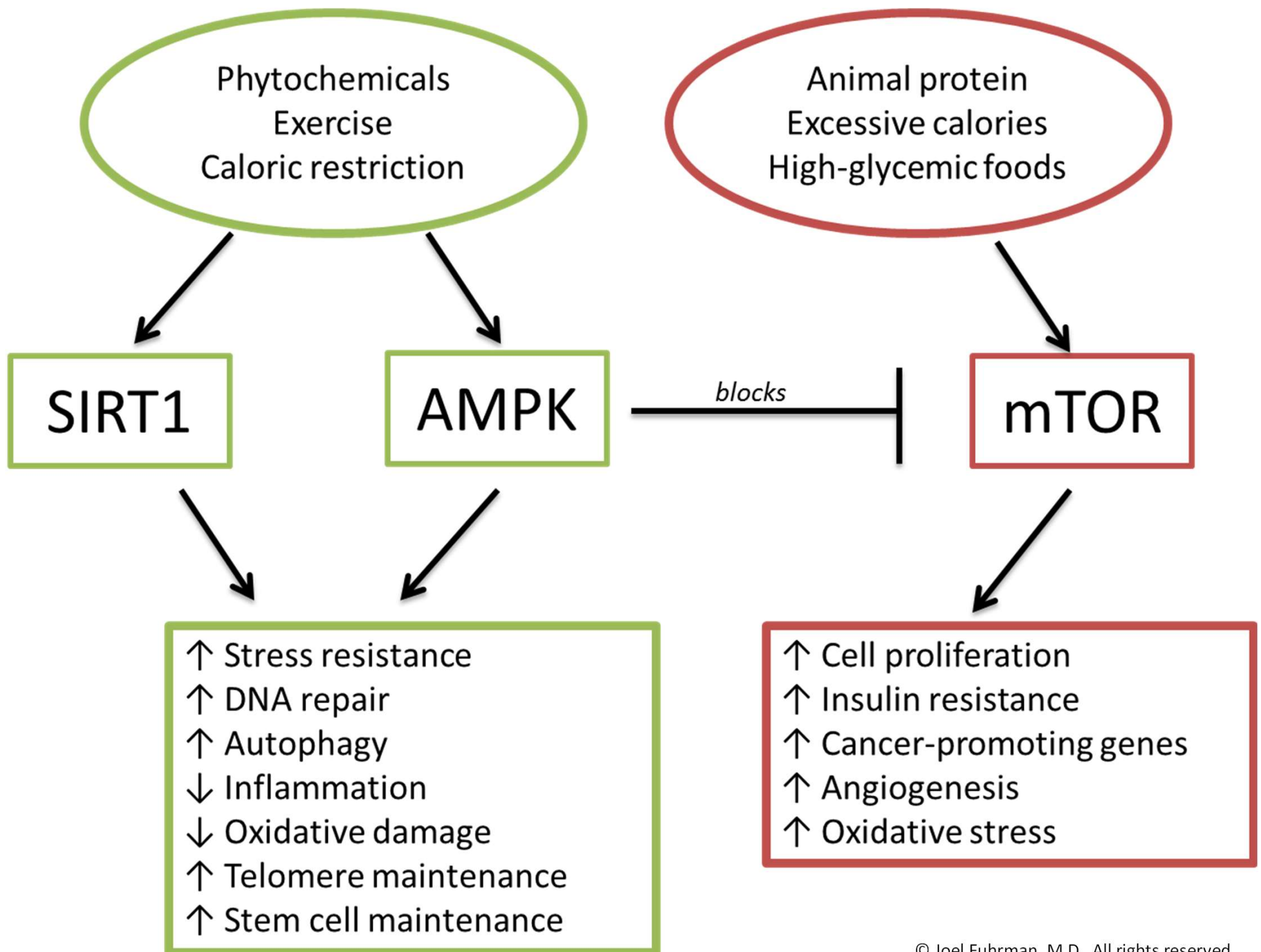
Bivalves and Shellfish

ALS-PDC

Amyotrophic Lateral Sclerosis Parkinsonism Dementia Complex
Now linked to BMAA toxin from cyanobacteria

BMAA highest in bivalves – muscles, oysters and clams and scallops,
and shellfish like crab and lobster.

Lake fish also a cause and ALS cases cluster around people living
near freshwater lakes, shark fins and shark cartilage super high in
BMAA





Kale



Arugula



Brussels sprouts



Collards

ITCs

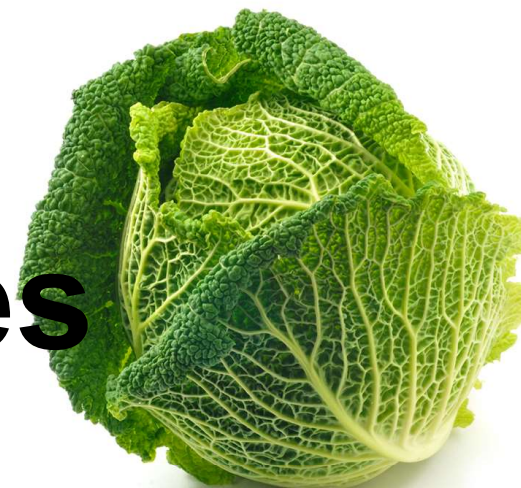
isothiocyanates



Bok choy



Watercress



Cabbage

Cancer-preventive actions of ITCs

ITCs work to prevent cancer initiation/progression

- Angiogenesis inhibition
- Antioxidant effects
- Anti-inflammatory
- Prevent carcinogen-DNA binding
- Detoxify carcinogens
- Repair damaged DNA
- Promote death of cancer cells (apoptosis)
- Promote removal of estrogens

Cruciferous Vegetables and Breast Cancer

4886 breast cancer patients

62 % reduction in total death

50% reduction of breast cancer
development with GSTP1 gene

Vegetable intake still works even if you have cancer

WHEL Study – Women's Healthy Eating and Living Study

3080 Women with breast cancer, compared 3 servings a day of green vegetables to ½ serving

With vegetables in top half and cruciferous in top third
Breast cancer recurrence dropped over 50 percent.

Beans Protect

Butyrate, Phytic Acid, IP-6 Lignans, Phenols

- 24 % lower risk of breast cancer from twice weekly intake in the Nurses Health Study, compared to no beans
- High glycemic index diet increase risk of breast cancer by 87 %

Onions and Cancer

Highest consumers of onions:

- 56% reduction of colon cancer
- 73% reduction of ovarian cancer
- 88% reduction of esophageal cancer
- 71% reduction of prostate cancer
- 50% reduction in stomach cancer

Mushrooms are an Integral Part of the Human Immune System

Angiogenesis Inhibitors

Aromatase Inhibitors

Antigen-Binding Lectins (ABL)

Anti-cancer effects of berries

- Inhibit angiogenesis, reduce inflammation
- Blackberries reversed DNA damage in rats
- Shrink breast tumor and prevent new tumor development
- Recent human study: reverse precancerous esophageal lesions

Tomatoes Reduce Prostate Cancer, Cooked Tomatoes Protect Even More

- Lycopene reduces risk of
 - pancreatic cancer
 - colorectal cancer
 - breast cancer
 - lung cancer
- 50% reduction in prostate cancer

Giovannucci E, et al. A prospective study of tomato products, lycopene, and prostate cancer risk. J Natl Cancer Inst 2002

Lignans Enhance Breast Cancer Survival

Lignans (mg/day)	% Risk reduction
0 – 0.155	0
0.155-0.227	6%
0.227-0.318	49%
> 0.318	71%

One tablespoon of flaxseed = 21.4 mg lignans!

The Nutritarian Prescription

- Eat at least **½ cup of beans/legumes** in soup, salad or a dish
- Eat at least **3 fresh fruits**
- Eat at least **1.5 ounce of raw nuts and seeds**
- Eat at least **one large salad**
- Eat **steamed or wokked greens**
- Eat cooked **mushrooms and raw onions**
- Supplement Smartly B12, zinc, DHA-EPA
curcumins, EGCG, mushroom extracts

JOEL FUHRMAN, MD

#1 *New York Times* Bestselling Author of **EAT TO LIVE**

EAT FOR LIFE

**The Breakthrough Nutrient-Rich Program
for Longevity, Disease Reversal,
and Sustained Weight Loss**

With
meal plans
and over 100
delicious
recipes

