



INE | INSTITUTE OF
NUTRITIONAL
ENDOCRINOLOGY

Managing Inflammation with Dietary Fats and Other Nutrients

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Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

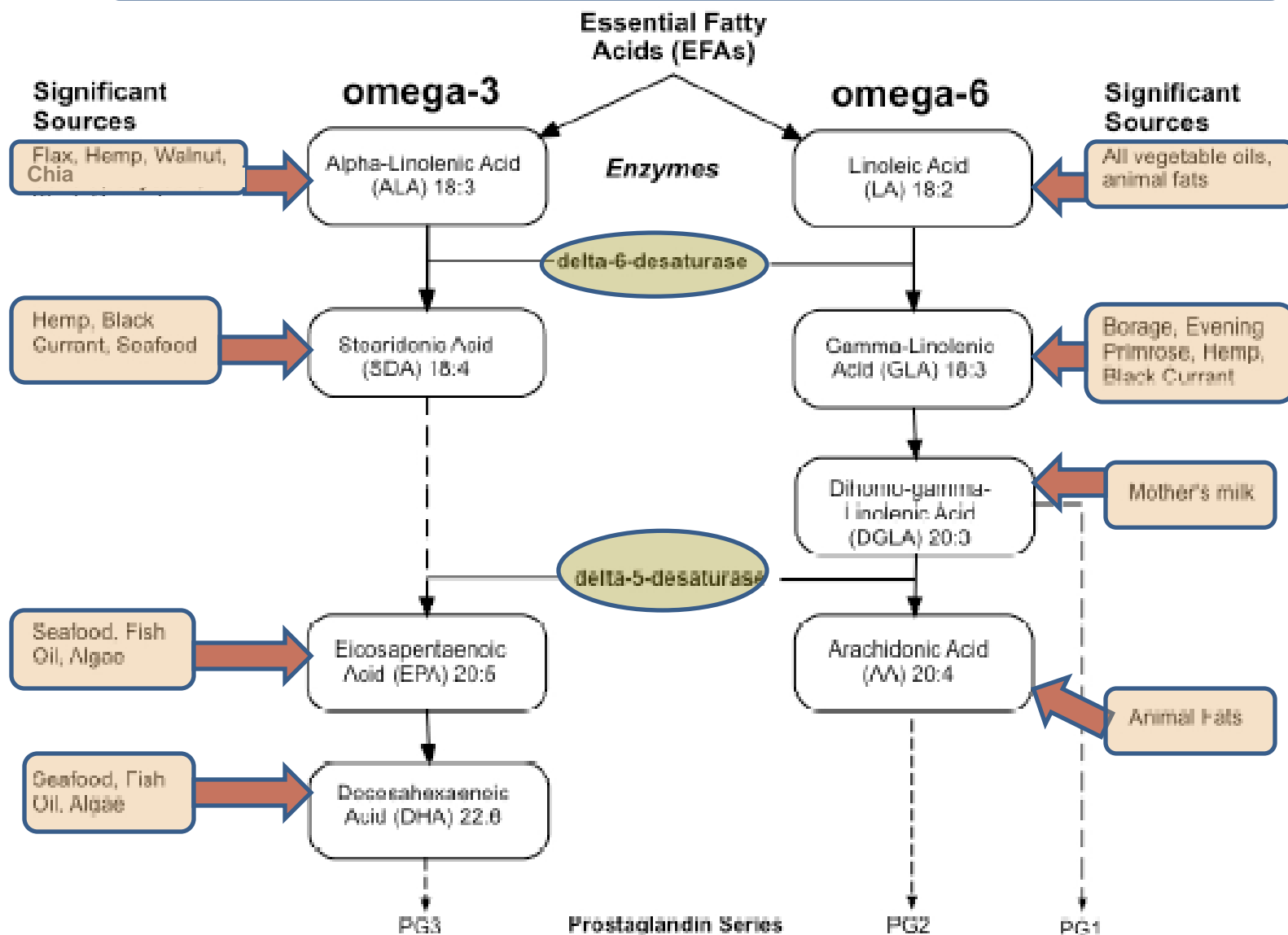


Health Benefits of Omega-3 Fatty Acids

- ✓ Improves heart health
- ✓ Reduces hypertension
- ✓ Improves autoimmune diseases
- ✓ Reduces inflammation
- ✓ Reduces depression
- ✓ Improves vision
- ✓ Cancer prevention and support
- ✓ Reduces risk of osteoporosis

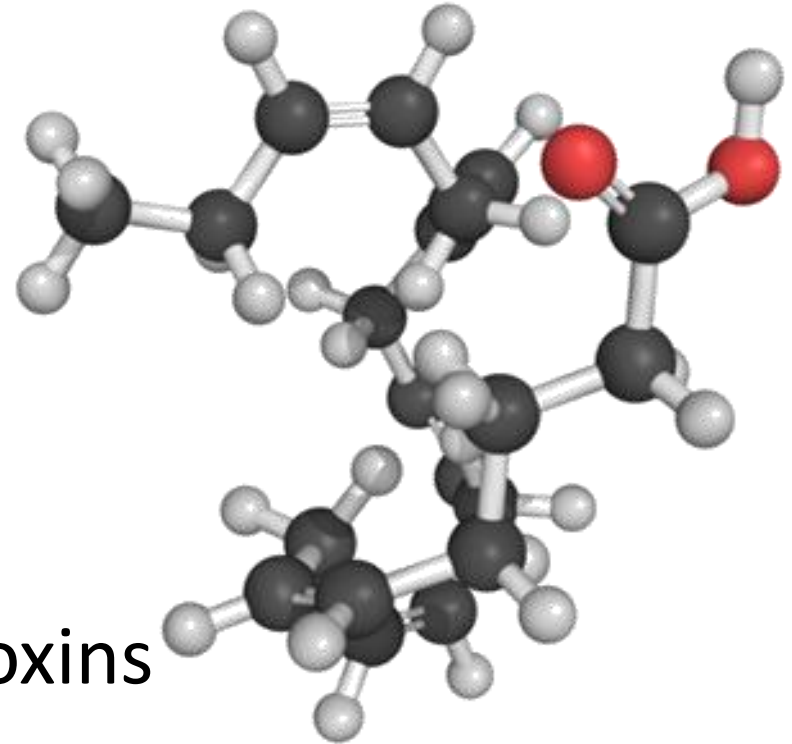


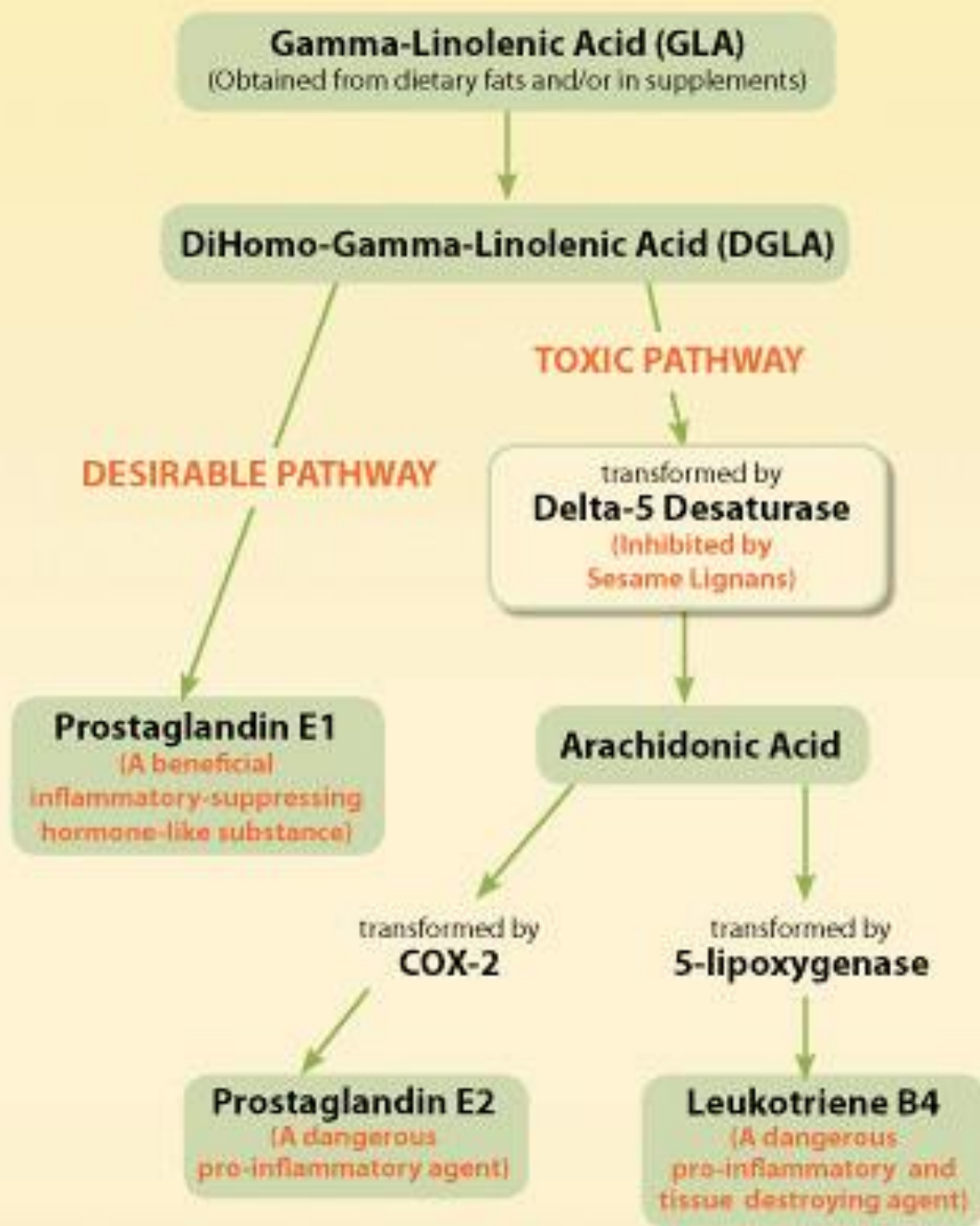
Figure 1. Metabolism of Omega-3 and -6 Fatty Acids in Humans



Eicosanoids

- ✓ Prostaglandins
- ✓ Thromboxanes
- ✓ Leukotrienes
- ✓ Lipoxins
- ✓ Hydroxylated fatty acids
- ✓ Aspirin-triggered Epi-lipoxins
- ✓ Isoprostanooids
- ✓ Epoxyeicosatrienoic acids
- ✓ Endocannabinoids





Delta-6 Desaturase (D6D) Inhibitors

Conversion from ALA to EPA/DHA estimated to be 2% to a high of 8%, average 3.8%**
One study measured it at 36% in females

- ✓ Trans fatty acids: margarine, shortening, and hydrogenated fats
- ✓ Excess omega-6 fatty acids
- ✓ Excess of oleic acid (olive oil)
- ✓ Sugar
- ✓ Caffeine
- ✓ Alcohol
- ✓ Food additives
- ✓ Protein deficiency
- ✓ Deficiencies of biotin, zinc, magnesium, and vitamins E, B₃, B₁₂, B₆
- ✓ Smoking



****less efficient in babies and elderly**



Things That Improve Delta-6 Desaturase

✓ Coconut Oil: Lauric Acid

✓ Biotin

✓ Vitamin E

✓ Vitamin C

✓ B Vitamins: B12, B2, and B6

✓ Zinc

✓ Magnesium



***When lauric acid is present in the diet, the long chain omega-6 fatty acids accumulate in the tissues even when consumption of essential fatty acids is low.*



How Much Omega-3 Do We Need?

According to the Scientific Advisory Commission, you need *a minimum of 0.45g long-chain fatty acids a day* or 3g a week to help keep your heart in good shape.

Scientific Advisory Committee on Nutrition, Committee on Toxicity

Generally recommended intakes to be safe:

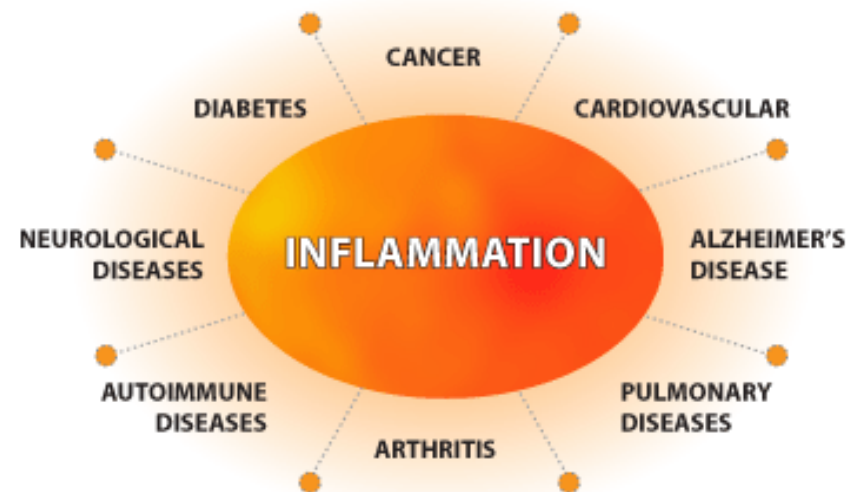
- ✓ **ALA:** 2.2 g per day
- ✓ **EPA/DHA:** .65 g/day, FDA American Heart Association say 800 mg if no heart disease, 2 g if heart disease risk

If it takes 10 times the amount of ALA to convert to EPA/DHA (range is 3 – 50 times depending on diet and lifestyle), vegans should add an extra 6.5g ALA. Coconut improves conversion.



Conditions That Inhibit Delta-6 Desaturase

- ✓ Diabetes
- ✓ Poor Pituitary Function
- ✓ Low Thyroid Function
- ✓ Cancer



Omega-3 and Omega-6 Ratios

<http://www.nal.usda.gov/fnic/foodcomp/search/>

n-3 is Omega 3 Alpha Linolenic Acid ; n-6 is Linoleic Acid

Seeds		Total n-3 FA (g)	Total n-6 FA (g)	n-6/n-3 Ratio
Flax seeds	1 oz.	1.8	0.4	0.2
Hemp Seeds	1 oz.	2.8	8.4	3
Chia Seeds	1 oz.	5	1.6	0.32
Pumpkin seeds, shelled	1 oz.	0.1	5.4	107.8
Poppy seeds	1 oz.	0.1	8.6	96.0
Sesame seeds	1 oz.	0.1	6.7	67
Sunflower Seeds	1 oz.	0.1	8.5	85

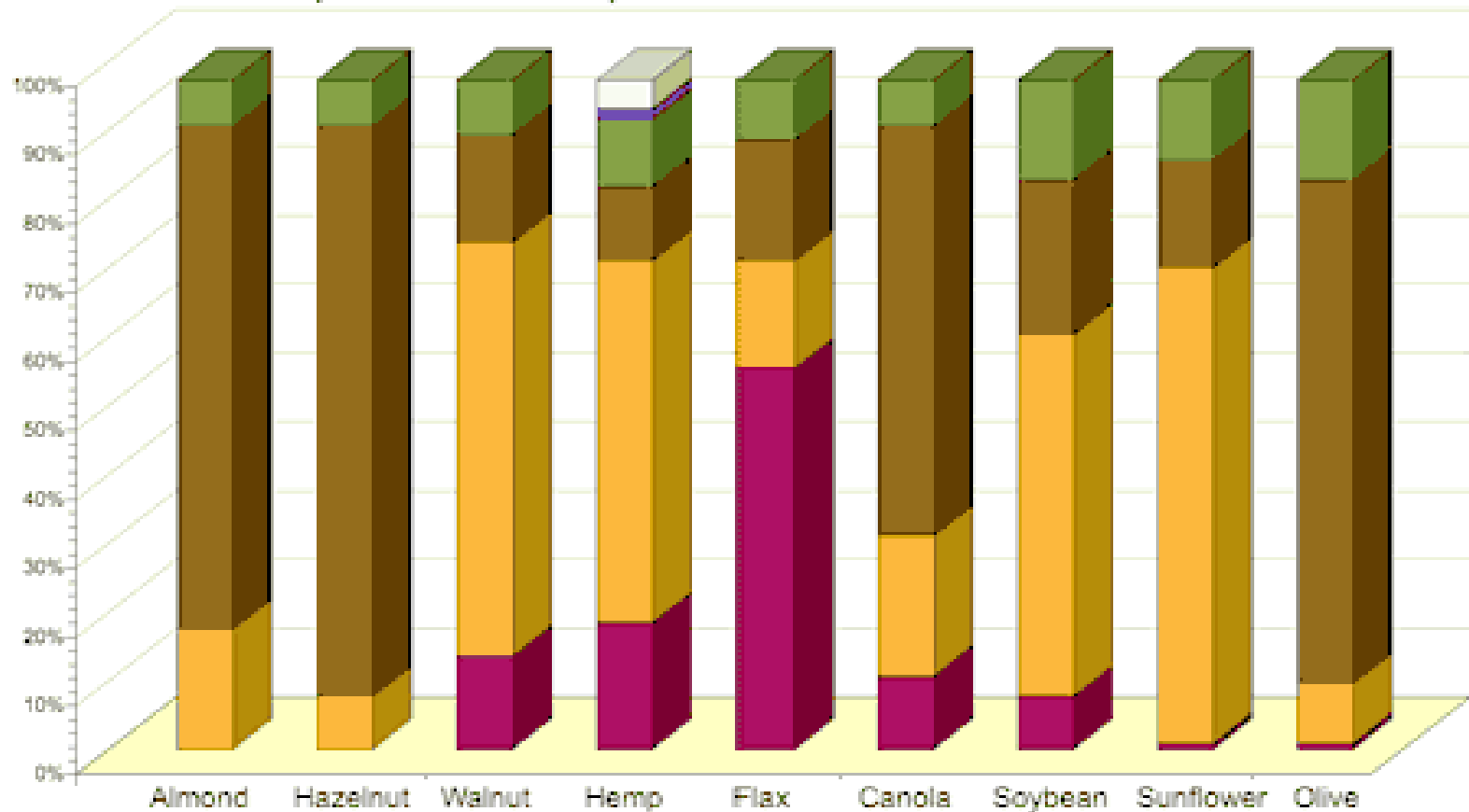
Fish		Total n-3 FA (g)	Total n-6 FA (g)	n-6/n-3 Ratio
Salmon	3 oz.	0.27g .251 EPA .948 DHA	0.14	.1

For people who don't eat fish, recommended intake of ALA is 10 g per day.

(1 ounce of chia seed, 2 ½ tablespoons, is 5 grams)



Fatty Acid Composition of Nut and Seed Oil



Source: Leson & Associates, Berkeley, CA

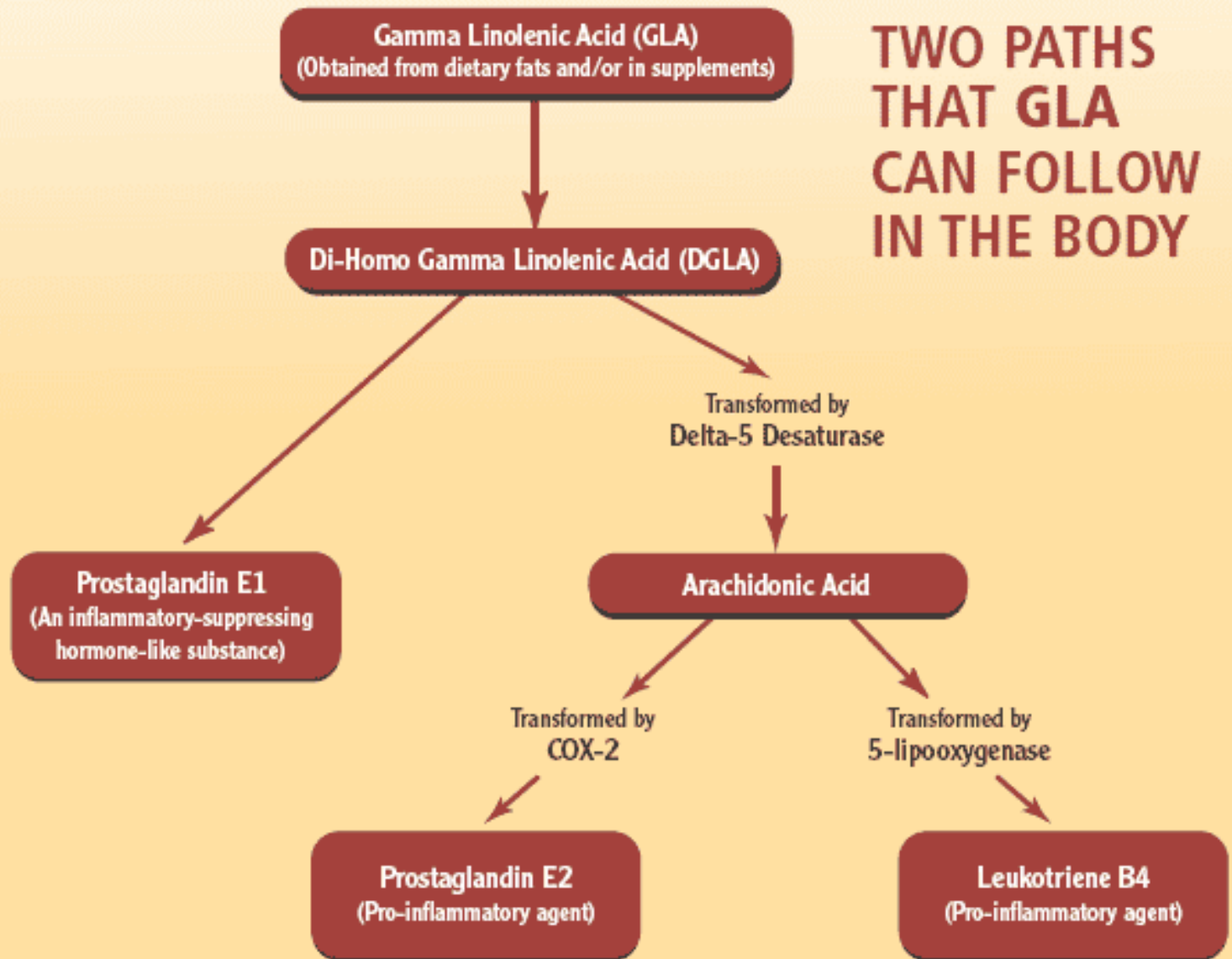
- Alpha-Linolenic- Acid (ALA, 18:3, omega-3)
- Oleic Acid (18:1, omega-9)
- Stearidonic Acid (SDA, 18:4, omega-3)
- Linoleic Acid (LA, 18:2, omega-6)
- Saturated Fatty Acids
- Gamma-Linolenic Acid (GLA, 18:3, omega-6)



Inflammation Marker: AA/EPA Ratio

- ✓ Optimum ratios are usually between 1.5 and 3.0
- ✓ It is considered “unwell” to have a ratio above 10
- ✓ Anything exceeding 15 means a high level of inflammation in the blood
- ✓ Average American serum AA/EPA ratio is 11
- ✓ People with chronic illness and disease typically have scores above 15





Interpretation Scale for Blood Spot Fatty Acid Test

†Inflammatory Risk	Omega-3 Dominance	Low	Mild	Moderate	High
AA/EPA Ratio	<2.2	2.2-8.0	8.1-13.0	13.1-30.5	> 30.5

The inflammatory risk corresponds to data published by Dr. Barry Sears based on serum specimens. The ranges on this report are based on bloodspot data. Reference ranges have been adjusted to correlate with Sears' data. (Sears, B. *The Omega Rx Zone: the miracle of the new high-dose fish oil*. 1st ed. New York, NY: ReganBooks; 2002.)

‡Relative Disease Risk Index*	High	Intermediate	Low
Index of Omega-3 Fatty Acids	< 0.67	0.67-1.4	> 1.4

*Harris WS, von Schacky C. The Omega - 3 Index: A new risk factor for sudden cardiac death? *Prev Med* 2004; 39:212-20.





†Sears, B. *Toxic Fat: When Good Fat Turns Bad*. 1st ed. Nashville, TN: Thomas Nelson; 2008.

‡Harris, WS. Omega - 3 fatty acids and cardiovascular disease: A case for omega-3 index as a new risk factor. *Pharmacological Research* 2007; 55:217-223.

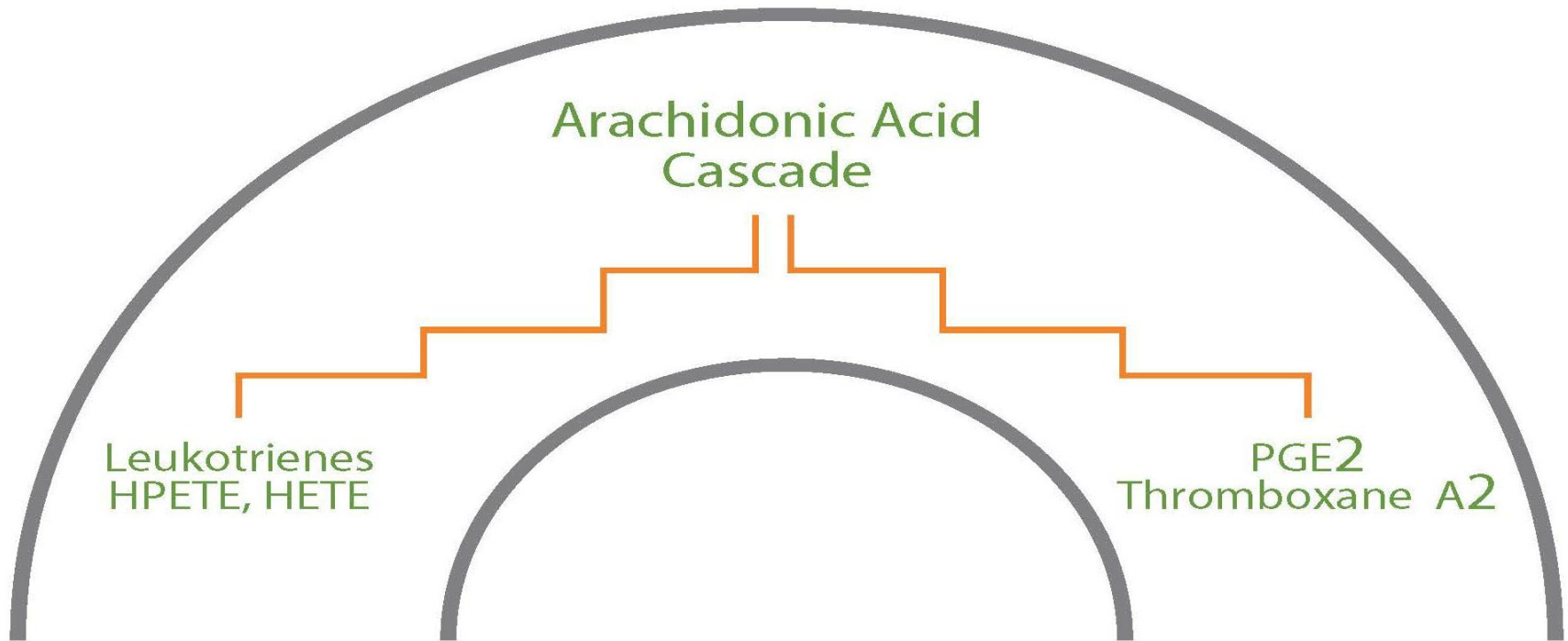


GLA Sources

- ✓ Hemp: 2-4%
- ✓ Evening primrose oil: 7%
- ✓ Black currant seed oil: 15%
- ✓ Borage oil: 23%



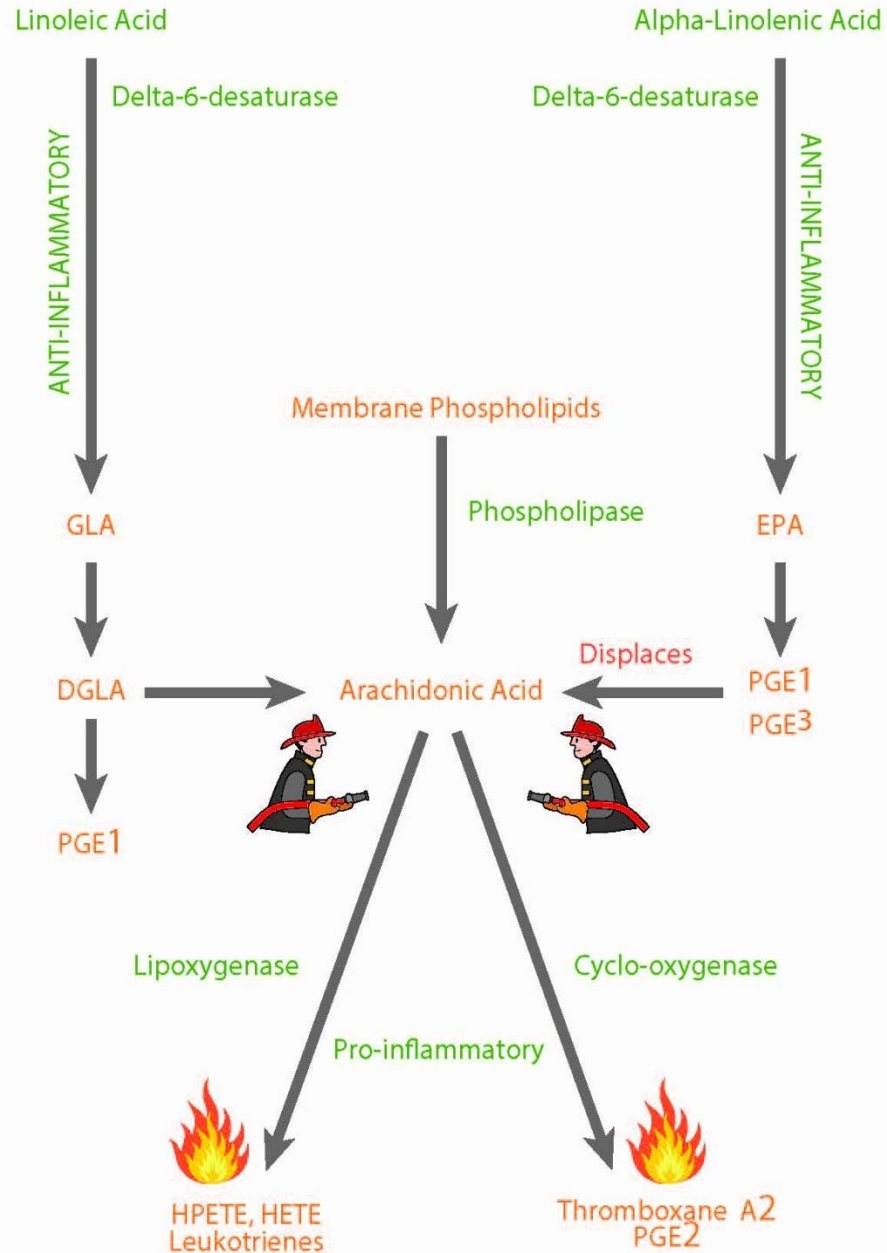
Mast Cell Membrane



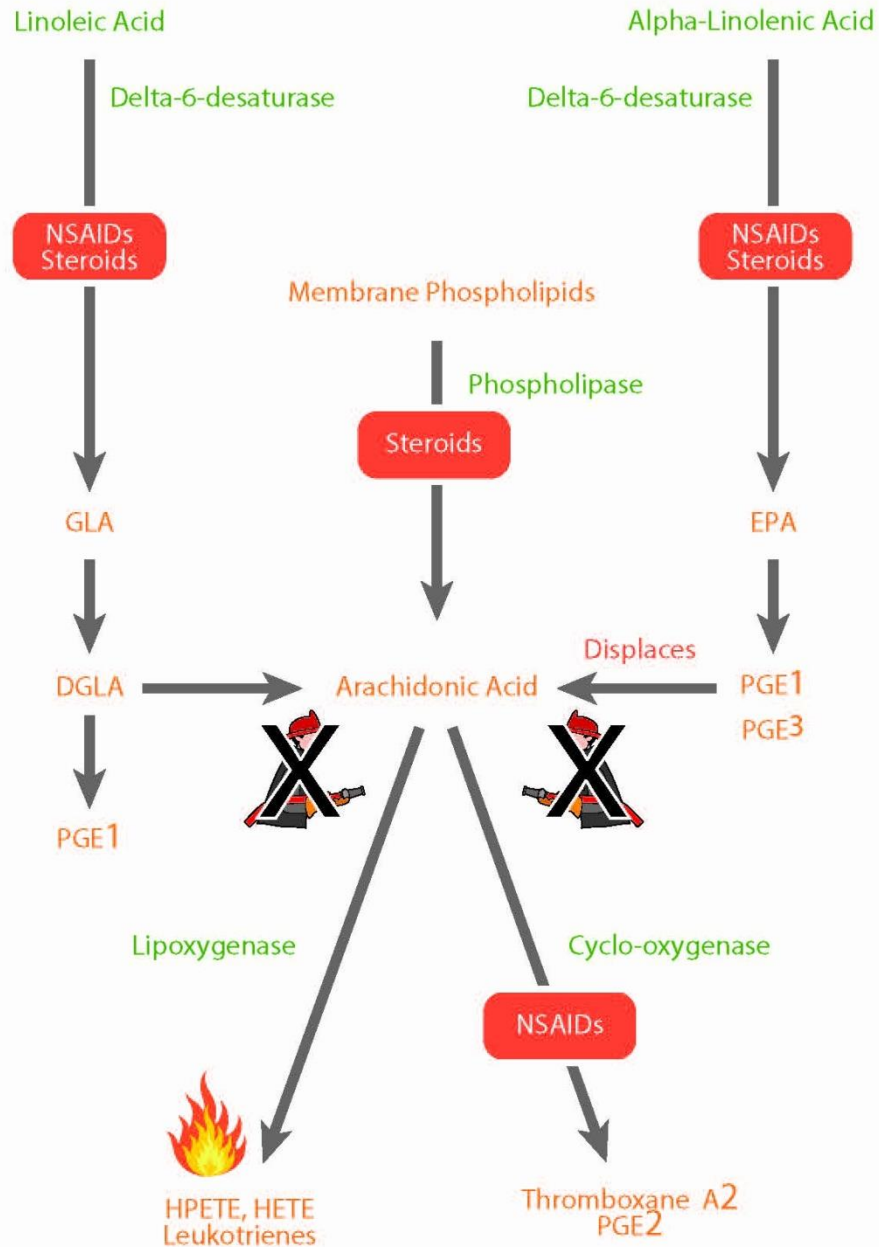
Producing Pro-inflammatory Agents



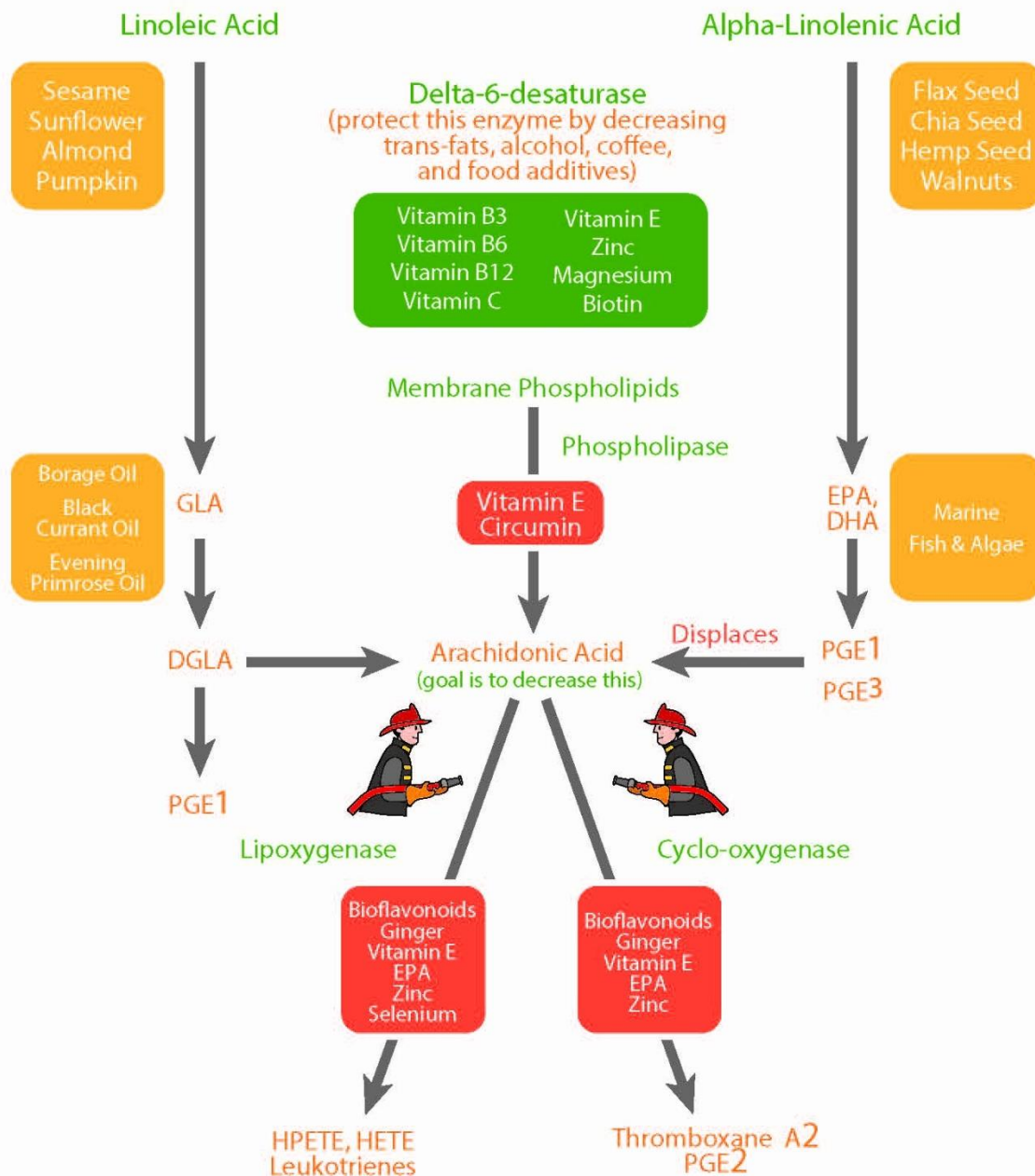
Inflammatory Cascade



Drug Modulation

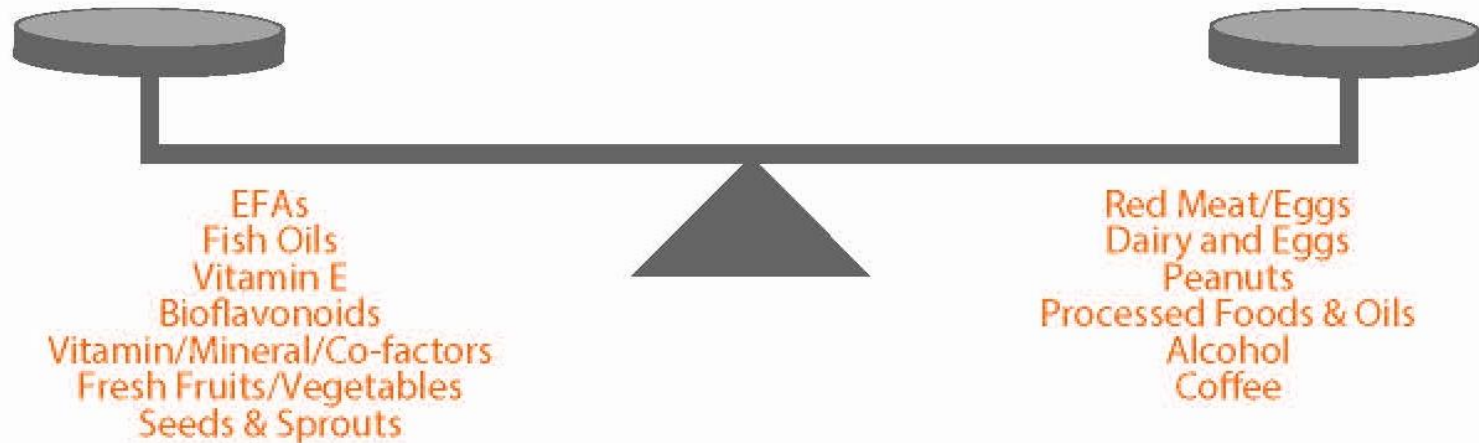


Nutritional Modulation



Anti-inflammatory

Pro-inflammatory



The Body's Clean-up Crew

Lungs, Lymph and Kidneys
Liver (Anti-histamines, CP450, Conjugation)
Circulating Digestive Enzymes (Proteases)
Antioxidant Nutrients (Vitamins A, C, E, Zinc, Selenium, etc.)

Additional Anti-inflammatory Support

Acupuncture
Homeopathic Medicine
Botanical Medicine
Bodywork, Manipulation and Exercise
Physical Therapy, etc.

