

# **Nutrition Strategies for Coping with Illness and Ageing**

**Charlie Smigelski, RD**

# Where Nutrition Impacts Disease ....

Diabetes

Heart Disease

Arthritis

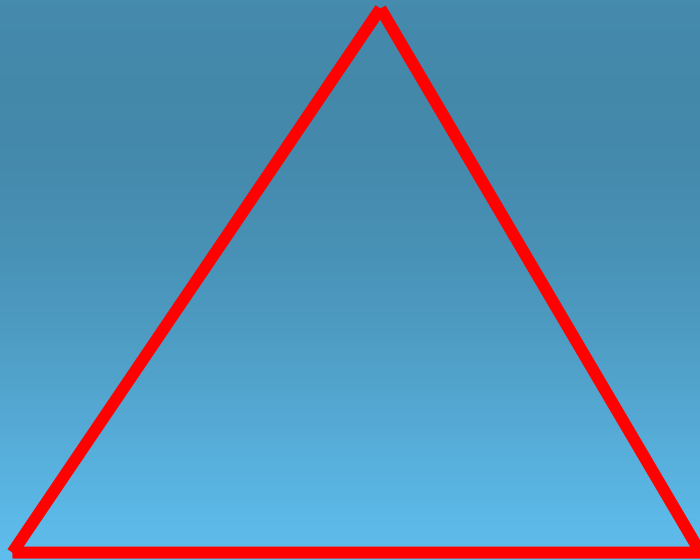
Cancer

AIDS

Hepatitis

**1. What is the totally best diet for health ?**

# The Food Guide Pyramid ?



# The Food Guide Pyramid ...

“the best diet advice you can  
buy in Congress ....”

Walt Willett MD

Eat Drink and Be Healthy

**What is the healthiest diet  
as we understand it ?.**

**When in doubt,**

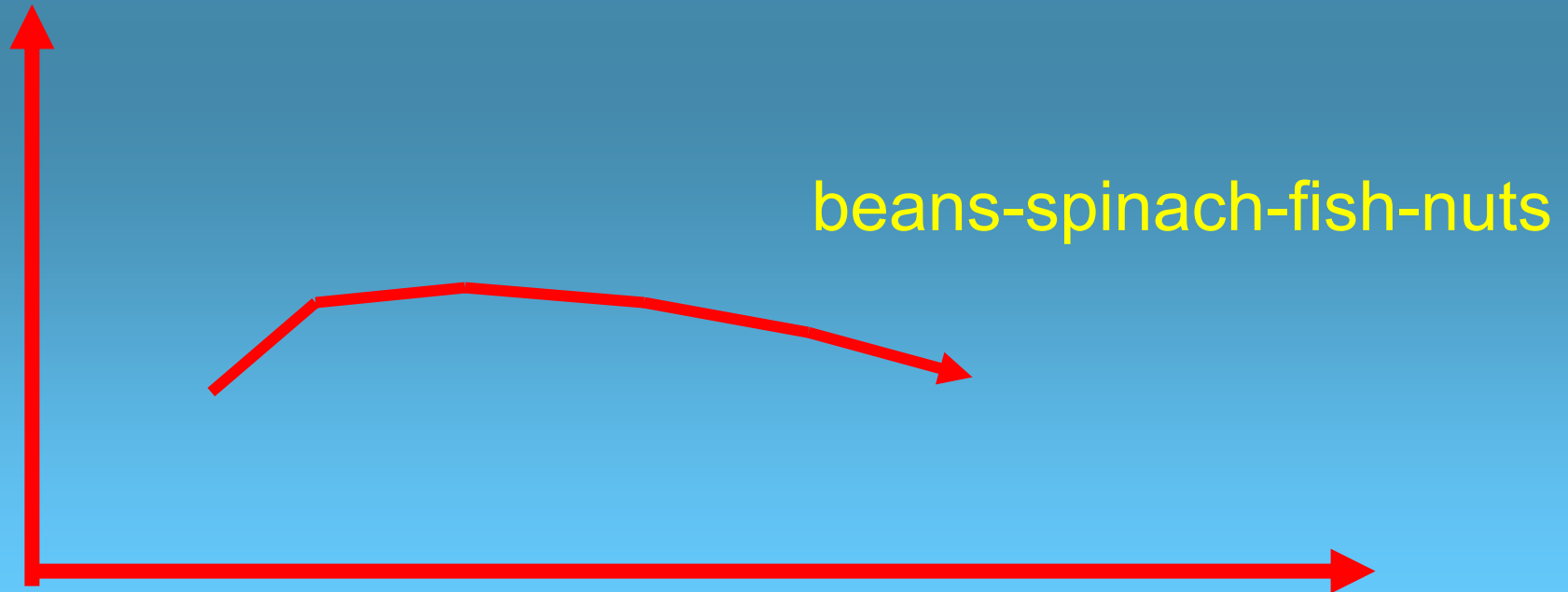
**eat Caveman Cuisine**

**You crawled out of your hut  
this morning, and you ..**

**... clobbered a fish, grabbed  
some mussels, and nibbled  
nuts and seeds and berries, ...**

# High Protein, Medium Fat Medium Carb. Diet

modest blood sugar curves

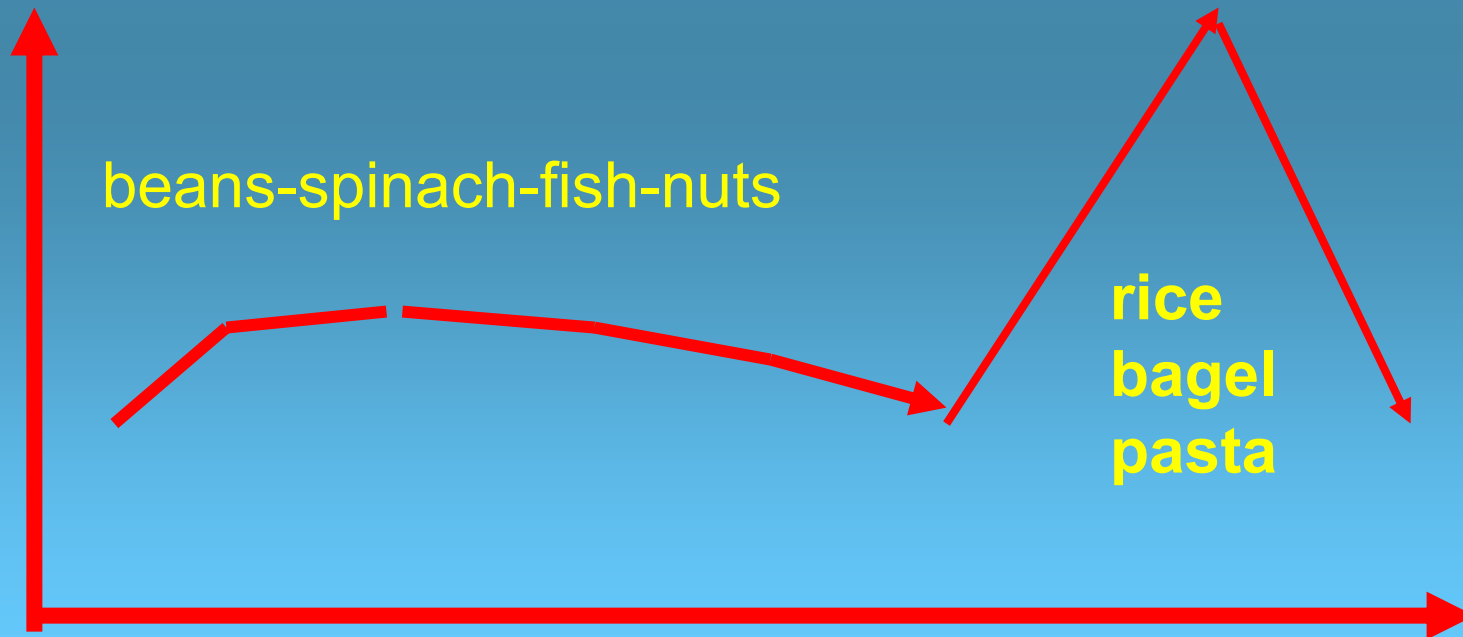




**... out of ....your condo,  
your palace, you shelter ....  
and snarfed down some ...**

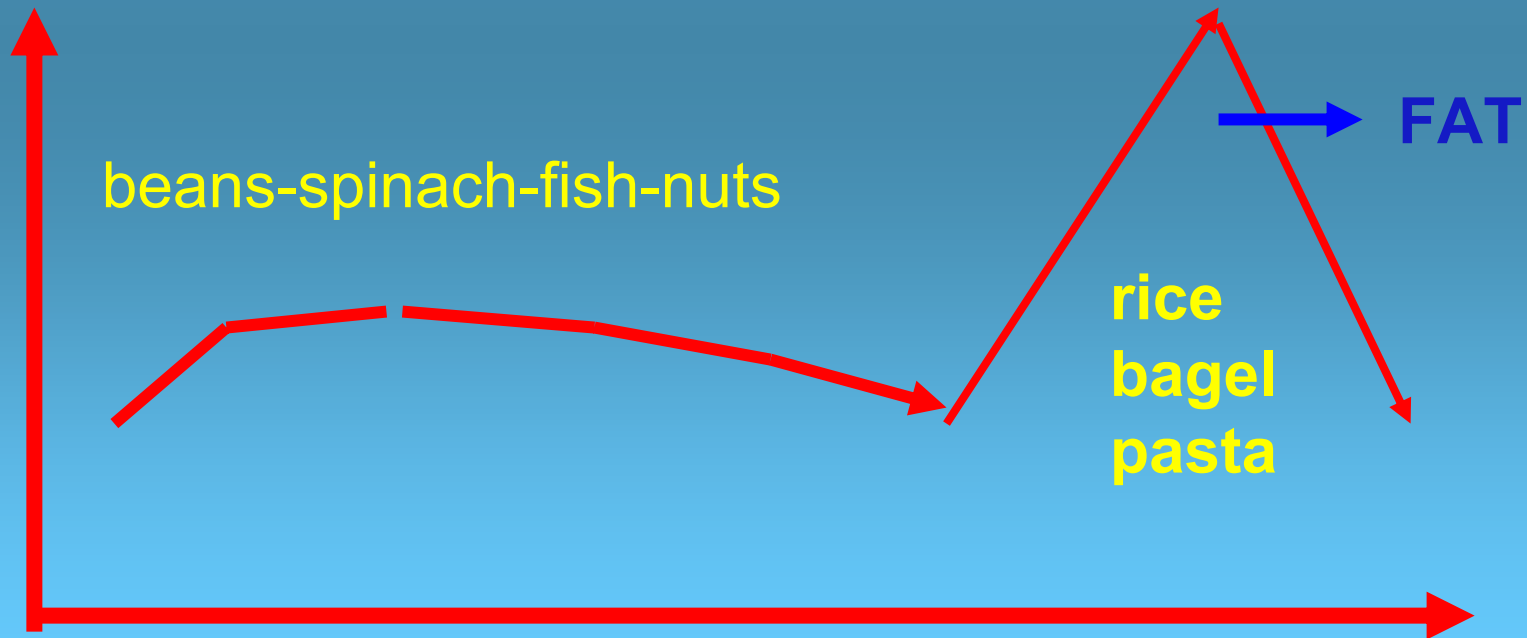
# Cereal Toast Poptart Bagel or Cinnabun

& spiked & crashed your blood sugar



# Cereal Toast Poptart Bagel or Cinnabun

& spiked & crashed your blood sugar



# Paleolithic Diet

Genes expect a blend of foods in the diet.

Balanced intake of  $n$  6:  $n$  3 fats.

Higher amounts of calcium & potassium

Many fruits & veges: vit C & vit E

Low in sodium.

Simopolous:

# Caveman Breakfast

Fish/mussels

moldy fruit/berries

Walnuts

Sunflower seeds

leaves/shoots

Soy/Whey Protein

& banana smoothie

Walnuts

Sunflower seeds

(juice)

# Cavewoman Lunch

Tuna White beans Romaine Olives  
an orange and some yogurt

Cottage Cheese Humus Raw veges  
red grapes and cashews

# Caveperson Supper

Salmon Green Peas Carrots Pine nuts

Chicken Sw. Potato Gr. beans Almonds

Pork loin Black beans Spinach Walnuts

# Caveman Cuisine

Grains and Crisco are modern inventions

**Stressed** metabolisms do not cope with  
some modern foods as well ....



# **Where Nutrition Impacts Disease/Infection: practical**

**Regular body function: keep  
muscles, liver, intestines well.**

**Reduce morbidity and mortality  
from physiological problems.**

# **Nutrition Impacts Disease/Infection: practical**

**Food: Regular body function.  
(Keep immune system supported)**

# Where Nutrition Impacts Disease/Infection: practical

Managing blood pressure:

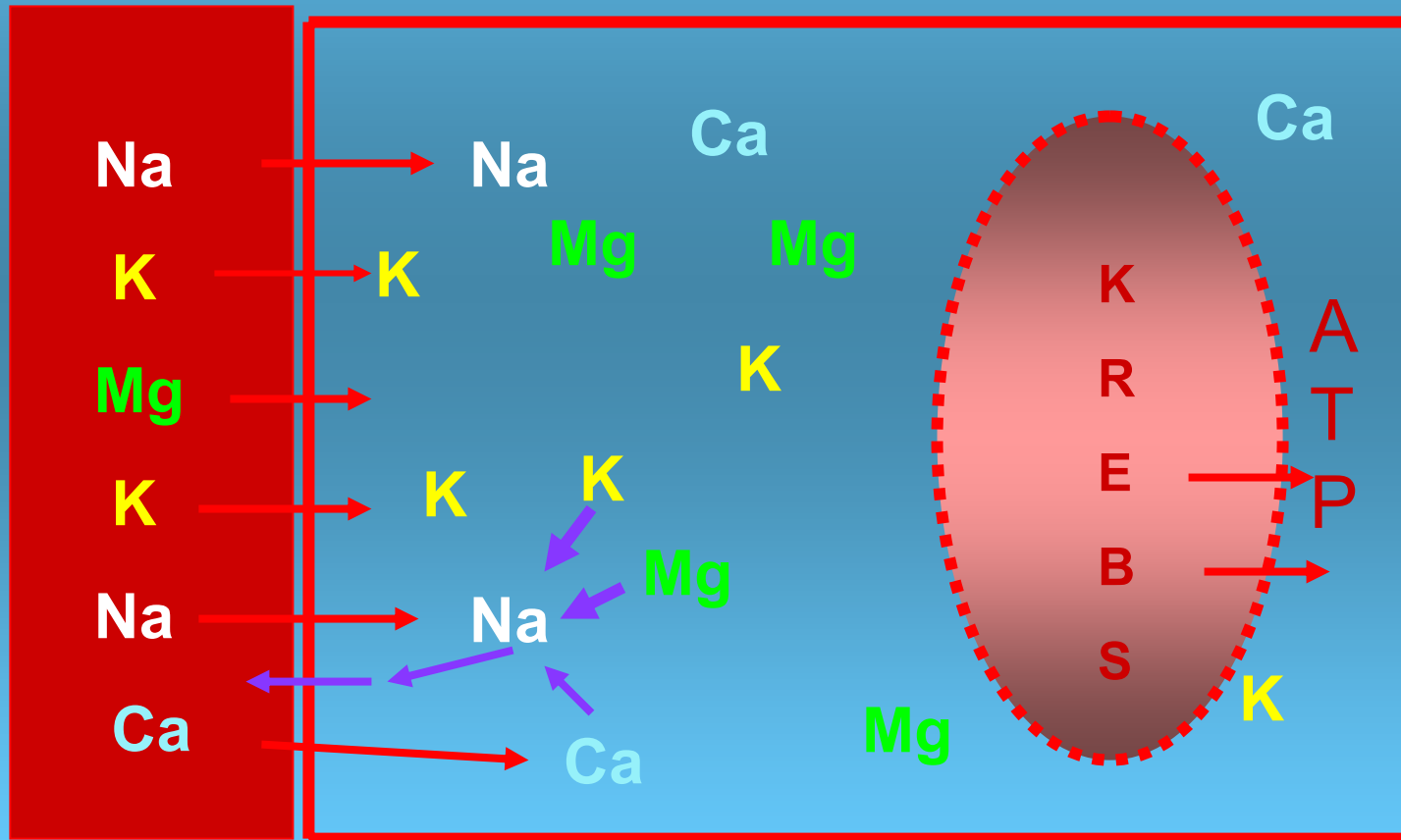
Low sodium diet, AND ?????

# Insulin messages

1. Move sugar, 2. Build fat
3. Retain sodium



# Electrolytes Activities



# LS Diet & **Forest Foods**

Magnesium   Potassium   Calcium

Black beans   Potato   Yogurt

Lentils   Sweet potato   Spinach

Humus   Banana   Poppy seeds

# Treatment of Essential Htn with Coenzyme Q10

n=109 avg. f/u 13 mo

HTN diag x avg 9.2 yrs

Age 62.1 yrs (27-89)

NYHA class II 56%

NYHA class III 39%

# Coenzyme Q10

Dose 100mg – 200 mg/day (1-2 mg/kg)

NHHA Class improvement 2.40 – 1.36

19% by 1 class, 66% by two

Mean systolic BP improved 159 to 147

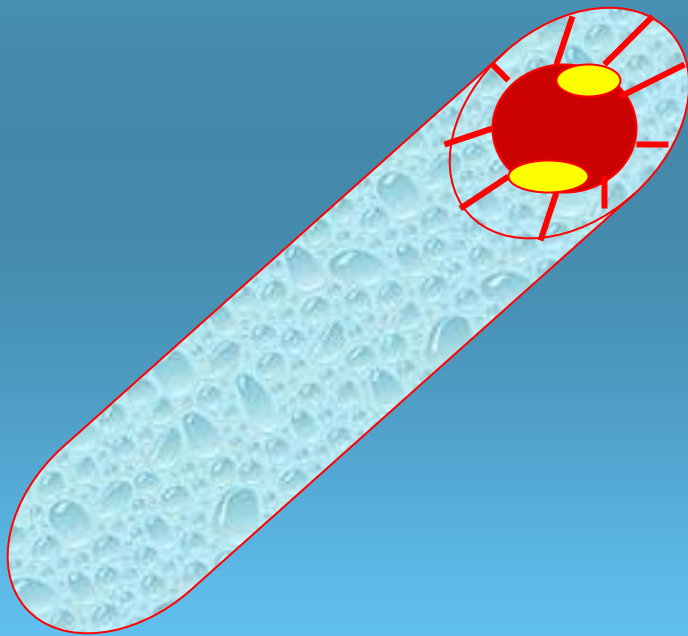
Mean diastolic BP improved 94 to 85

37% of Pts. d/c'd 1 antihypertensive drug

Langsjoen Mol Aspects Med 1994;15:s265-s272.



# Health of Blood Vessels

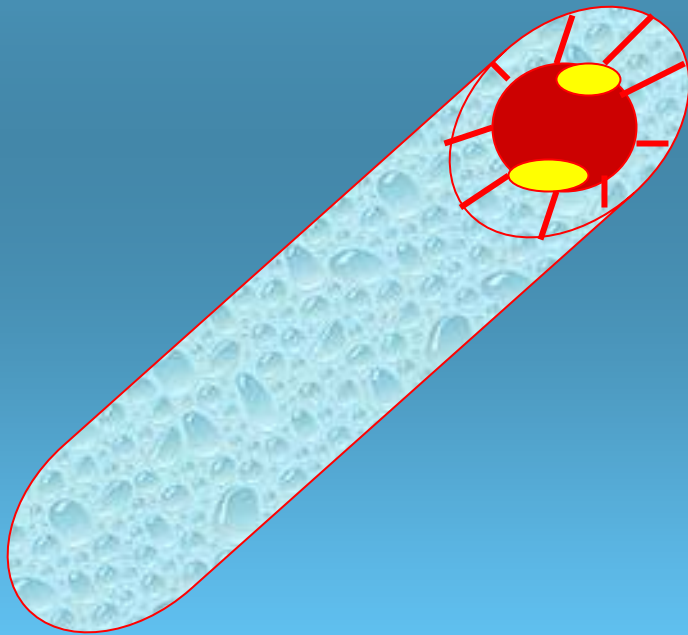


**C-reactive protein**

**Homocysteine**

**Oxidants**

# HAART & Blood Vessels



C-reactive protein

Homocysteine

Oxidants

PI's

Nucleosides

Nitric Oxide

# Dietary intake of *a*-linolenic acid and risk of fatal ischemic heart disease among women

## Contributors of *a*-linolenic acid

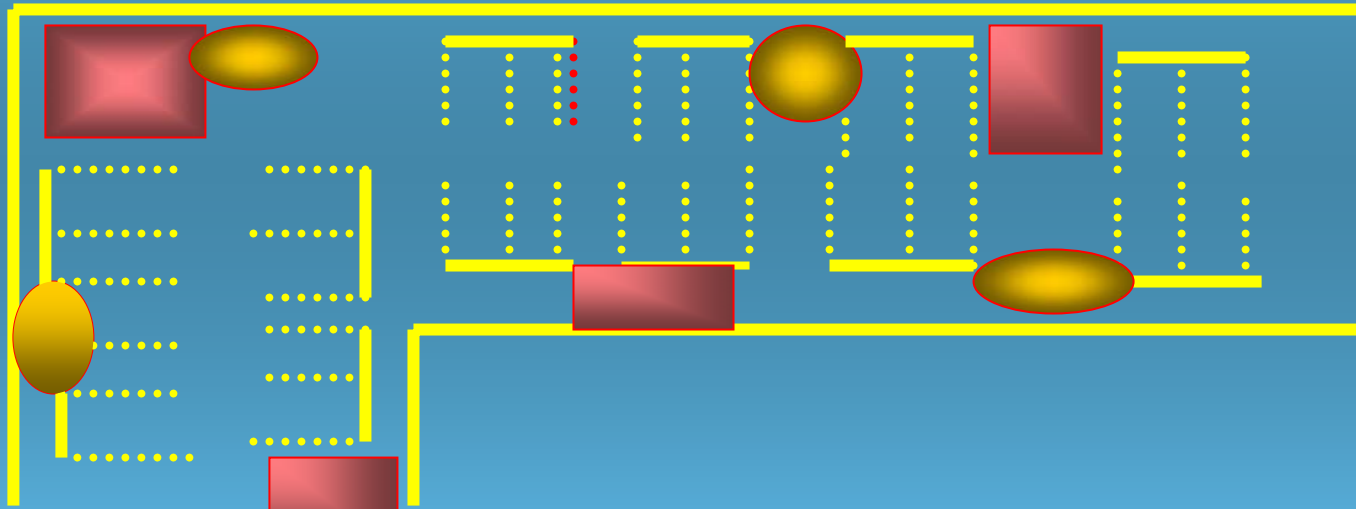
Mayonnaise and creamy dressings	16.7%
Oil & vinegar / Italian dressings	12.2%
Margarine	6.8%

**Hu / Willett Am J Clin Nutr 1999; 69:890-7.**



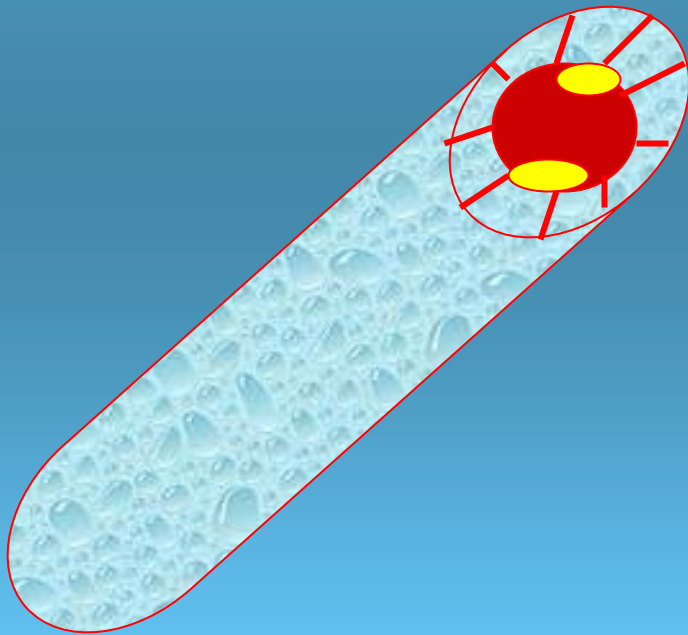
# You are what you eat

## Lipid Bi-layer and dietary fats



Aging: *N* 6 fats & cholesterol change cells

# HAART & Blood Vessels



C-reactive protein

Homocysteine

Oxidants

PI's

Nucleosides

Nitric Oxide

# Lyon Diet Heart Study

Crete - Mediterranean Diet vs NCEP1  
(fruits-veges-mono fat/olive oil)

ALA: leafy veges, purslane, nuts, legumes  
& margarine w/ 4.8% ALA

At 27 months, 76% reduction relative risk of in  
fatal and non-fatal MI's

No differences in Chol TG HDL !!

Circulation 1999; 99:779-785.

# Lyon Diet Heart Study

Crete - Mediterranean Diet vs NCEP1

Fatal MI	3	16
Non-fatal MI	5	17

(70% drop in death rate)

(4 yr data )... 56% drop in cardiac deaths

61% drop in cancer deaths

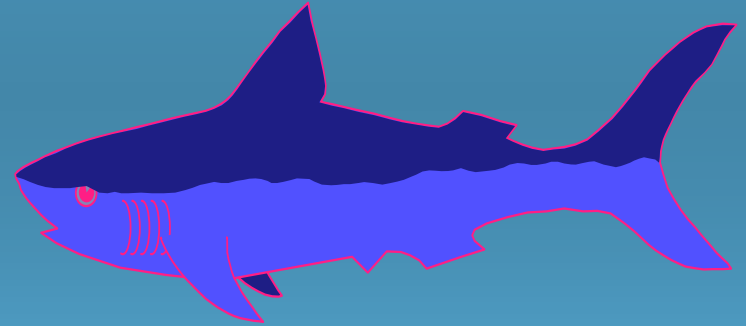
Circulation 1999; 99:779-785.



# Omega 3 Fatty Acids

- Fish Oils
- 10% Flax Seeds
- Wheat Germ
- Walnuts
- Purslane
- (Borage Oil)

Rx 2-3 gms/d



# GISSI - Prevenzione Trial

- n=11,324 s/p MI
  - 1 arm *n* 3; 1 vit E, 1 both, 1 nothing
- 1 gm/day fish oil ... 850mg EPA/DHA
- 20% reduction in MI, nf-MI, stroke.
- Likely more benefit in US diet ...

Lancet 1999; 354:447-455.

# Practical Nutrition: Think about systems ...

Intestines

Muscles

Lymphocytes

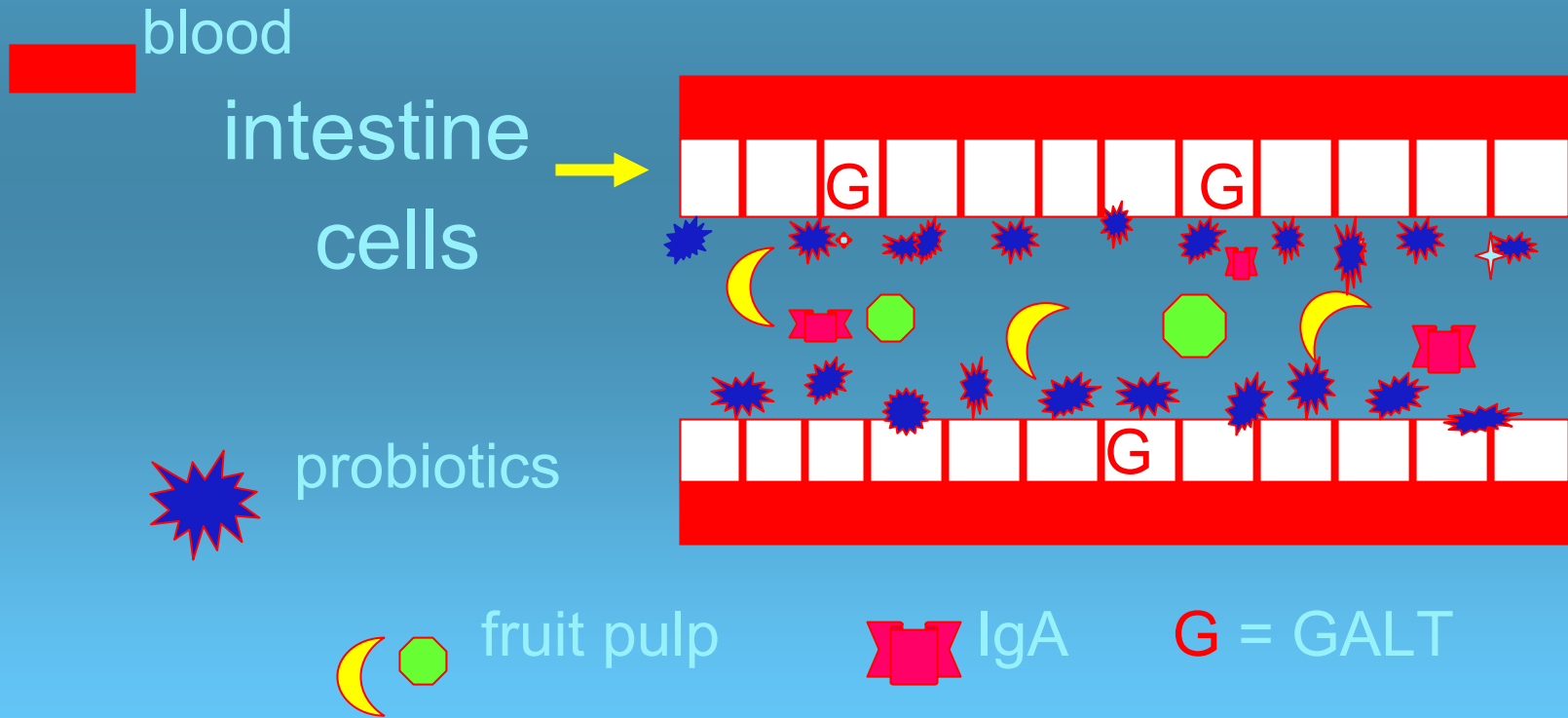
Organs

# **Diarrhea and Abnormalities of Gastrointestinal Function in a Cohort of Men and Women with HIV infection**

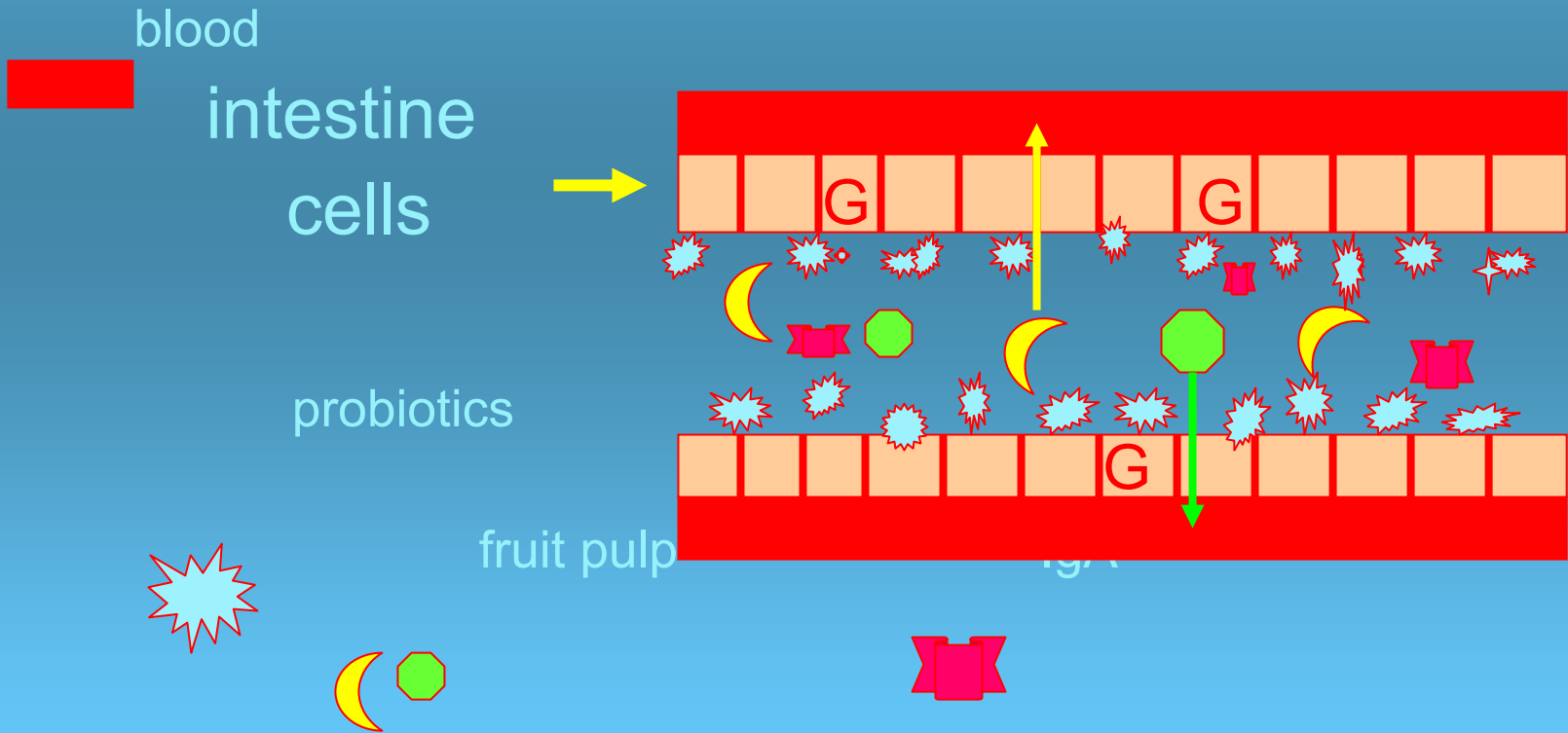
**80% of 671 people in NFHL study  
47.7 low D-xylose absorption**

**Gorbach Am J Gastroenterol 2000 95(12):3482-89.**

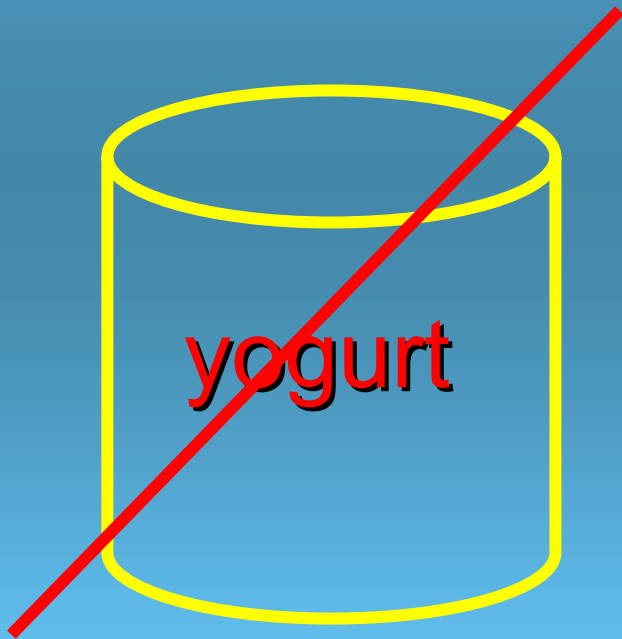
# Practical Nutrition: Think about Gut ecology ...



# Leaky gut .....



# Gut Ecology S. Bengmark



**Lactobacillus GG**  
**“Culturelle” @ cvs**

**S. Gorbach**

# Diarrhea

**Muscles >> L-glutamine >> Gut Repair**



# Diarrhea: practical

Glutamine powder 5-10 grams/day

Acidophilus pills 1-2 /day

Fiber pill: Fibercon or Citrucel

Imodium: 1/day

(less wheat: pasta, bagels, bread)

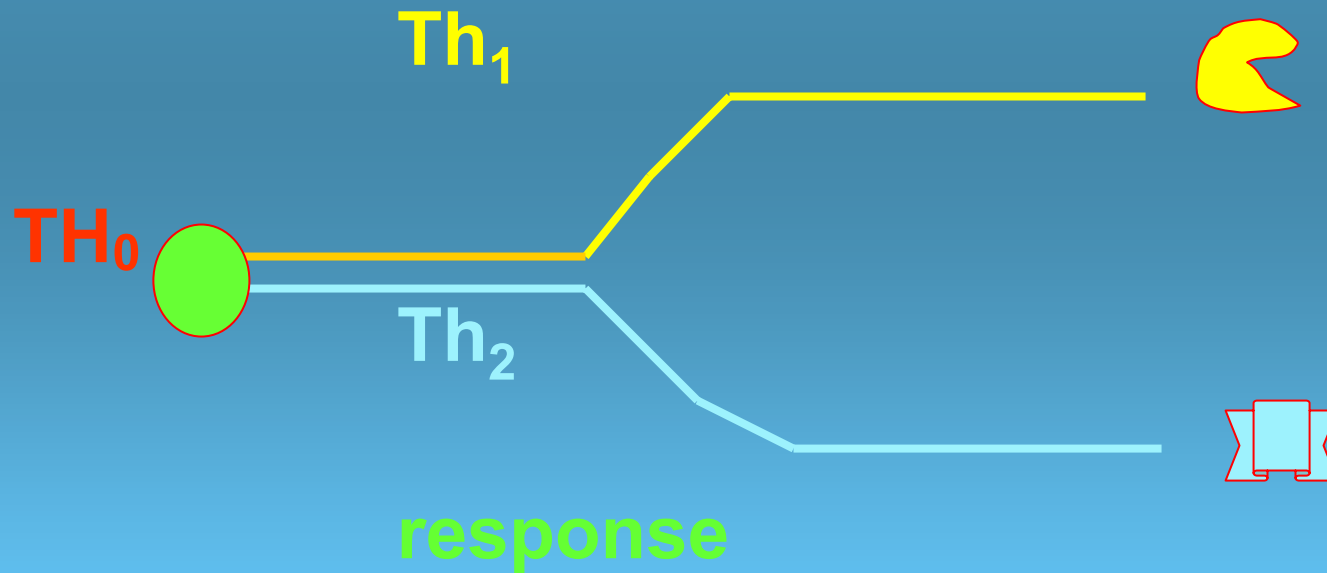
# **Nutrition Impacts Disease/Infection: practical**

**(Regular body function.)**

**Keep immune system supported.**

# Immunology

Immune cells differentiate to:



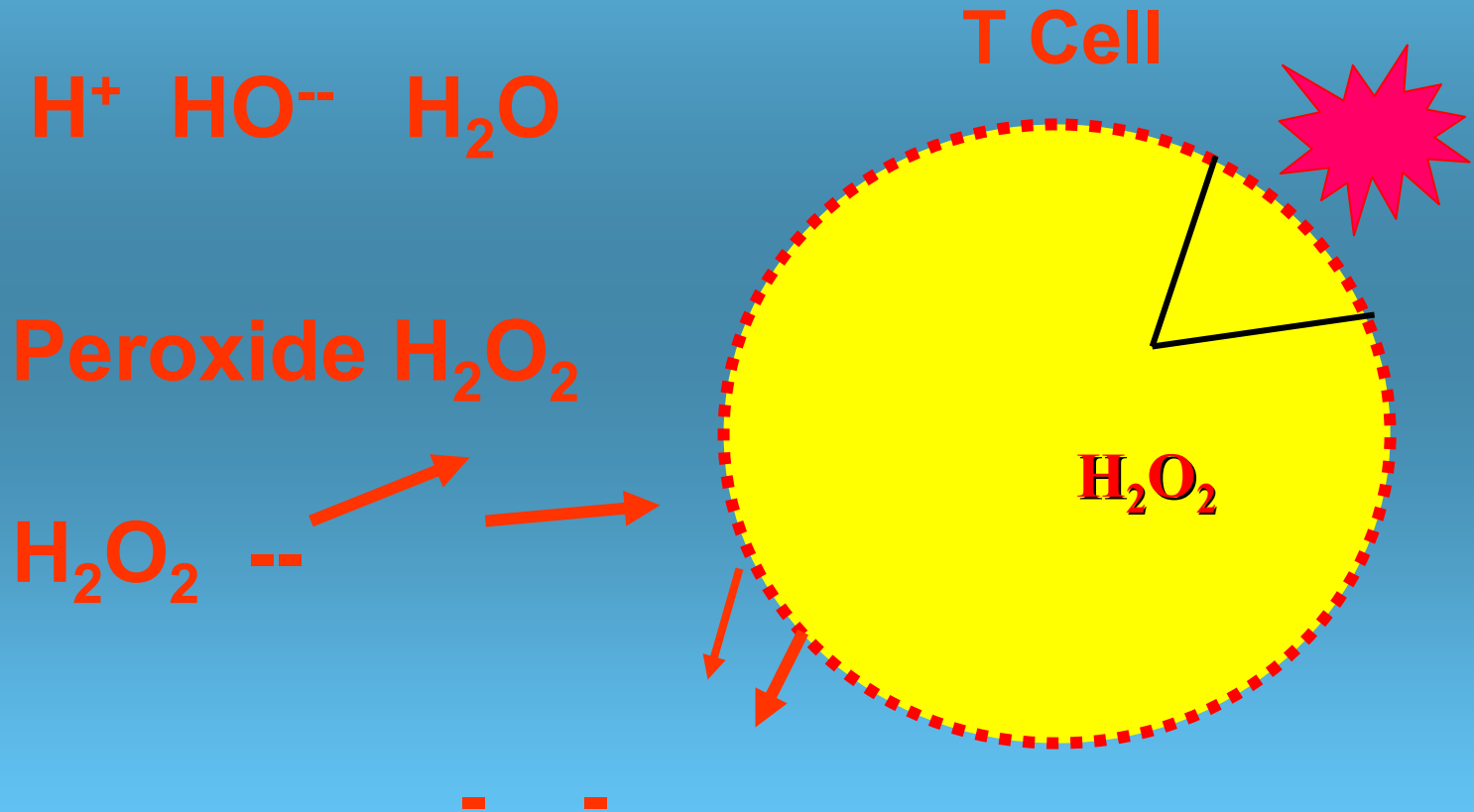
**What's in here that  
boosts repair or immunity ?**



# IMMUNOLOGY



# Oxidative Stress



# Cellular Dysmetabolism: The Dark Side of HIV-1 Infection

<b>Apoptosis</b>	<b>High</b>
<b>Oxidant Stress</b>	<b>Yes</b>
<b>Mitochondrial Toxicity</b>	<b>Yes</b>
<b>Liver enzymes</b>	<b>Elevated</b>
<b>*Cytokines</b>	<b>Th1-&gt;Th2</b>

Famularo, Moretti, Marcellini, Alesse, DeSimone.

J Clin Lab Immunol 1996;48:123-32.

# Oxidative Stress

Random Oxygen Species ROS

Stray Electrons ( Rust Corrosion )

Induce cytokines: IL<sub>1</sub> IL<sub>2</sub> IFN (Th1)

IL<sub>4</sub> IL<sub>5</sub> IL<sub>6</sub> (Th2)

**TNF<sub>a</sub>** **wasting**

NF<sub>k</sub>B grow HIV



Increased serum IFN $\alpha$  in HIV associated lipodystrophy synd.

Three parameters: IFN- $\alpha$ , insulin, and cortisol:DHEA ratio aggregated to form the best model for hyperlipidemia associated with anti-retroviral therapy.

**Eur J Clin Investig. 2002; 32(1):43-50 Christeff, Melchior, et al.**

# Effects Of IFN- $\alpha$ On Metabolism

1. Hepatic lipogenesis & TG pdn.
2. Decreases adipose LPL activity
3. Increases adipose lipolysis

# **Massive Loss of Sulfur in HIV Infection**

**Sulfur loss in asx HIV+ people  
10 grams a day  
versus usual 3 /day**

**HAART therapy not sulfur-sparing**

**W. Droge AIDS Res & Hum Retrovirol**

**2000 16:203-209.**

# Glutathione deficiency linked to impaired survival

Oral administration of NAC:

% survival      2-3 years (CD4<500)

NAC              60%

---                40%

GSH deficiency is due to a shortage of  
cysteine availability

Herzenberg Proc Nat Acad Sci USA 1997 94:1967

Jahoor Am J Physiol 1999 276: E205-211.

Zidovudine-induced experimental myopathy: dual mechanisms of mitochondrial damage.

A short-term mechanism that affects the respiratory chain; and a long-term mechanism that alters *mtDNA*, altering protein synthesis.

J Neurol Sci 1999; 166(2): 131-40.

# AZT: Oxidative Damage to Muscle Mitochondria

## Urinary excretion of 8-oxo-dG:

(8-oxo-7, 8-dihydro-2' deoxyguanosine)

**355<sub>±</sub>100 pmol/kg/d** (HIV/AZT)

**182<sub>±</sub>29** (HIV alone)

**110<sub>±</sub>79 with Tx vit C & vit E**

J Clin Invest 1998; 102(1): 4-9.

# Glutamine Increases BCM

Vitamin C 500 mg

Vitamin E 400 iu

Selenium 200 mcg

L-Glutamine 40 gms

N-Acetylcysteine 2 grams

Beta Carotene 25,000 iu

Shabert/Wilmore Nutrition 1999 15:860-64. \* $p < 0.001$

JM Kinney International Award Nutrition 2001 17:206-210.

# Glutamine Increases BCM

	Placebo	Gln/Antiox
Weight	71.7 <sub>±</sub> 11.2	68.3 <sub>±</sub> 8.3
gain	71.9 <sub>±</sub> 11.2	70.6 <sub>±</sub> 4.6
BCM	28.4 <sub>±</sub> 6.0	26.9 <sub>±</sub> 4.4
gain	28.8 <sub>±</sub> 6.1	28.6 <sub>±</sub> 4.6*
avg. gain		1.8 kg

Shabert/Wilmore Nutrition 1999 15:860-64. \*p<0.001

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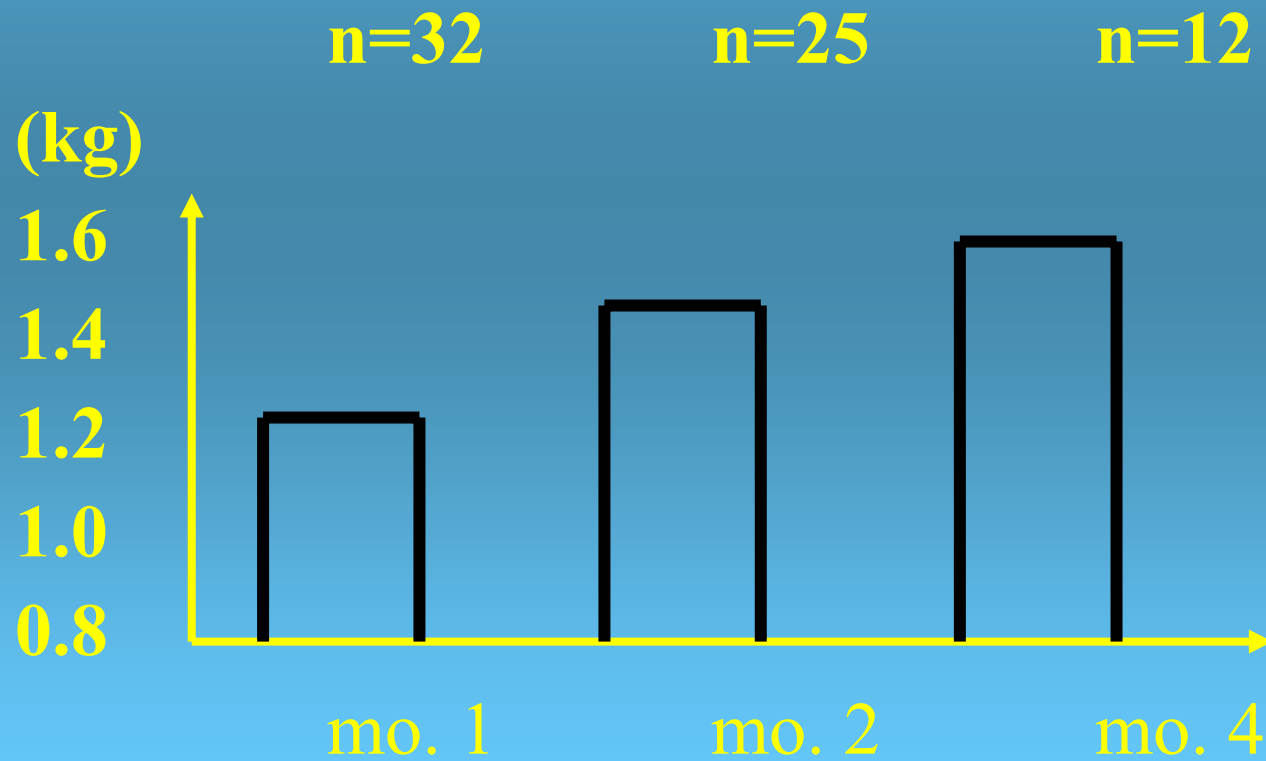


# Changes in Body Cell Mass

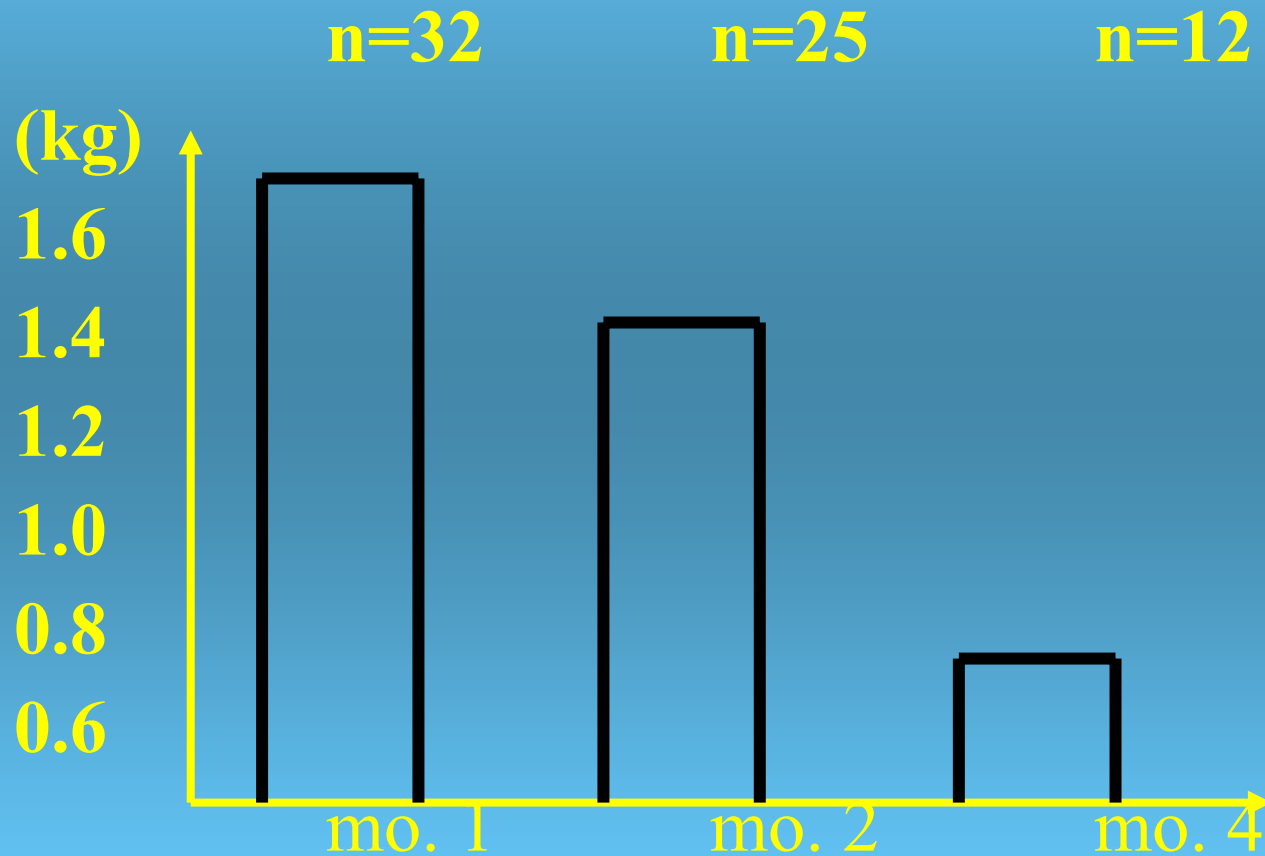
**Oxandrolone**      20 mg per day

A Fisher, M Abbaticola, Cannes, France 1997  
2<sup>nd</sup> International Conference on Nutrition-HIV  
Infection

# Mean change BCM

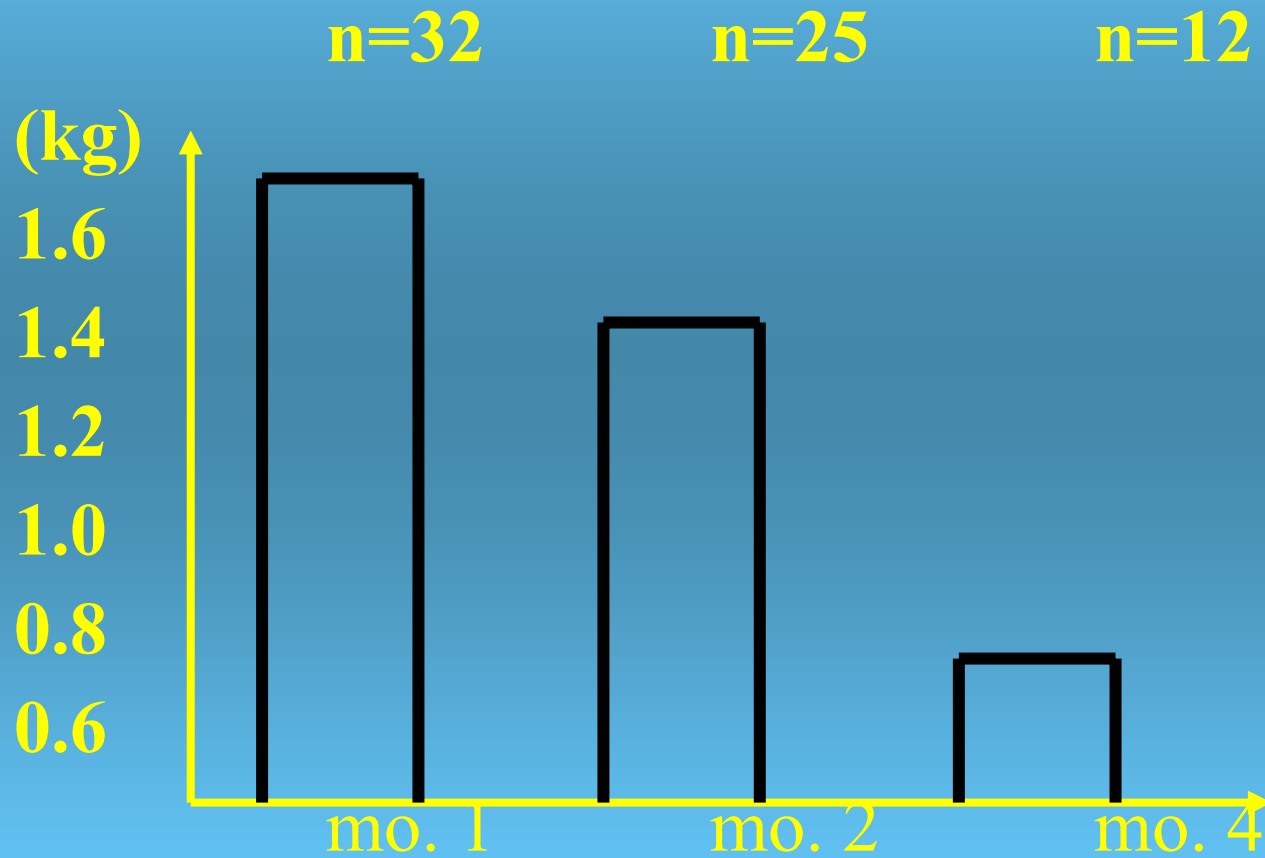


# Kilogram change BCM



Fisher/Abbatocola, 1997

# L-glutamine 20 grams/d for 1 mo.



Fisher/Abbaticola, 1997

# Lipodystrophy Syndrome

**Modest elev. Cholesterol**

**Very high TG's**

**Low HDL**

**Dry itchy skin**

**Abdominal fat - paunch**

**Thinning arms/legs**

**Breast swelling**

**Buffalo hump**

# Effects Of IFN- $\alpha$ On Metabolism

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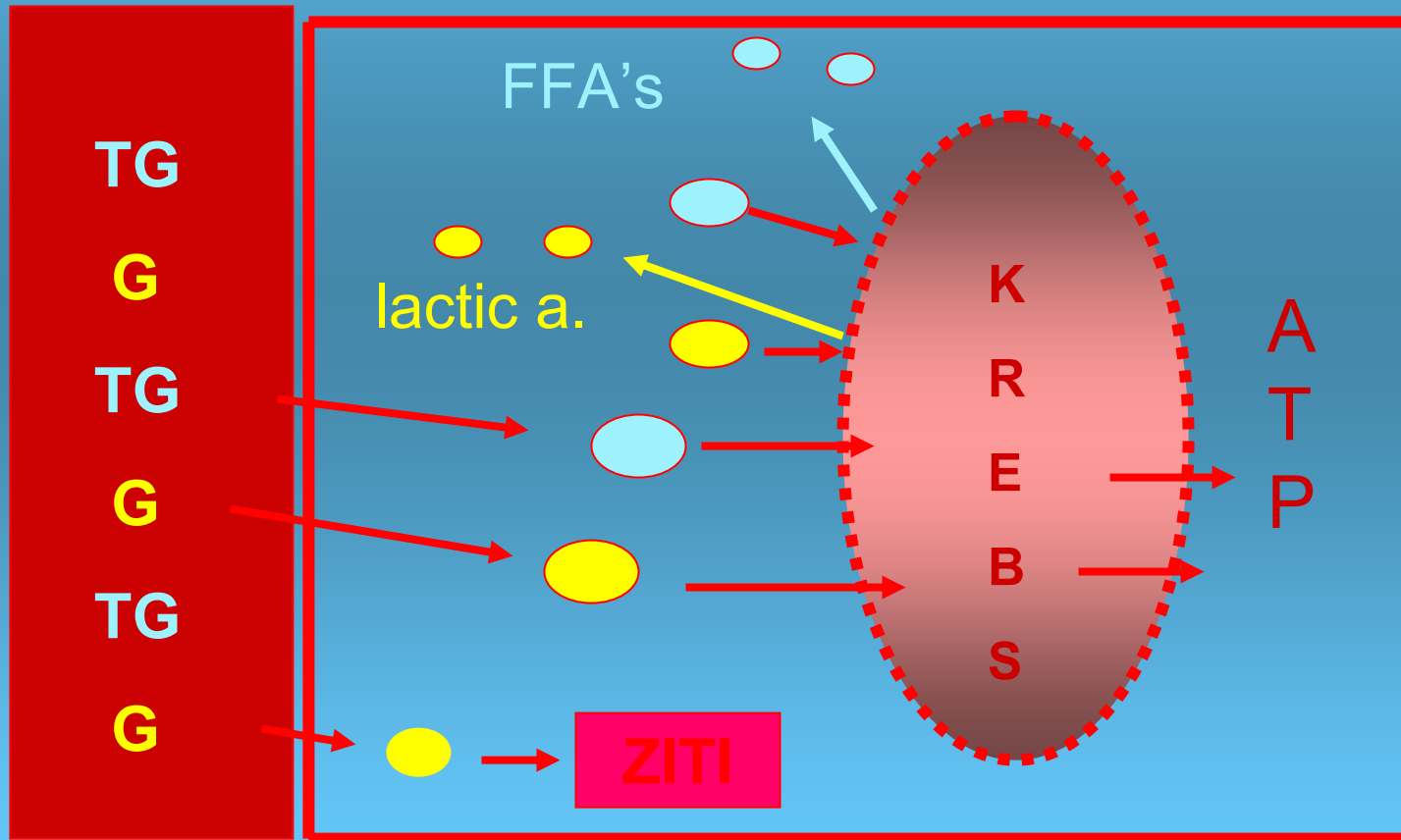
# Cellular Dysmetabolism: The Dark Side of HIV-1 Infection

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Famularo, Moretti, Marcellini, Alesse, DeSimone.

J Clin Lab Immunol 1996;48:123-32.

# Making Energy: ATP





# Insulin Resistance .....

plasma  $\uparrow$  FFA's impairs insulin signal.

muscle  $\uparrow$  FFA's impairs insulin signal (Glucosamine path)

$\text{TNF}_\alpha$  reduces Insulin receptor phosphorylation

# Fasting Hyperinsulinemia in HIV+ Men: relationship to body composition, gonadal function and PI use

Hadigan, Corcoran ....Grinspoon

J Clin Endocrinol Metab 2000 85(1):35-41

# Carnitine Intervention

3 g a day L-carnitine to Rx elev. TG's

16 ppl 7.2 yrs Rx CD4 218<sub>±</sub>210

Day 1	5.67 <sub>±</sub> 1.78	(nml 0.5-2.0)
1 mo	3.43 <sub>±</sub> 1.27	(39%)
2 mo	4.08 <sub>±</sub> 1.93	(28%)
last	3.70 <sub>±</sub> 2.50	(35%)

Loignon/Toma AIDS 2001 15(9):1194-5

# Essential Fatty Acid Deficiency

**Plasma Lipids changes:**

- + free fatty acids**
- ++ triglyceride**
- + total cholesterol**
- + phospholipids**
- extrahepatic LPL**

**(J Lipid Res 1990 31(11):2009.)**

# Caveman Fats & Hormones

**N-6**

**LA- corn oil**

**GLA-primrose**

**AA arachidonic**

**(COX/Vioxx)**

**Prostaglandins/PGE<sub>2</sub>**

**D-6\***

**D-5**

**D-4**

**N-3**

**ALA -flax walnuts**

**--**

**EPA**

**DHA fish oils**

**\*Delta 6 Delta 5 Delta 4 desaturase enzyme**

# Omega 6 Fatty Acids

## Gamma Linolenic

- **Evening Primrose Oil**
- **(Borage Oil)**
- **(Black Currant Oil)**

**Raise HDL's**

**Rx Dry Skin**

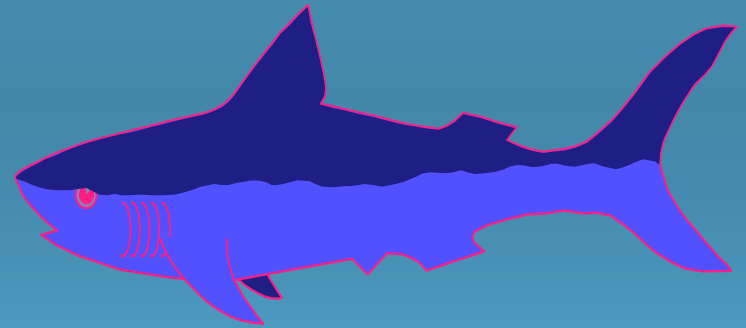
**2 grams/day**



# Omega 3 Fatty Acids

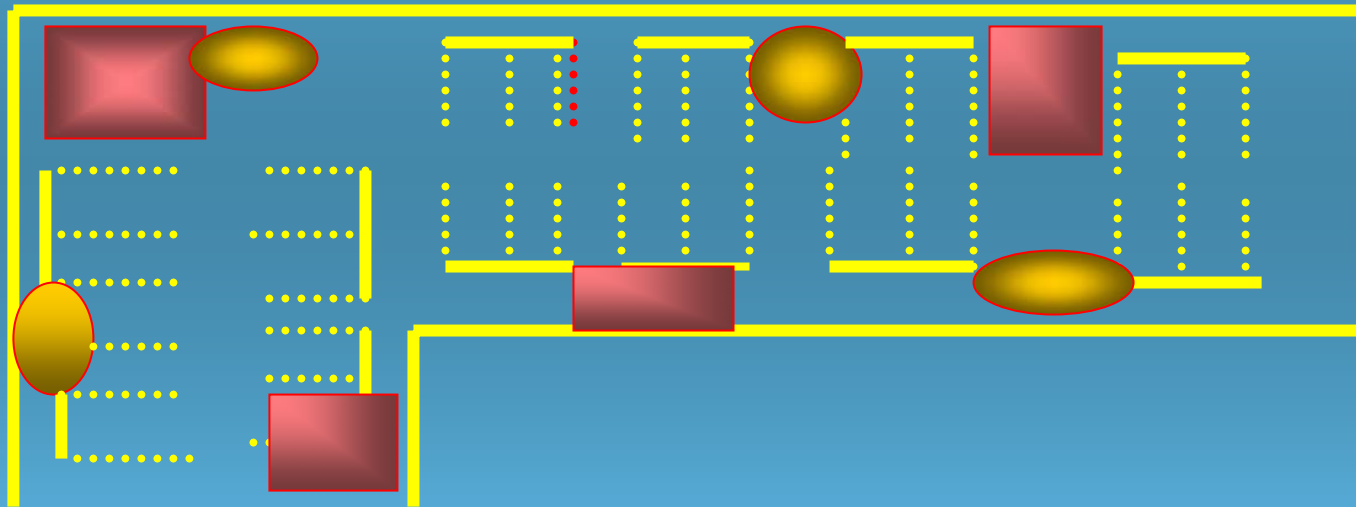
- **Fish Oils**
- **10% Flax Seeds**
- **Wheat Germ**
- **Walnuts**
- **Purslane**
- **(Borage Oil)**

**Rx 2-3 gms/d**



# You are what you eat

## Lipid Bi-layer and dietary fats



Aging: *N* 6 fats & cholesterol change cells



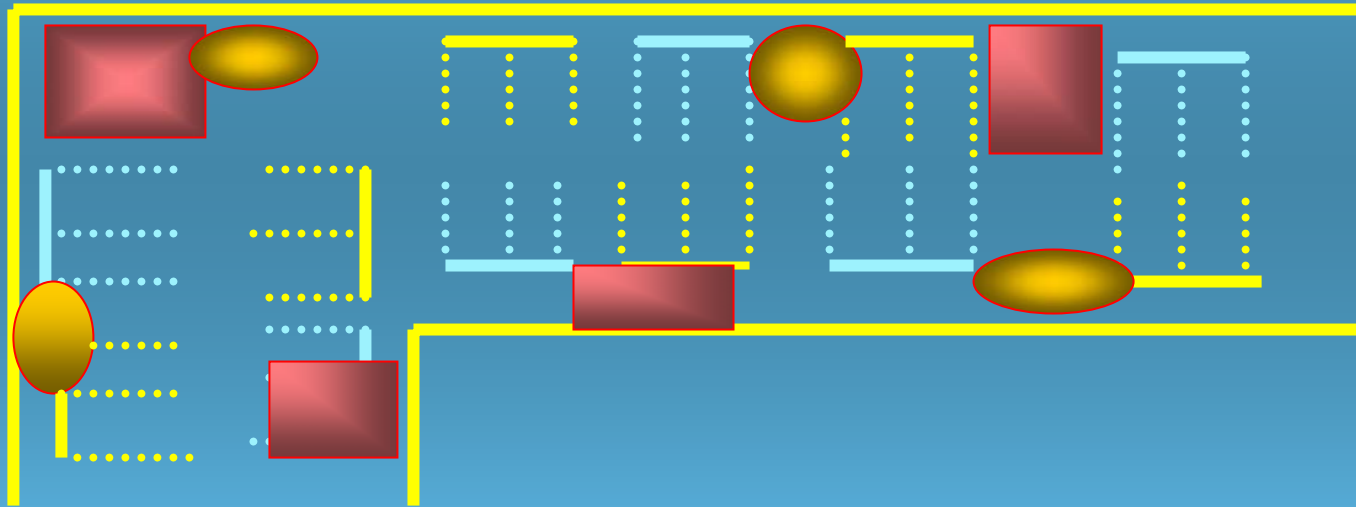
# Fatty acids, triglycerides and syndromes of insulin resistance

“strong relationships between the fatty acid composition of structural membrane lipids and insulin action.... Good insulin action is associated with increased proportion of *n*-3 fatty acids”

Prostaglandins Leucotrienes and Ess Fatty Acids 1997; 57:379-85

# You are what you eat

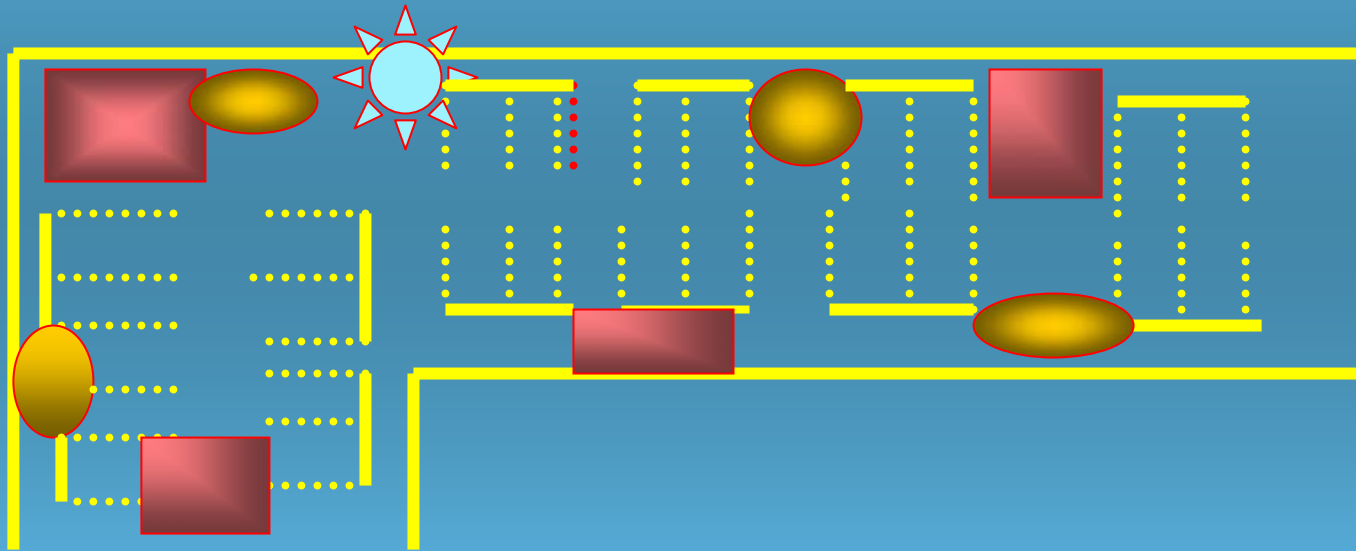
## Lipid Bi-layer and dietary fats



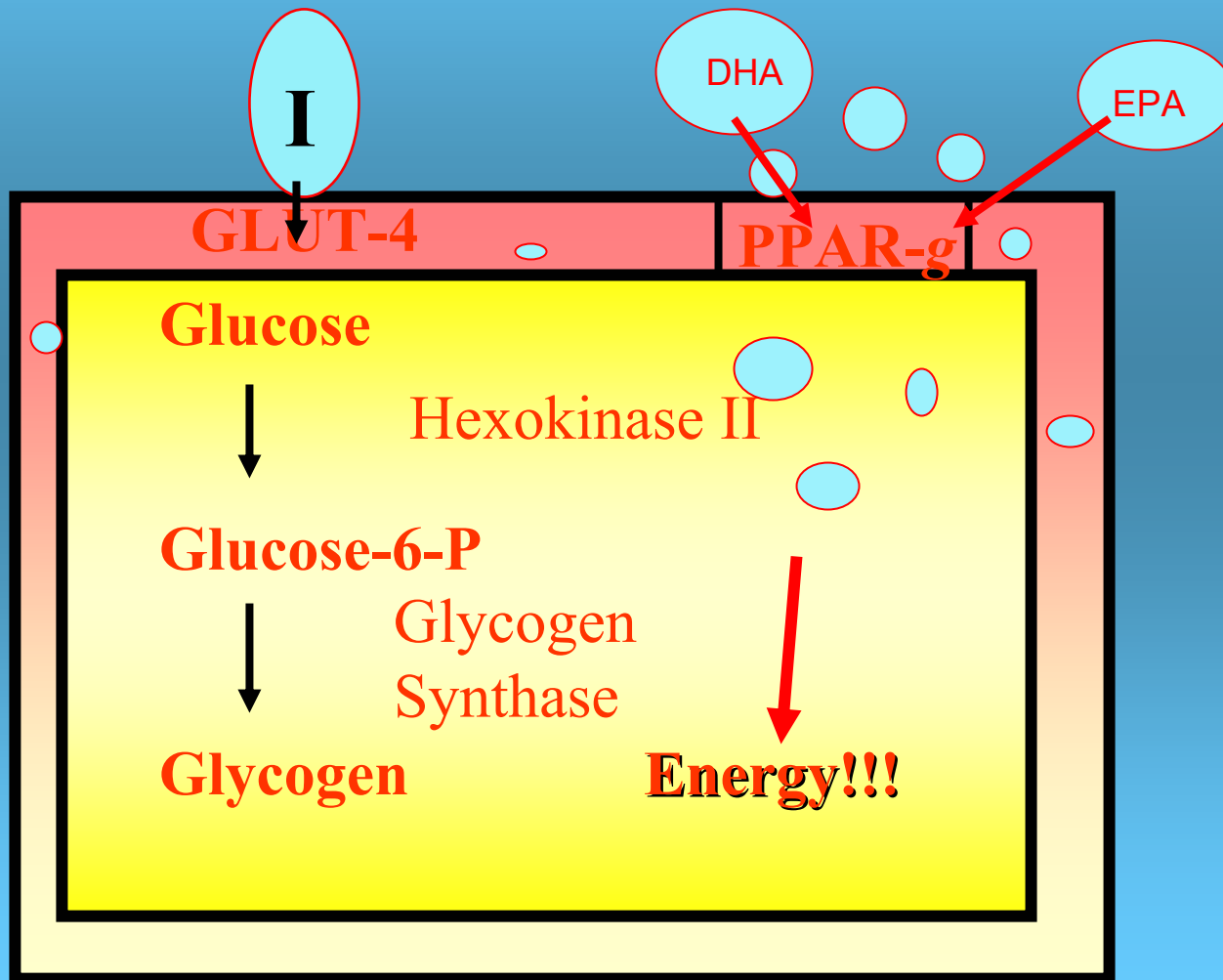
Rehabilitation: *N* 3 fats restore ideal function

[www.omegabrite.com](http://www.omegabrite.com) Andrew Stoll

insulin TNFa T-gel AZT  
Avandia, corn oil, fish oil



# EPA/DHA Action on Cells

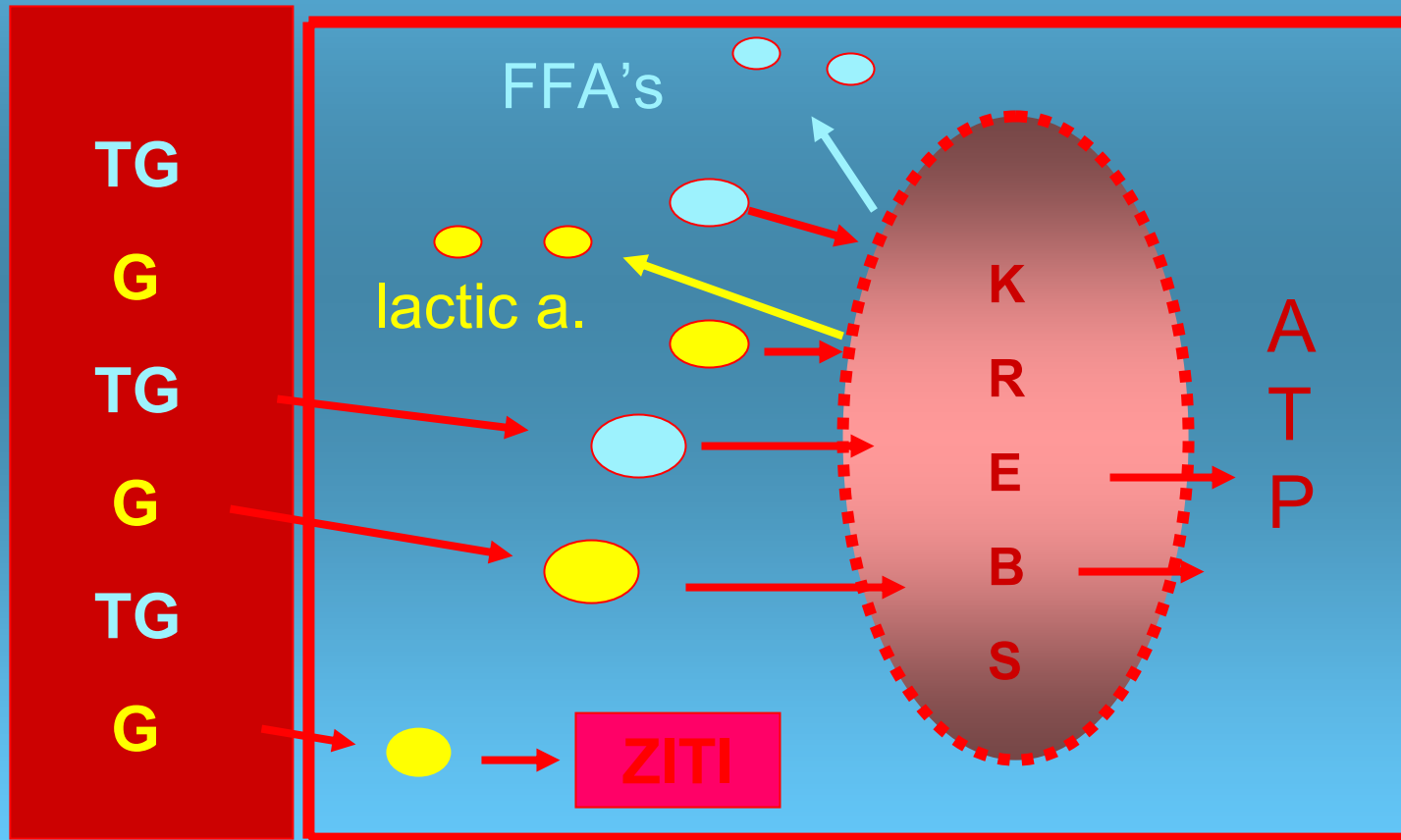


# Caveman Fats & Hormones

<i>N-6</i>		<i>N-3</i>
LA- corn oil	D-6*	ALA flax walnuts
GLA-primrose	D-5	--
AA arachidonic	D-4	EPA
(COX/Vioxx)		DHA fish oils
Prostaglandins/PGE <sub>2</sub>		

\*Delta 6 Delta 5 Delta 4 desaturase enzyme

# Making Energy: ATP



# Essential Fatty Acid Deficiency

**Plasma Lipids changes:**

- + free fatty acids**
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- extrahepatic LPL**

**(J Lipid Res 1990 31(11):2009.)**

# Omega 6 Fatty Acids

## Gamma Linolenic Acid

- **Evening Primrose Oil**
- **480 mg GLA (3gm)**

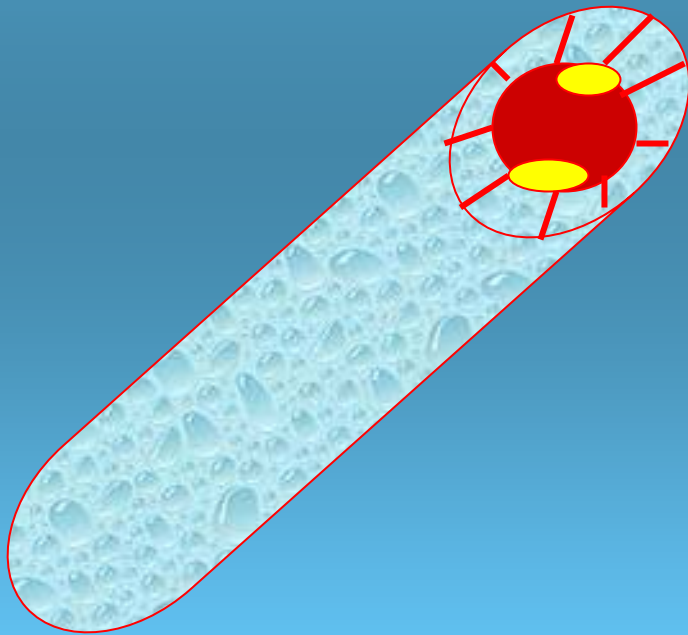
## DM Neuropathy

DM Care 1993 16(1):8-15





# HAART & Blood Vessels



**C-reactive protein**

**Homocysteine**

**Oxidants**

**PI's**

**Nucleosides**

**Nitric Oxide**

# Where Nutrients Impact Disease: practical

- Food: help, not hassle the body
- Nutrients: support immune cells
- Supplements: fix metabolism

# Should I Take Vitamins ?

<b>Vitamin C 500mg</b>	<b>1/day</b>
<b>Vitamin E 400iu</b>	<b>1/day</b>
<b>B-complex 25+</b>	<b>1/day</b>
<b>Fish Oils 1000mg</b>	<b>2+/day</b>
<b>Magnesium 300 mg</b>	<b>1/day</b>
<b>Selenium 200 mg</b>	<b>1/day</b>

# Should I take vitamins ?

[www.Boston Buyers Club.com](http://www.BostonBuyersClub.com)

[www.HoustonBuyersClub.com](http://www.HoustonBuyersClub.com)

**Perfect Blend, 2/day**

**from Supernutrition company**

**(fish oil 1 gm/day)**

# What Color Is Your Diet ?

David Heber MD PhD



# Should I Take Vitamins ?

Enhanced Plan  
(Glutathione support  
)

N-Acetylcysteine      2+ gms/day

L-glutamine            5-10 gms/day

**CambridgeNutra.com :**  
**Immune Deficiency Formula**

# **Rx Elevated SGOT/SGPT**

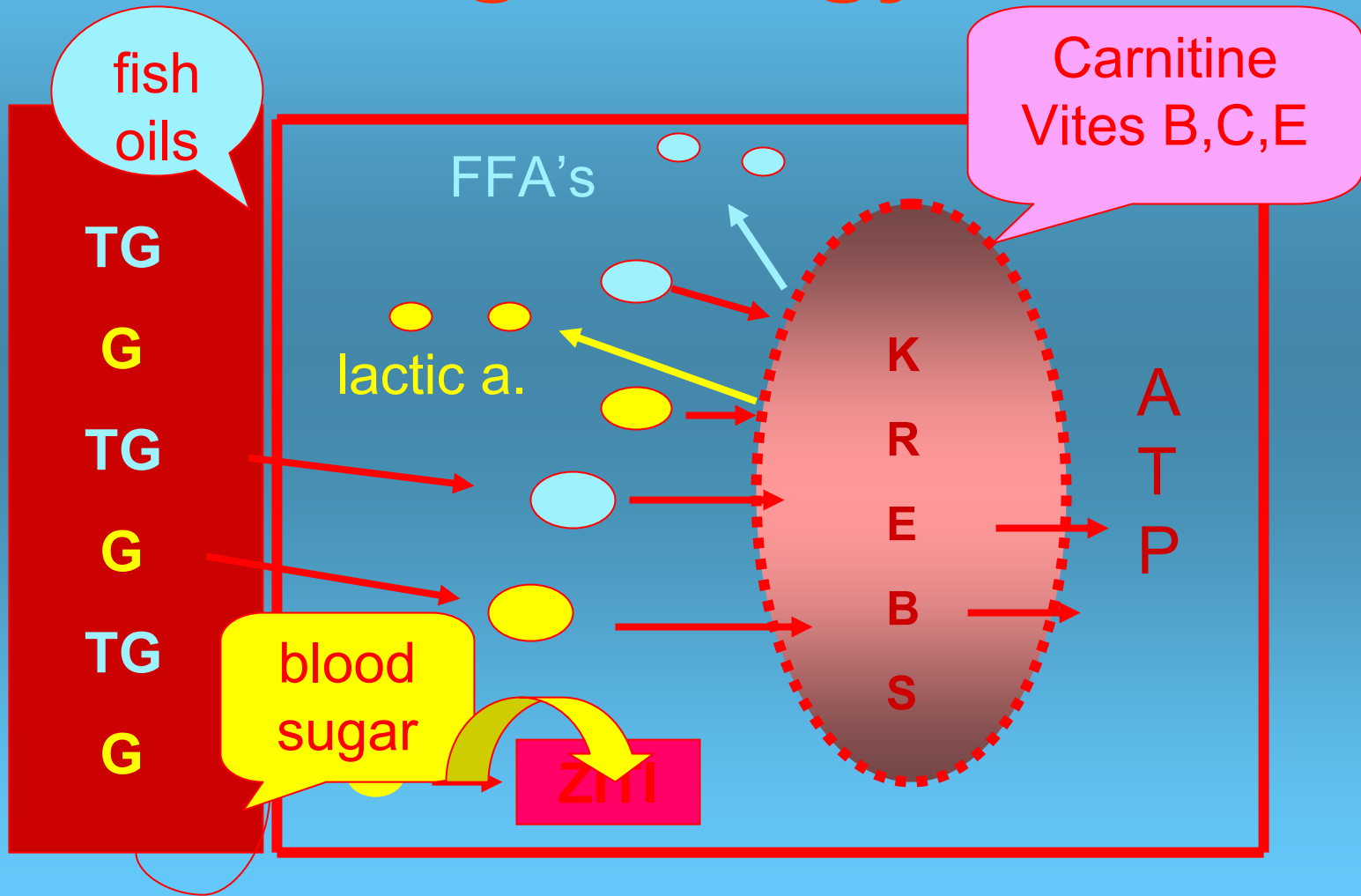
**L-glutamine                      5-10 gm/day**

**&**

**Nutrivir    80 grams / day**

**[www.bionxs.com](http://www.bionxs.com)**

# Making Energy: ATP





**Thanks for your attention**

**Charlie Smigelski, RD**

**[www.eatupbooks.com](http://www.eatupbooks.com)**