

K,
it's just not
for clotting
any more



A Precise, Concise, & Condensed
Chemical Engineering Controls Engineer's 50,000' view
of
The Key Roles of
K-1 and MK-7 and MK-4 et.al
Regarding
Dental Health

Confucius



He who learns but does not think, is lost! He who thinks but does not learn is in great danger... Men of superior mind busy themselves first getting at the root of things; when they succeed, the right course is open to them.

AZ QUOTES

The only source of knowledge is experience.

— Albert Einstein

Double Quotes
doublequotes.net

“Everything should be made as simple as possible, but not simpler.”

Albert Einstein



The walking/talking lab rat

General CV of Patrick J. Theut

Education:

BS

Majors: Mathematics, Biology, Chemistry, Environmental Chemistry

Minors: Business, Pulp & Paper Engineering, Communication Arts

MS

Biochemical Engineering sub-specialty Pulp and Paper sub-sub-specialty instrumentation and control systems levels 1, 2, 3.

Master Six Sigma Black Belt (Statistics)

MBA

PhD: Leadership

Work Experience:

48 years in various leadership roles (Production Manager, Mill Manager, General Superintendent, E&I Superintendent, Technical Manager, Corporate Trouble Shooter, Corp Construction, Personal Consulting. Retired 4/1/22.

Co-Principle (9 yrs): Koncentrated K. (k-vitamins.com)

Patients: 3

PE?: No, declined to apply even thou was qualified in instrumentation and control systems

Taught Three years Junior College

Pulp and Paper

Industrial Safety

Applicable Area Expertise aka Subject Matter expert:

A. Anaerobic Digestion of Acid Lignins and 5 Carbon Sugars

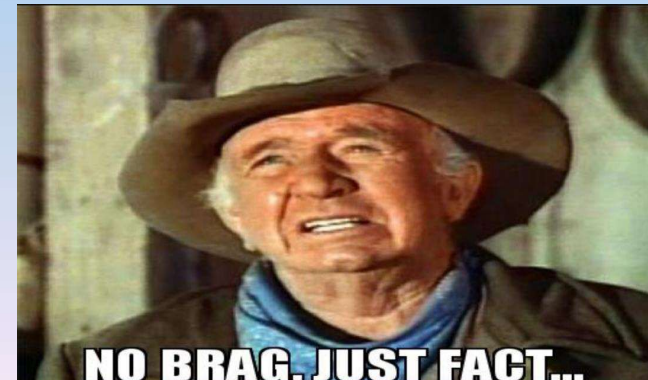
B. Aerobic Digestion of Organics

C. RCFA/APS/DMAIC

**This 45 minute presentation represents the body
of work from Nov 2002 to date of:**

**❖ 16,000 + hours of peer reviewed literature analysis
Primarily focused on Cardiology & Other Parallel Health Related Issues**

**❖ References found at K-Vitamins.com
(the clearing house of all peer reviewed literature on K on the Web)
(no “hype” here)**



Executive Summary:

- a) Along with C, D, A, & Magnesium reverses the impact of BRONJ
- b) Speeds healing via optimizing clotting factors
- c) Speeds healing via vessel wall reconstruction
- d) Speeds healing of tooth implants
- e) Speeds healing of broken jaws
- f) Optimizes tooth repair
- g) Kills bad acting oral bacteria
- h) ROS scavenger in the Hypothalamus

You are NOT what you eat

You ARE what you digest

Thus

When Taking Vitamins You are Also Feeding Your Gut Bacteria

Thus

You ARE what you absorb (what's left over)

Thus

You ARE what you process

YOU ARE A SYSTEM

“K” has two roles:

First being a Pre-“K”ursor

&

Second being an Organic “K”atalyst



“K” Comes in Two Flavors:

Vitamin K-1 aka Phylloquinone

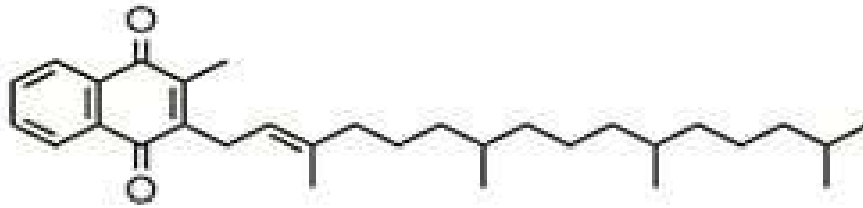
&

**Vitamin MK-x aka Menaquinone
(x = 4 to 13 isoprene units)**

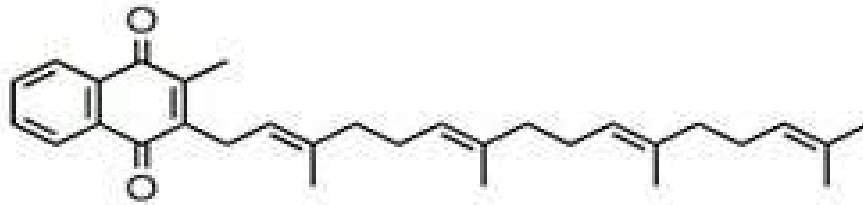


Vitamin “K” Chemical Structure

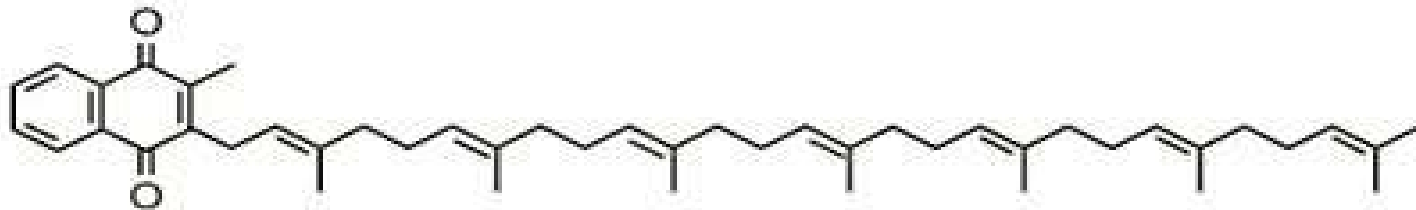
K1



MK-4



MK-7





“K” has is found in the following ways:

K-1 = Broccoli, Kale, Collard, et. al

&

**MK’s = Fermented Products like Sauerkraut, Kimchee,
Natto, Animal Fats, Cheese, Animal Organs,**

&

**Your Gut
(requires pre-cursors)**



Top K-1 & K-2 Containing Foods - - - 100 grams aka a “quarter-pounder”

K-1 Foods in mcg

dried basil -1714.5
dried sage - 1714.5
dried thyme - 1714.5
fresh parsley - 1640
dried coriander leaf - 1359.5
raw swiss chard - 830
raw dandelion greens - 778.4
cooked collard greens - 623.2
dried marjoram - 621.7
dried oregano - 621.7
cooked mustard greens - 592.7
raw cress - 541.9
cooked spinach - 540.7
cooked turnip greens - 518.9
cooked beet greens - 484
cooked kale - 418.5

K-2 Foods in mcg

natto - 939
soft cheese - 506
blue cheese - 440
goose liver - 369
hard cheese - 282
beef liver -106
pepperoni - 41.7 (sausage - tbd)
full-fat milk - 38.1
chicken meat -35.7
bacon - 35
turkey frankfurter - 31.2

Big Assumption(s) - - - - the “K” is Liberated Completely & Your Grocery Store Carries the “Stuff”

Bioavailability is roughly 10 to 20%

**Vitamin K Follows Triage Theory
(McCann & Ames)**



**Nature ensures that at suboptimal supply, vitamins and minerals
are
primarily used for functions required for short-term survival.**

The best example is the RDA for K-1

ONLY

reflects clotting requirements.

**Also of note if one does not have enough K-1
but**

MK-7 is present or other MK's, the respective MK is substituted.

In the mean time, alternative pathways take over at the cellular level in other parts of the body

**Vitamin K Follows Triage Theory Cont.
(McCann & Ames)**

McCann and Ames Concluded:

**long-term micronutrient insufficiencies are a risk factor for the development of
a wide variety of age-related diseases,**

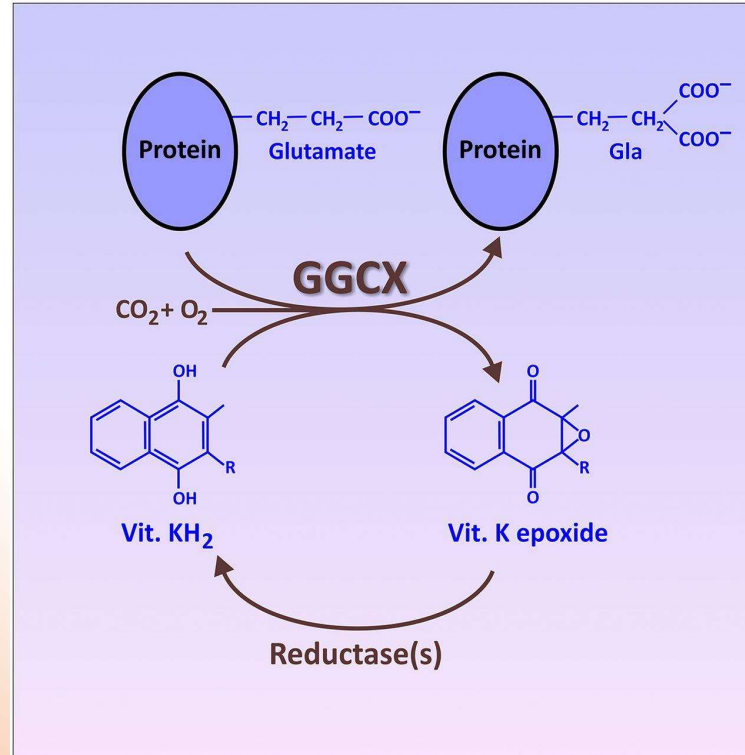
**such as osteoporosis, cardiovascular disease (CVD), and cancer
which
are the result in part due to the incomplete or non-carboxylation**

of extra-hepatic Gla proteins aka Matrix Gla Proteins (MGP)

**Am J Clin Nutr. 2009 Oct;90(4):889-907. doi: 10.3945/ajcn.2009.27930. Epub 2009 Aug 19.
Vitamin K, an example of triage theory: is micronutrient inadequacy linked to diseases of aging?
McCann JC1, Ames BN.**

Vitamin K Follows Triage Theory Cont. (McCann & Ames)

17 K dependent proteins that are known that require carboxylation
(You cannot ever be fully Carboxylated)



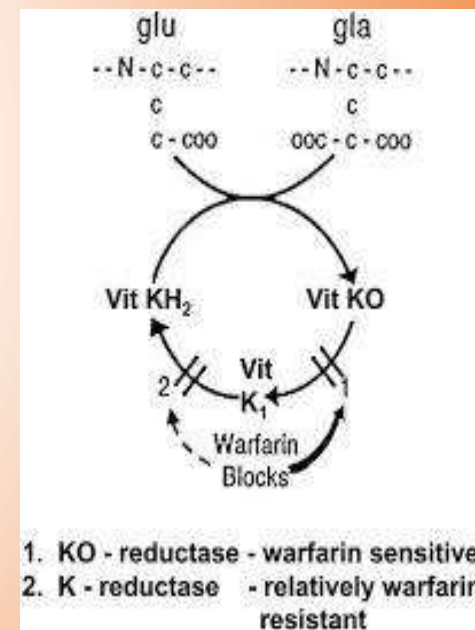
Vitamin K & Storage

K is not stored in any appreciable amount in any form as it appears to be too valuable all the time

The significance is that:

**The liver recycles “K”
&
has two pathways to do it
(one could term it proactive sparing)
&**

**Warfarin Interrupts the Process
(not a good thing in the long term)**



Vitamin K

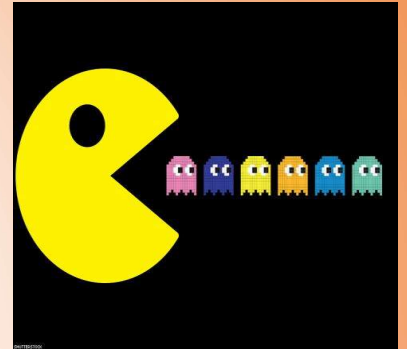
The half-life of K-1 one to two hours

&

MK-7 lasts two to three days.

&

**MK-4 lasts a few hours to a half a day
(much debate to MK-4 “half-life”)
(Gut Bacteria Love “K”)**



SUGGESTED "K" TESTS:

PIVKA II: (proteins induced in vitamin K absence) aka DCP:
ng/ml 0.0–7.5 (ideal 0.00)

Uncarboxylated Osteocalcin: ng/ml 0.00 to 6.00
(lower is better – target less than 2.00)
(no longer available)

Prothrombin Time: seconds 9.1 - 12.0
(suggest 11.0)

NTx: urine test for bone resorption

K1: ng/ml (assuming not taking exogenous K)

Other Suggested Tests

Beta Carotene

Serum Calcium

Vitamin A

Serum Iodine

Free T3

Insulin

Red Blood Cell Phosphorous

HbA1c

Red Blood Cell Magnesium

Vitamin C

Red Blood Cell Selenium

CoQ10

Red Blood Cell Boron

Vitamin D

Vitamin K

**Suggested dose of K intake per day for tooth/jaw healing
based on literature and conversations with experts:**

1.0 mg MK-7, 50 mg MK-4, 5 mg K-1.

Half this amount of MK-7 and MK-4 daily for maintenance

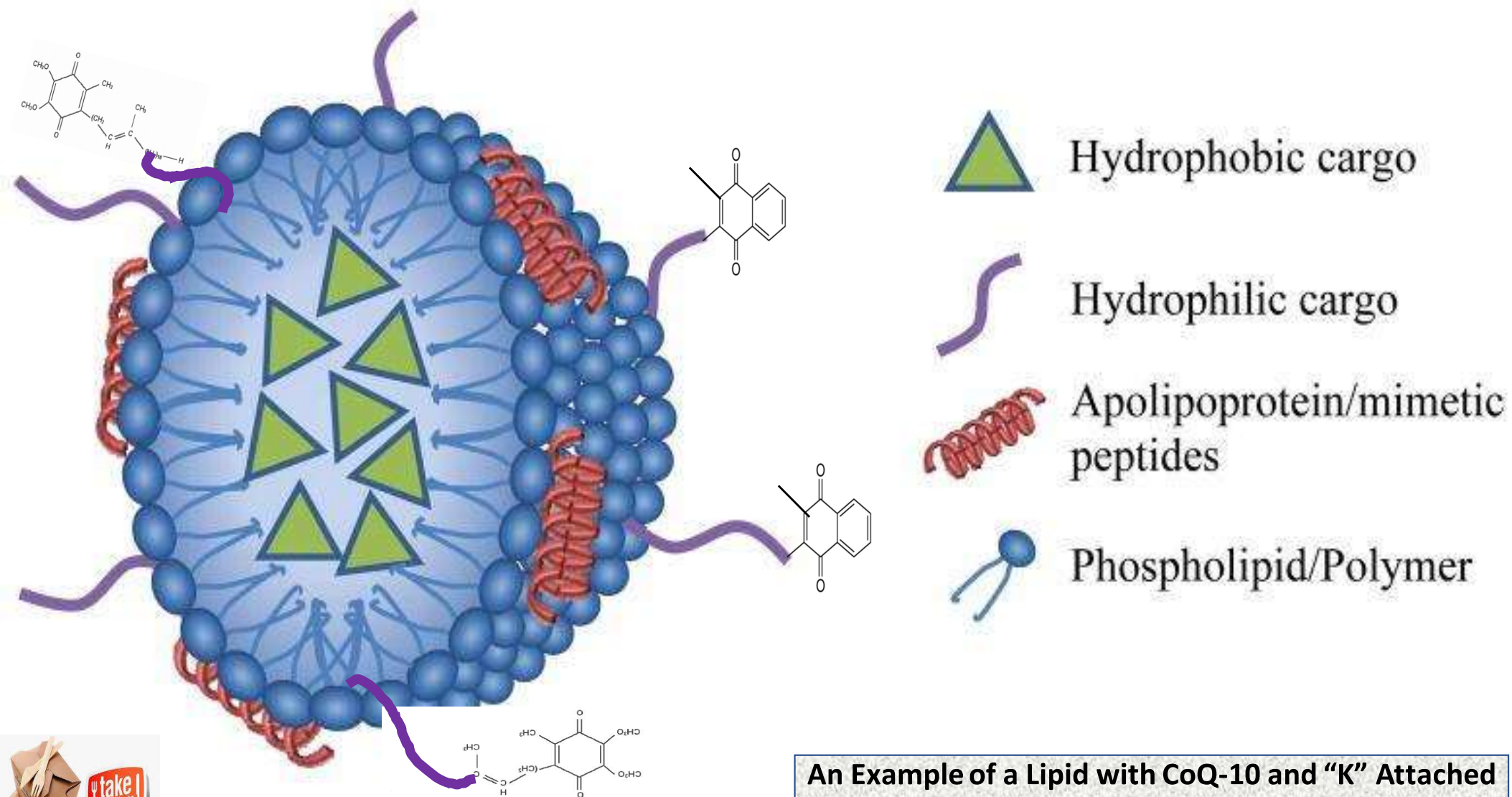
How is “K” Transported?

From the Intestine

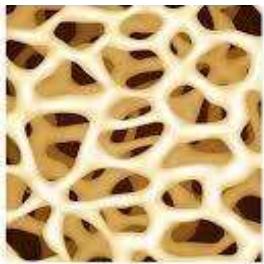
To

The Entire Body Including the Saliva?





An Example of a Lipid with CoQ-10 and "K" Attached
"Its kinda-sorta-like-a-porcupine"



Normal Bone



Bone with Osteoporosis

Impact #1 = = = Bone



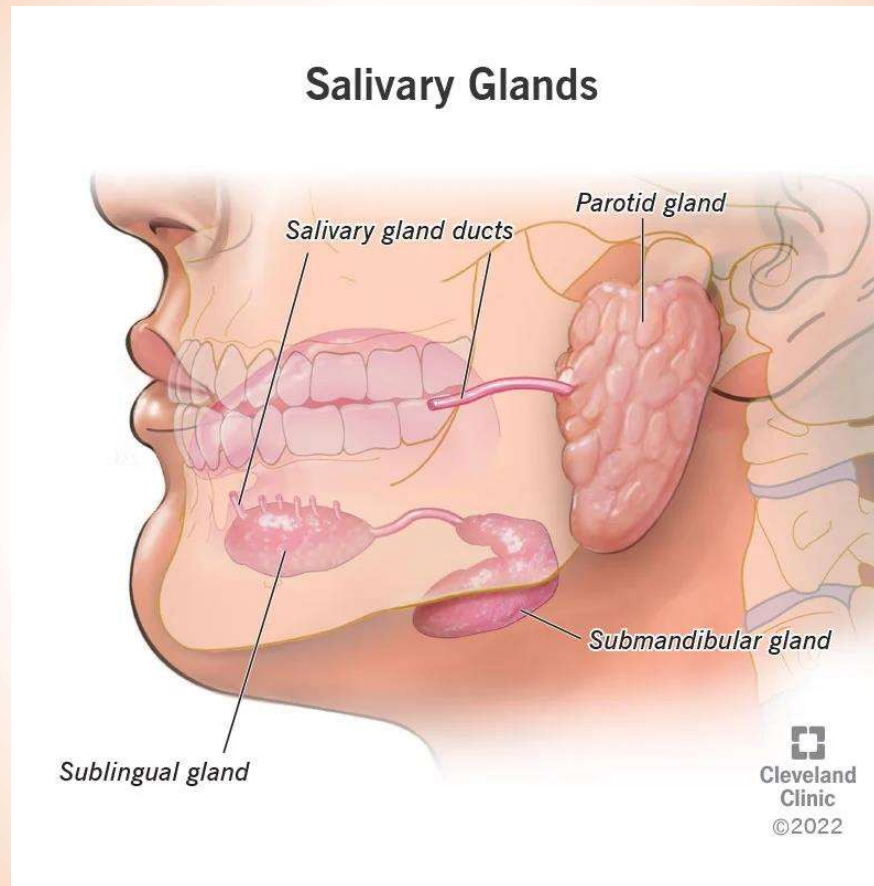
- a.) In conjunction with “D”, Mag, & K reduces healing time.
Typically by 50%**

Vitamin K and Bone Metabolism: A Review of the Latest Evidence in Preclinical Studies
[Solmaz Akbari](#)¹ and [Amir Alireza Rasouli-Ghahroudi](#) *Biomed Res Int.* 2018; Jun 27
PMID: 30050932

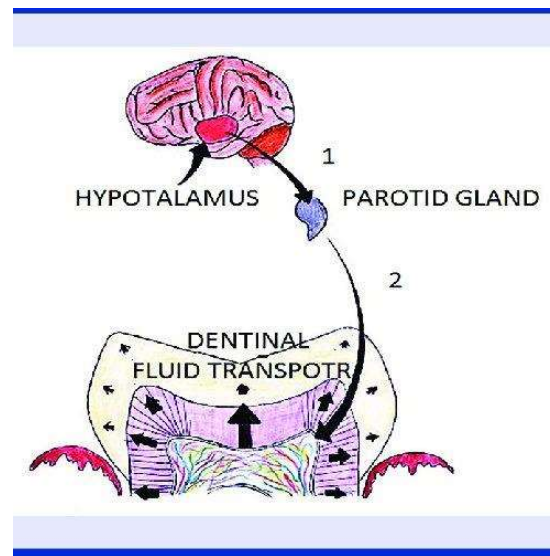
- b.) In post menopausal women slows or stops osteoporosis
(Japan)**

Vitamin K₂ Therapy for Postmenopausal Osteoporosis, [Jun Iwamoto](#)
Nutrients. 2014 May; 6(5): 1971–1980.
Published online 2014 May 16. PMID: [24841104](#)

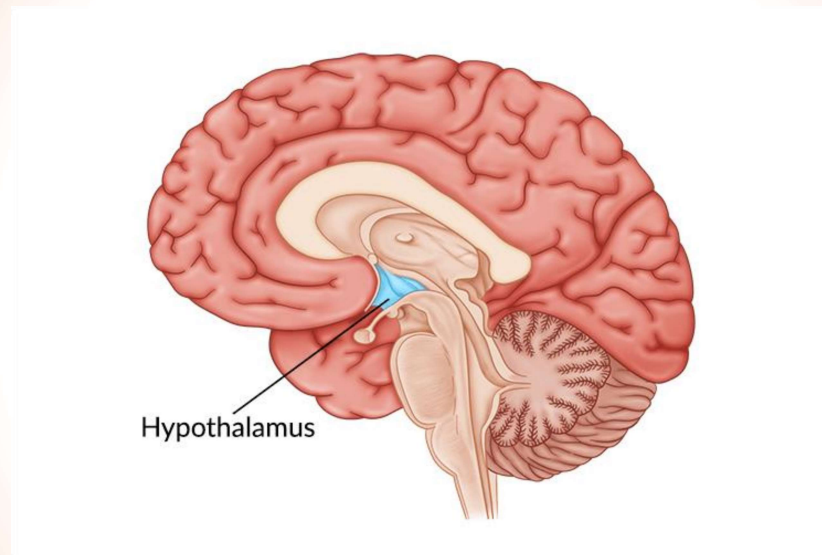
OTHER TRIVIA aka Theut's Tips



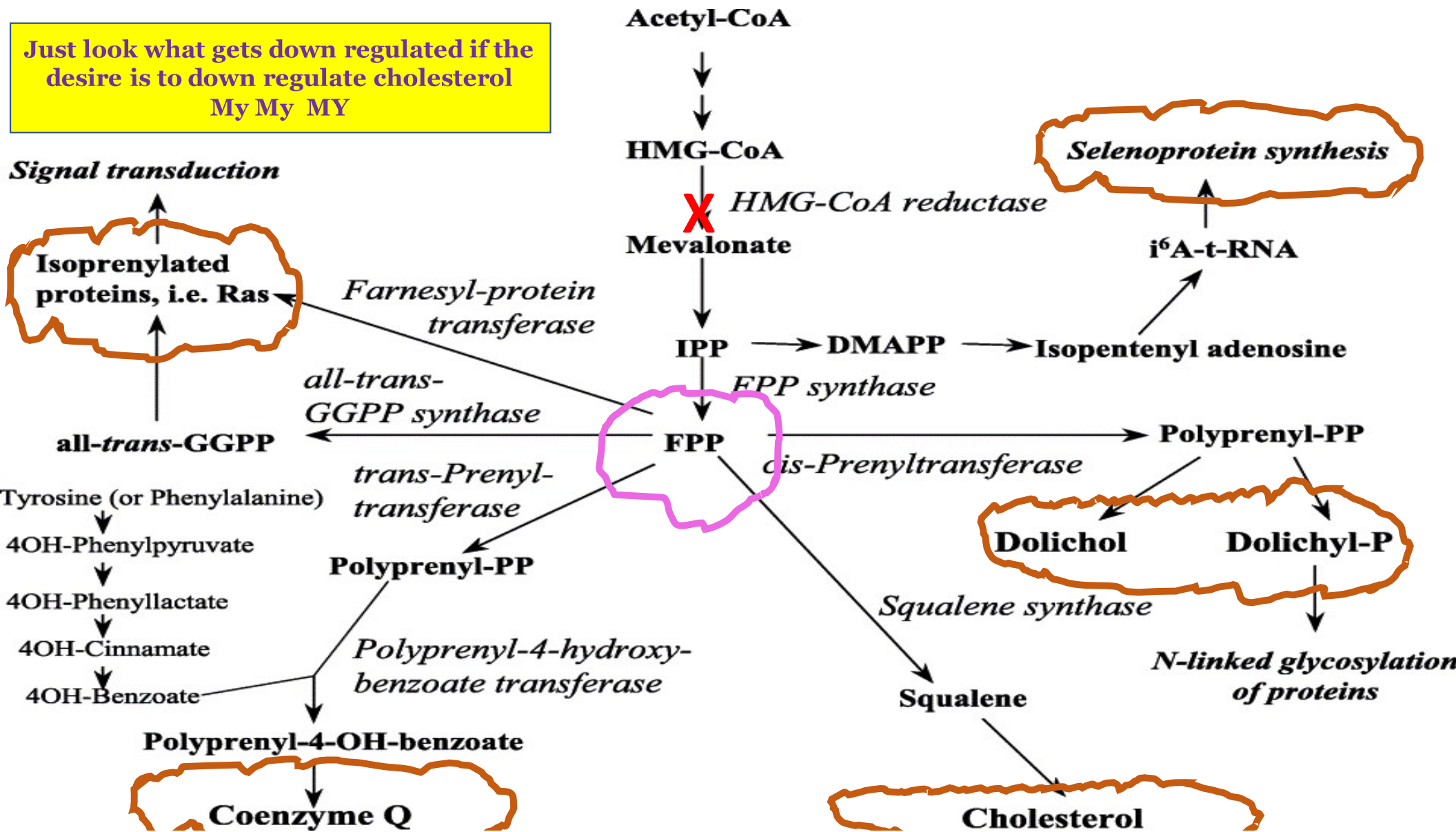
OTHER TRIVIA aka Theut's Tips



OTHER TRIVIA aka Theut's Tips



Just look what gets down regulated if the desire is to down regulate cholesterol
My My MY



**SXR target gene* expression
induced in LnCap C-81 cells by
ectopic **TERE1** or **Vitamin K-2 (30 μ M)**
Fold change relative to C81**

Cholesterol hydroxylation:

*CYP7A1	+3.5	+1.2	↑
*CYP7B1	+3.6	+2.5	↑
*CYP27A1	+2.5	+2.4	↑

Steroid catabolism:

*AKR1C1	+6.6	+3.6	↑
*SULT2A	+3.	+2.8	↑
*UGT2B17	+1.7	+1.3	↑
*UGT2B15	+10.3	+1.	↑
*CYP3A4	+4.4	-0.5	↑
HSD17B2	+1.2	+1.6	↑
PSA	-0.9	+1.7	↑

+153.	TERE1	+1.2
+11.3	SXR	-0.6

Cholesterol efflux:

*ABCA1	+1.5	+2.1	↑
*ABCB1	+4.4	+1.3	↑
*ABCG1	+2.	+1.2	↑
*SRB1	+1.5	+1.3	↑
*CD36	+1.2	+1.1	↑
APOE	+1.9	+1.9	↑
MRP2	+1.8	+2.	↑

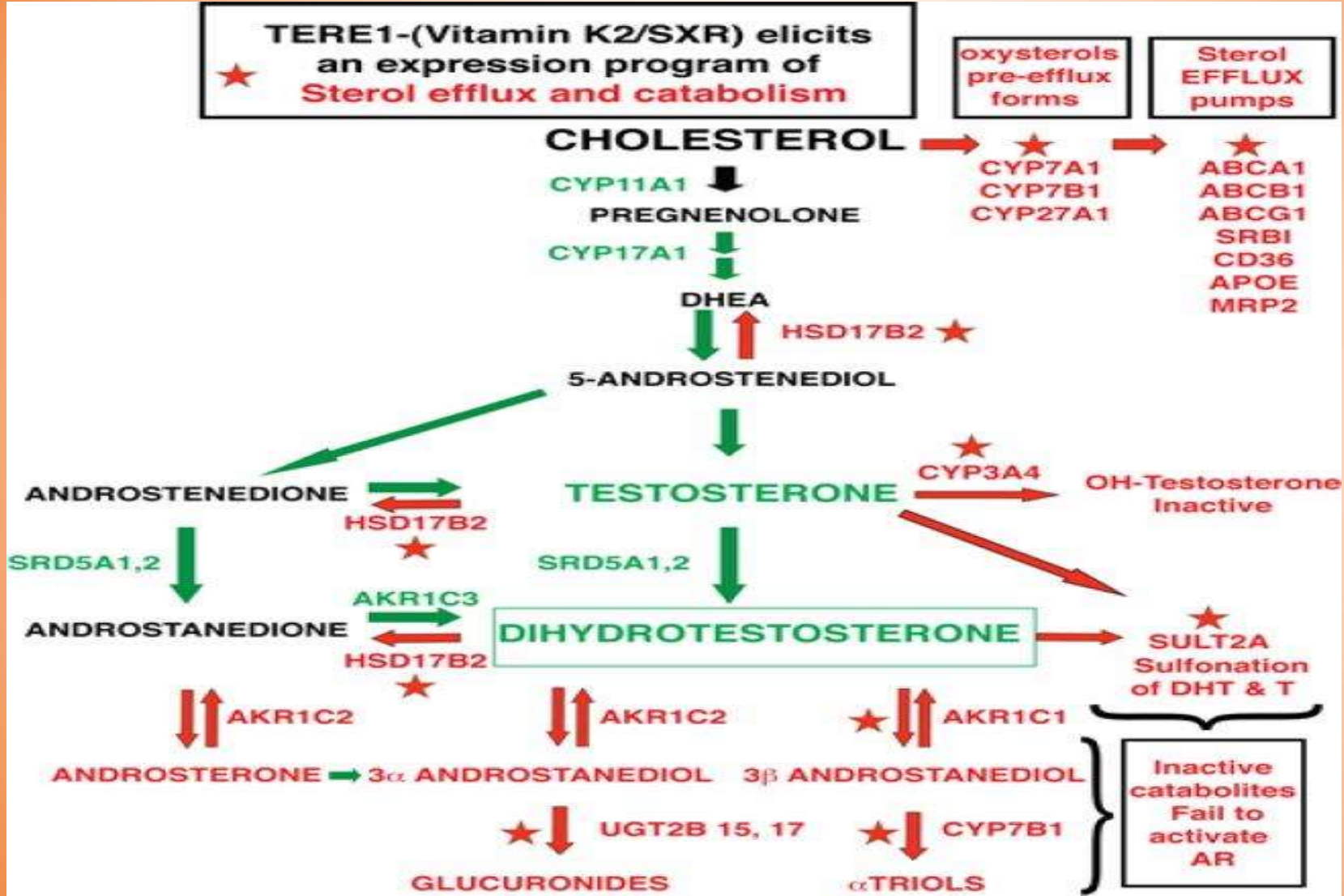
Lipid metabolism:

*HMGCS	+2.4	+2.4	↑
*CPT1A	+7.1	+579	↑
*SCD1	+4.	+1.3	↑
*FASN	+3.1	+1.	↑
*CYP24A1	+2.	+2.5	↑
SREBP1	+1.8	+1.2	↑
VDR	+28.6	+2.5	↑

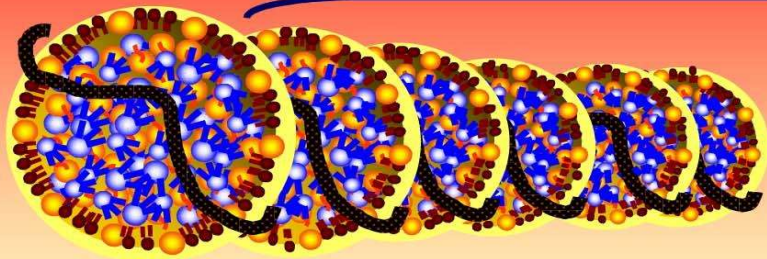
**Fold difference by Fluidigm Taqman RTPCR relative to C81 reference cells
+= induction, - = repression, TERE1-induced (Blue), K-2-induced (red)**

Figure 8: Ectopic TERE1 or Vitamin K-2 reactivate an anti-steroid suite of SXR target genes in C81 LnCaP

★ **TERE1-(Vitamin K2/SXR) elicits an expression program of Sterol efflux and catabolism**

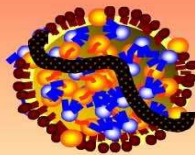


ApoB Lipoproteins

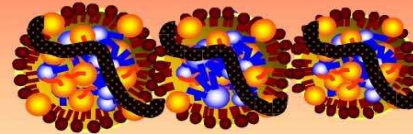


V6 V5 V4 V3 V2 V1

VLDL



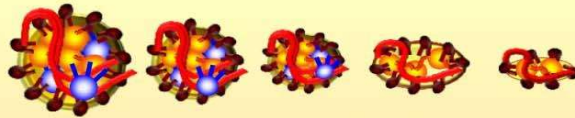
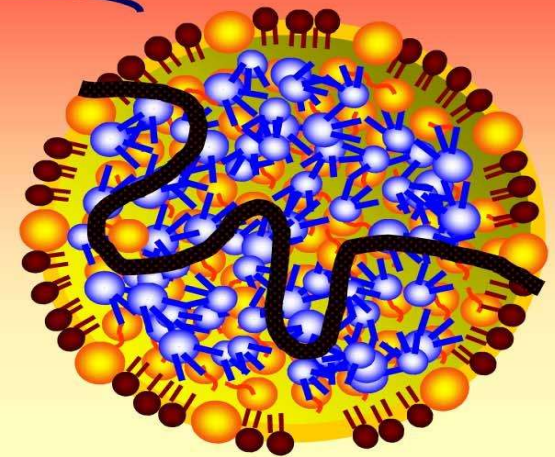
IDL



L3 L2 L1

LDL

Chylomicron



HDL₂

HDL₃

H5 H4 H3 H2 H1

ApoA-I Lipoproteins

Phospholipids 

Triglyceride 

Cholesterol 