

# NUTRITION AND CANCER: Prevention and Treatment

## 營養與癌症：預防和治療

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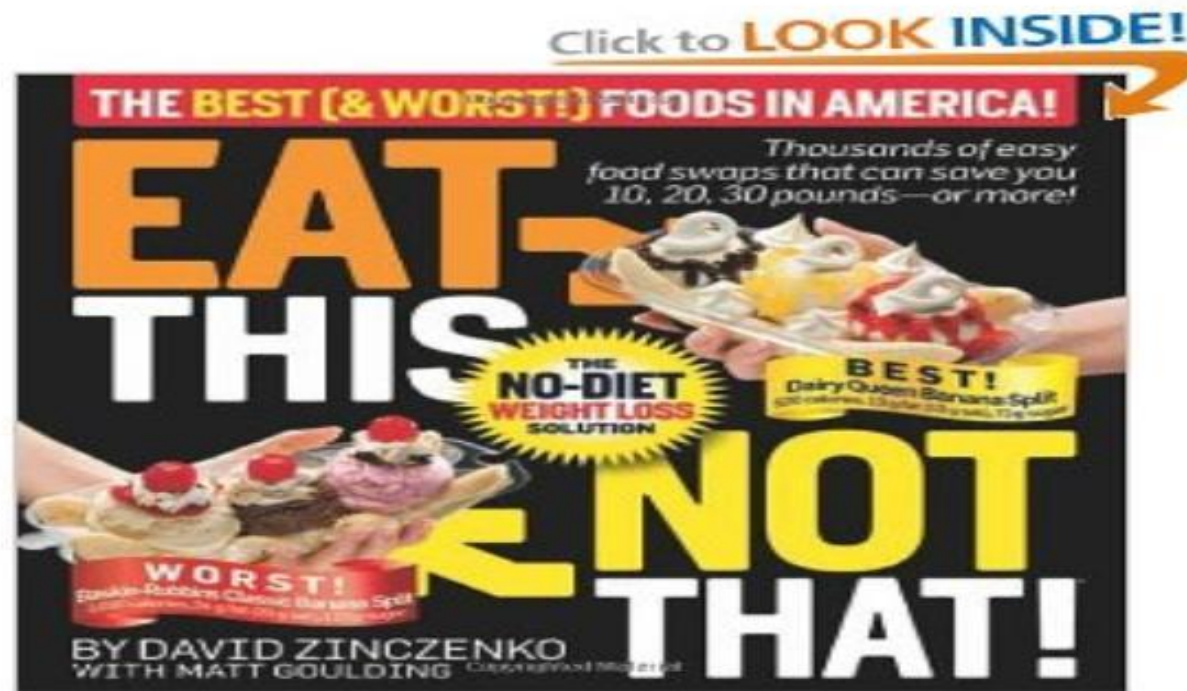
The Herald Cancer Association-Houston  
12/11/2010 角聲癌症協會



# Disclosures

- Consulting: 顧問
  - Amgen 安進公司
  - Bayer 貝爾公司
  - Genetech 公司

# CONFUSIONS? 困惑?



在美國, 最好與最壞的食品

吃這種飲食

無節食減肥的解決答案

不吃那種飲食

# WHAT THE BIBLE SAYS

# 聖經說

## Genesis 1:29

Then God said, "I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food

- 神說：看哪，我將遍地上一切結種子的菜蔬和一切樹上所結有核的果子全賜給你們作食物

## **Revelation 22:2**

On each side of the river stood the tree of life, bearing twelve crops of fruit, yielding its fruit every month. And the leaves of the tree are for the healing of the nations.

启示录**22:2** 在河这边与那边有生命树，结十二样果子，每月都结果子。树上的叶子乃为医治万民。

# WHAT IT MEANS 意味著什麼

## Seed-bearing plants: 含種子的植物

A seed plant which does not develop woody persistent tissue.

種子植物不生長木質組織。

- GRAINS - wheat, corn, rye, barley, rice, oats, millet.
- 穀物 - 小麥，玉米，黑麥，大麥，大米，燕麥，小米。
- SEEDS - sunflower, sesame, flax, pumpkin seeds
- 種子 - 向日葵，芝麻，亞麻，南瓜子。

# WHAT IT MEANS 意味著什麼

## Seed-bearing plants: 含種子的植物

- LEGUMES - soybeans, lentils, peas, peanuts, other beans
- 豆類 - 大豆，扁豆，豌豆，花生，豆類等.
- SUCCULENT FOODS 多肉植物 - eggplant, okra, bell peppers, squash, green beans, pumpkins, cucumbers, tomatoes, melons
- 多汁的植物 - 茄子，秋葵，青椒，西葫蘆，青豆，南瓜，黃瓜，蕃茄，瓜類.

# WHAT IT MEANS 意味著什麼

Tree that has fruit with seed in it: a woody perennial plant.

有種子的水果樹: 常年生木本植物.

- FRUITS - citrus fruits, palm fruits.  
水果 - 柑橘類水果, 棕櫚果.
- NUTS - almonds, pecans, cashews, brazil, walnuts.  
堅果 - 杏仁, 山核桃, 腰果, 巴西堅果, 核桃。

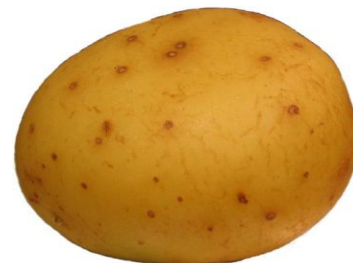
# The plants of the field

## 田野的蔬菜



### 田間的蔬菜

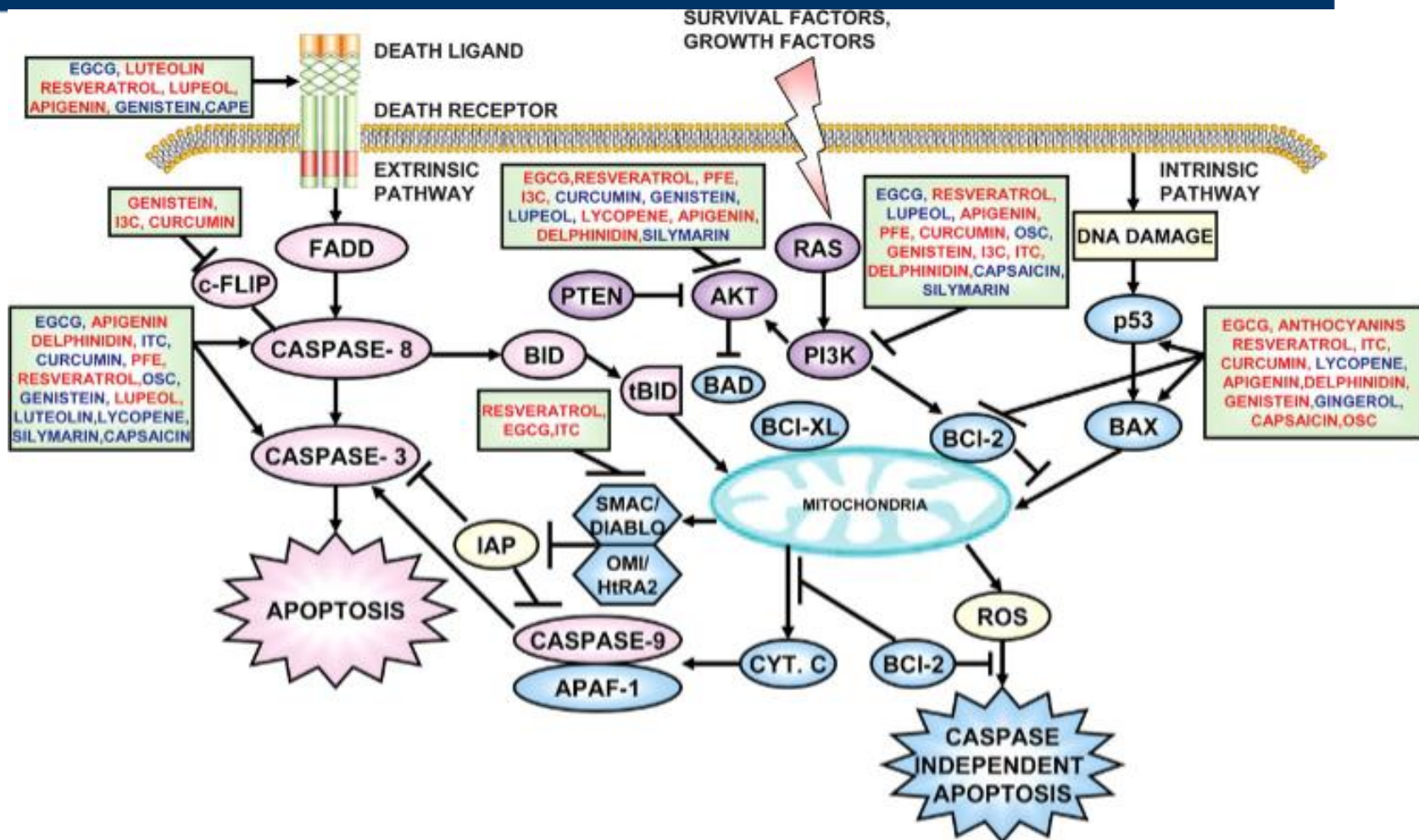
- Leaf 葉
  - beet greens, Brussels sprouts, cabbage, collard
  - 甜菜, 球芽甘藍, 捲心菜, 芥蘭菜.
- Flower 花
  - Artichoke, broccoli, cauliflower.
  - 朝鮮薊, 綠色花椰菜, 白色花椰菜.
- Root 根
  - carrots, beets, potatoes, turnips
  - 胡蘿蔔, 甜菜, 土豆, 蘿蔔





# Why is Nutrition so important for cancer patients?

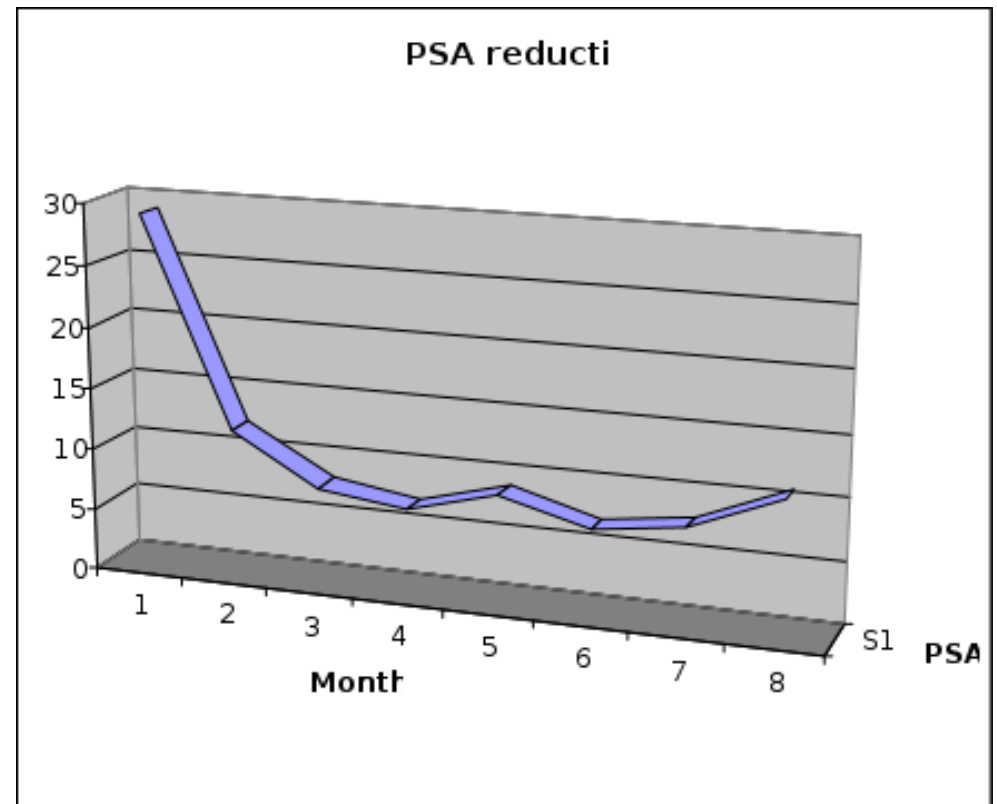
## 營養對癌症病人為什麼如此重要？



# Nutrition and Cancer: 營養與癌症

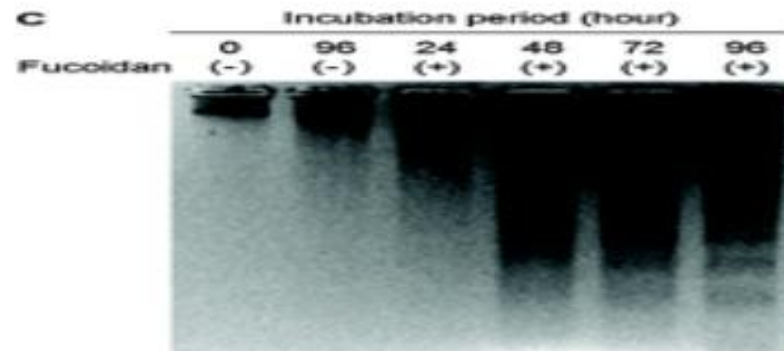
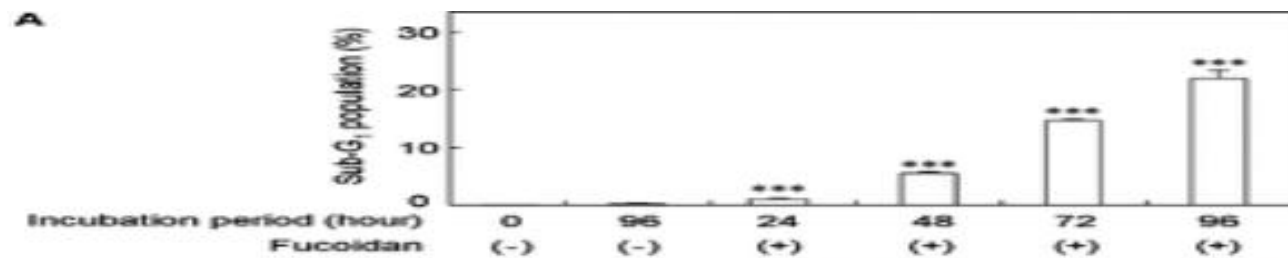
## A Case Study 個案研究

- Hormonal Refractory Prostate Cancer  
激素難治性前列腺癌
- On “seaweed” alone  
僅“海藻”，
- **FUCOIDAN** 褐藻糖膠  
(褐藻素)



# Case Study: The Science

## 案例實驗研究



Fucoidan  
ingredient from seaweed  
從海藻得到的成分

# Vitamins 維他命

- 68 y/o man, with family history of prostate cancer (father at 60, brother at 62), now is diagnosed lymphoma  
68歲男性，有前列腺癌家族史的父親在60歲，弟弟62歲），現在被診斷淋巴瘤
- He is taking several vitamins (Puritan Pride) and asks you if he can continue them during chemotherapy  
他服用數種維他命 (Pritan Pride)，詢問在化療中是否能繼續服用

- MVI 多種維他命 加  
Vit E 1000U  
**E 1000U**  
Fish Oil 1 cap  
魚油 1 膠囊



# Vitamins 維他命

- MVI: Regular dose safe  
多種維他命: 常規量是安全的
- Vit A: 3500U 維他命 A
- Vit C: 60mg 維他命 C
- Vit D: at least 2000U/day  
維他命 D: 至少 2000U/日
- Vit E: 30-200U/d(50U)  
維他命 E
- Vit B12: < 1 mg/d  
維他命 B12: 少於1 mg/日
- Folate: <400ug 葉酸



# Vitamins: Too Much is harmful

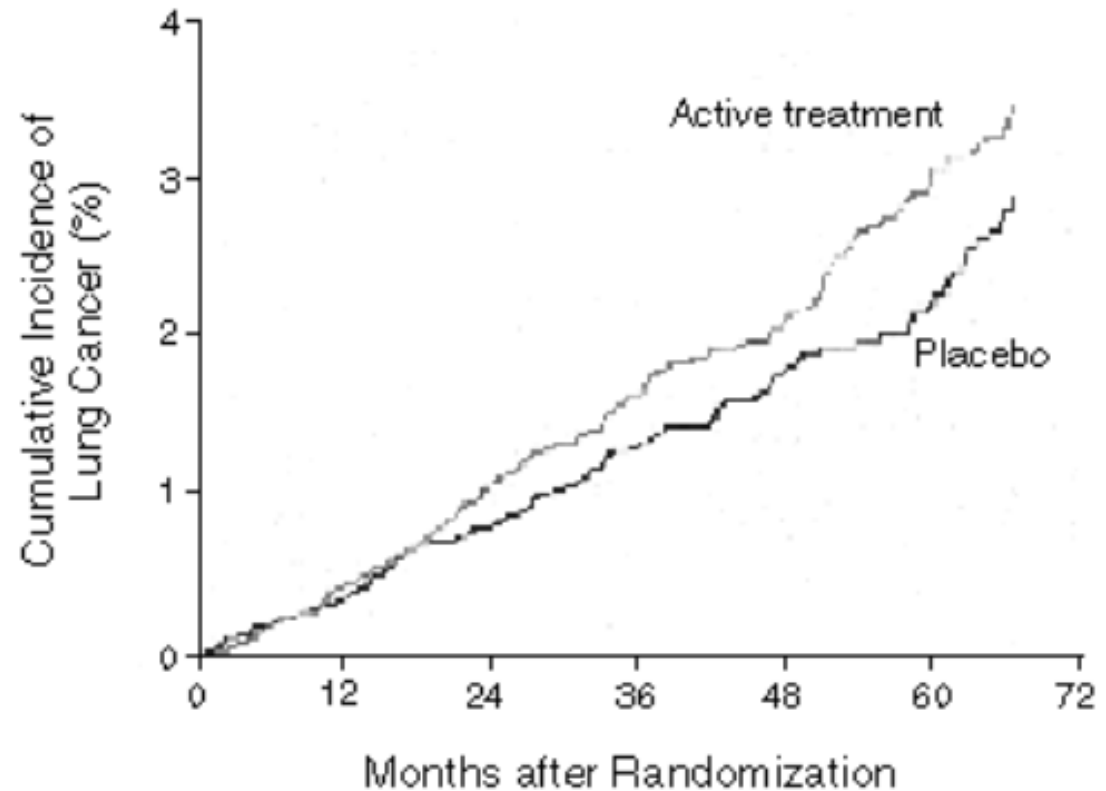
## 維他命：太多是有害的

CARROT Trial 試驗  
30 mg of beta  
carotene  $\beta$ -胡蘿蔔素  
25,000 IU of retinol  
視黃醇(vitamin A)

### 結果

Lung Cancer: UP

增加肺癌



N Engl J Med 1996;334:1150-5



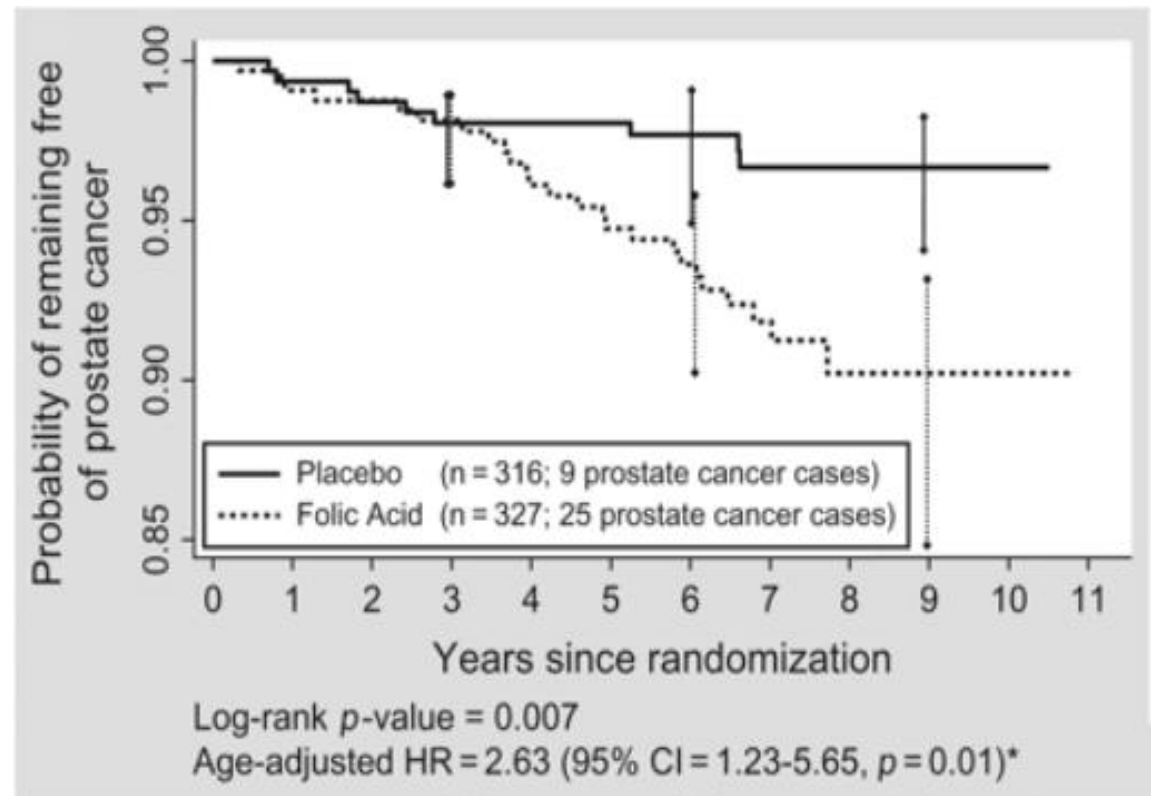


# Vitamins: Too Much is harmful

## 維他命：太多是有害的

- **Folic Acid and Risk of Prostate Cancer**

葉酸與前列腺癌  
風險的關係



J Natl Cancer Inst 2009;101: 432 – 435

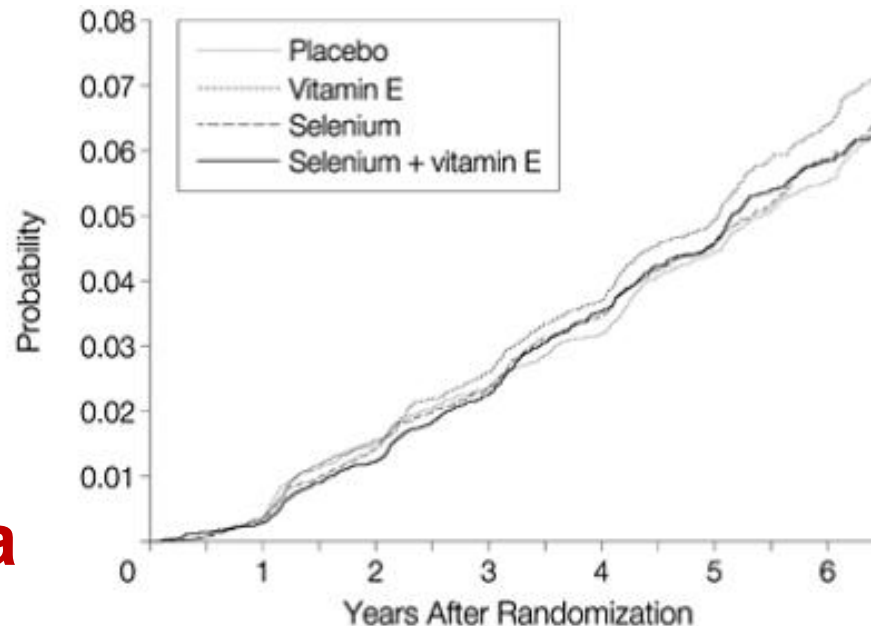


# Vitamins: Too Much is .....

維他命：太多是.....

- SELECT Trial
- 選擇性 試用 試驗
- Se 200ug
- Vit E 400IU
- 維他命 E

**Increase Prostate Ca**  
**增加前列腺癌**



No. at risk							
Placebo	8689	8553	8328	8039	7389	4892	2516
Vitamin E	8732	8610	8373	8098	7401	4867	2537
Selenium	8750	8597	8341	8083	7393	4848	2558
Selenium + vitamin E	8700	8585	8371	8097	7428	4894	2580

Lippman, S. M. et al. JAMA 2009;301:39-51.



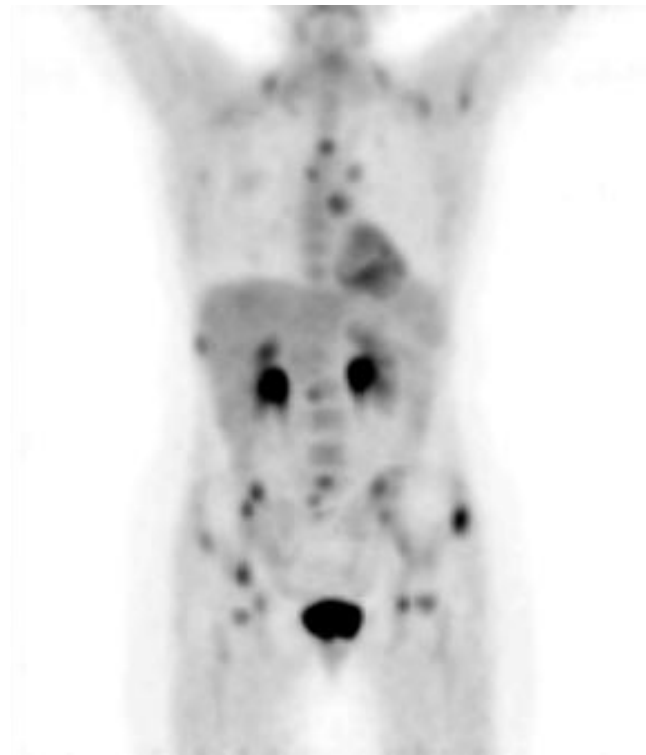
# Vitamins: (Very) High Dose

## 維他命：（非常）高劑量

- 54 y/o female with stage 4 breast cancer for 10 years

**54歲女性10年 4期的乳腺癌**

- She underwent numerous chemos but her disease remains active and progressive 她接受了無數化療但她的病仍然活躍和進展
- Can she take high dose vitamins?  
她能服用高劑量的維生素嗎？

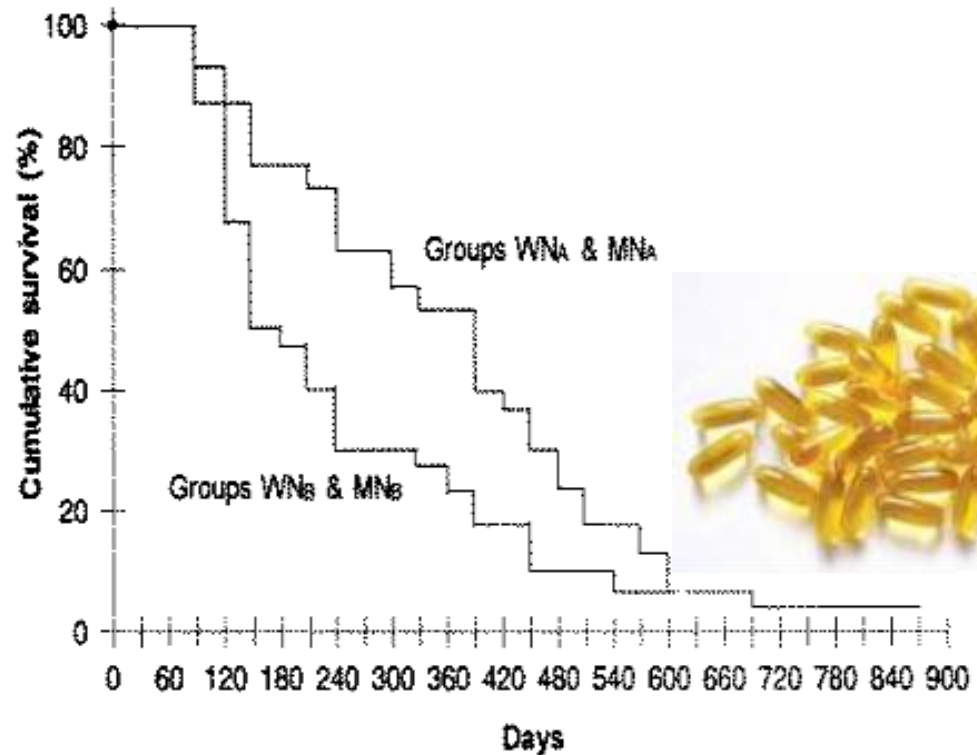


# High Dose Vitamins

## 高劑量維他命

- Omega-3 high dose(16 g)
- 歐米茄-3 高劑量(16 克)
- Vit E (200 mg, 300U)  
維他命 E

*Prolong Survival*  
延長壽命

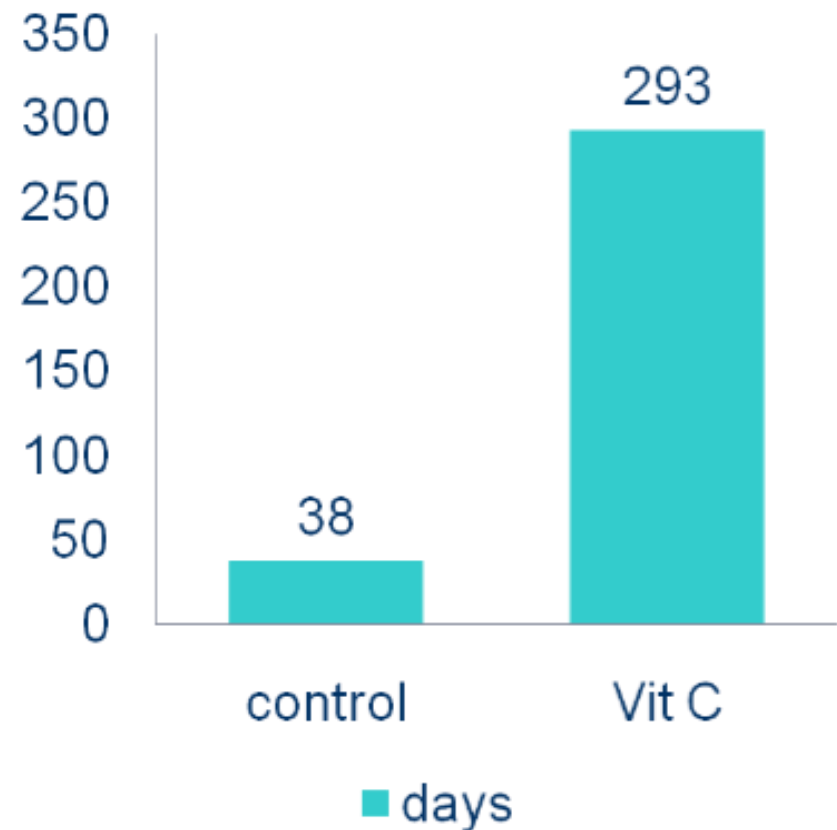


Cancer. 1998 Jan 15;82(2):395-402

# High Dose Vitamin C

## 高劑量維他命 C

- **High Dose Vit C**  
高劑量維他命 C
- **High-dose Vit C is a potent anti-cancer agent in vitro**
- 高劑量維他命 C 在體外是一種有效的防癌劑
- **Clinically safe**  
臨床安全
- **Efficacy: Controversial**  
功效：有爭議



Pauling 1976 study  
鮑林 的研究--1976年



# High Dose Vitamin C

## 高劑量維他命 C

- High Dose Vit C 65g/week  
高劑量維他命 C 65 克/週

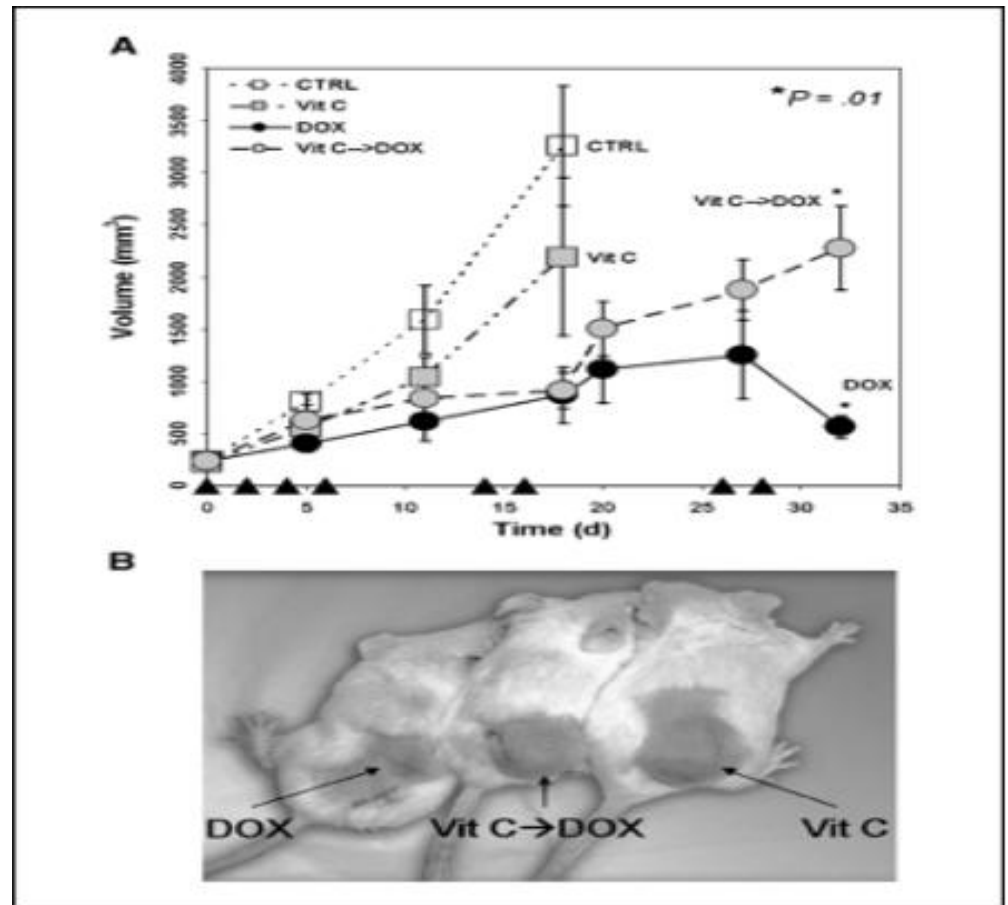
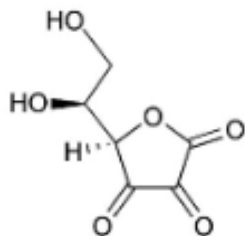
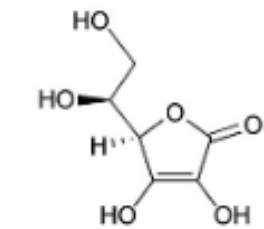


CMAJ • March 28, 2006; 174 (7).

# High Dose Vitamin C

## 用高劑量維他命 C 的另一個案例

- High Dose Vit C  
高劑量維他命 C
- DHA is not Vit C!  
DHA不是維他命 C



# High Dose Vitamin D

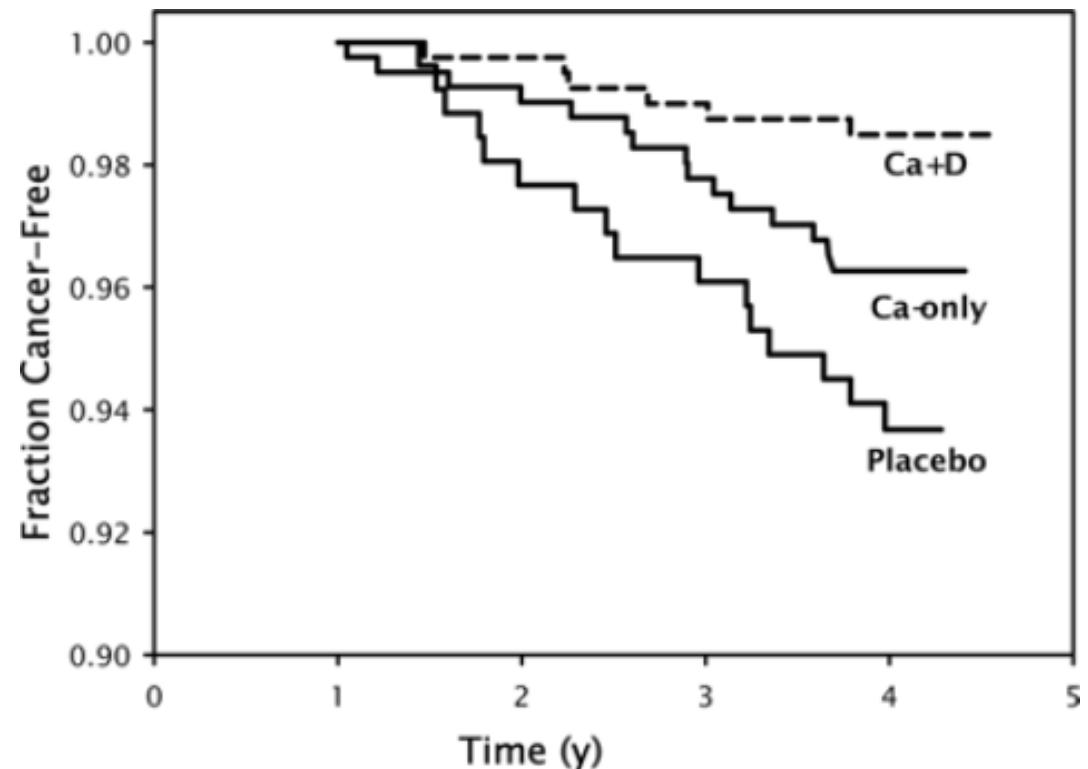
## 高劑量維他命 D

- Vit D 維他命 D
- How Much?

Ca 1500mg/d 鈣,  
1500毫克/天

VitD 1000U/d  
1000單位/天

- Blood Level >50 ng/ml  
血濃度 > 50 ng/ml



Am. J. Clinical Nutrition, Jun 2007; 85: 1586 - 1591



# High Dose Vitamin D: Ultra High is Harmful

## 高劑量維他命 D: 超高有害

- High Dose Vit D
- 高劑量維他命 D
- Ultra-High Dose Vit D trial halted 2007
- 高劑量維他命 D 2007年停止試驗
- (more death! )
- 更多的死亡!



# Phytochemical 植物性營養素 (天然生物活性物質)

Natural bioactive compounds found in plants and fruits 在植物和水果中發現的化合物

- 25000 kinds, an orange has 100 kinds. 在植物和水果中發現**25000**種天然生物活性物質. 一個橘子有上百種。
- Functions 功效 : anti-oxidant, detox, antibacterial, stimulating immune systems 抗氧化, 排毒, 抗菌, 刺激免疫系統



# Phytochemical 植物性營養素 (天然生物活性物質)

Natural bioactive compounds found in plants and fruits 在植物和水果中發現的化合物

- Benefits 好處：

Heart Disease, stroke, cancer, ageing, hypertension, vision, infections(urinary). : 心臟病, 中風, 癌症, 老化, 高血壓, 視力, 感染 (泌尿)。

# Phytochemical 植物營養素

A family of about **25,000** different chemical compounds found in fruits, vegetables and other plants. 共約25000種不同的化合物存在於水果，蔬菜和其他植物。

## Functions: 功效

- antioxidant effects 抗氧化作用
- modulation of detoxification enzymes 調節解毒酶活性
- stimulation of the immune system 刺激免疫系統
- modulation of hormone metabolism 調節激素代謝
- Antibacterial, anti-cancer effects 抗菌，防癌

An orange has more than **170** Phytochemical that act as anti-tumor and anti-oxidant agents. 一個橘子有超過**170**種植物化學成分，作為抗腫瘤和抗氧化劑。

# Phytochemical Health Benefits

## 植物营养素抗癌及对健康的意义

- **Detoxification 解毒**
- **Boost Cancer Fighting Enzymes**  
提升抗癌酶活性
- **Reduce Platelet Aggregation**  
降低血小板聚集
- **Alter Hormone Metabolism**  
改善激素代谢
- **Prevent Inflammation 防止發炎**
- **Antioxidant 抗氧化**
- **Antiviral & Antibacterial Effects**  
抗病毒及抗菌作用



# Phytochemical 植物性營養素

## PHENOLIC COMPOUNDS

- *Monophenols*
- *Polyphenols(flavonoids)*
- *Phenolic acids*
- *Hydroxycinnamic acids*
- *Tyrosol esters*
- *Stilbenoids*

## TERPENES (ISOPRENOIDS)

- *Carotenoids (tetraterpenoids)*
- *Monoterpenes*
- *Saponins*
- *Lipids*

## 酚化合物

單酚化合物  
多酚(黃酮類)  
酚酸  
羥基肉桂酸  
醑醇醑素  
芪類化合物

## 帖烯(異戊二稀)

類胡蘿蔔素(芪類化合物)  
單帖類  
皂甙  
脂質

# Phytochemical 植物性營養素

- **BETALAINS**
- **ORGANOSULFIDES**
  - *Dithiolthiones (isothiocyanates)*
  - *Thiosulphonates (allium compounds)*
- **INDOLES (GLUCOSINOLATES)**
- **OTHER ORGANIC ACIDS**
  - *Oxalic acid*
  - *Phytic acid (inositol hexaphosphate)*
  - *Tartaric acid*

甜菜素  
烯丙基硫化物  
硫糖甘水解物 (異硫氰酸鹽類)  
)  
Thiosulphonates (蒜蔥素)

引堞(葡萄糖二酸脂)  
其它有機酸  
草酸  
植酸(肌醇六磷酸)  
酒石酸

# Top Scoring Veggies with Phytochemical 植物性營養素 得分最高的蔬果

Prunes 西梅

Raisins 葡萄乾

Bitter Greens 苦綠黨

Blueberries 藍莓

Blackberries 黑莓

Strawberries 草莓

Kale 甘藍

Spinach 菠菜

Brussels Sprouts

甘藍抱子

Raspberries 樹莓

Oranges 橘子

Red Grapes 紅葡萄

Cherries 櫻桃

Beets 甜菜

Nuts 堅果

Extra Virgin Olive Oil

榨橄欖油

# Phytochemical-Rich Foods

## 富含植物性營養素的蔬果

- 蔬菜

- 芥菜 菠菜
- 大蒜
- 芹菜
- 胡蘿蔔
- 白菜
- 綠花椰

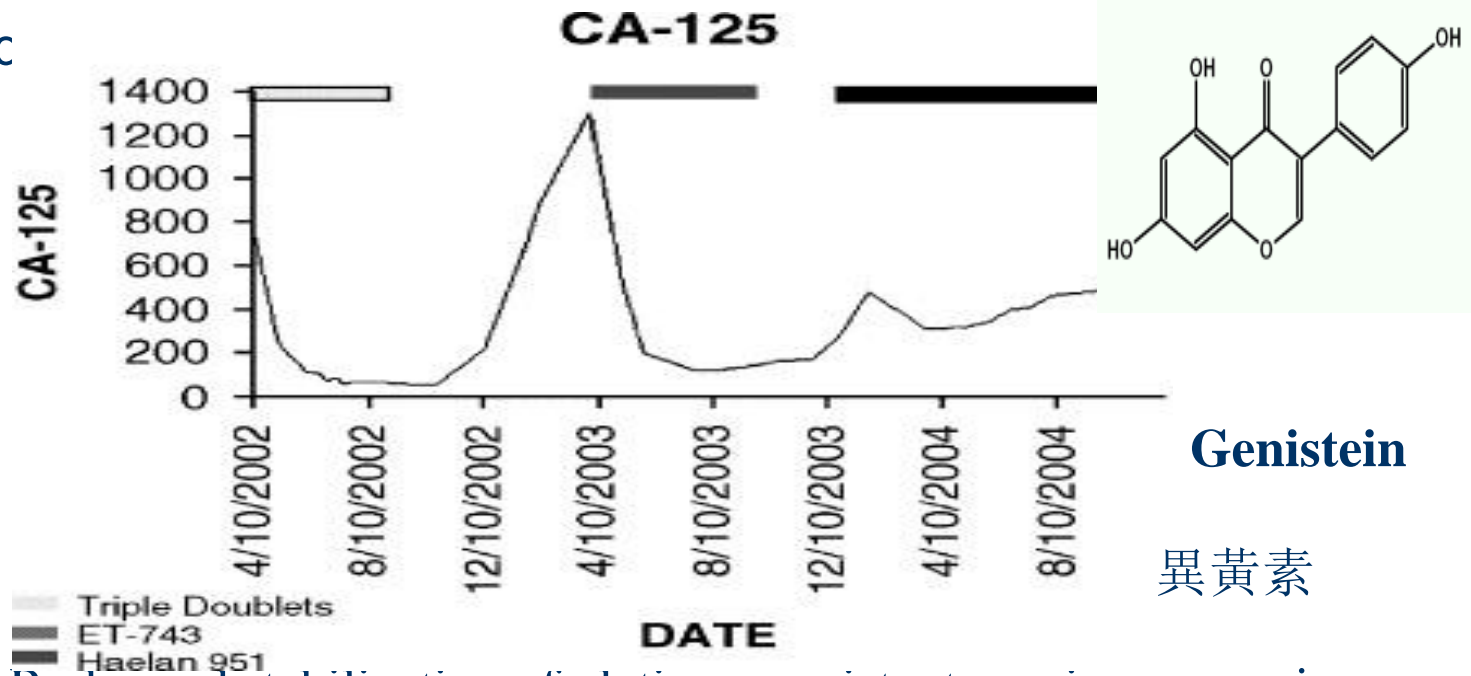
- 水果

- 葡萄 西瓜 香瓜 櫻桃 李子 莓類 柑橘類

# Soy and Cancer 大豆與癌症

- Ovarian Cancer Responds to Fermented Soy Even After Chemo Failed
- 即使化療失敗，卵巢癌對發酵大豆有反應

Harvard Mec

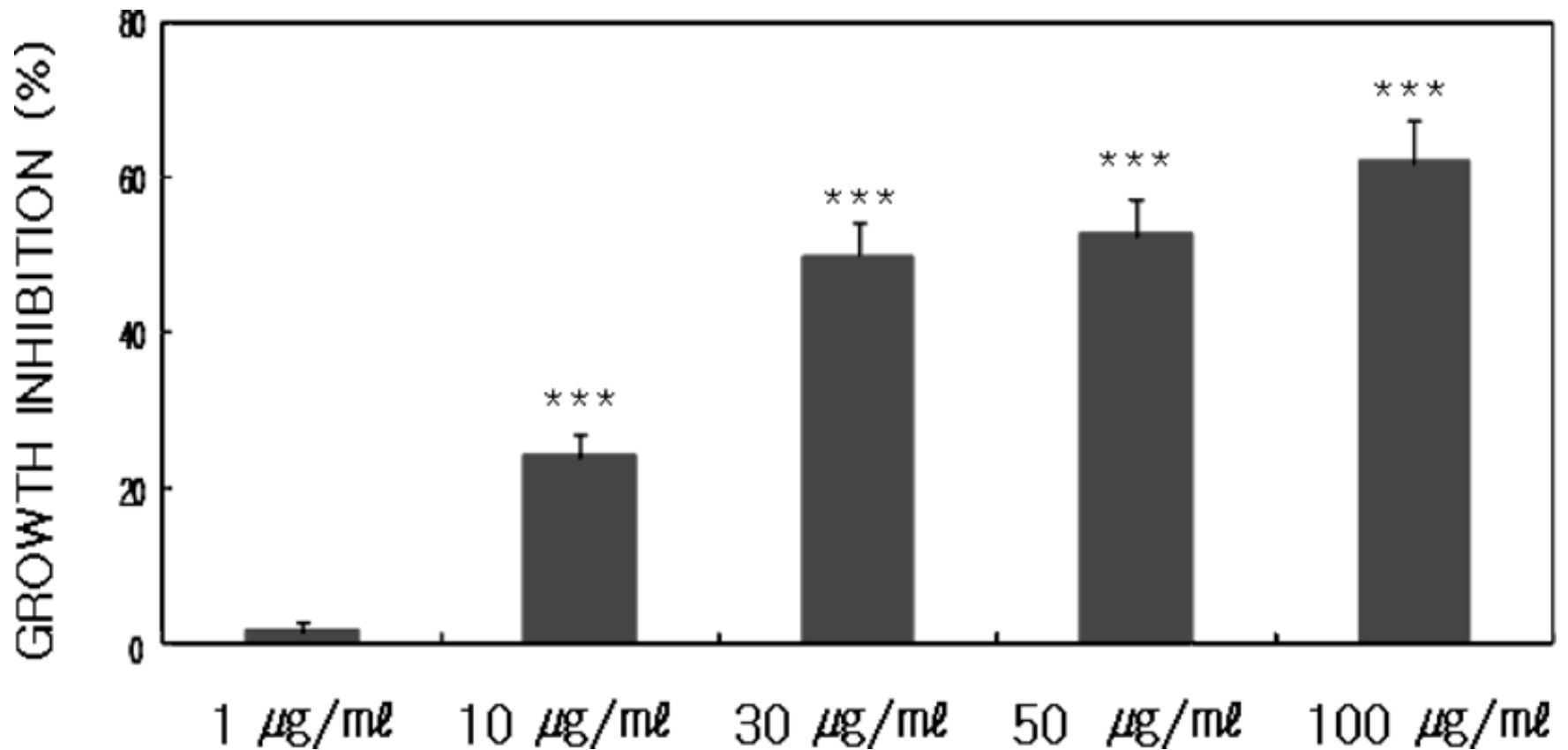


Prolonged stabilization of platinum-resistant ovarian cancer in a single patient consuming a fermented soy therapy 2006



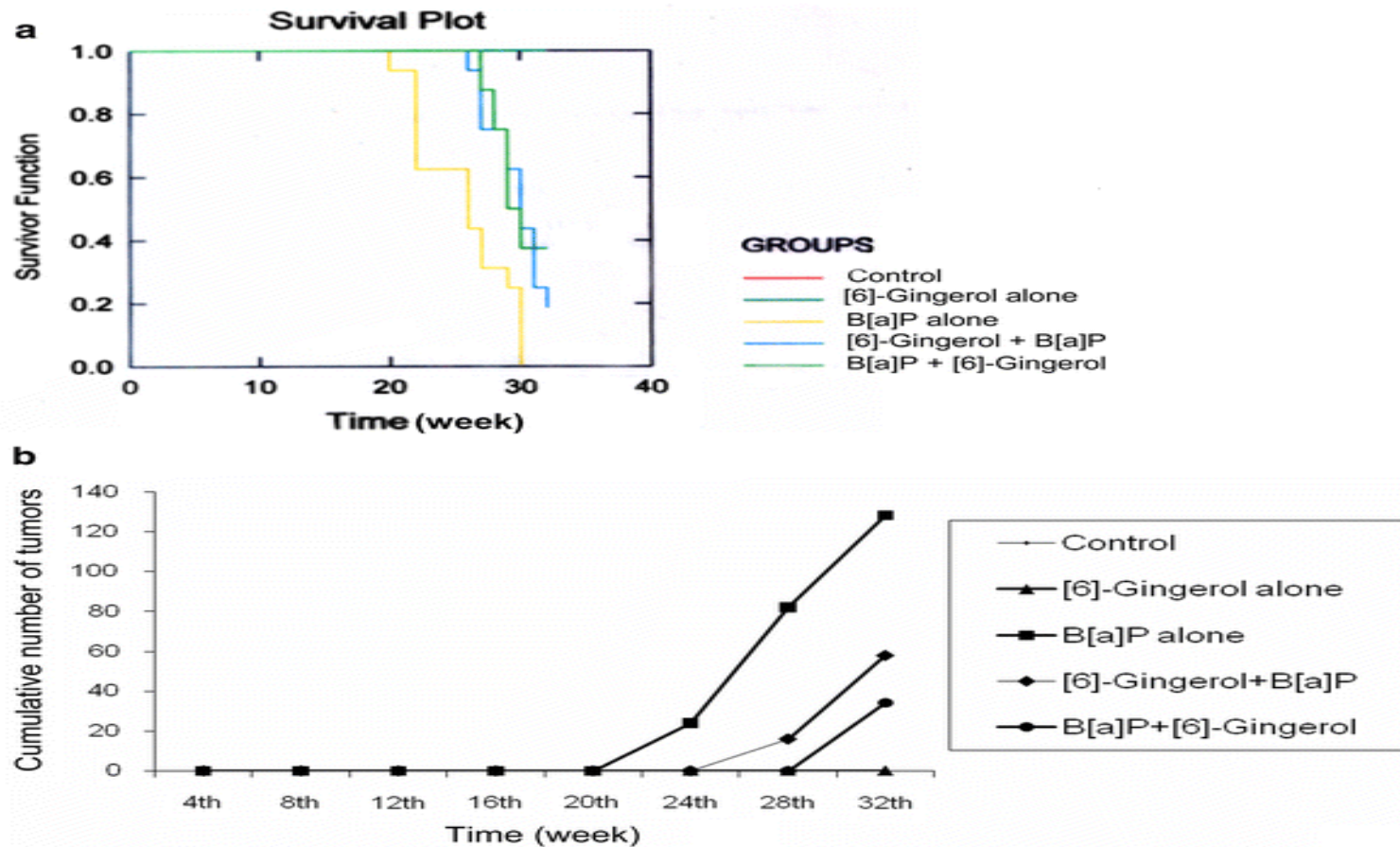
# FUCOIDAN STOP COLON CA

## 褐藻多醣硫酸酯防止結腸癌



# Gingerol Suppresses Skin Cancer

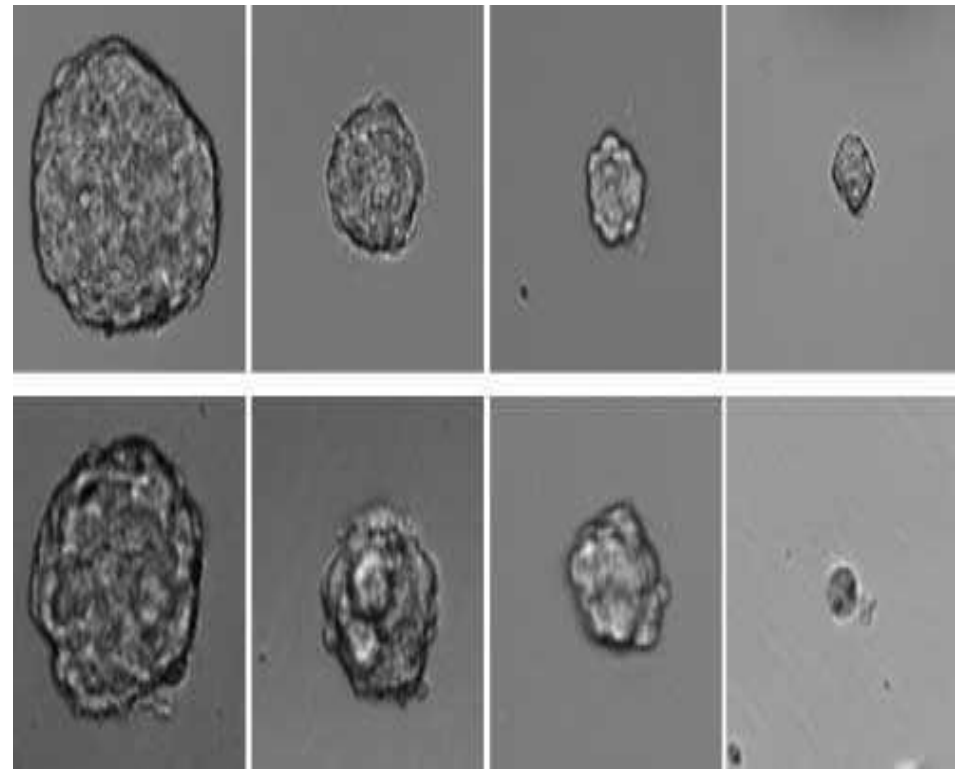
## 姜抑制皮膚癌



# Broccoli Against Breast Cancer

## 西蘭花抑制乳癌

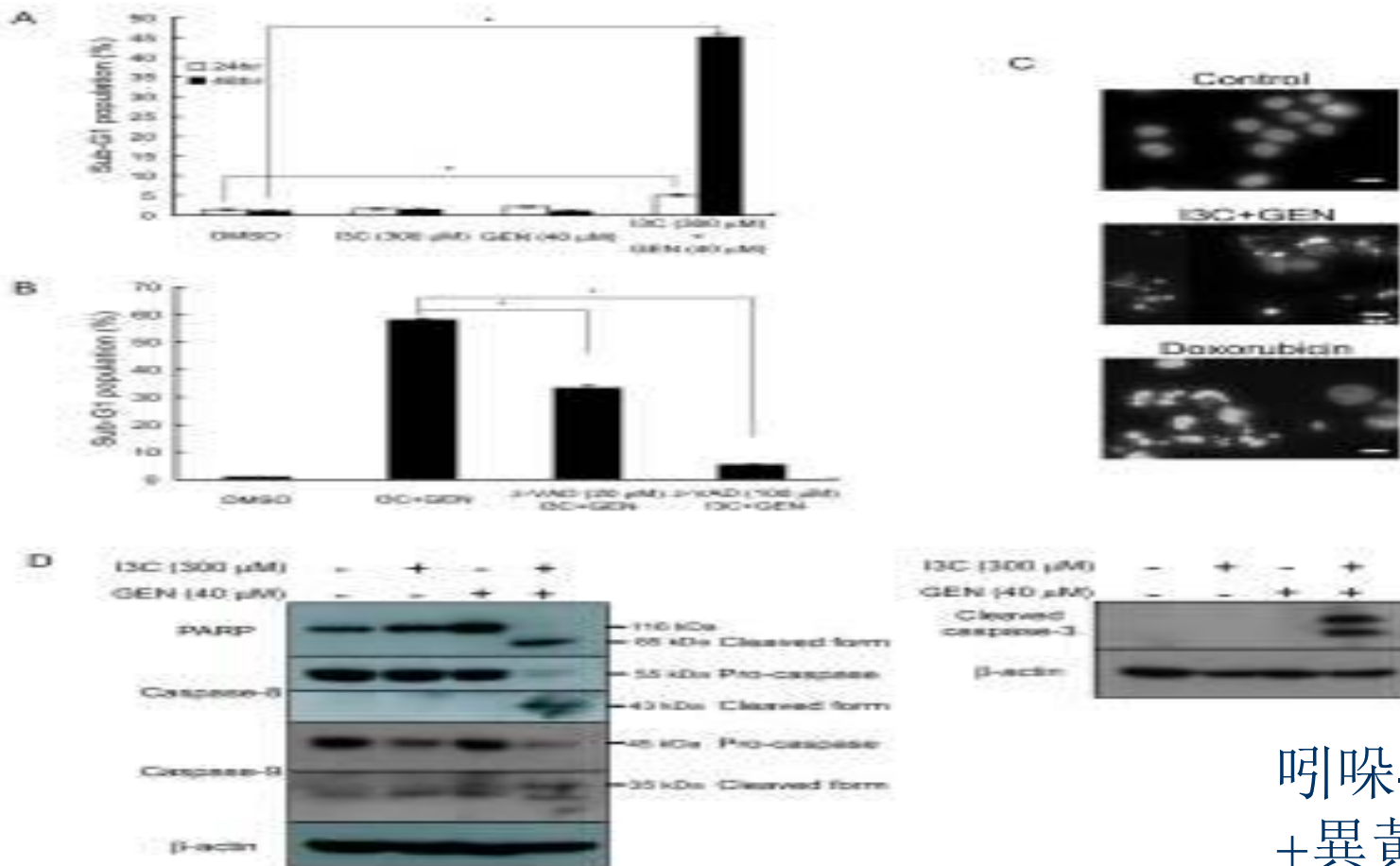
- 萝卜硫素
- Sulforaphane
- Stem Cell Killer!



Zhang, 4/13/2010, Cancer Research

# Phytochemical Work in Harmony

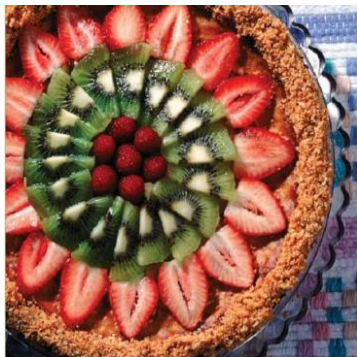
## 植物性營養素的協同效應



吲哚-3-甲醇 I3C  
+ 異黃素

# Do you have to remember all the strange names? 有必要记住所有名字吗?

- No! 不
- God Created Colors!  
上帝创造颜色



Color Wheel of Foods & Phytochemical

Color Group	Phytochemical	Fruits and Vegetables
Red	Leucopenia Phytoene Phytofluene Vitamin E	Tomatoes Tomato Sauce Vegetable Juice Tomato Soup Watermelon
Green	Glucosinolates Isothiocyanates Indole-3 Carbinol Folic Acid	Broccoli Brussels Sprouts Bok Choy Cauliflower Cabbage
Green/Yellow	Lutein Zeaxanthin	Spinach Avocado Kale Green Beans Green Peppers Kiwi Collard Greens Mustard Greens
Orange	Alpha & Beta Carotene Beta-Cryptoxanthin	Carrots Pumpkins Butternut Squash Mangos Apricots Cantaloupe
Orange/Yellow	Vitamin C Flavonoids	Oranges Orange Juice Tangerines Yellow Grapefruit, Peaches Lemons Limes Papaya Pineapple Nectarines
Red-Purple	Anthocyanins Ellagic Acid Flavonoids	Grapes and Grape Juice Cherries Red Wine Strawberries Blueberries Blackberries Raspberries Cranberries Plums Prunes Raisins
White/Green	Allyl Sulfides	Garlic Onion

**Green 綠色**

**3 cups/w 3 杯/週**

Phytochemical 植物性營養素

Glucosinolates

Isothiocyanates

Indole-3 Carbinol

Folic Acid

- Veggies: 蔬菜

Broccoli 西蘭花

Brussels Sprouts 球芽甘藍

Bok Choy 西蘭花菜

Cauliflower 白菜

Studies: 對下列有保護作用  
breast, bladder, lung cancer  
乳腺癌，膀胱癌，肺癌





# Green/Yellow 綠色/黃色 3杯/週

**Phytochemical 植物性營養素**

**Lutein 葉黃素**

**Zeaxanthin 玉米黃素**

**Vegs: 蔬菜**

**Spinach 菠菜**

**Avocado 酪梨**

**Kale 甘藍**

**Green Beans 青豆**

**Green Peppers 青椒**

**Kiwi 獼猴桃**

**Mustard Greens 芥菜**



# Red 红色

- Lycopene 番茄紅素
- Phytoene 八氫番茄紅素
- Phytofluene 六氫蕃茄紅素
- Vitamin E

Cherries 櫻桃  
Red cabbage 紅卷心菜  
Beets 甜菜  
kidney beans 芸豆  
Tomato 番茄

Protective effects for  
對下列有保護作用

- Heart Disease 心臟病
- *Prostate Cancer* 攝護腺癌





# Orange 橘黄色

- Carotene 胡萝卜素  
Cryptoxanthin 隐黄质  
Carrots 胡萝卜  
Pumpkins  
Butternut Squash 冬南瓜  
Mangos 芒果  
Apricots 杏  
Canteloupe 哈密瓜



# Yellow, Orange 黄色, 橘黄色

## 2 cups/week 2杯/週

Antioxidant 抗氧化劑

Vitamin C 維生素C  
Flavonoids 類黃酮

- Protective effects for 對下列有保護作用
    - Heart disease 心臟病
    - Lung breast cancer 肺癌, 乳腺癌
- Immune function 免疫力  
Eyesight 視力

Oranges 橘子  
Orange Juice 橘子汁  
Tangerines 橘子  
Yellow Grapefruit 柚子  
Peach 桃  
Lemons 檸檬  
Limes 青檸檬  
Papaya 木瓜  
Pineapple 菠蘿  
Nectarines 油桃



# Blue to Purple 蓝色到紫色

Anthocyanins 花青素

Ellagic Acid 鞣花酸

Flavonoids 類黃酮

Studies for protective 對下列  
有保護作用

Heart disease 心臟病  
cancer 癌症

Inflammation 炎症

Alzheimer's 癡呆症

Berries 莓類(blueberries,  
strawberry, blackberry  
cranberries 蔓越莓)

Cherries 櫻桃

Plums 西梅

Raisins 葡萄乾

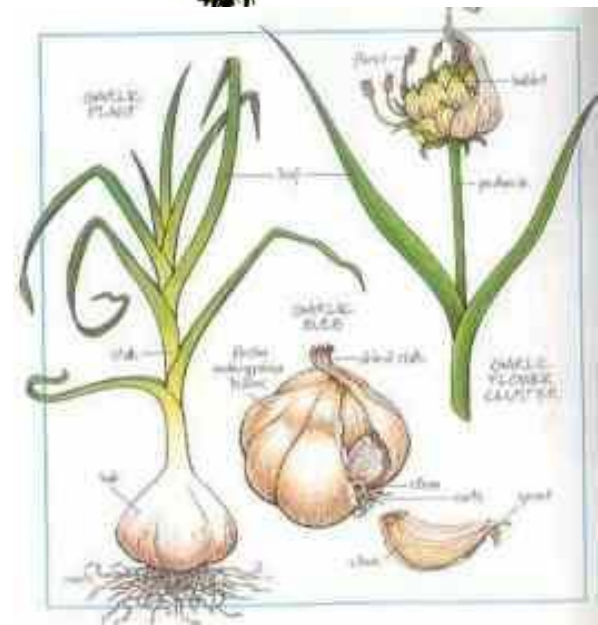
Grape 葡萄

black currants 黑醋栗



# White/Green 白色/綠色

- Allyl Sulfides 硫化烯
- Garlic 大蒜
- Onion 圓蔥
- Chives 细洋葱





# Resources

- CDC



<http://www.fruitsandveggiesmatter.gov/index.html>

- Harvard and CIA

<http://www.hsph.harvard.edu/nutritionsource/what-should-you-eat/vegetables-full-story/index.html#1>

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# Q and A



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