# Some facts about Cancer →

**From Book by -**

**Richard Beliveau and Dr Denis Ginger, "Foods to Fight cancer"**

**WHO Statistics:**

**1 out of 3 people is affected by cancer → Before age of 75**

**It corners 12 per % of all (reported) deaths on Earth.**

But, there is hope.

**False** -  (A) there is little that can be done to prevent it.
       (B) it to hereditary factors or just bad luck.

Scientific research→ lifestyle factors can play a major role in preventing cancer

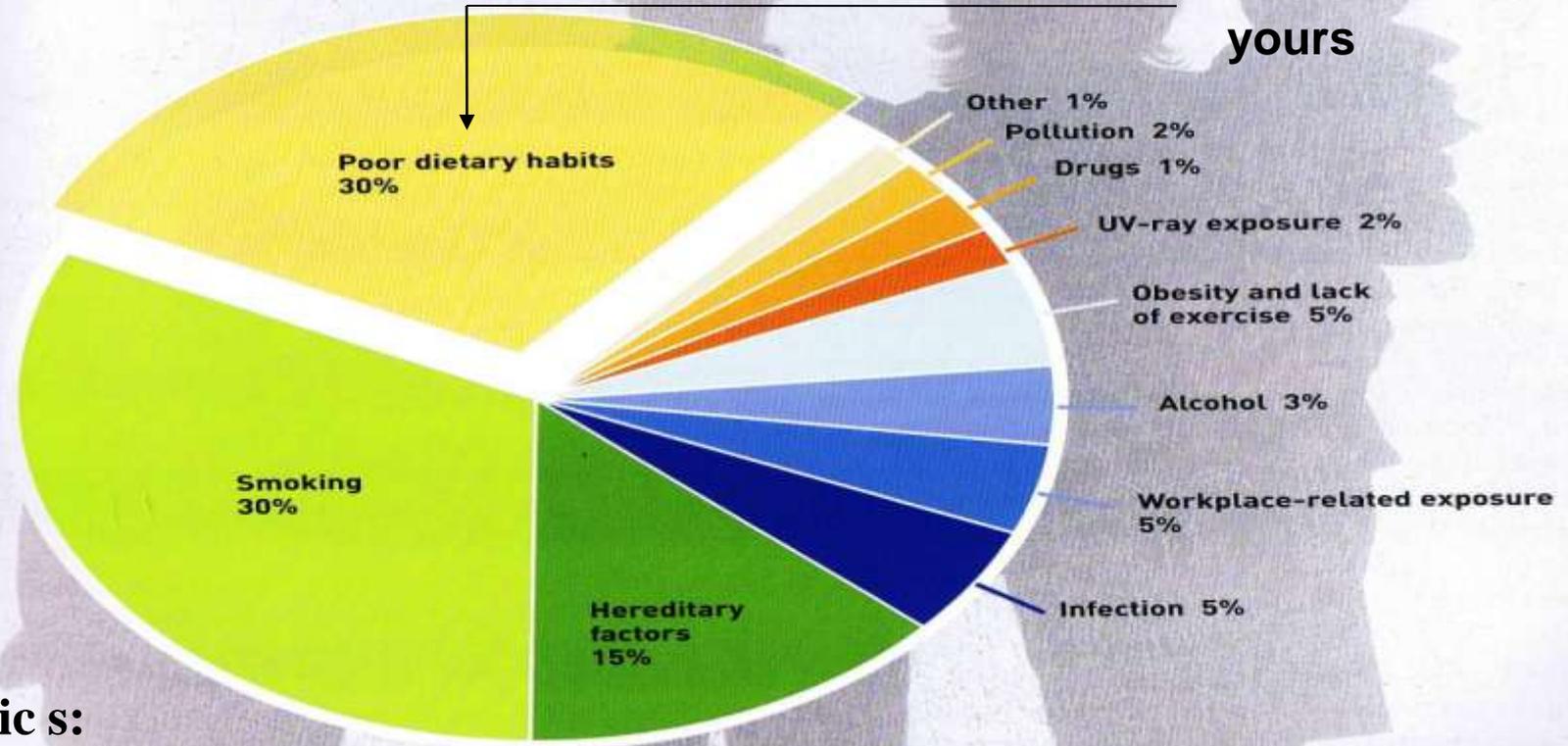33% of all cancers are linked to poor eating habits?

The choice is yours

Other 1%
Pollution 2%
Drugs 1%
UV-ray exposure 2%
Obesity and lack of exercise 5%
Alcohol 3%
Workplace-related exposure 5%
Infection 5%
Poor dietary habits 30%
Smoking 30%
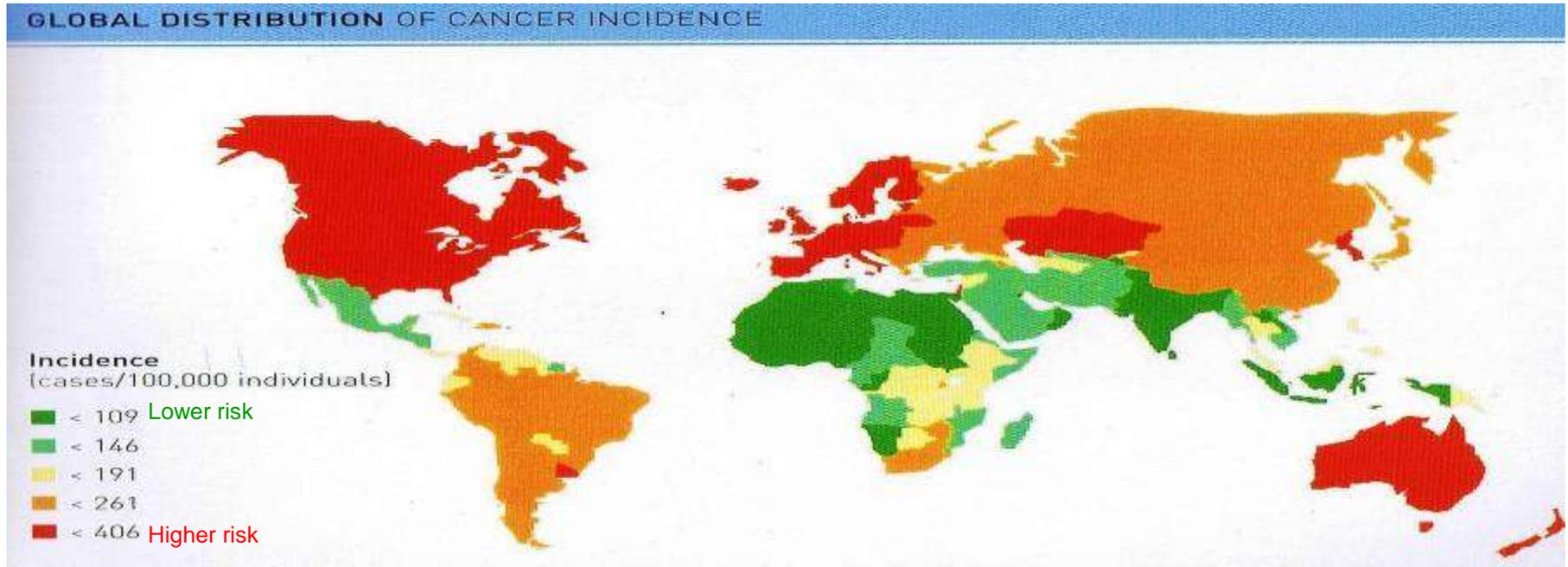Hereditary factors 15%

Figure 2

**Statistic s:**

**30% of Cancer patients are smokers. For a non smoker, risk is reduced by 30%**

**15% of Cancer patients are due to hereditary. if family line does not have any cancer history, then risk of cancer is further reduced by 15%.**

**Another 30% of Cancer patients are due to poor dietary habits. Good food can further reduce the risk of cancer by another 30% by adopting dietary habit.**

4

# Poor Dietary - risk of cancer



GLOBAL DISTRIBUTION OF CANCER INCIDENCE

Incidence
(cases/100,000 individuals)

- < 109   Lower risk
- < 146
- < 191
- < 261
- < 406   Higher risk

**Data → Individuals consuming fewest fruits and vegetables have twice the chance of developing certain cancers**

**→ Dietary shortcomings could play a role in the high cancer rates afflicting the West.**

5

# What is Cancer ?

- **Cancer is a disease of the cell.**
  **A Human beings is made up of 60,000 billion cells.**

- **The growth of cancer takes a long time (many years or decades).**
  **A cancerous tumor takes several years to form.**

- **The slowness in the growth presents the opportunity to intervene (to block the rebel cells from maturing into a cancer cells).**

# Preventing Cancer Growth

Common method is by destroying the cancerous tumor by

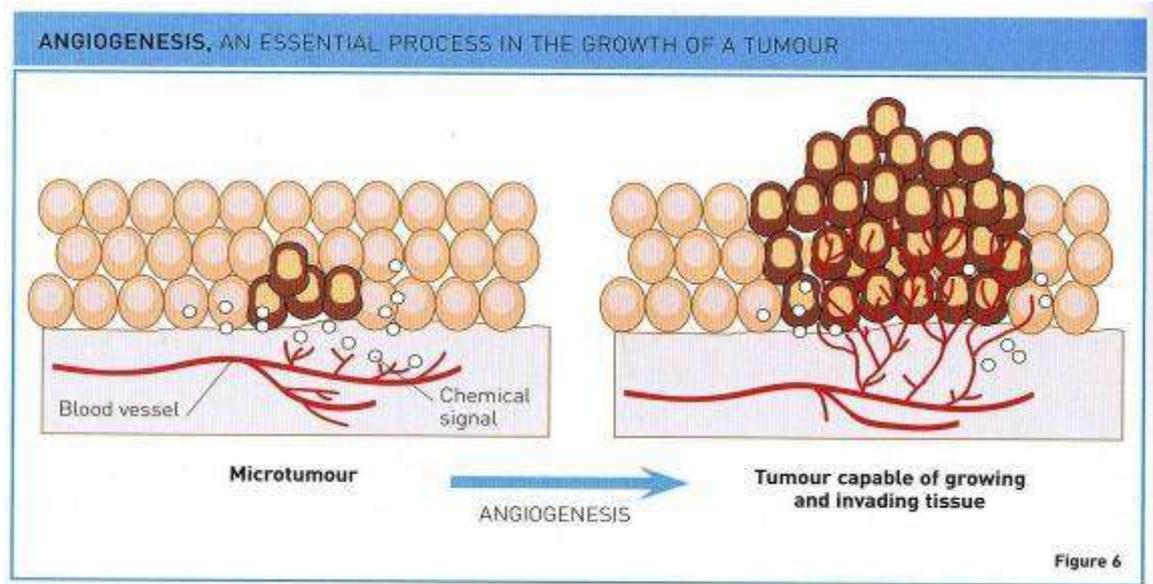1) Surgery,  2) Radiotherapy and 3) Chemotherapy (Usually done together ).

Limitations
- Surgery – cannot eliminate all cancerous cells.
- Radiotherapy ( X rays) – radiation will kill some of the normal cells too.
- Chemotherapy by medication or drugs to reach cancerous cells – many side effects including hair loss or drop in immune cell, organs complication.

4) Anti-Angiogenesis Metronomic is a new approaches by attacking the tumor's blood supply thus depriving it food.  But anti-Angiogenesis Metronomic has to be a continuous process.

The good news → significant quantities of some Anti-Angiogenesis Metronomic molecules are present in fruits and vegetables.
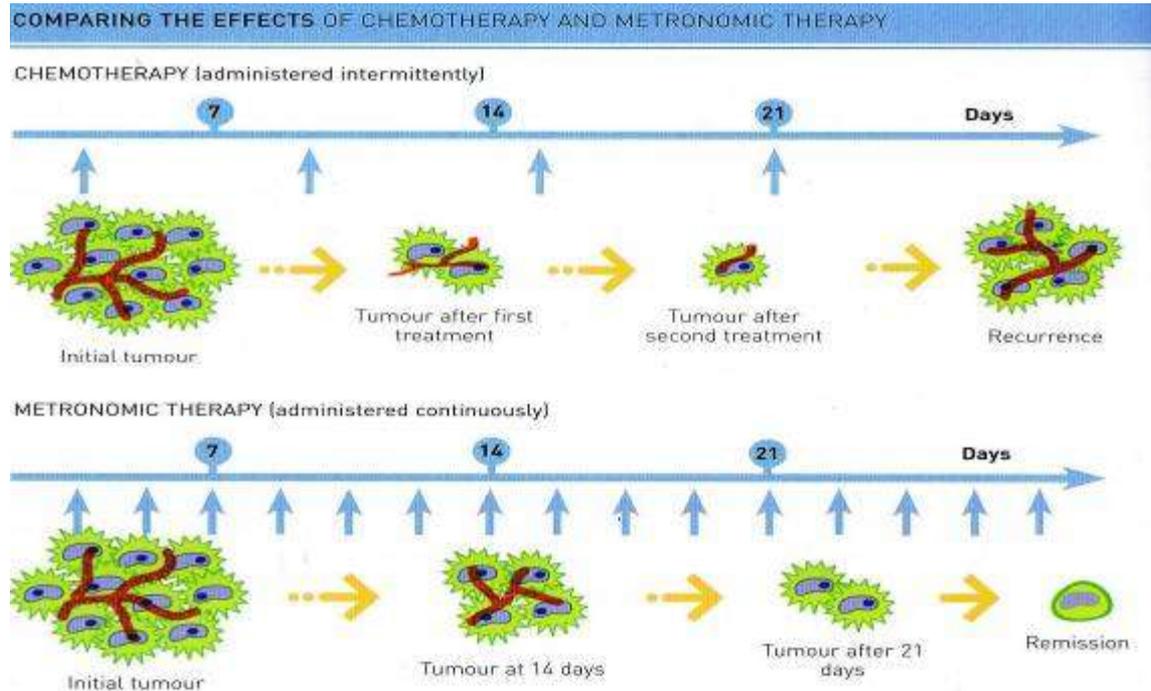
**Angiogenesis –an essential process in the growth of a Tumor**



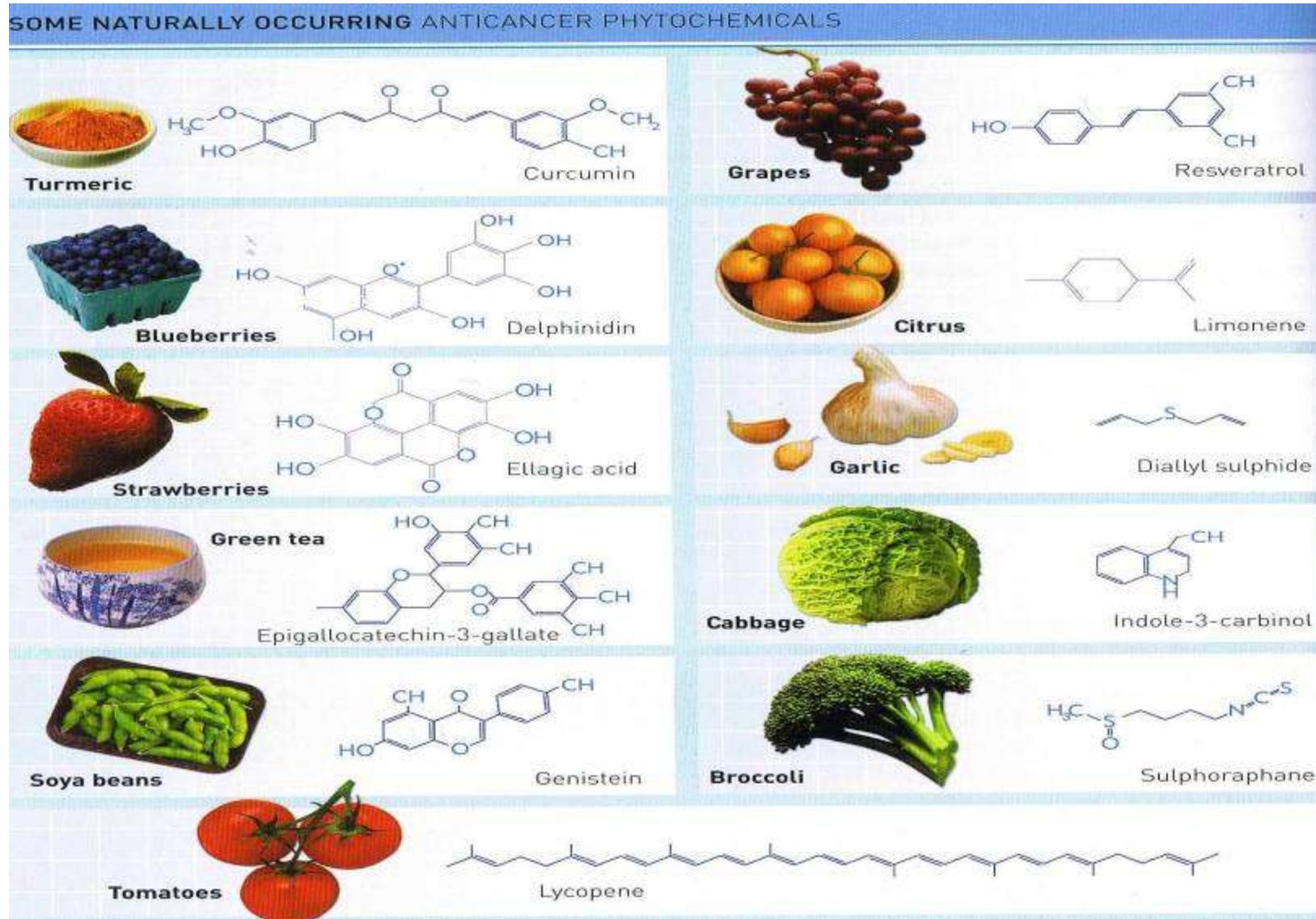ANGIOGENESIS, AN ESSENTIAL PROCESS IN THE GROWTH OF A TUMOUR

Blood vessel | Chemical signal

Microtumour

ANGIOGENESIS

Tumour capable of growing and invading tissue

Figure 6

**Chemotherapy therapy**

vs

**Anti Angiogenesis Metronomic therapy process**



COMPARING THE EFFECTS OF CHEMOTHERAPY AND METRONOMIC THERAPY

CHEMOTHERAPY (administered intermittently)

7    14    21    Days

Initial tumour

Tumour after first treatment

Tumour after second treatment

Recurrence

METRONOMIC THERAPY (administered continuously)

7    14    21    Days

Initial tumour

Tumour at 14 days

Tumour after 21 days

Remission

8

# Eating to Prevent Cancer

- **True** → **(i)** the tumors that forms spontaneously in our bodies generally remain microscopic in size (posing no danger to health),

  + → **(ii)** that all too often these tumors do not grow and develop into lethal end stage cancel

- Anticancer molecules present in fruits and vegetables →

- **(i)** fight cancers at the source, before it can reach maturity.

  + → **(ii)** keeps them from progressing to an advanced stage of lethality.


- Think of cancer as a chronic disease →

   one that can be **controlled on a daily basis** with the help of foods rich in anticancer compounds.


- Among the many anticancer compound present in fruits and vegetables, **phytochemicals** are the most important.
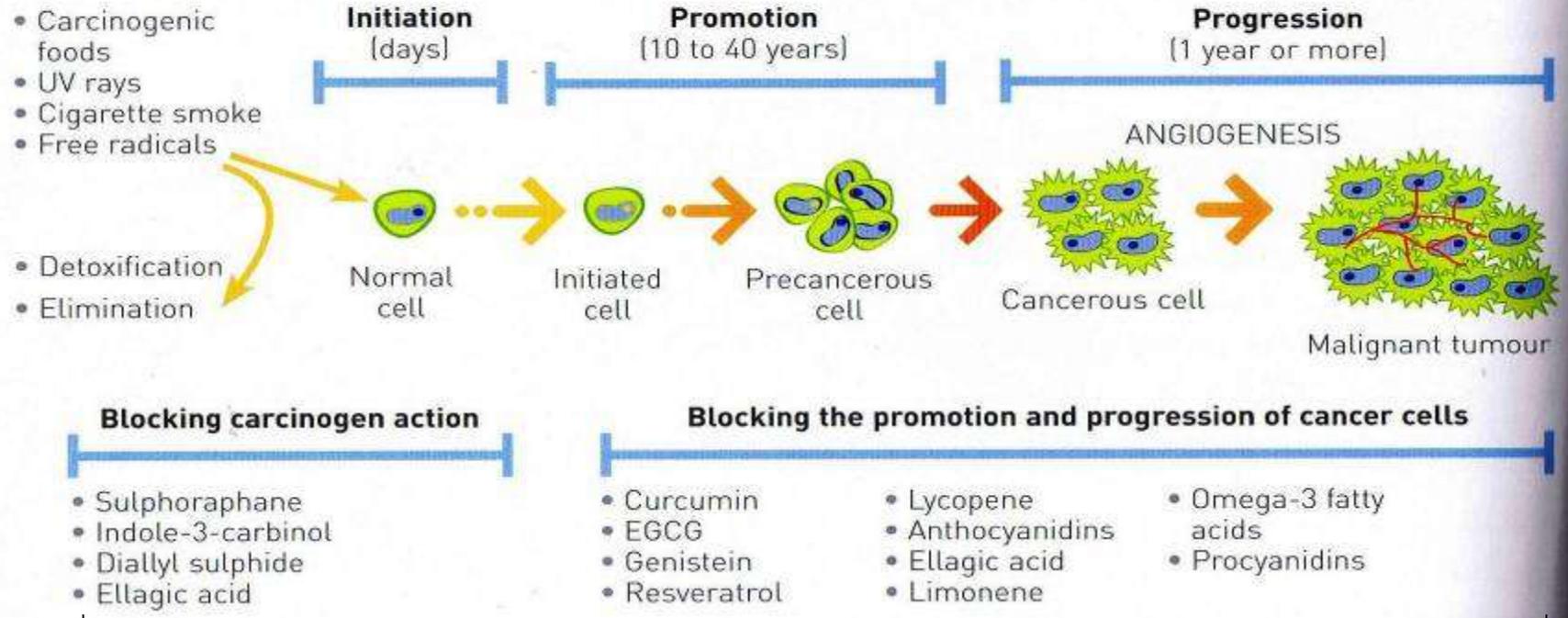
# Anticancer compound present in fruits and vegetables, phytochemicals are the most important



SOME NATURALLY OCCURRING ANTICANCER PHYTOCHEMICALS

Turmeric — Curcumin
Grapes — Resveratrol
Blueberries — Delphinidin
Citrus — Limonene
Strawberries — Ellagic acid
Garlic — Diallyl sulphide
Green tea — Epigallocatechin-3-gallate
Cabbage — Indole-3-carbinol
Soya beans — Genistein
Broccoli — Sulphoraphane
Tomatoes — Lycopene

After Surh, Y-J (2003), Nature Review on Cancer 3, 768-780.

Figure 18

10

THE ACTION PATHWAYS OF ANTICANCER AGENTS

- Carcinogenic foods
- UV rays
- Cigarette smoke
- Free radicals

- Detoxification
- Elimination

**Initiation** (days)

**Promotion** (10 to 40 years)

**Progression** (1 year or more)

ANGIOGENESIS

Normal cell

Initiated cell

Precancerous cell

Cancerous cell

Malignant tumour

**Blocking carcinogen action**

- Sulphoraphane
- Indole-3-carbinol
- Diallyl sulphide
- Ellagic acid

**Blocking the promotion and progression of cancer cells**

- Curcumin
- EGCG
- Genistein
- Resveratrol

- Lycopene
- Anthocyanidins
- Ellagic acid
- Limonene

- Omega-3 fatty acids
- Procyanidins

**Anticancer compound present in fruits and vegetables, phytochemicals block carcinogen action, block the promotion and progression of cancer cells**

# Cabbage

- **Cabbage family** ( Cabbage, Broccoli, Cauliflower, Brussels sprouts ) have → a magical ability to fight against the development of cancerous cells in the body. **Eaten regularly**, they are an easy way to help to prevent cancer.

- Broccoli is by far the best source of sulphorahane ( one of the phythochemical compounds )

- **Rapid** or **light** cooking techniques, by steaming or stir-frying in a wok, are an effective way to maximize the quantity of anticancer molecules.

  Over cooking reduces the effectiveness of the anticancer molecules.

# Garlic and Onions

- **Used since 2000 BC  → Best documented examples of the role of plants in the treatment of diseases and maintenance of good health.**

- **The molecules found in garlic and onions → are also capable of slowing down the propagation of tumors by interfering with the growth processes in cancer cells, leading to cell death by apoptosis.**

- **Freshly crushed garlic is by far the best source of anticancer compounds and should be preferred over supplements (Drug).**

# Soya

- **Soya Beans, Soya sauce, Tofu →**

  **has "Isoflavones" the anticancer compounds present in soya. It possesses a chemical structure similar to that of sex hormones and may thus interfere with the development of cancers caused by high levels of these hormones in the bloodstream.**

- **Soya plays an important role in the prevention of breast and prostate cancer.**

- **Studies has shown that taking soya at an early age for woman decreases the incidence of breast cancer.**

14

# Japanese Green Tea

- **Green tea** → **undergos the least transformation of all teas.**

- **Green tea** → **is an exceptional source of powerful anticancer molecules . These can be a key feature of any diet designed to prevent the growth of cancer.**

- **Japanese Green tea** → **contains much more anticancer activity know as EGCG than Chinese Green Tea.**

- **Brewing time matters too, and to maximize the extraction of the anticancer compound, the infusion time allowed should be at least 8 to 10 minutes.**

- **Black tea (Red tea) resembles that of green tea, except that the roasting stage is carried out and thus have very little anticancer activity.**
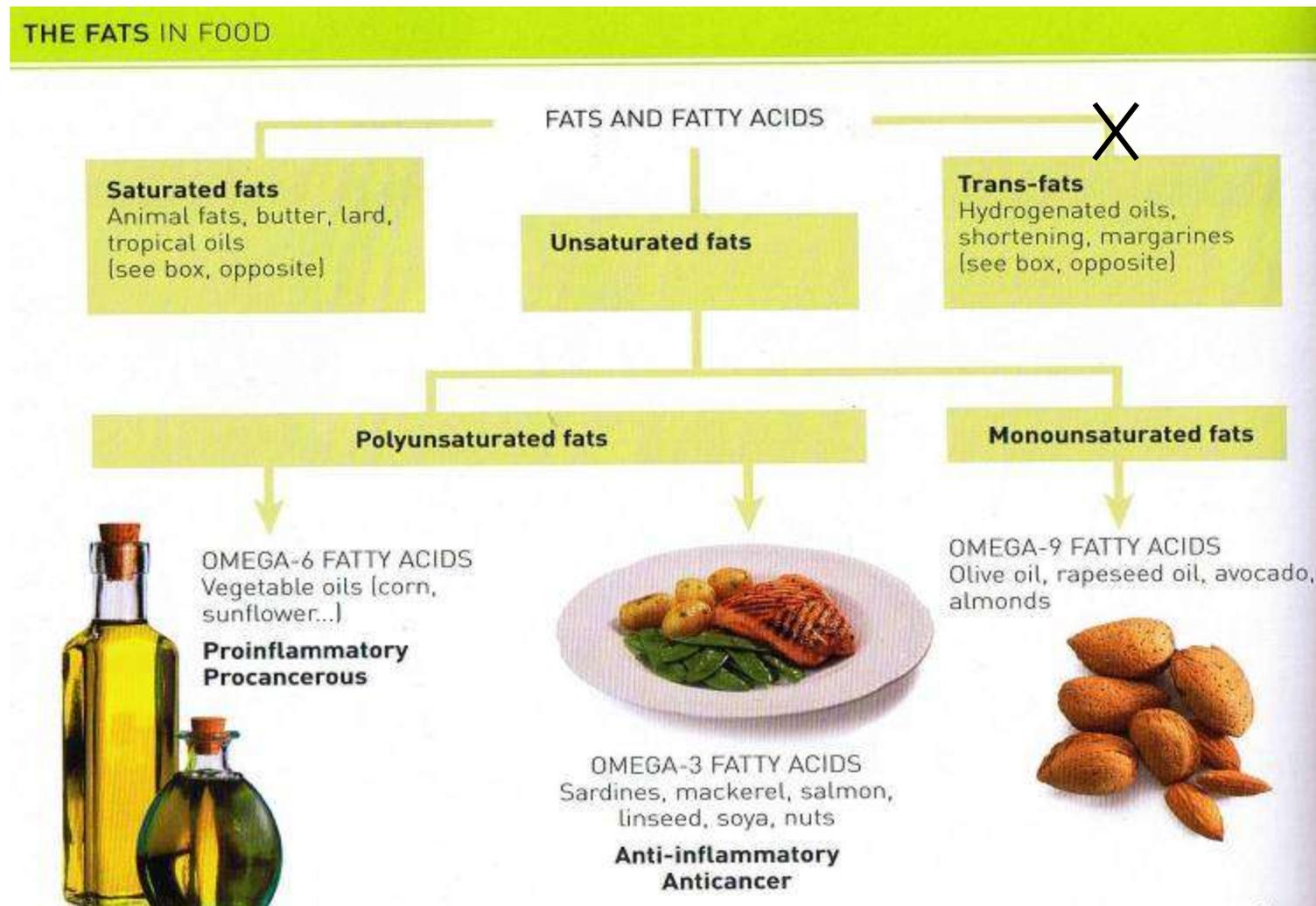
# Higher EGCG has better anti cancer compound



EGCG CONTENT IN DIFFERENT GREEN TEAS
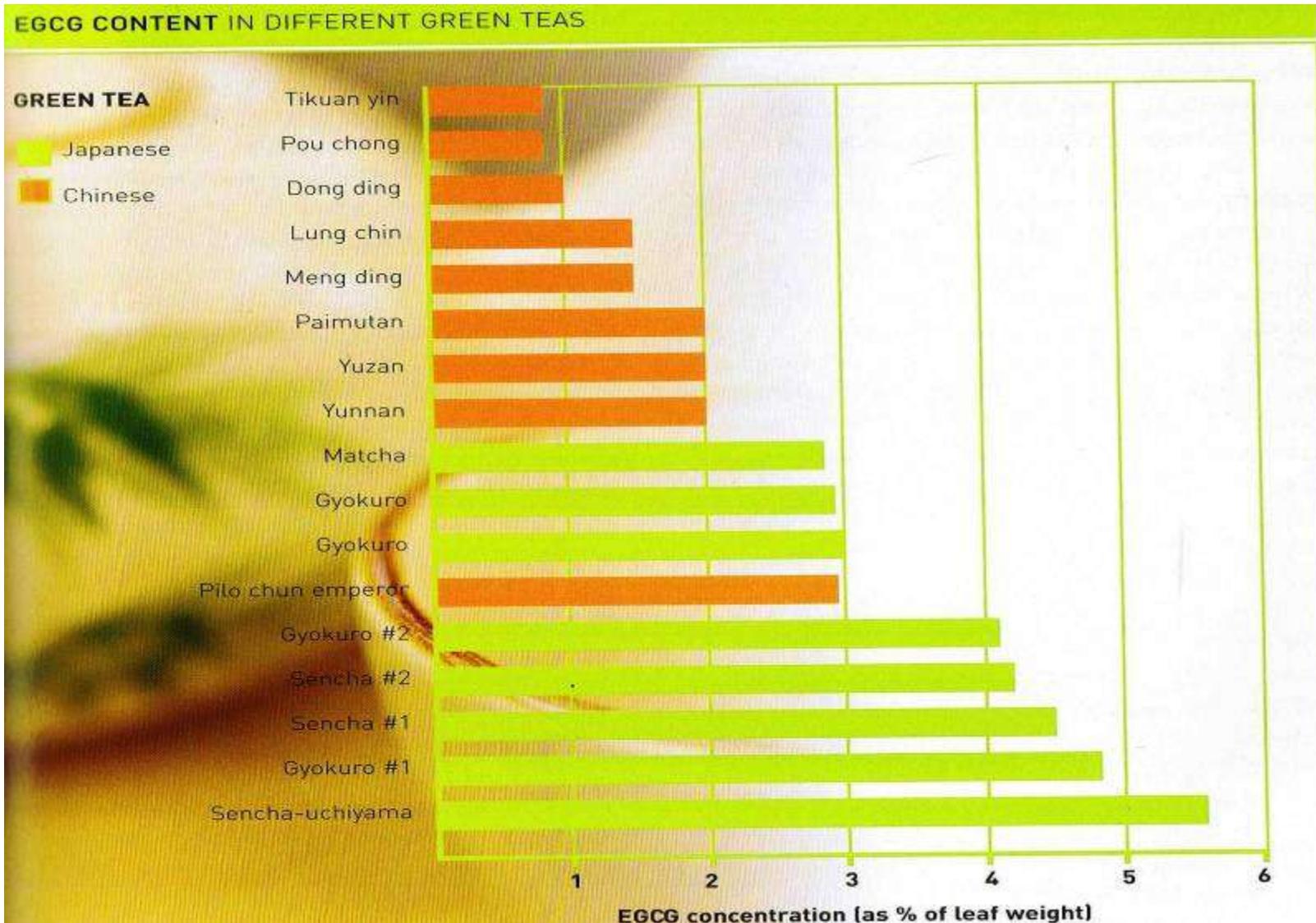
# Berries

- **Most Berries → an exceptionally abundant source of several classes of polyphenols that posses anticancer potential: ellagic acid, anthocyanidins, and proanthocyanidins.**

- **Eating cranberries → should be preferred over drinking cranberry juice.**

# Omega-3s

- **Studies show → Omega-3s reduce the cardiovascular disease and reduce cancer.**

- **Omega-3s acids → are naturally extremely unstable and it is preferable to use whole foods as source instead of omerga-3s supplements (Drug).**

- **Eating fatty fish once or twice a week is one simple way of increasing omerga-3 levels in your diet.**

- **Sardines, Salmon, linseed, soya, nuts are other sources of Omega -3 fatty acids.**

**Trans-fats (fats that are unknown in nature) → cause damage to cell.**

**Look at the label on food packages, it usually indicates if there is any trans- fat.**



THE FATS IN FOOD

FATS AND FATTY ACIDS

✗

**Saturated fats**
Animal fats, butter, lard,
tropical oils
(see box, opposite)

**Unsaturated fats**

**Trans-fats**
Hydrogenated oils,
shortening, margarines
(see box, opposite)

**Polyunsaturated fats**

**Monounsaturated fats**

OMEGA-6 FATTY ACIDS
Vegetable oils (corn,
sunflower...)
**Proinflammatory
Procancerous**

OMEGA-3 FATTY ACIDS
Sardines, mackerel, salmon,
linseed, soya, nuts
**Anti-inflammatory
Anticancer**

OMEGA-9 FATTY ACIDS
Olive oil, rapeseed oil, avocado,
almonds

19

# Citrus Fruits

- **Citrus fruits** : **Oranges, Grapefruit, Lemons, Mandarins**

- **Studies ➔ Phytochemical compounds in citrus fruits block tumor growth by direct action on the cancerous cells (restrict their ability to reproduce).**

- **Citrus fruit consumption ➔ whether in the form of whole fruit or juice, supplies the body with an incomparable source of specific anticancer molecules, while also providing the necessary daily requirements of many vitamins and minerals.**

# Red Wine

- **Alcohol is a double-edged sword → Moderate intake increases HDL ( good cholesterol ) in blood levels ( a key factor in protection against cardiovascular disease ( heart and blood vessel ) and decreases the tendency of blood to form clots by inhibiting blood platelet aggregation.**

  **Conversely → high doses of alcohol causes considerable damage to cells regardless if it is red or white wine.**

- **Polyphenons in particular Resveratrol ( anticancer properties) → are found primarily in the skins and seeds of grapes and are extracted during the fermentation process leading to red wine.**

# Dark Chocolate

- **Dark chocolate → contains polyphenols that are potentially capable of exercising beneficial effects on some chronic illness, including cancers and cardiovascular disease ( heart and blood vessel).**

- **Milk chocolate contains less polyphenols.**

  **(Substitute dark chocolate →**

**instead of "sugar-filled junk food" (with no nutritional benefits)).**

# Supplement ( Drugs)

- **Eating whole food → provides greater benefits than taking supplements.**

- **There are no and there will be no miracle cures that are able to entirely repair the damage caused by a poor diet**

  **(Someone cannot eat just anything and then get off the hook by taking a pill.)**

# Myth

- 1. **Fruits and vegetables** contain pesticide residues that causes cancer. - **False,** the residue is present in trace amounts and no study has ever established a link between these residues and cancer.

- 2. Only organic fruits and vegetables offer real health benefits. - **False,** In fact it would be better to consume many standard fruits and vegetables on a **daily basis** than to only occasionally eat organic foods.

# Fighting Cancer Menu

- **Quit smoking**

- **Lower** → **red meat and calorie intake- avoid or reduce industrially process foods i.e. chips, soft drinks, crisps, hamburgers.**

- **Avoid** **barbecued meats. The greasy drippings that fall and catch fire produce toxic substances know as aromatic hydrocarbons.**

- **Exercise regularly**

- **Choosing to modify your diet in order to include certain foods that are sources of anticancer molecules represents one of the best prevention currently at our disposal in the fight against cancer.**

# Anti-Cancer Food

- **Lightly cook**, steam or stir-fry ➔ Cabbages, Broccoli, Cauliflower, Brussels sprouts or Tomatoes.

- Habitually **add** ➔ Garlic or Onions while cooking.

- **Drink** ➔ more (i) Soya Bean Drink or (ii) Japanese Green Tea or (iii) choose Red Wine than beer.

- **When you buy your fruit**, take Berries, Oranges, Grapefruit, Lemons, Mandarin Oranges conveniently.

- Add Sardines or Salmon to your dish.

- Choose Dark Chocolate rather than sugar.

# PRINCIPAL ACTIVITY SITES OF ANTICANCER COMPOUNDS PRESENT IN DIET (FOOD)

| Goals targeted by nutraceuticals | Green tea | Turmeric | Soya | Cruciferous vegetables | Garlic and onions | Grapes and berries | Citrus fruits | Tomatoes | Omega-3s | Dark chocolate |
|---|---|---|---|---|---|---|---|---|---|---|
| Reduction of carcinogenic potential | | | | ● | ● | ● | ● | | | |
| Inhibition of tumoural cell growth | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| Induction of tumoural cell death | ● | ● | ● | ● | ● | ● | | | | |
| Interference with angiogenesis | ● | ● | ● | | | ● | | ● | | |
| Impact on the immune system | | ● | | | | | ● | | ● | |

**Table 21**

27
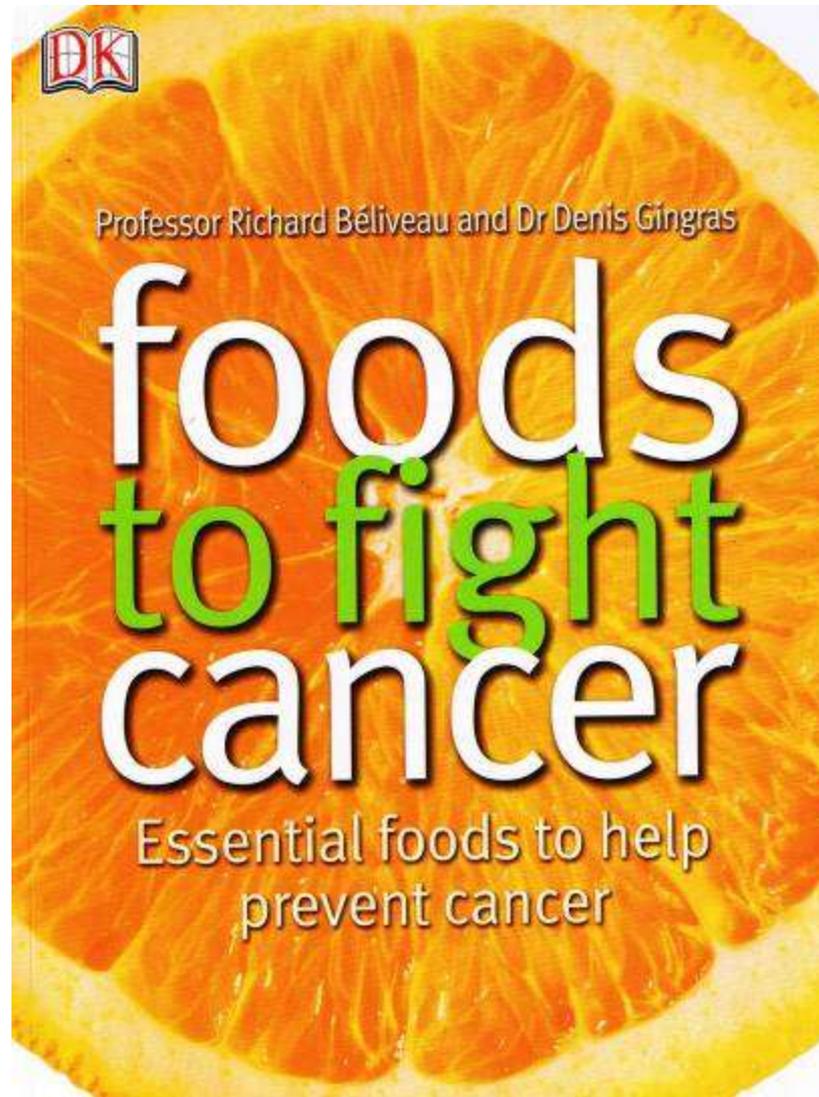
**To see more details, refer to the book**

**Recommended reading → the book,**

**(Be in control to protect our life and our family).**

**Simple adjustments to lifestyle can protect from life threatening diseases.**