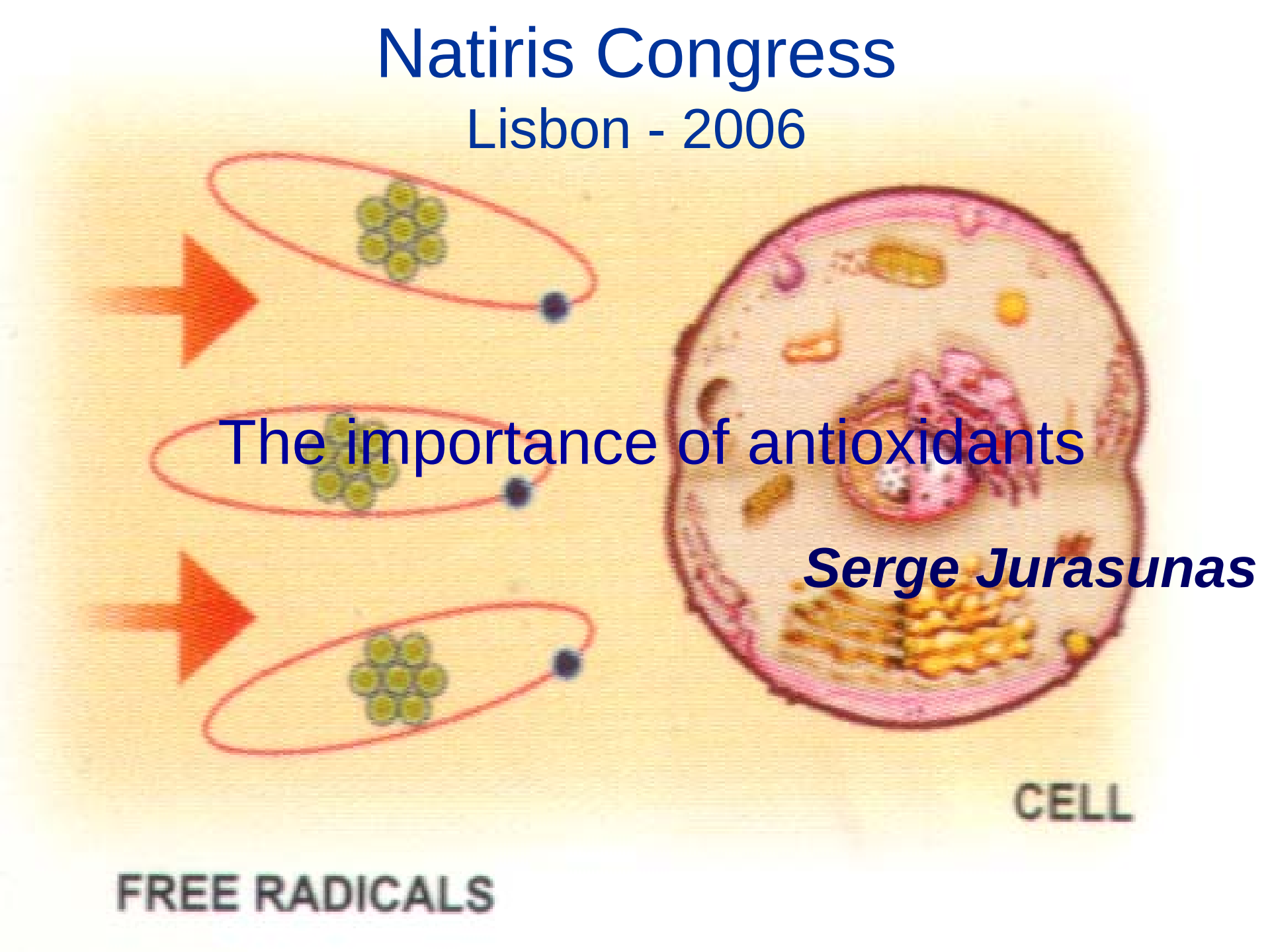
Natiris Congress

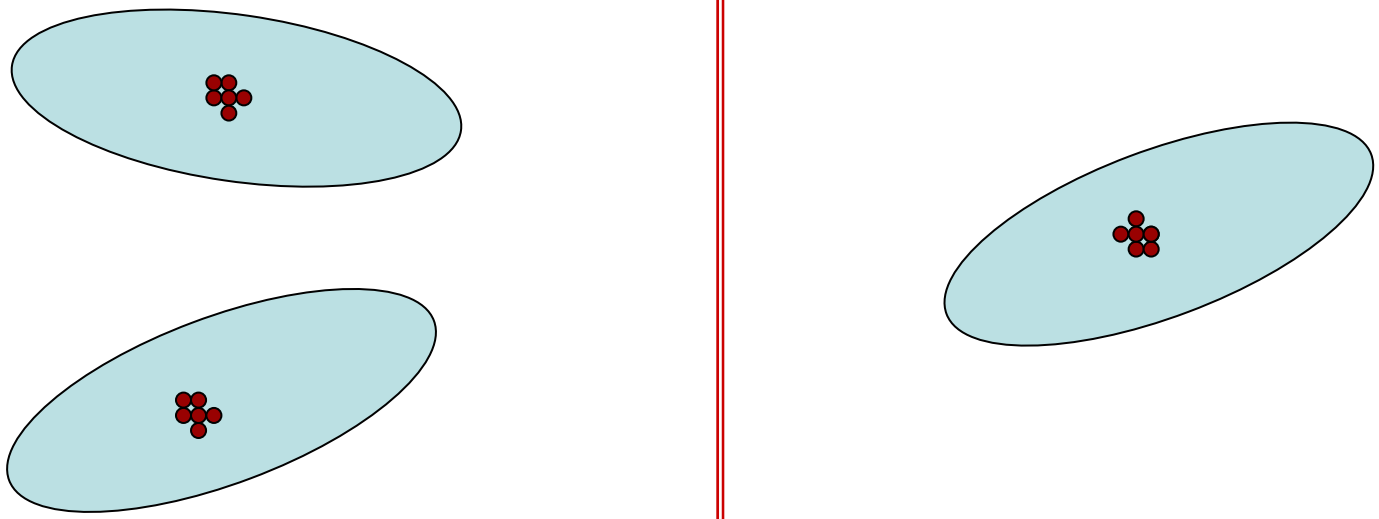
Lisbon - 2006



The importance of antioxidants

Serge Jurasunas

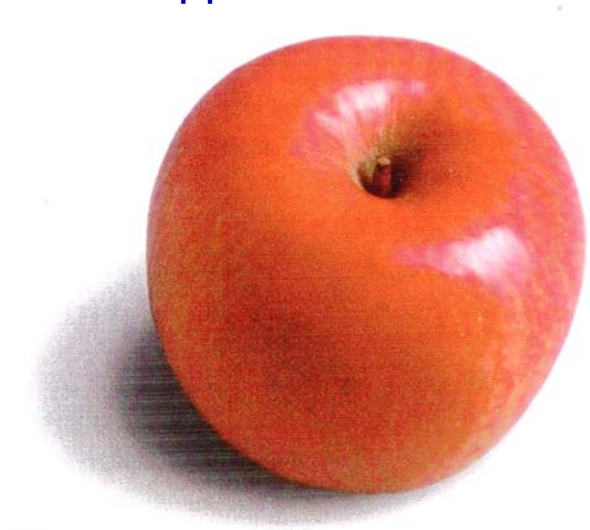
Free radicals → antioxidants



A new medical and nutritional conception to understand prevent and participate in the treatment of diseases

Free radicals = The most important medical discovery of the XX century discovered by J. Mc. Cord

Good apple



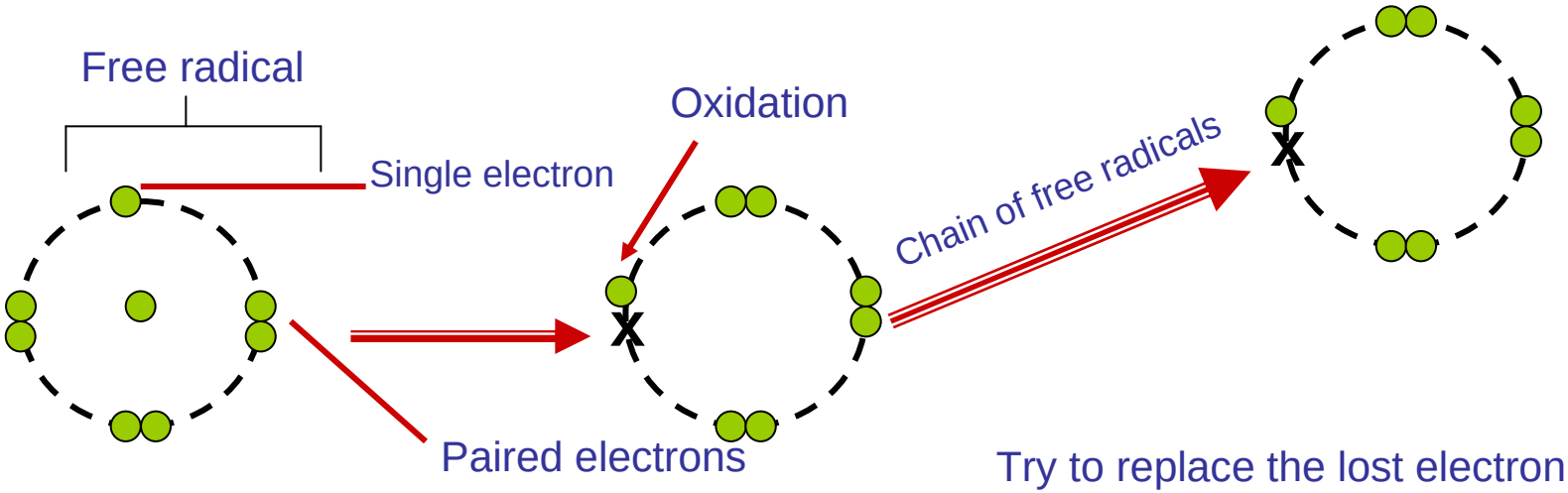
Healthy cell

Bad apple

Membrane oxidize by contact from oxygen atmosphere and light

Why an apple cut in two pieces turn brownish after few minutes or spoiled like this apple?
Oxygen is responsible for this process called oxidation, the same happens in our body.

Why oxygen can become a toxic product?



Atoms oxygen: 4 pairs of electrons

Try to replace the lost electron from any other cell membrane or molecule nearby.

With the lost of one or two electrons a oxy-molecule becomes instable

When oxygen is utilize by mammalian cells or during the process of energy making in the respiratory chain of mitochondria and other body's natural metabolism one or two electrons are robed and therefore the oxygen molecule become instable and become reactive.

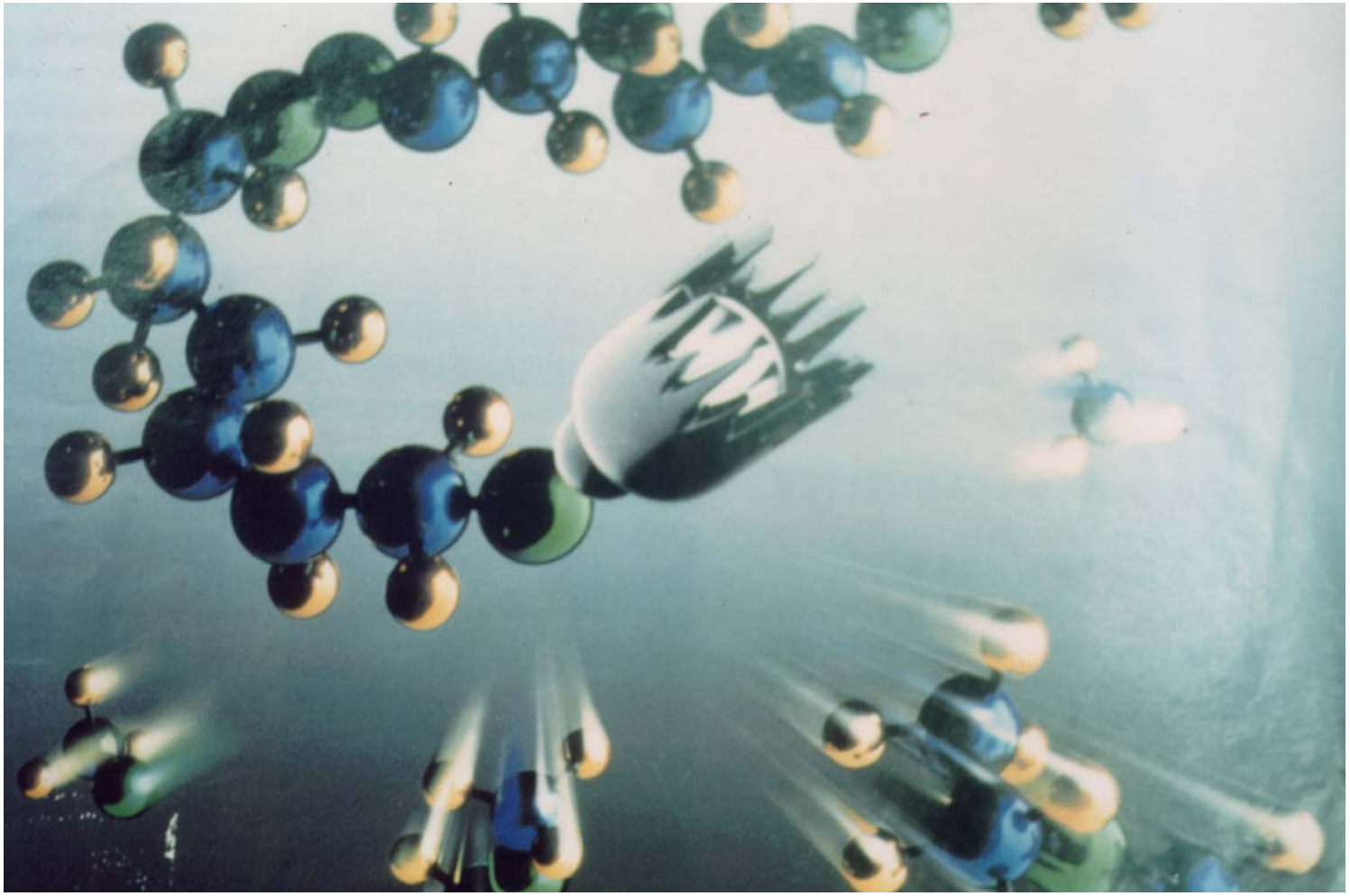
The reactive molecule from oxygen is called

A “Free radical”

Because it becomes independent and it is not anymore tied or linked to any other molecules.

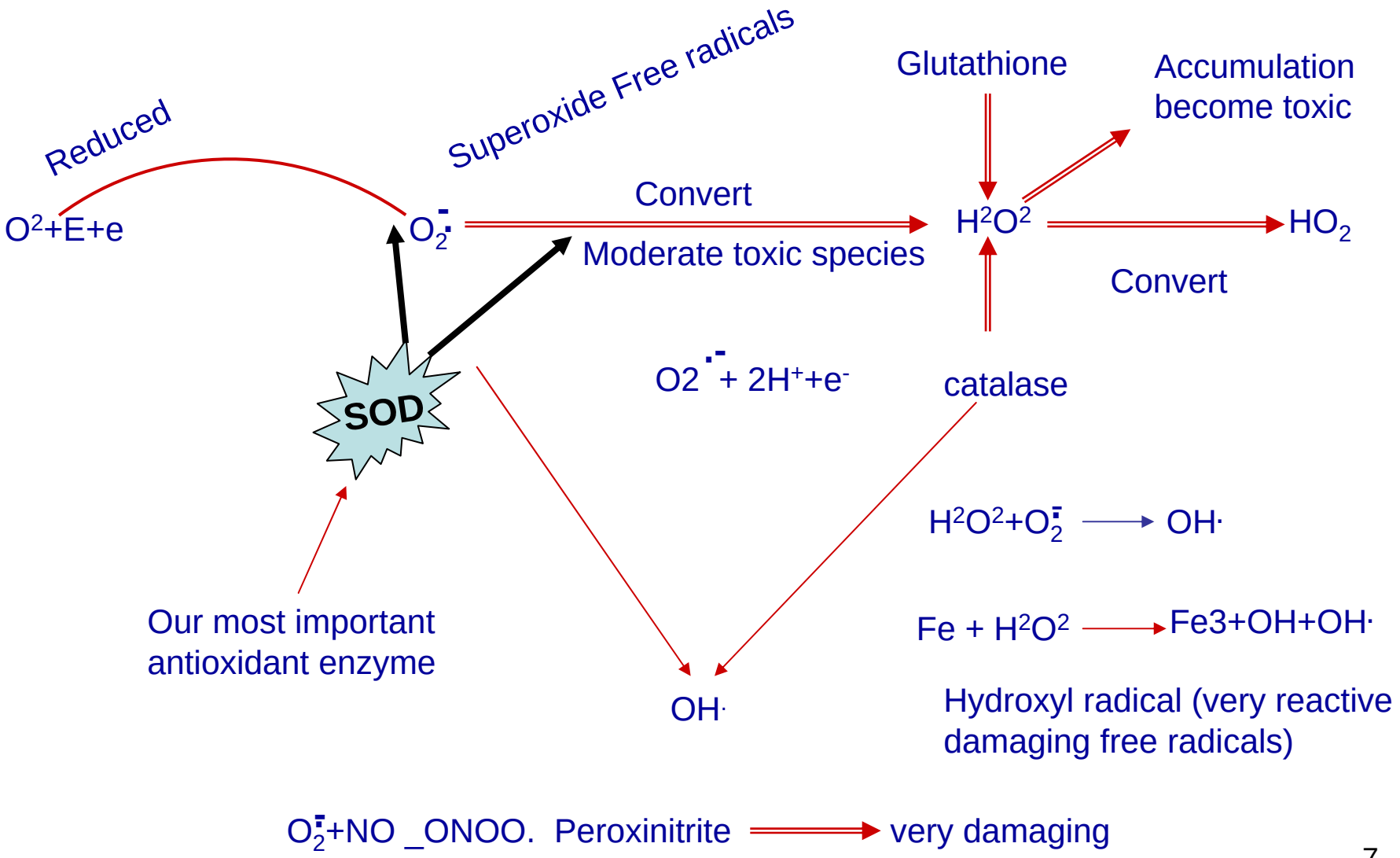
$O2 + e \longrightarrow O_2^{\cdot-} \longrightarrow$ The first free radical is called “superoxide”

There is other family of free radicals such hydrogen peroxidase (H^2O^2) hydroxyl radicals (HO.) more toxic and highly reactive. There are billions of free radicals outside and inside of our body that travel up to 300000 Km/s



Free radicals – (bound broken between molecular chain)

Our body is genetically build to cope with the excess of Reactive Oxygen Species (ROS)



Free radicals attack in human

10000 attack per day and per cell

Rats

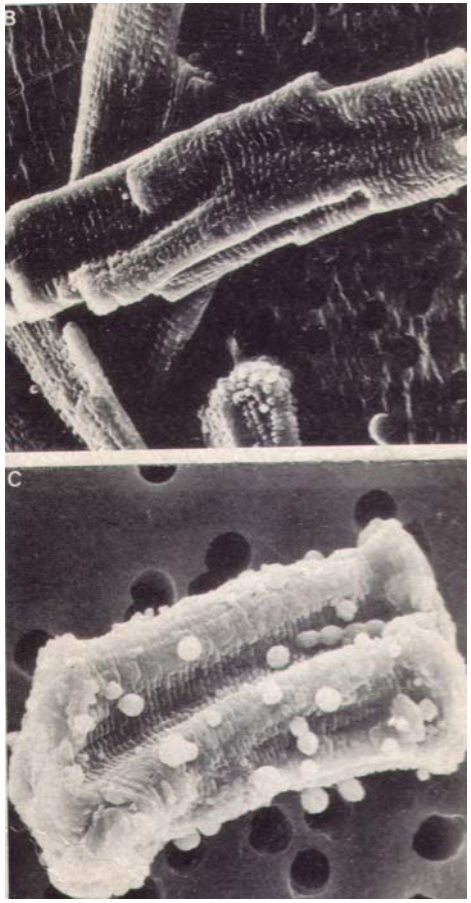
100000 attack per day and per cell

Human can live up to 100 years

Rats can live only 30 months because of the high rate metabolism of free radicals.

DNA repair mechanism

Free radicals



LOO. Lipid peroxidation chain

membranes

Fatty acids

receptor cholesterol

protein

Cell-to-cell

Carry hormones and proteins information from outside to inside

Molecule

relay

DNA

Information

$LH + LOOH + O^2 + L^{\cdot} = ROO^{\cdot}$ – Peroxyl radical

Lipid

Lipid peroxide

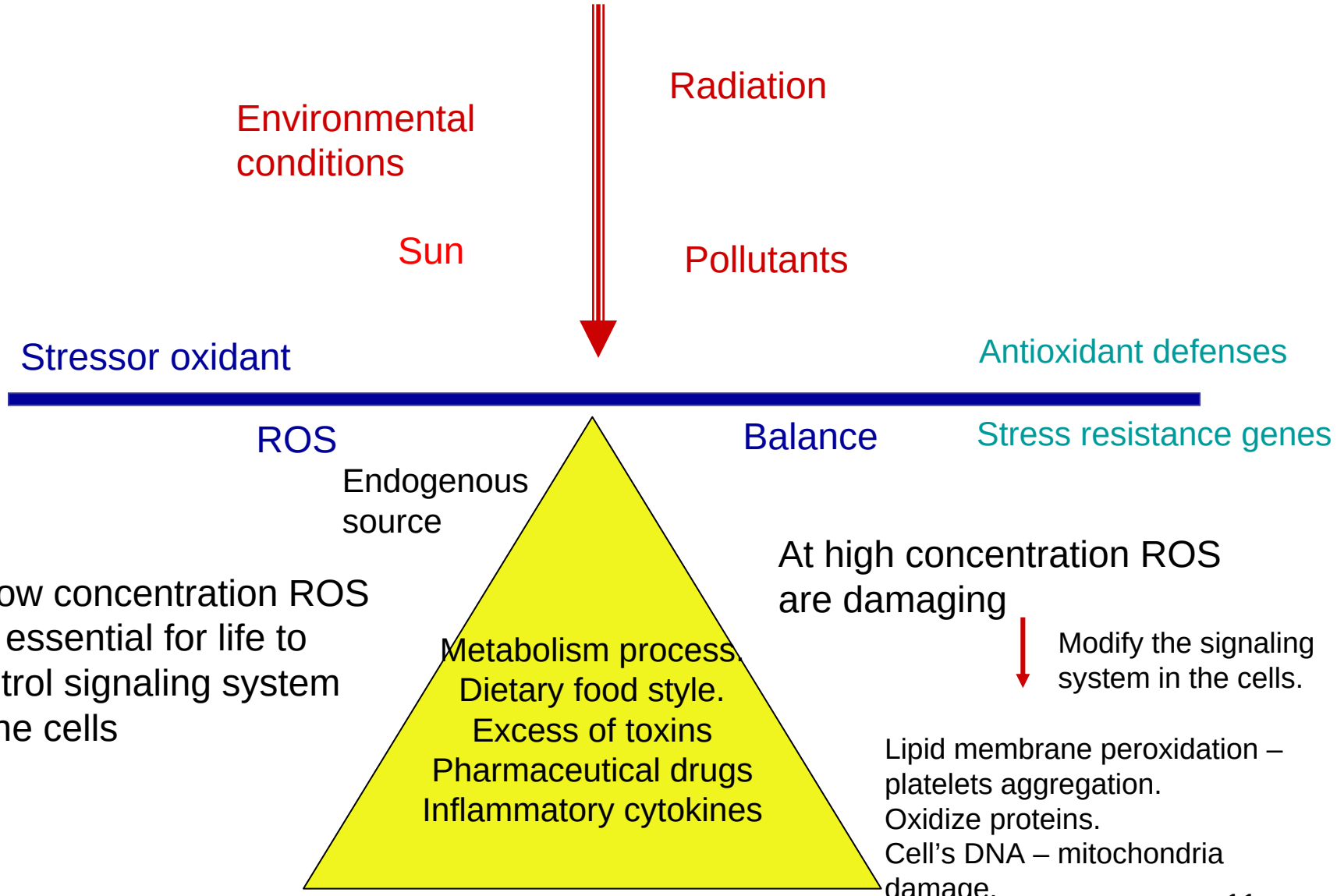
Lipid hydroxil

Vitamin E prevents lipid peroxidation

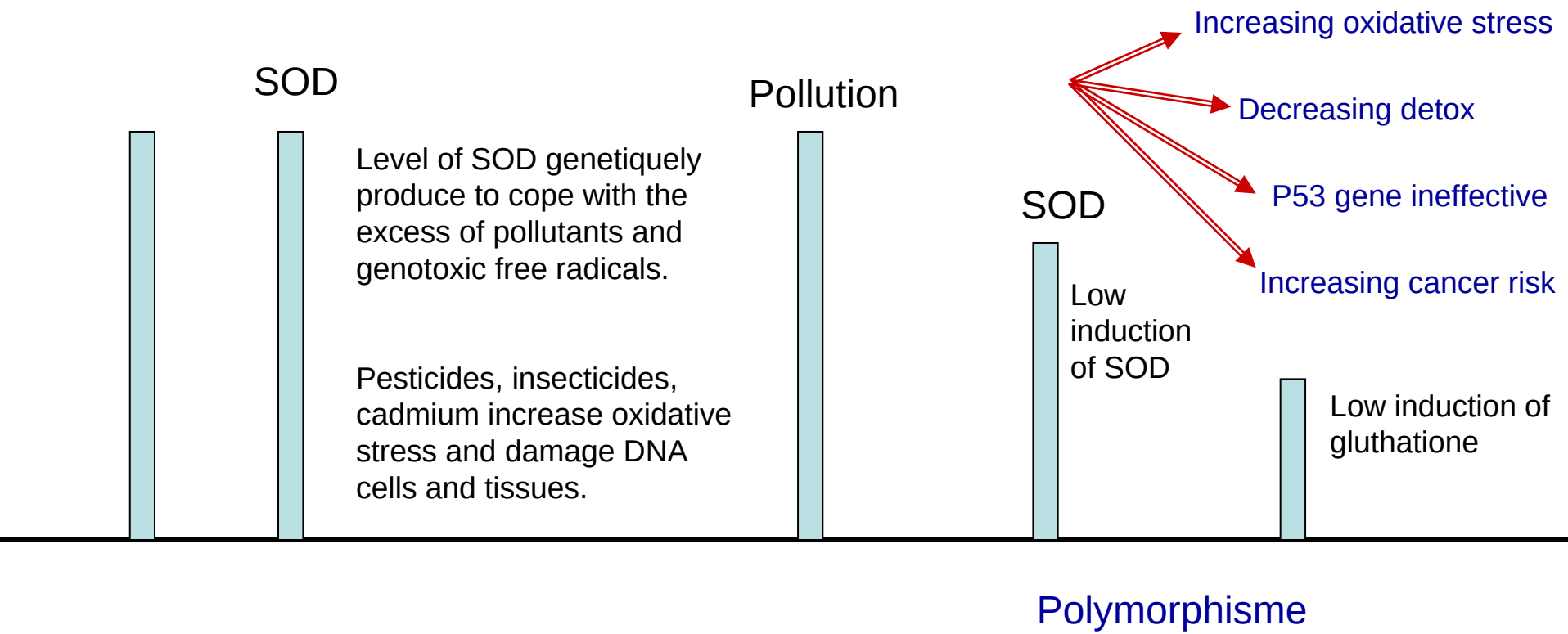
Lipid peroxidation levels and SOD activity in health blood cells, tissues and organs

	Tissue	Lipid peroxide levels (nmol/mg protein)	SOD activity (unit/mg protein)
Blood cells	erythrocytes	0.08±0.02 (62.3±11 nmol/g Hb)	**89±6.6**
	T lymphocytes	1.26±0.08	5.8±0.7
	B lymphocytes	0.91±0.07	3.1±0.5
	monocytes	0.48±0.03	1.5±0.1
	macrophages	0.44±0.03	1.2±0.2
	neutrophils	0.59±0.04	2.0±0.4
	Platelets	0.96±0.07	3.9±0.6
Skin, muscle	Epidermis/dermis	0.72±0.07	8.4±1.2
	Dermis/fat tissue	0.61±0.06	6.5±1.8
	Muscle	0.55±0.05	2.9±0.5
Internal organs	Liver	**1.12±0.10**	**66.7±9.6**
	Kidney	**1.04±0.10**	**60.2±8.9**
	Spleen	0.84±0.07	41.2±5.3
	Lung	0.79±0.07	37.5±4.5
	Pancreas	0.66±0.05	24.6±3.1
	Stomach	0.56±0.05	9.6±1.1
	Small intestine	0.53±0.04	9.3±1.2
	colon	0.40±0.03	6.1±0.8

Balanced antioxidants on Oxidant Stressor



Pollution and the antioxidant defense



Middle age individuals are now unable to cope from the excess of pollution from a genetic difference to induce SOD and glutathione antioxidant enzyme.

Cancer: Biological clue indicating the body has been assaulted by cancer causing agent.

HEALTH	CANCER
Normal	
Levels of antioxidant is High.	Levels of antioxidant is low.
Efficient immune function.	Immune function is low.
Activation of genes involved in detoxification of chemicals.	Activation of genes involved in detoxification is high.
DNA repair system.	DNA repair inefficient.
Apoptosis over mitosis.	Apoptosis over mitosis is abnormal.

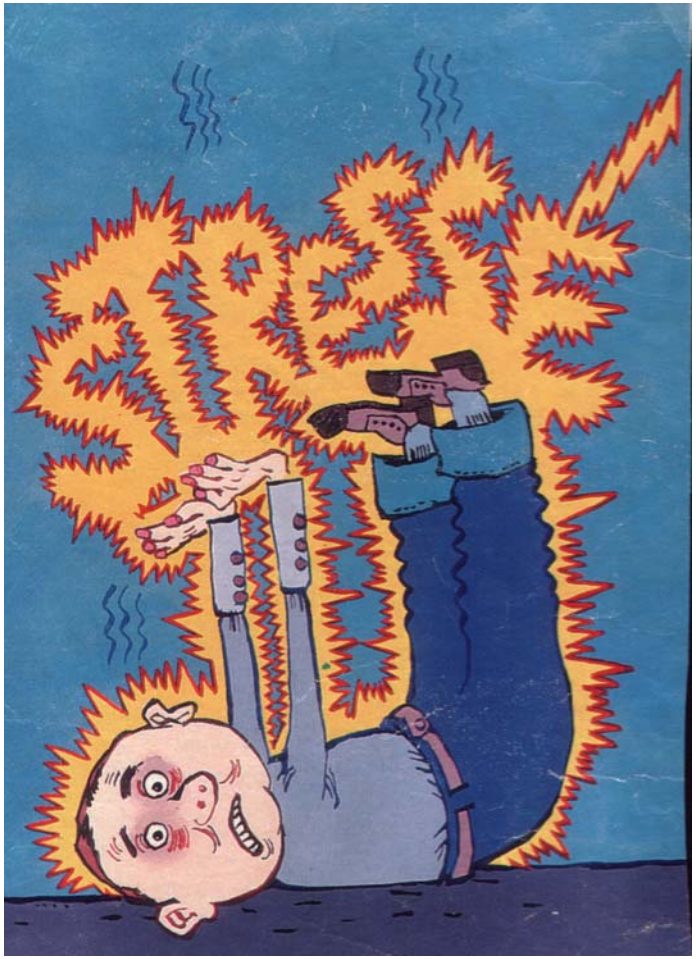
Vitamin C, E, betacarotene and glutathione decrease chomosomal damage produced by ionizing radiation and chemical carcinogens. (1)

High levels of antioxidant block the formation of cancer causing agents from exposure to pollution and thus reduce the risk of cancer

(1) Kedar N. Ph.D. Director of the Center for vitamins and cancer research – University of Colorado, School of Medicine

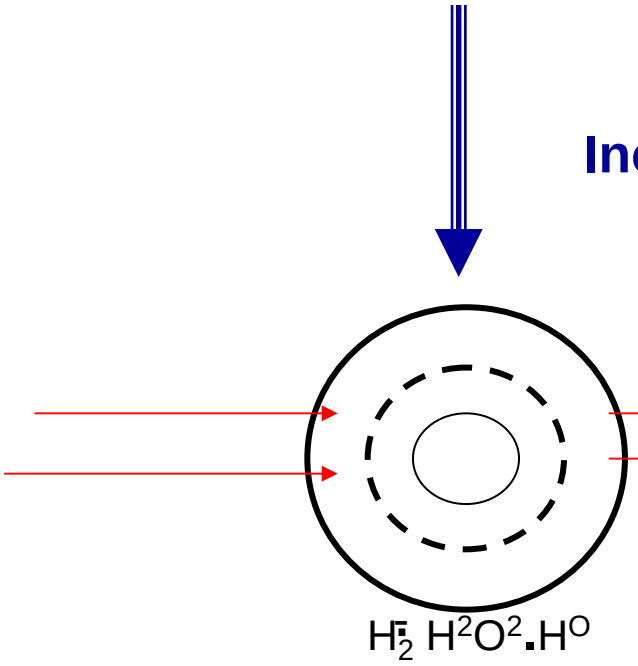
Stress: Nerve tension, emotivity, anxiety, sensorial, physical, intellectual work

Develope a condition of stress in the body (and brain) by the overproduction of hormons (cortisol adrenaline) via the Hypothalamus and suprarenal gland that increase free radicals activity in blood, tissues and brain.



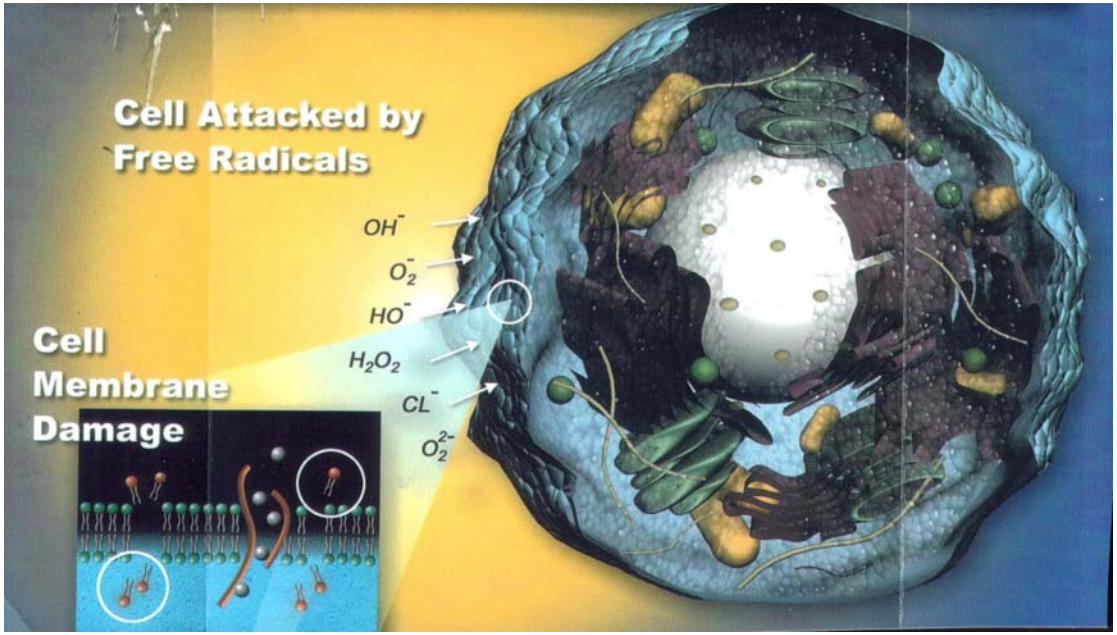
Hormonal storm

Cellular response to stress



High steady state level of Oh8GUA in urine

Oxidative Stress is the result of three factors:



1 – An increase in oxidant generation.

2 – A decrease in antioxidant protection.

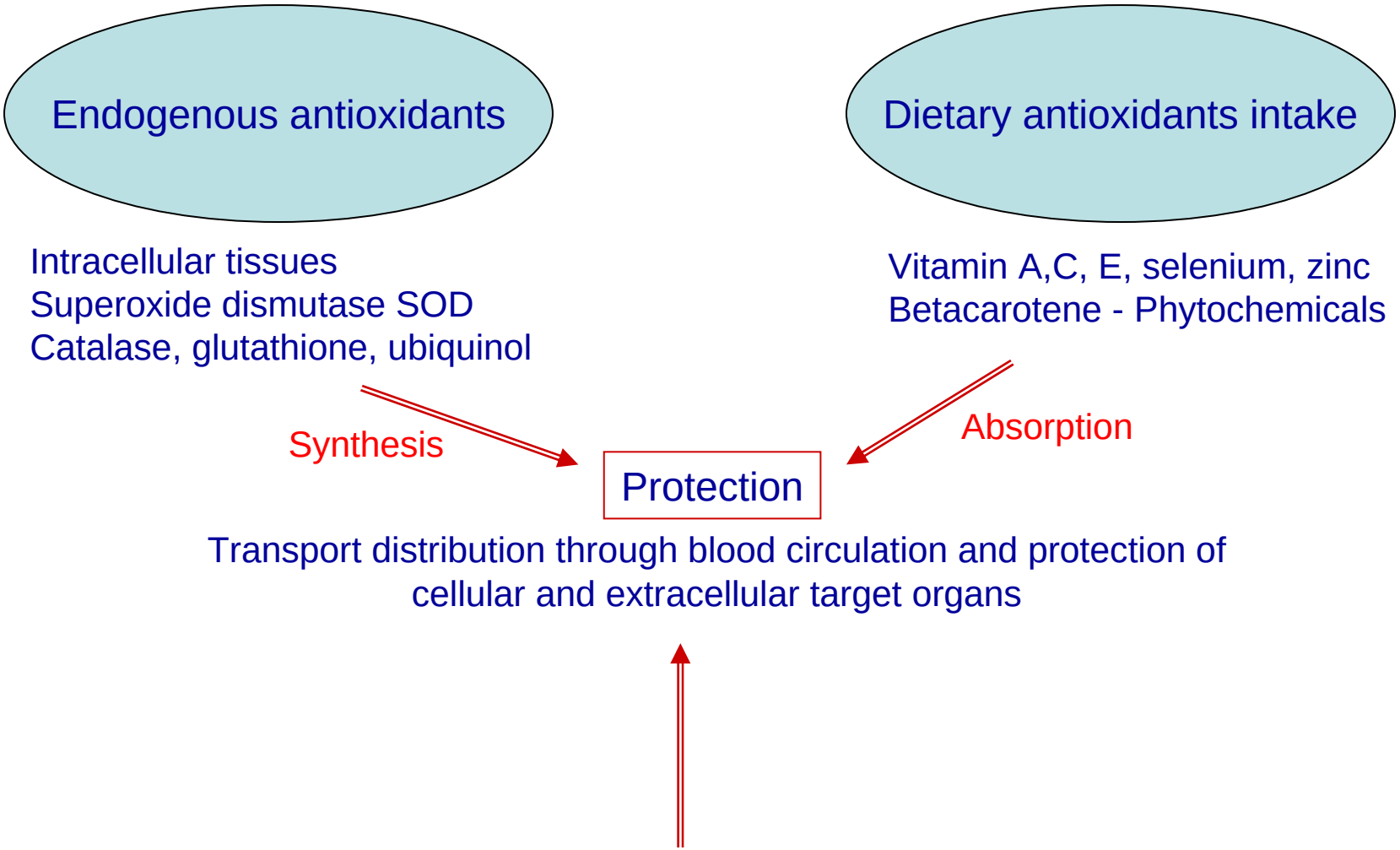
3 – A failure to repair oxidative damage.

Many lines of study demonstrate the link between excess of ROS activity, low antioxidant status and pathologies

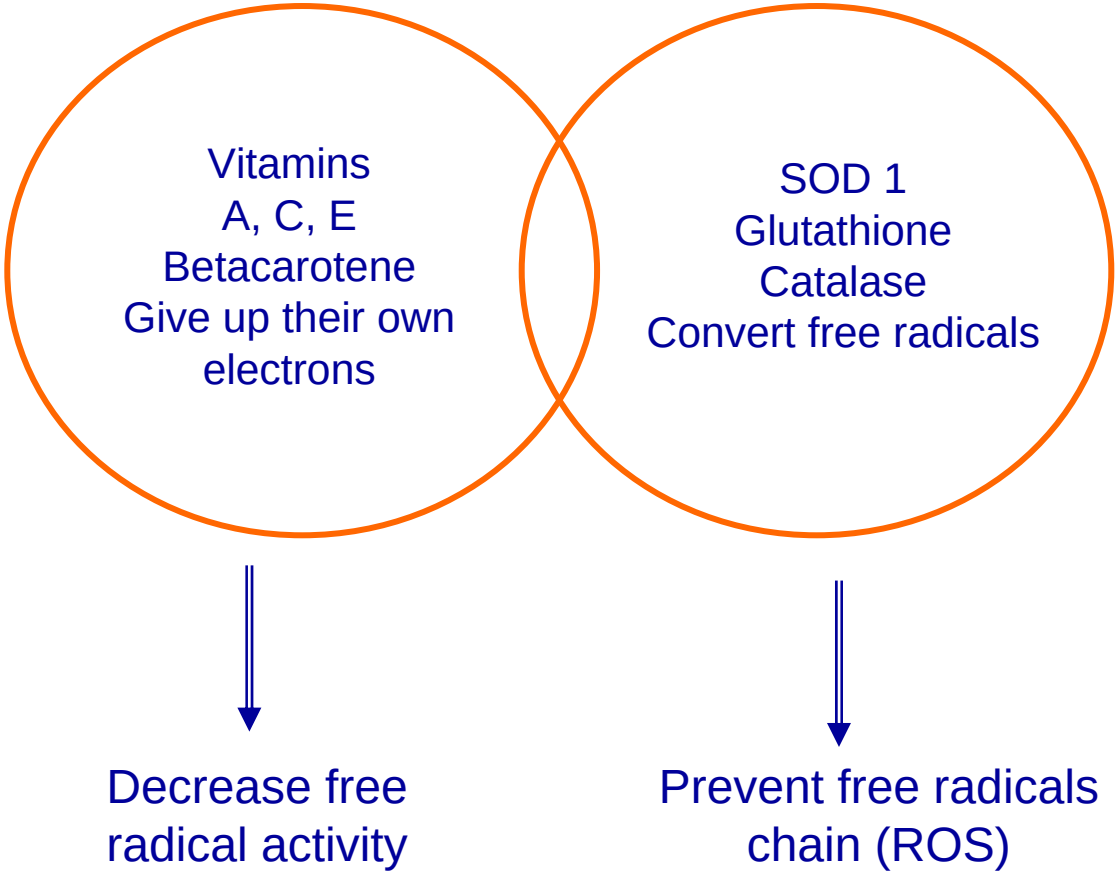
Oxidative Stress

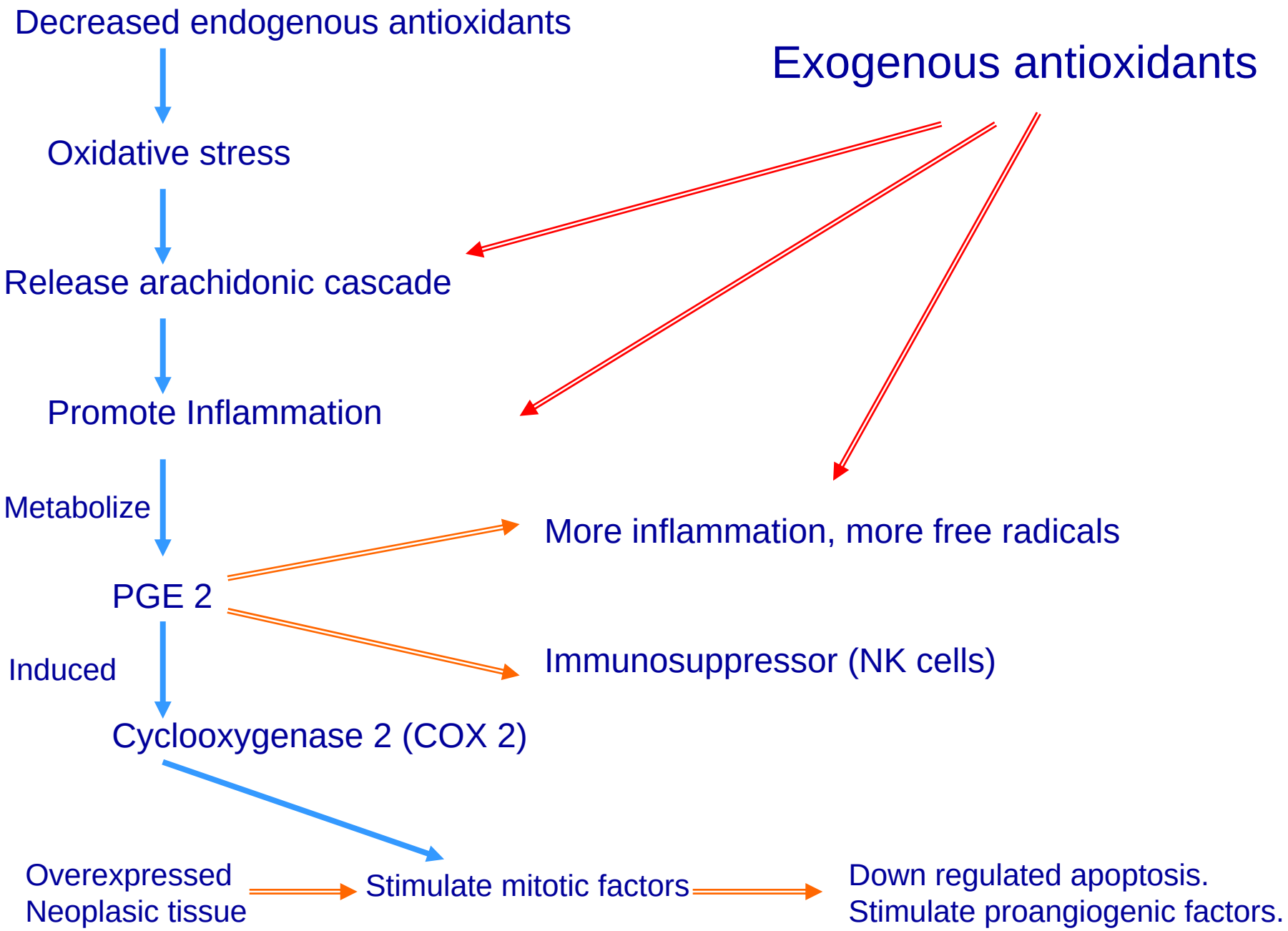
- Brain stroke
- Heart stroke
- Atherosclerosis
- Neurological disease
- Oncological disease
- Macula degeneration
- Gastrointestinal disease
- Parkinson
- Rheumatoid disease
- Physiological breakdown
- Cognitive disorders and memory breakdown
- Earlier aging

Antioxidant defense



Low molecular antioxidants compound end-up the free radical chain




Decreased endogenous antioxidants
Exogenous antioxidants
Oxidative stress
Release arachidonic cascade
Promote Inflammation
Metabolize
More inflammation, more free radicals
PGE 2
Immunosuppressor (NK cells)
Induced
Cyclooxygenase 2 (COX 2)
Overexpressed
Neoplasic tissue
Stimulate mitotic factors
Down regulated apoptosis.
Stimulate proangiogenic factors.

Do antioxidants are able to manipulate the excess of ROS activity and prevent or participate in the treatment of disease?

Yes, many lines of research and thousands of scientific papers now demonstrate that exogenous antioxidants can play a key role in prevention and support during the course of a disease including cancer. Some new research demonstrate that antioxidants and specially SOD may modelate the redox signal tranduction pathways in the treatment of cancer and inhibit tumor growth.

Dietary Antioxidant and Human Cancer

Epidemiological studies show that a high intake of antioxidant-rich foods is inversely related to cancer risk.

While animal and cell cultures confirm the anticancer effects of antioxidants by their ability to reduce cancer risk such in prostate colon and breast cancer.

Cancer treatment by radiation and drugs reduces inherent antioxidants and induce oxidative stress, which increases with disease progression.

Vitamin E, C, gluthatione, superoxide dismutase (SOD) have been shown to ameliorate adverse side effects associated with free radical damage to normal cells in cancer therapy and to reduce the recurrence of breast cancer.

Experimental studies show that antioxidant vitamins and some phytochemicals selectively induce apoptosis in cancer cells but not in normal cells and prevent angiogenesis and metastatic spread. (angiogenic response in vascular tissue is triggered by ROS signaling that plays a crucial role from its direct role as mediator of angiogenesis and inhibition of angiogenesis with free radicals scavengers and/or antioxidant (1)

Therefore it is suggested that antioxidant have a potential role as adjuvants in cancer therapy (2)

1. Nilanjana Maulik – Redox Signaling of Angiogenesis – Antioxidants x redox Signaling – Vol 4, Number 5.805.815 – 2002
2. Carma Borek Ph.D. – Antioxidants and cancer Therapy – Integ. Cancer Ther, December 1, 2004, 3 (4): 342.348

Categories in which antioxidants serve to balance metabolism function and serve as Biological Response Modifier.

-Detoxification

-Protection or inhibition from platelets aggregation

- Increase blood flow and oxygen supply to cells

-Immune modulation

-Modulate the signaling transduction pathway in the cells

-Genetic expression

-Protect our body against damaging pollutants

Antioxidant defences protect against some injury

SOD scavenge $O_2^{\cdot-}$ and lipid peroxide (LOOH)

Vitamin C scavenge superoxide ($O_2^{\cdot-}$) and hydroxyl radical (·OH)

.

Vitamin E scavenge peroxyl radical (ROO·) and alkoxyl radical (RO**.**) Lipid peroxidation of membrane

Beta-carotene scavenge peroxyl radical (ROO**.**) and alkoxyl radical (RO**.**)

Flavonoids scavenge hydroxyl radical (**.**OH) peroxyl radical (ROO**.**) and other oxygen reactive species (ROS)

An answer to oxidative stress

Anoxe

A Biotechnological Innovation (SOD like activity)

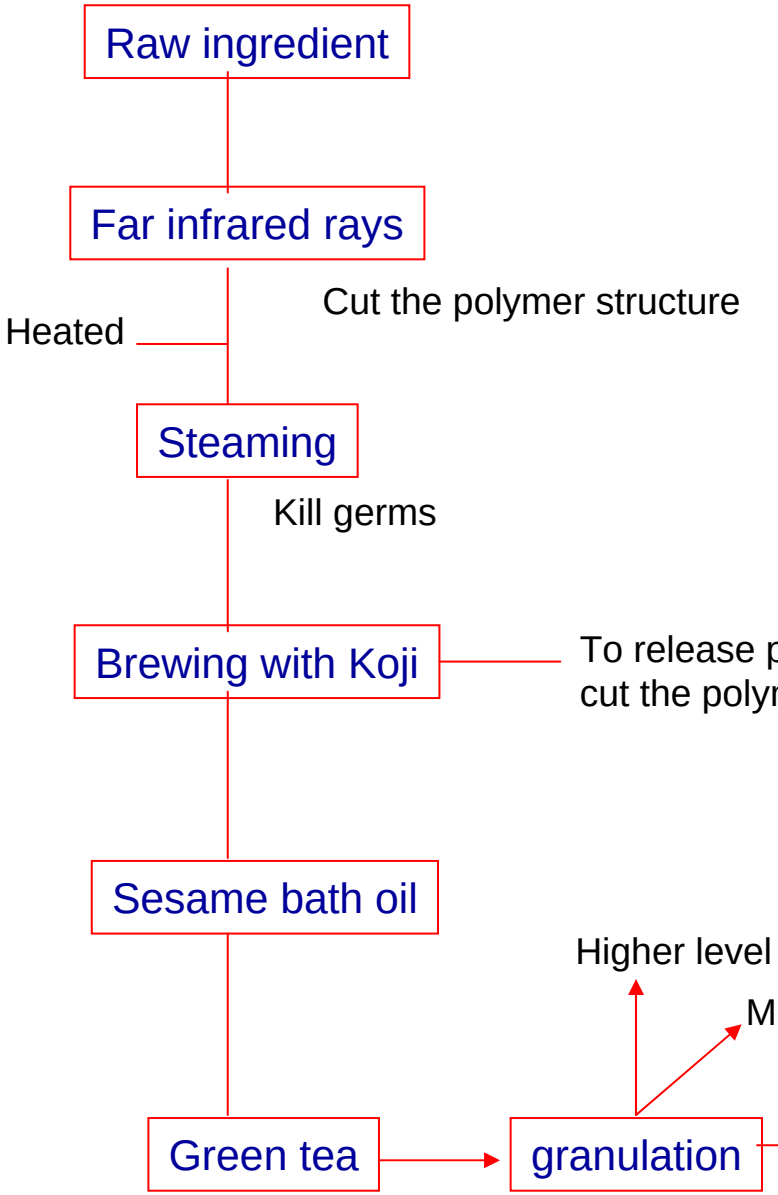
A low molecular weight antioxidant compound made from herbs quickly absorbed by the body for immediate healing.

Anoxe – Low molecular antioxidant compound
SOD like activity – 7.3 x 1,000 unit/g

Plants/herbs	Active Ingredients	Pharmacological effects
Vegetable basis Soya bean Japanese darkon raddish Rice bran Green tea Wheat germ Yuzu orange Hatomugi Sesame seed	Vitamin A.C.E. Beta-carotene Catalase Glutathione Riboflavine Polyphenols Flavonoids Tannin Catechin With a SOD like activity	Decrease ROS activity Anti-inflammatory property Decrease and inhibit Lipid peroxidation Inhibit cyclooxygenase 1-2 Possess high redox potential suggesting to induce apoptosis. Balance antioxidant activity in blood plasma. Protect RBC´s – WBC´s from damage by free radicals. Strengh immune function.
Modified to extract low molecular antioxidants fully active	Very quick absorption into the body	

Dr. Serge Jurasunas 2005

Preparation of Anoxe

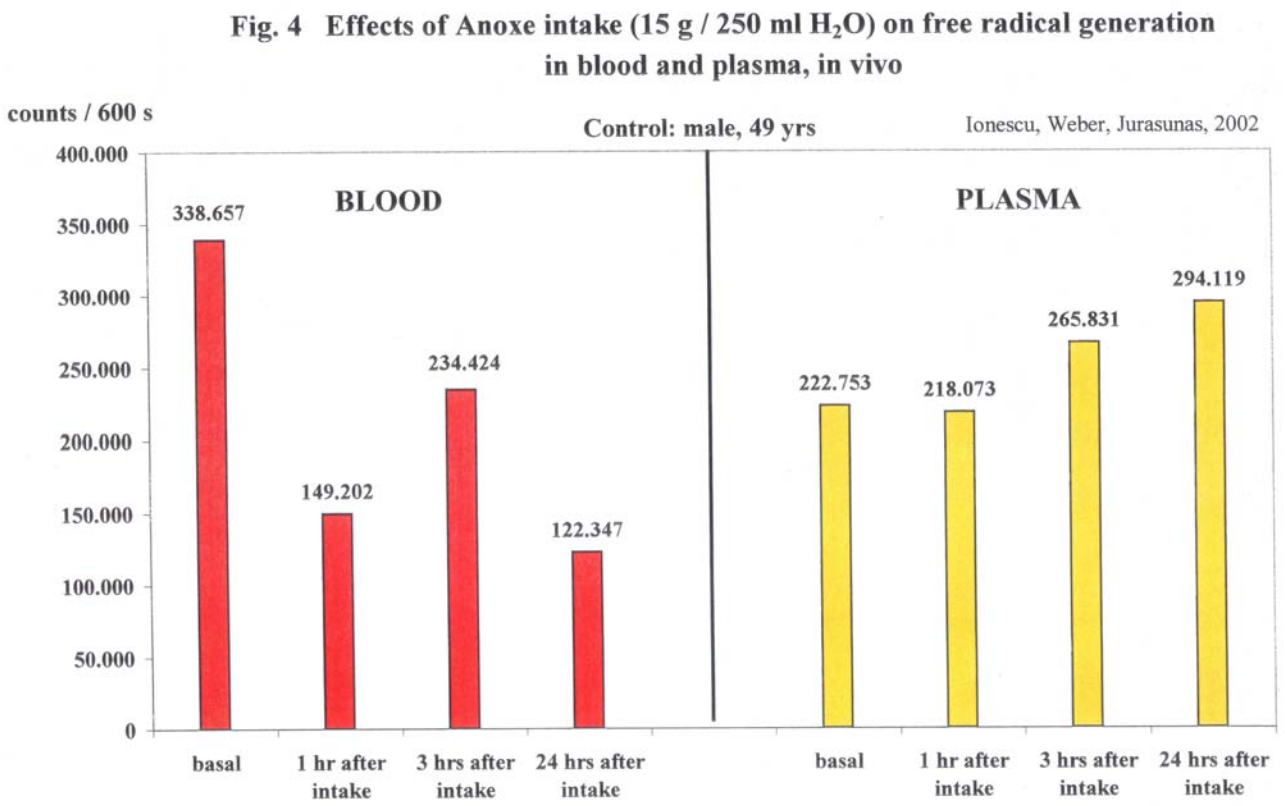


Comparison

	before	Final preparation
Riboflavin mg	0.14	0.53
	Tannin –0.6	1.6
	Carotene 0.12	0.27

Oral SOD and catalase tablets not effective.

The most significant ROS – inhibition was registered at 1 hr and 24 hrs after 15g of Anoxe intake



Potential application of Anoxe which has been study – By reducing or neutralizing the ROS cascade

1. Inflammatory disease
2. Gastro-intestinal disease
3. Atherosclerosis
4. “Jet Stress”
5. Rheumatoid disease
6. Diabetes
7. Heart disease
8. Neurological dysfunction
9. Cognitive dysfunction
10. Increase the body’s defense

Support in Oncological disease to protect healthy tissue and increase the efficiency of the cytotoxic therapy

How to measure free radical activity and oxidative stress

1 – Chemunolluminescence

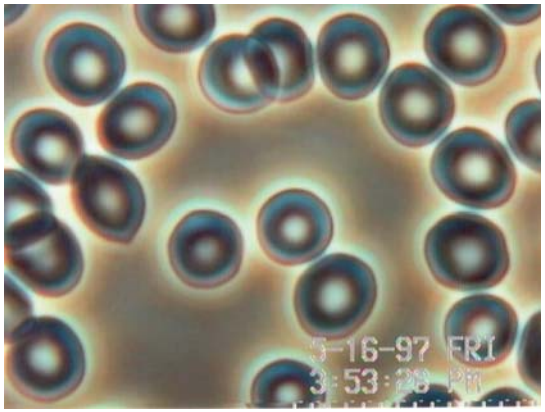
2 – Election spin resonance (magnetic field)

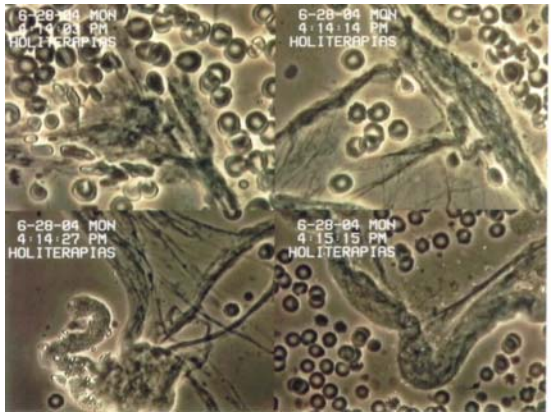
3 – Urine test (8 – Hydroxyguanine – Malondialdehyde (MDA)

4 – Peripheral blood analysis (High Morphology Blood Test)

Oxidative Stress profile

Method: High Resolution Blood Morphology to observe under a multi-phase optical microscopic system (40 x 18,000) the morphology and red cells, white cells and other information linked with free radical activity.





Platelets aggregation

Red blood cells aggregation

Microclot

Lipid ribbon and plaque

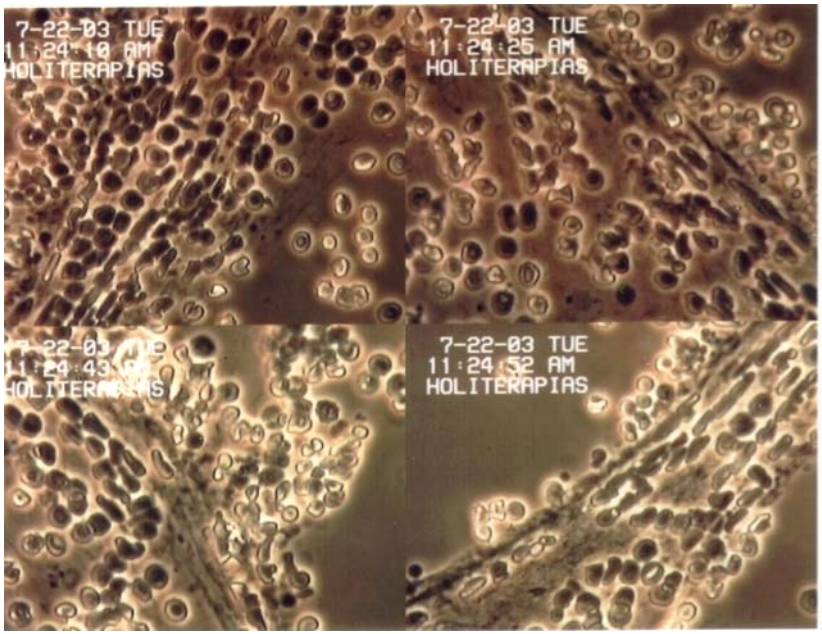
Fragile and disintegrated WBC's

Bacterial invasion etc.

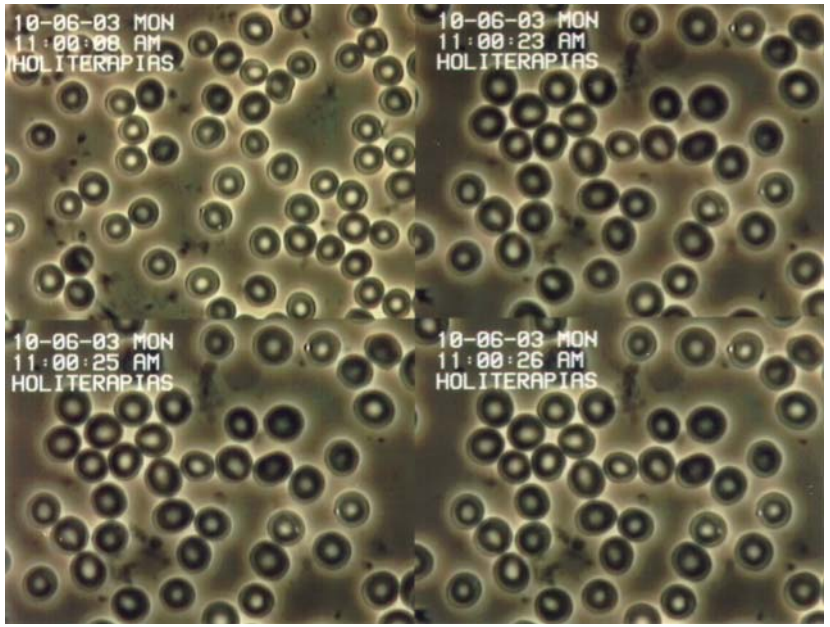
Abnormal shaped red blood cells

F – 10 years

Processes of red cells and platelets agglutination to make a thrombus.
High free radical activity and oxidize lipid

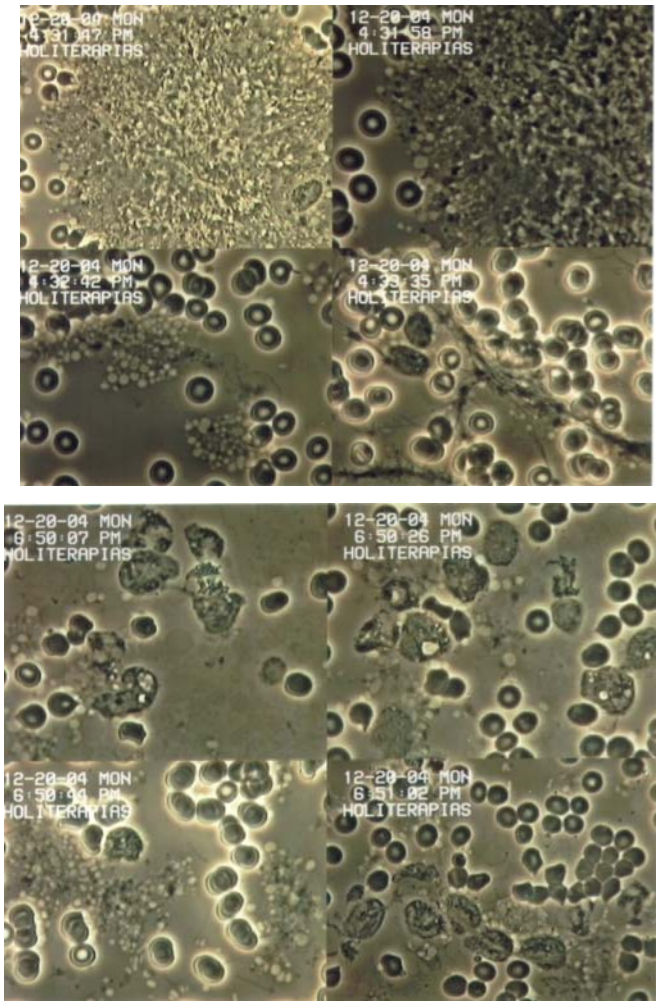


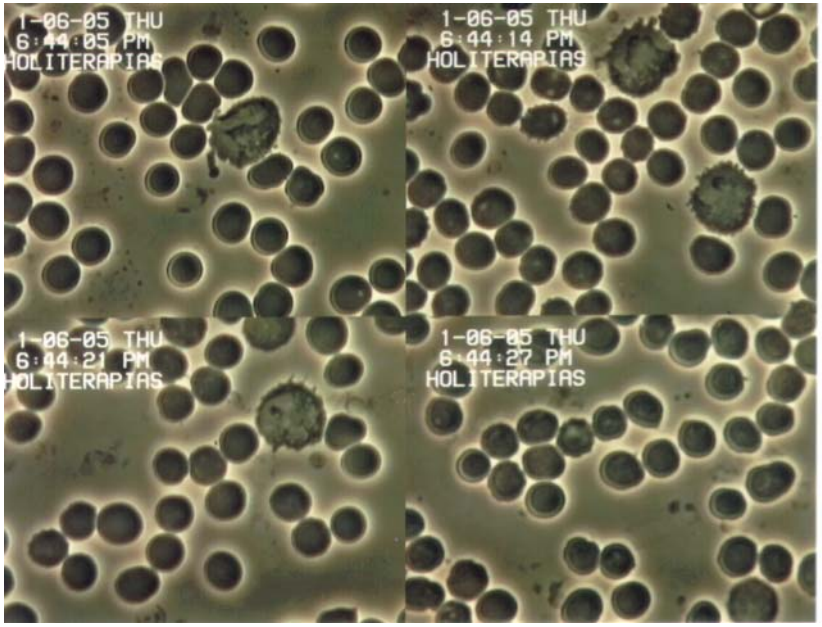
Before the therapy



3 months after the therapy

F – 80 years
Rheumatoid arthritis – heart disease degenerative condition.
Excess of lipid peroxide, platelets aggregation, fungal invasion and excess of white cells.





After 16 days taking 18g of Anoxe per day.

Posology of Anoxe

Course from one month to 3 months

Dosage per day (3g sachet of granule)

12g to protect against excessive oxidative stress

18g to 24g as support to pathological disease

18g per day against cognitive disorder

12g per day for nervous children under oxidative stress

12g to 18g during a course of detoxification

12g to contrecare excessive intake of pharmaceutical drugs that generate excessive free radicals

12g to 18g per day against inflammation and pains

For more information, scientific datas on antioxidants and the pharmacological effects of Anoxe:

www.sergejurasunas.com

Therapeutic application of a new low molecular antioxidant compound (Anoxe) in ROS activity.

International Symposium
8-12 July 2002 – St. Petersburg - Russia