Natural Antioxidants

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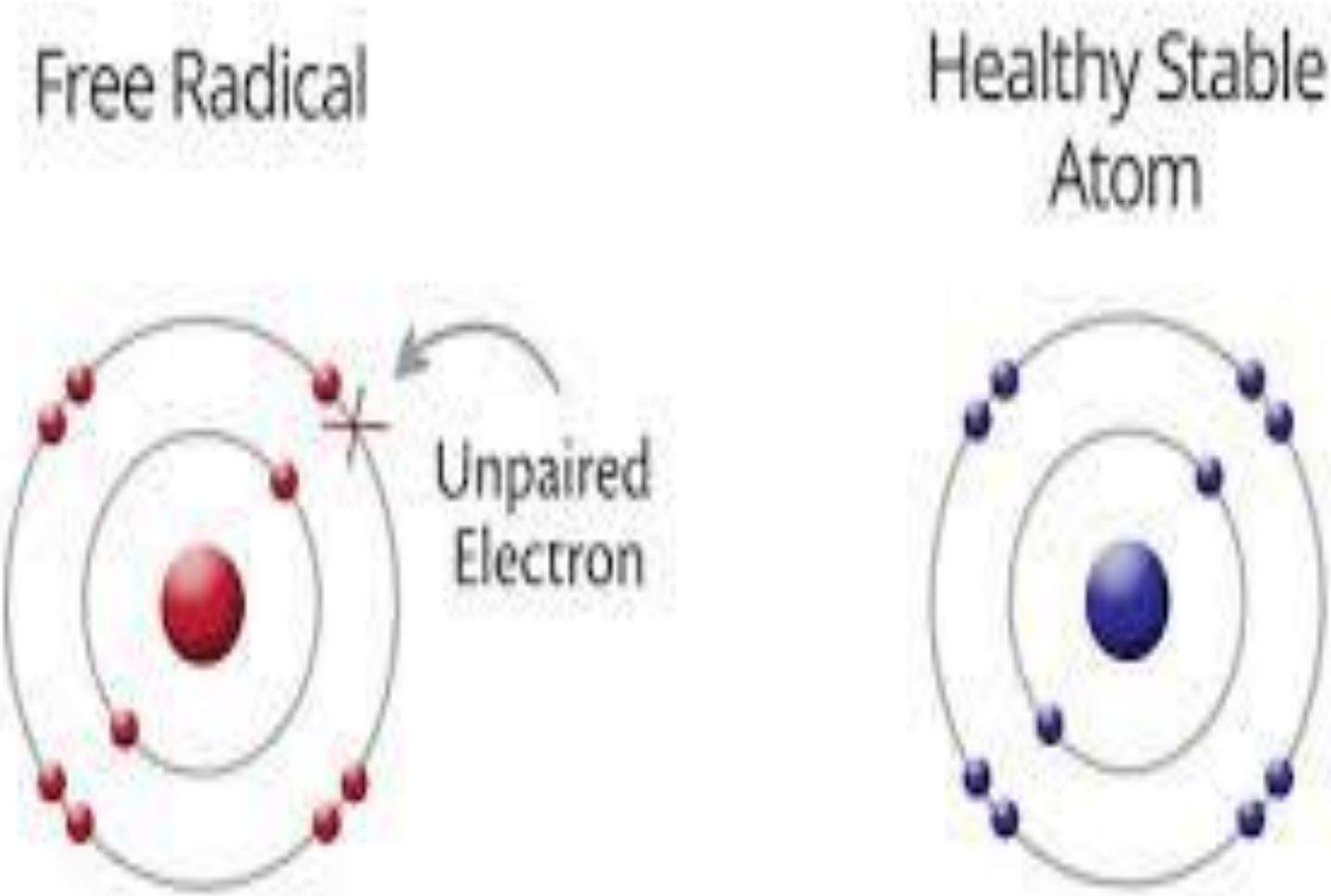
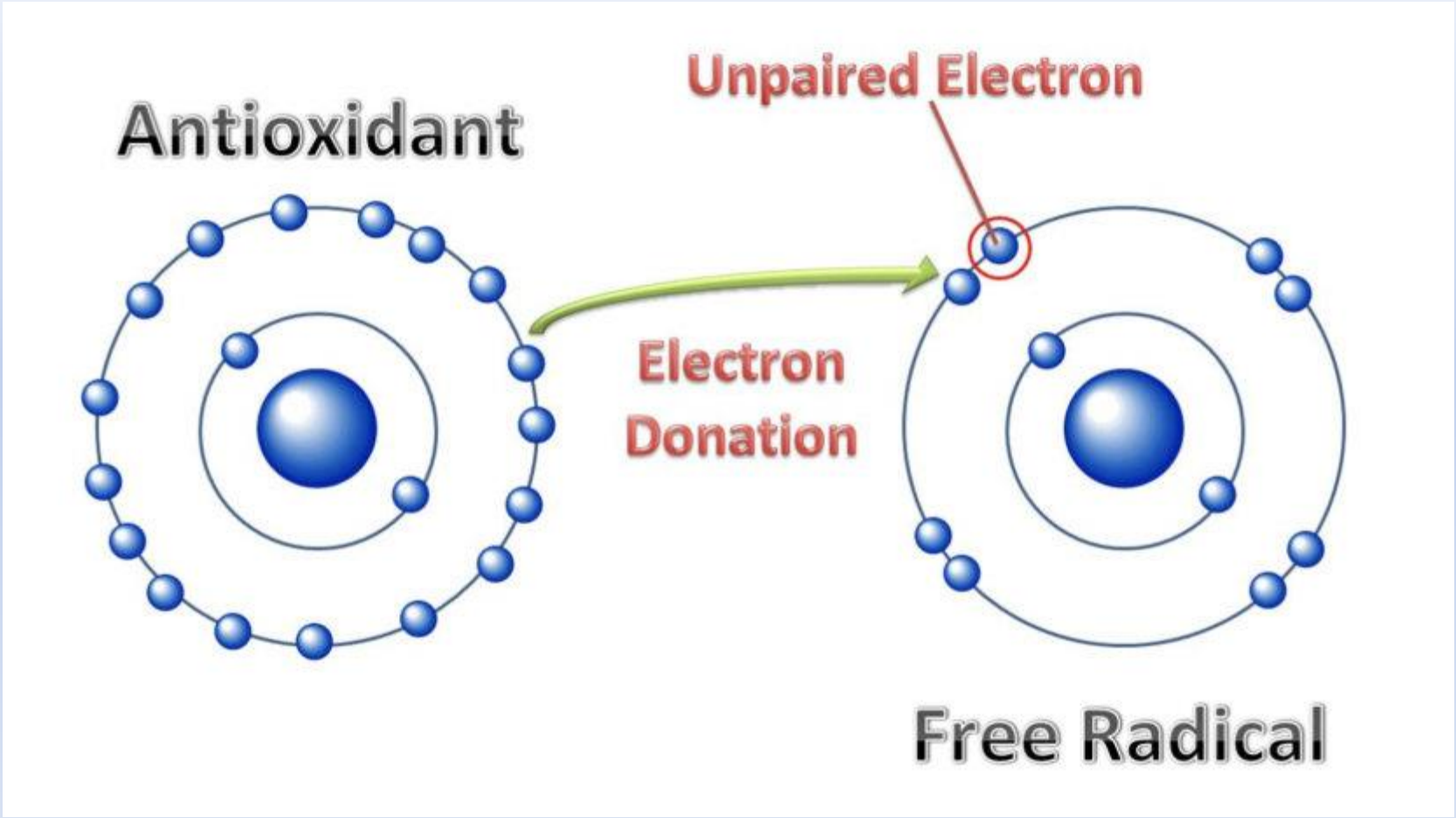
- Antioxidants are substances that can prevent or slow the damage to cells caused by free radicals. They are sometimes called "free-radical scavengers.“

- **Antioxidants** are a set of chemically different substances that inhibit oxidation.

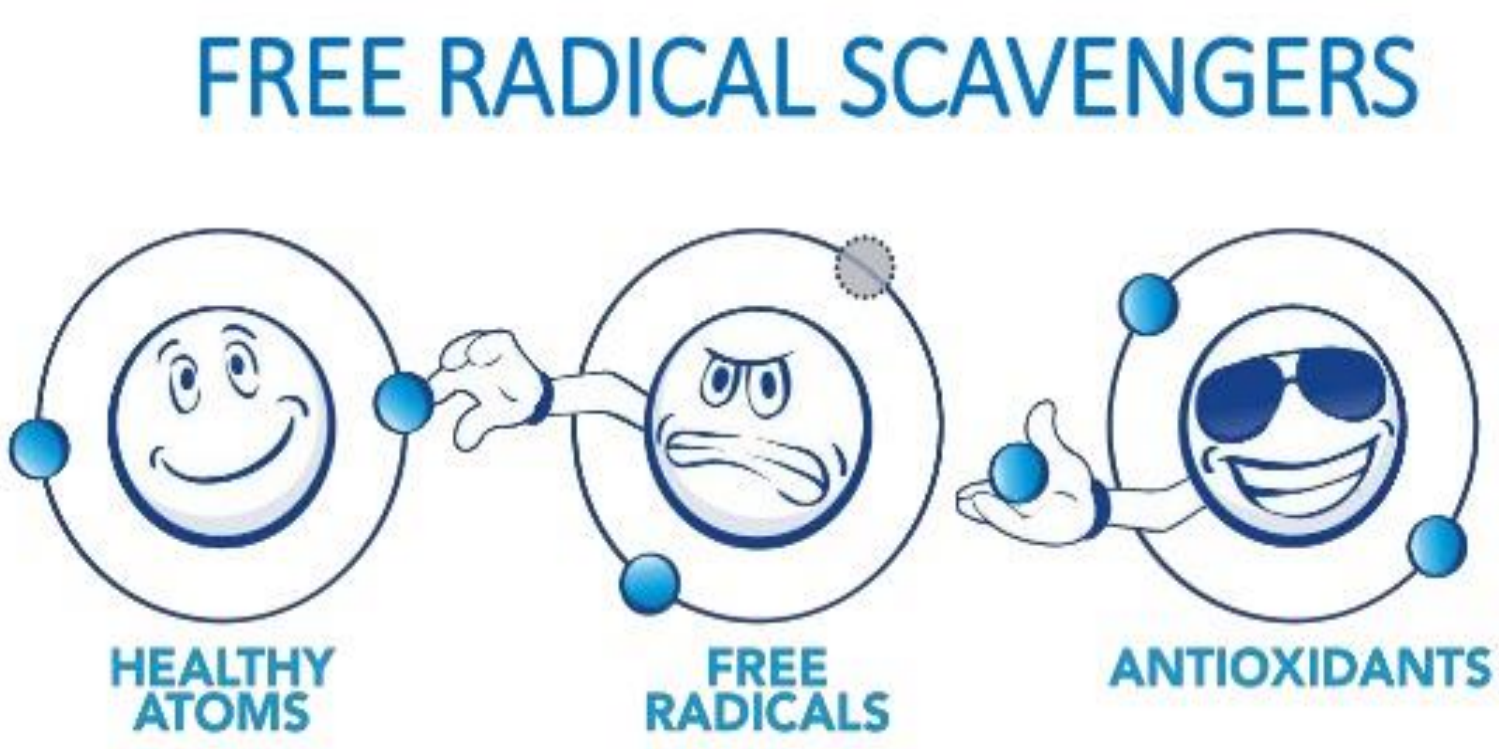
- **free radicals**, unstable molecules that the body produces as a reaction to environmental and other pressures.
- Free radicals are also known as reactive oxygen species (ROS).

Free radicals are molecules with one unpaired electron or two or more unpaired electrons that do not interact with one another.

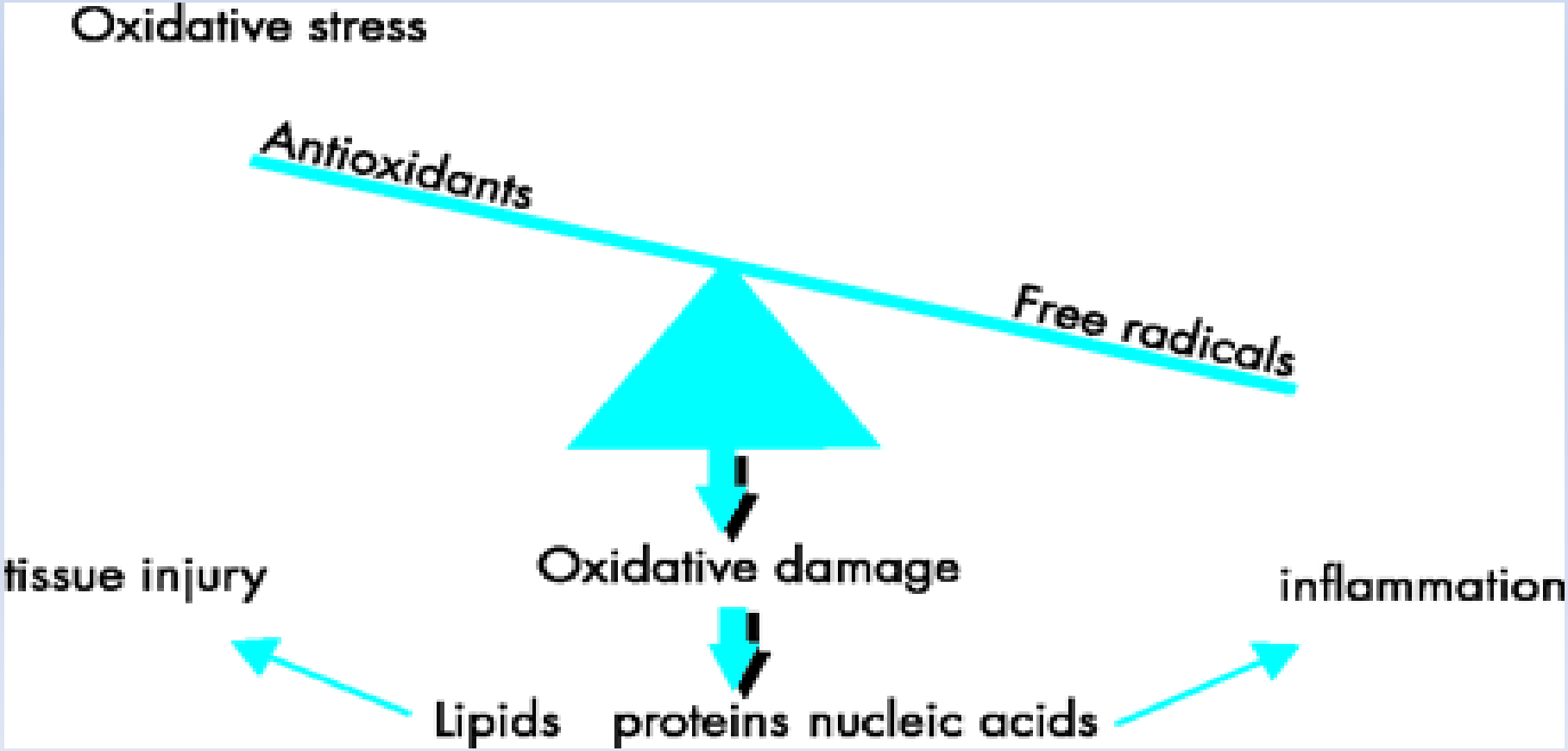


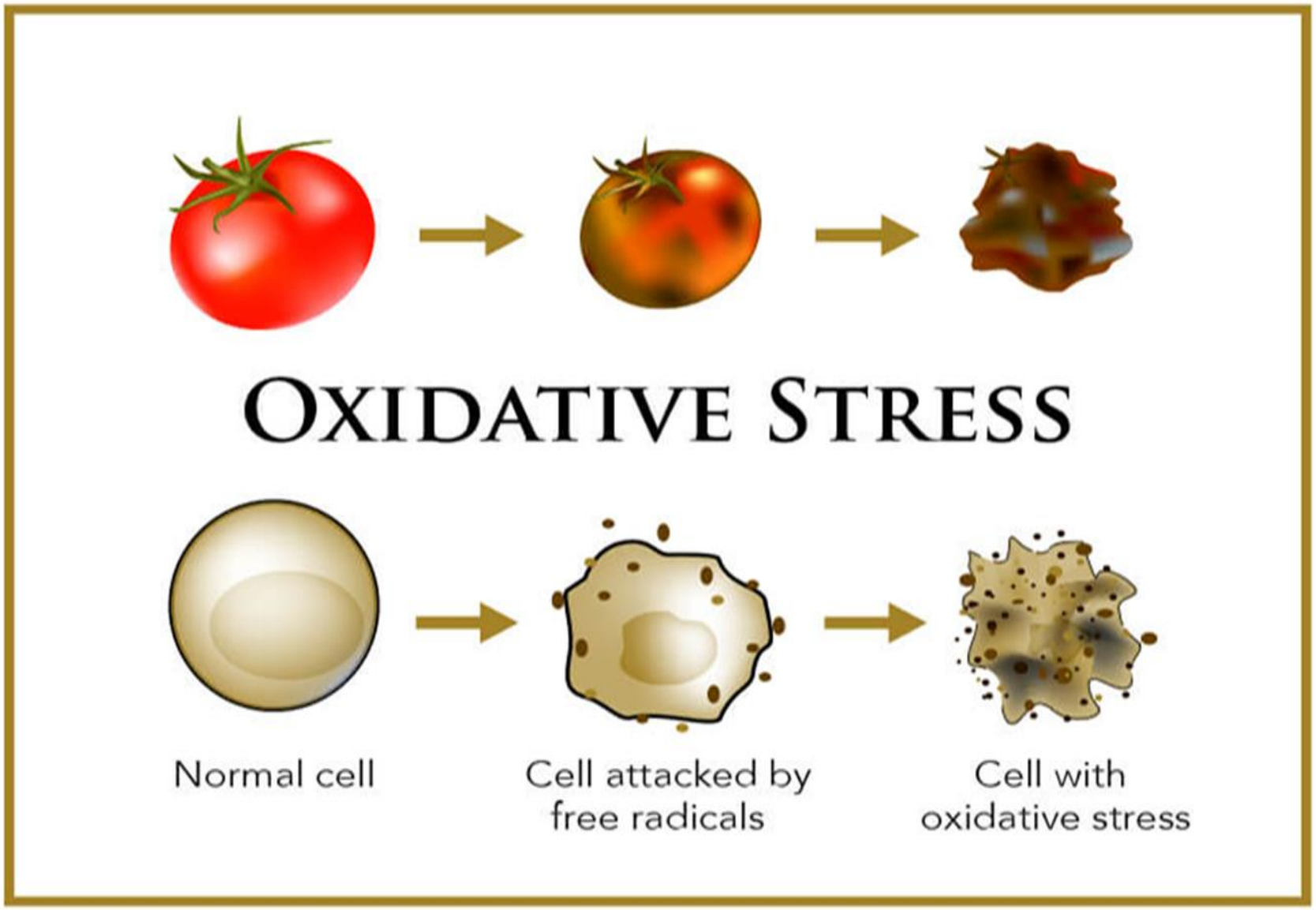

Antioxidant
Unpaired Electron
Electron
Donation
Free Radical

Antioxidants help to neutralize free radicals in the body, and this is thought to boost overall health.

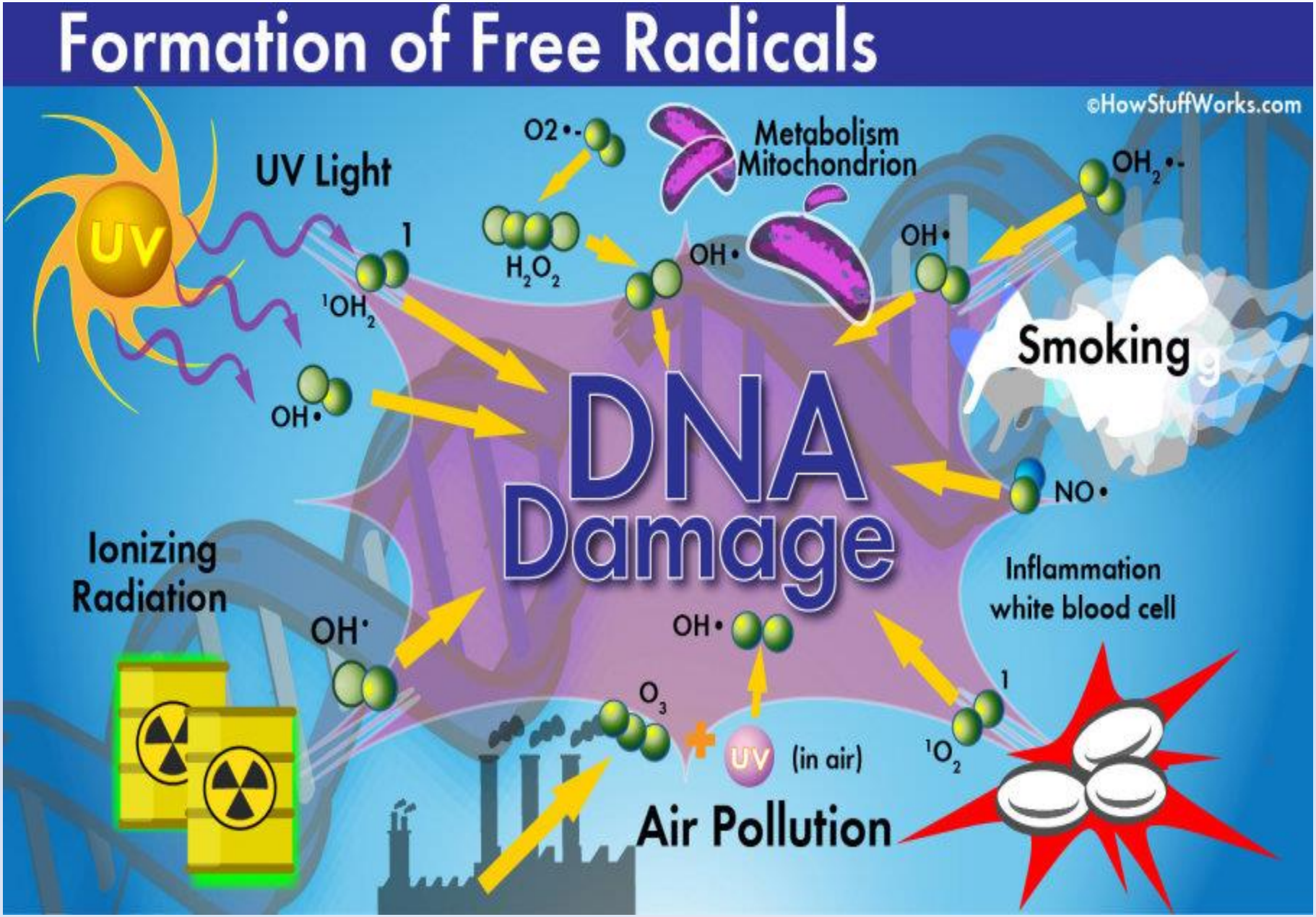


If the body cannot process and remove free radicals efficiently, oxidative stress can result. Which is an imbalance between free radicals and antioxidants in the body.. **This can harm cells and body function.**




OXIDATIVE STRESS
Normal cell
Cell attacked by free radicals
Cell with oxidative stress

- Factors that increase the production of free radicals in the body can be either :-
- Internal, such as inflammation
- External, for example, pollution, UV exposure, and cigarette smoke.


Formation of Free Radicals
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UV Light
UV
1
$^1OH_2$
OH•
O2•-
H_2O_2
OH•
Metabolism
Mitochondrion
OH_2•-
OH•
Smoking
NO•
DNA
Damage
Ionizing
Radiation
OH•
OH•
O_3
UV
(in air)
Air Pollution
Inflammation
white blood cell
1
$^1O_2$

- UV generates oxidative free radicals. UV photons interact with atomic oxygen to promote formation of free radical derivatives such as **superoxide, hydrogen peroxide and the highly reactive hydroxyl radical**.
- Free radicals attack macromolecules such as protein, lipid, RNA and DNA, altering their structure and interfering with their function.
- Detoxifying and protective enzymes such as **superoxide dismutase, catalase and glutathione peroxidase** detoxify and reduce levels of oxidative species in the cell.

Activities and processes that can lead to oxidative stress include:

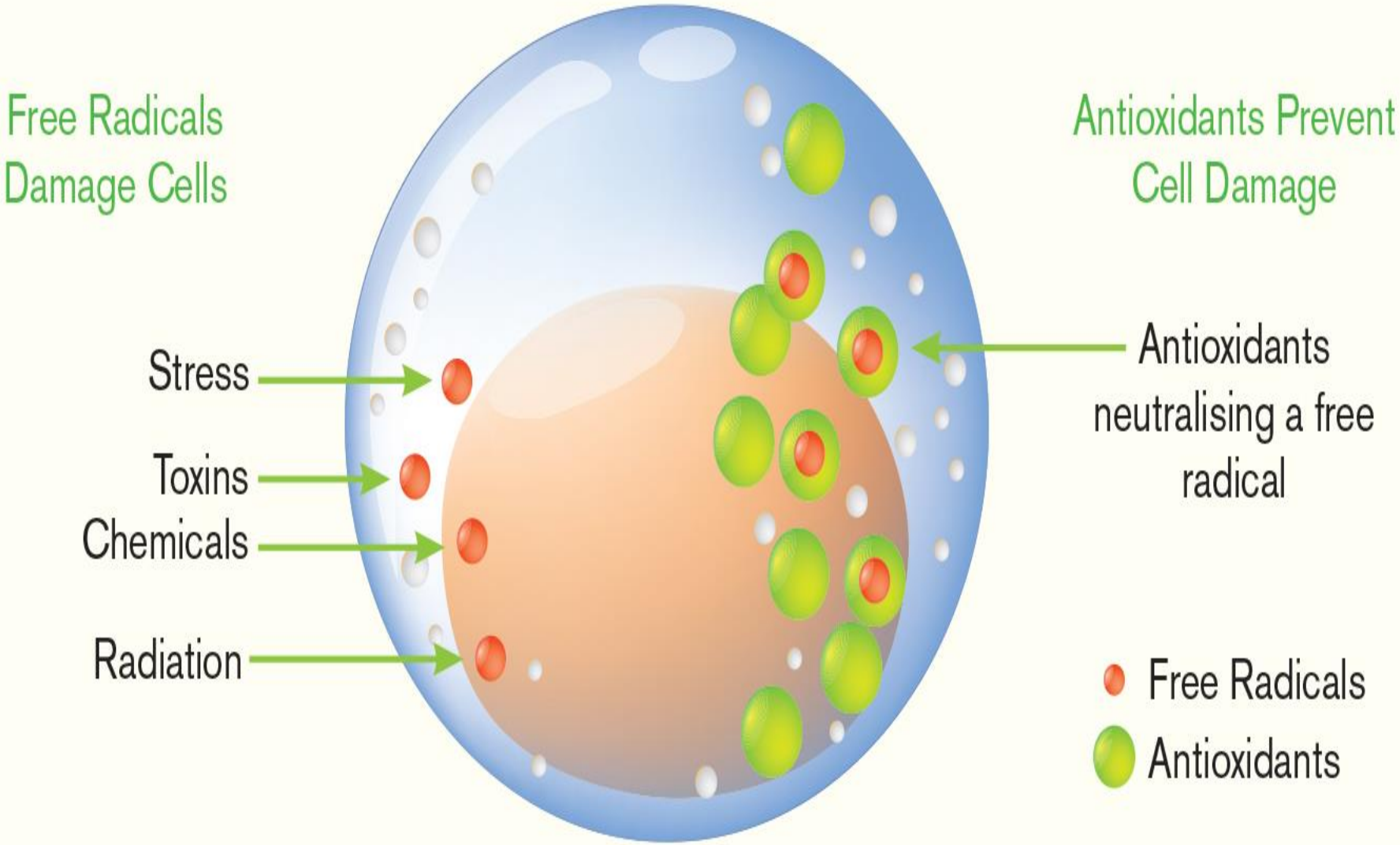
- excessive exercise
- tissue trauma, due to inflammation and injury
- ischemia and reperfusion damage
- consumption of certain foods, refined and processed foods, trans fats, artificial sweeteners, and certain dyes and additives
- smoking
- environmental pollution
- radiation
- exposure to chemicals including chemotherapy
- industrial solvents
- ozone

such activities and exposures can result in cell damage.

Oxidative stress has been linked to different diseases like

- heart diseases
- cancer
- arthritis
- stroke
- respiratory diseases
- immune deficiency ,
- emphysema
- Parkinson's disease
- other inflammatory or ischemic conditions.

HOW DO ANTIOXIDANTS WORK?

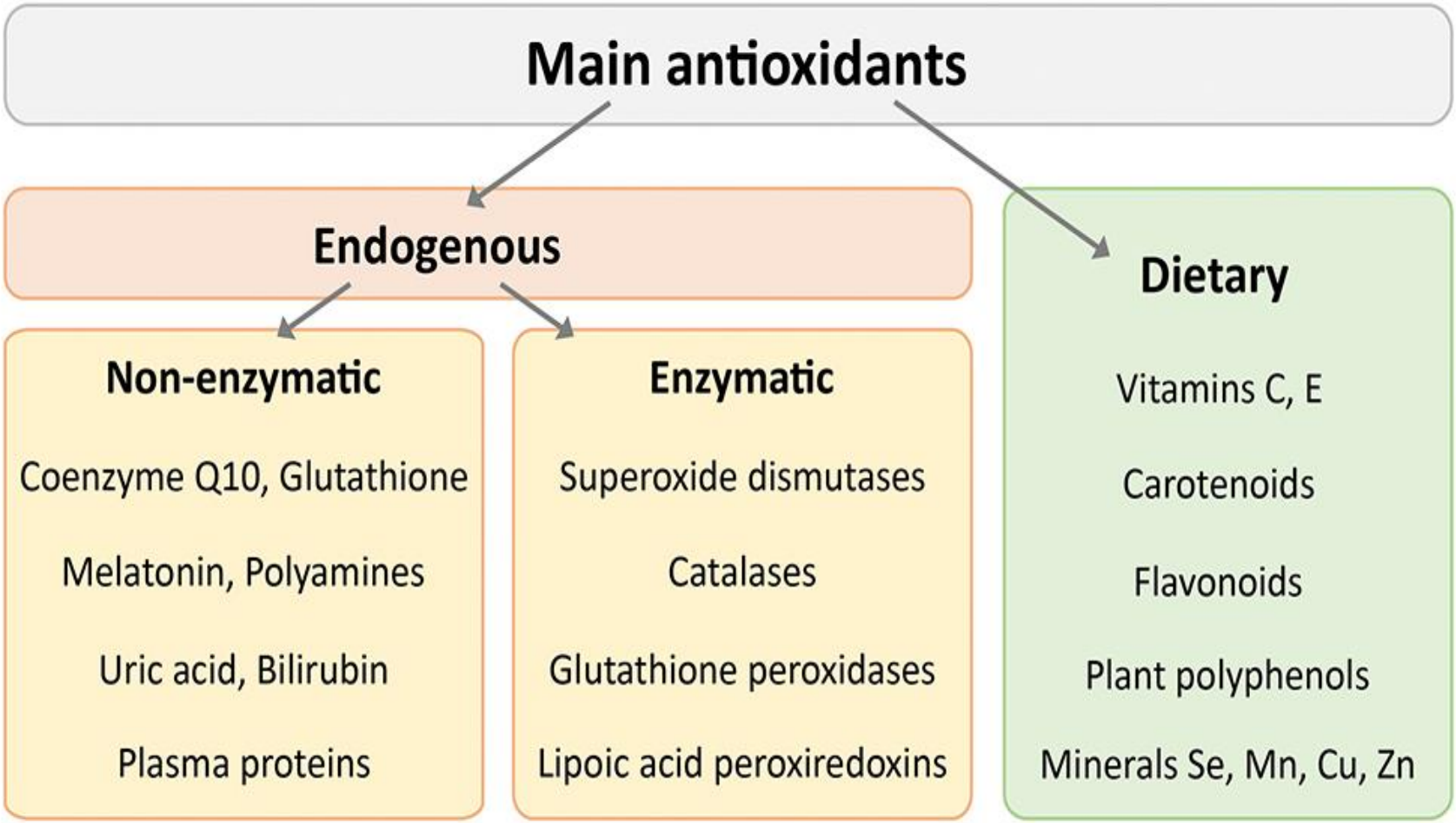


- **Antioxidant systems can be divided into :-**

1- endogenous, the ones produced by our body. Glutathione is the most powerful and important among the antioxidants our body produces. produced by the liver

2- exogenous that are introduced through food or supplements.

Figure 1. Main Endogenous and Dietary Antioxidants



- The best sources of antioxidants are plant-based foods, especially fruits and vegetables. **and are divided into 5 groups:**

1- vitamins (A,C,E)

2- Carotenoids include:

3- (B-carotene, lycopene, Lutein, Zeaxanthene)

4- Polyphenols(Flavonides and phenolic acids)

5- Minerals (zinc , selenium, Cu, Mn)

- Foods that are particularly high in antioxidants are often referred to as a "superfood" or "functional food."

Antioxidants 101

BETA-CAROTENE

It stimulates the production of white blood cells.

Spinach

VITAMIN E

It delays aging and protects cells from free radicals.

Nuts

Olives

Sunflowers seeds

SELENIUM

It neutralizes free radicals from oxygen and nitrogen.

Brazil nuts

Sacha inchi

Cold water fish

OMEGA-3 FATTY ACID

An essential nutrient, it protects brain cells.

Genistein
Tofu

Anthocyanins
Blackberries

Quercetin
Onion

FLAVONOIDS

Lemon

VITAMIN C

It helps regenerate soft tissues around the body.

www.herbazest.com

Sources of Natural Antioxidants

- **1. Berries and cherries**

These are known as “fruits of color.” Any fruit that is high in color, such as blackberries, blueberries and strawberries, are high in antioxidants. This also includes cherries and pomegranates. White fruits such as white grapes also have antioxidants, but a lesser amount than darker fruits.

- **The red grains of pomegranates**

contain powerful polyphenolic antioxidants including ellagic acid this has:

1-strong anti-mutagenic properties, so it fights genetic mutation and development of tumors.

2- Also it has positive effects on the cardiovascular system by reducing blood pressure and LDL oxidation.

- **2. Citrus**

Citrus fruits – such as oranges,
tangerines and grapefruit
contain high amounts of antioxidants.

- **3. Pomes**

This type of fruit includes
apples and pears.
Though they may not be as high as
some other foods in antioxidants,
they are still great sources.

- **4. Honey and bee pollen**

These are also high on the
list for antioxidants. honey used as
a sweeteners as well as a food source.

- **6. Chocolate**

Dark chocolate has more antioxidants than milk chocolate

The higher the percentage, the better. If you can handle 70%, that is one of the best. If 100% bittersweet chocolate, It's mostly for cooking, but is also a great source of antioxidants.

it has a beneficial antioxidants called flavonoids ,are responsible for chocolate's anti-inflammatory effects and help keep the endothelial cells that line arteries healthy.

- **7. Tea and coffee**

-green tea have been attributed to longevity

-Green tea contains more antioxidants and chemical compounds than most black teas.

- both coffee and tea are high in antioxidants that help neutralize harmful free radicals in the body, but there are more antioxidants in a cup of coffee than in a cup of tea.

-Some also think that the antioxidants in coffee may help delay the onset of or even prevent Alzheimer's Disease.

- coffee is the No. 1 source of antioxidants in the American diet. And get more of their antioxidants from coffee than any other dietary source.

- **8. Legumes**

Most of your legumes, beans, peas and even peanuts are high in antioxidants.

- **9. Argan Oil**

Argan Oil has been used in cosmetics and hair care for centuries. Now it’s edible and has a high amount of antioxidants.

- **10. Olive Oil**

Olive oil is another great source of antioxidants. In fact, the olive itself is also a source.

- **11. Vitamin E**

Vitamin E is a powerful antioxidant, and is used as a preservative in many food and cosmetic products. But it can also be found naturally in certain foods like sunflower seeds, avocados, and peanut butter. Vitamin E oil added to DIY beauty products to get benefits for skin and prevent oxidative damage.

- **12. Herbs**

Many of the herbs we use are great sources as well. Fresh parsley, oregano and even mints are all good sources.

- **13. Spices**

Most of culinary spices, such as cinnamon and nutmeg are great sources of antioxidants. In addition, they are usually antimicrobial and antibacterial – probably because of the antioxidants present.

- Here's a surprising fact:

a tablespoon of ground cinnamon has more antioxidants than a cup of blueberries.

- **14. Nuts**

Most nuts, like almonds, pecans and pistachios and walnuts, have a high amount of antioxidants. In addition, they contain numerous other vitamins and minerals. Should be added to daily diet in many ways.

- **15. Celery**

Celery and celery root contain a high amount of antioxidants. Add them to a salad

16. Brassicas

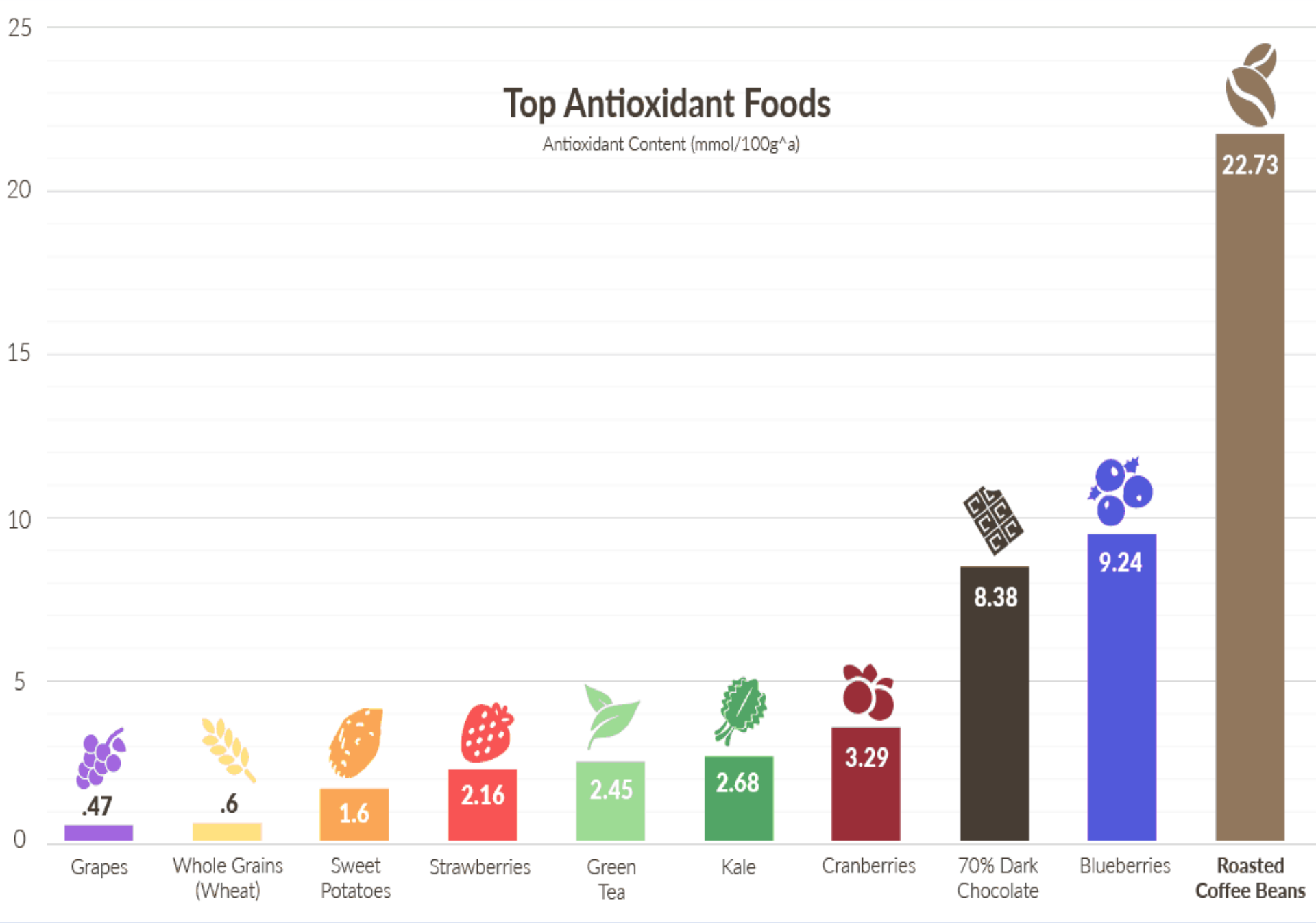
The cabbage family – cabbage, kale, broccoli – they are all very high in antioxidants.

- Many people find it hard to incorporate some of these things into their diets, but it’s really not hard.

To obtain some specific antioxidants, try to include the following in your diet:

- **Vitamin A**: Dairy produce, eggs, and liver
- **Vitamin C**: Most fruits and vegetables, especially berries, oranges, and bell peppers
- **Vitamin E**: Nuts and seeds, sunflower and other vegetable oils, and green, leafy vegetables
- **Beta-carotene**: Brightly colored fruits and vegetables, such as carrots, peas, spinach, and mangoes
- **Lycopene**: Pink and red fruits and vegetables, including tomatoes and watermelon
- **Lutein**: Green, leafy vegetables, corn, and oranges
- **Selenium**: Rice, corn, wheat, and other whole grains, as well as nuts, eggs, cheese, and legumes

- There is no set recommended daily allowance (RDA) for antioxidants, but a high intake of fresh plant-based is considered healthful.



coffee is the No. 1 source of antioxidants (Nov 2017)

Effects of cooking

- Cooking particular foods can either increase or decrease antioxidant levels.
- Lycopene is the antioxidant that gives tomatoes their rich red color. When tomatoes are heat-treated, the lycopene becomes more bio-available (easier for our bodies to process and use).

- However, studies have shown that cauliflower, peas, and zucchini lose much of their antioxidant activity in the cooking process.
- **Boiling results in the greatest loss of nutrients**, while other cooking methods more effectively preserve the nutrient content of food. **Steaming, roasting and stir-frying are some of the best methods of cooking vegetables when it comes to retaining nutrients.**

Supplements

- Vitamins and minerals are considered essential nutrients, and important for bones, heal wounds, and immune system.

- The National Institutes of Health (NIH) warn that high doses of antioxidant supplements can be harmful.

- A high intake of beta-carotene, for example, has an increased risk of lung cancer in smokers.
- A high dose of vitamin E has been found to increase the risk of prostate cancer .

- Antioxidant supplements may also interact with some medications. For example, vitamin E supplements may increase the risk of bleeding in people who are taking anticoagulant drugs .

Dietary tips

The following tips could help increase your antioxidant intake:

1- Include a fruit or a vegetable every time of eat, meals and snacks.

2- Have a cup of green every day.

3- Look at the colors on the plate. If your food is mostly brown or beige, the antioxidant levels are likely to be low. Add in foods with rich colors, such as kale, beets, and berries.

4- Use turmeric, cumin, oregano, ginger, clove,
and cinnamon to spice up the flavor and antioxidant content of the meals.

5- Snack on nuts, seeds, especially Brazil nuts, sunflower seeds, and dried fruit, but choose those with no added sugar or salt.

- As a result, it is important to seek out natural sources of antioxidants, in the form of a healthful diet.

- Consuming fruits and vegetables has been linked to a lower rate of chronic diseases, and antioxidants may play a role. However, it is unlikely that consuming added antioxidants, especially in processed foods, will provide significant benefits.


Thank You!