Cancer fighting foods

By: Dr. Azza Alareefy

Lecture Outline:

- Sources of carcinogenic substances in our life.
- Foods help to fight cancer.
- Tomatoes
- Garlic.
- What is the mechanism of action

10 Foods to Help REDUCE Cancer Risk

Onions

Garlic

Apples

Tomatoes

Flaxseed

Berries

Leafy Greens

Cruciferous Vegetables

Carrots

Omega-3 Fatty Acids

Food Rx by Produce for Kids with Jessica DeLuise, PA-C, CCMS

Produce for Kids® Creating a healthier generation

Shuman Farms REALSWEET Sweet Onions

- **Whole Grains:**

According to a 1998 research study carried out at
The Division of Epidemiology,
School of Public Health,
University of Minnesota, Minneapolis,
people who consume diet high in whole grains are at the lower risk of developing a multitude of cancer.

Green Tea:

- Researchers from the School of Medicine at the University of California, Los Angeles, found that the **antioxidant polyphenols in the green tea could successfully reach the cancer infected tissues of the prostate in men and reduce the inflammation.**
- **Levels of prostate-specific antigen, responsible for the promotion of this cancer also reduced due to the green tea.**

- **Leafy Green Vegetables:**

A study funded by the American Institute of Cancer research found that the

carotenoids in green leafy vegetables reduce the risk of mouth, pharynx and larynx cancers.

Tomatoes

Lycopene and cancer:

Prostate cancer:

- The strongest relationship were found for cancer of the prostate lung and stomach cancer. Whereas the lesser relationship were determined for cancer of the colon, pancreas, esophagus, digestive tract, and breast.

- Interestingly food that contribute to 82% of lycopene intake were inversely associated with prostate cancer risk when >10 serving/week were consumed compared to 1.5 serving/week.

The mechanism of action:

- Lycopene inhabited cellular proliferation in human cancer cell.
- High concentrations of insulin-like growth factor-1 are associated with increased risk for breast and prostate cancers. In mammary cancer cell, **lycopene inhibited growth stimulation by insulin-like growth factor-1 without inducing apoptosis or necrosis.**

In leukemia:

A- decreased cell growth,

B- Inhibited cell cycle progression.

C- Moreover, a synergistic effect of lycopene and vitamin D was found for cell proliferation .

In breast cancer

- However among premenopausal women only, there was a significant inverse relationship between breast cancer and plasma lycopene level.

- Therefore, it seems possible that lycopene may reduce the risk of breast cancer among young premenopausal women.

Lycopene and GIT cancer

- **In Urguay,** a case control study was conducted in which 238 cases and 491 hospitalized controls were matched on the basis of age, sex, residence and urban or rural status.
- **Results**
- **A significant reduction in risk for cancer of the upper GIT was found with tomato intake and tomato sauce.**

Lycopene and GIT cancer

- Similarly, **lower carotinoid intakes have be associated with increased risk for colorectal cancer**.

Garlic and cancer

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- Studies found an inverse association between raw and cooked garlic consumption and both stomach and colorectal cancer risk.

- Furthermore, a study reported that the reduced risk of prostate cancer in those consuming increasing quantities of allium vegetables .

Cancer protection can arise several mechanisms including:

1-Blokhage of carcinogen formation.

2-Suppressed bio-activation of carcinogens.

3-Enhaned DNA repair.

4-Reduced cell proliferation.

1-Blokhage of carcenogen formation

Due to:

- Reducing nitroseamine and heterocyclic amine formation.
- Human beaing are exposed to a complex array of substances may be involved in cancer through food sources.

- Nitrosamines , heterocyclic amines , and polycyclic aromatic hydrocarbons are potential dietary carcinogens that not normally present in foods but arise during preservation or cooking.
- Human exposure to such carcinogen occurs through the ingestion or inhalation preformed NOCs.

- **The role of the garlic is to** suppress the formation of several **nitroseamine compounds .**
- This ability of the garlic to reduce NOCs may be due to increase formation of nitrosthiol as sulfer compounds can foster the formation of nitrosthiols, therby reducing the quantity of nitrite available for NOCs formation.

2-Reducing cell proliferation:

- Garlic constituents have the ability to suppress proliferation of cancer cells by **blocking cell-cycle progression** and or cause **apoptosis**.
- 3-Inhancing DNA repair.

- Recently, the effects of combining **tomato** and **garlic** were examined using several carcinogenesis models.

- The combination suppressed the incidence of **tumor of hamster carcinomas more than either alone.**

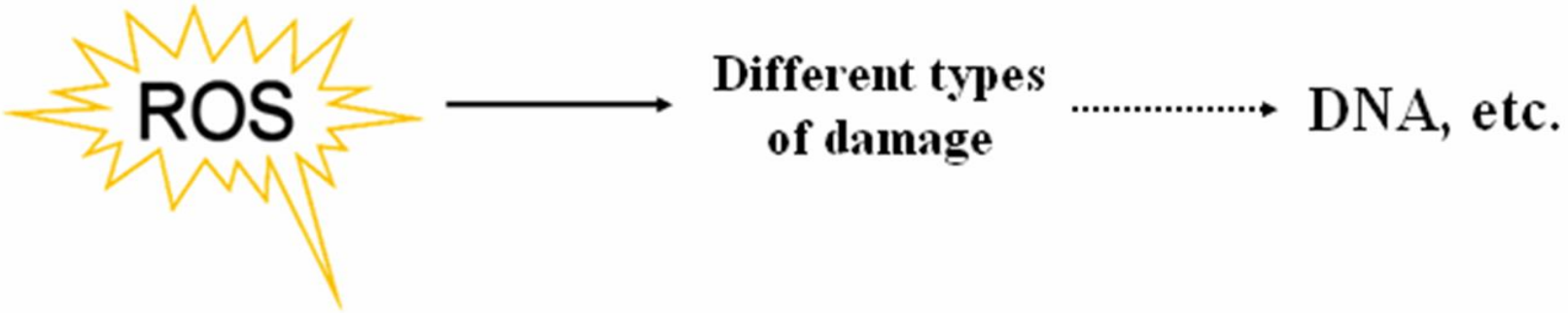
- A variety of individual **food components** may also influence the response to garlic.

- Notable are the modifications made by the quantity of fat, **selenium, methionine**, and vitamin **A in the diet**.

- A study showed that selenium enhanced the protection against mammary carcinogens beyond that provided by garlic alone.

The AO actions of garlic have been documented through:

- Inhibit lipid peroxide formation.
- Their ability to scavenge ROS.
- Retard LDL oxidation.
- Enhancing endogenous AO systems.



In Conclusion,

- A variety of organosulfur compounds have been reported to exhibit AO properties.
- Garlic oil is also an effective AO against the oxidative damage caused by various agents.
- **Heating garlic can not only denature proteins, but also its AO properties.**

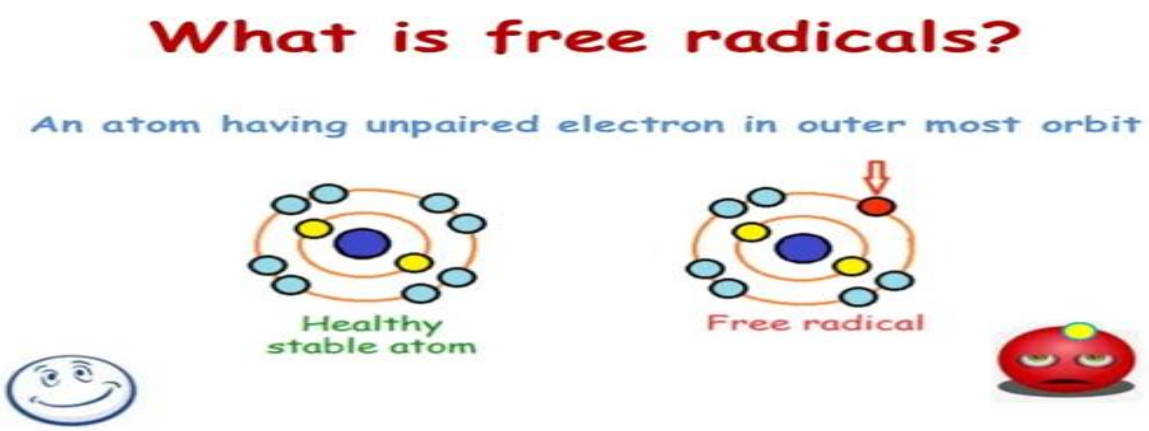
What are Carcinogenic Substances in our life?

Nitrate in processed food

They are added to food to preserve it and also **help hinder the growth of harmful microorganisms**, in particular Clostridium botulinum, the bacterium responsible for life-threatening botulism.

What are Free Radicals

- Free radicals are reactive molecules that are **unstable** because they are missing an electron.



- **In the process, they cause oxidation of body tissues.**

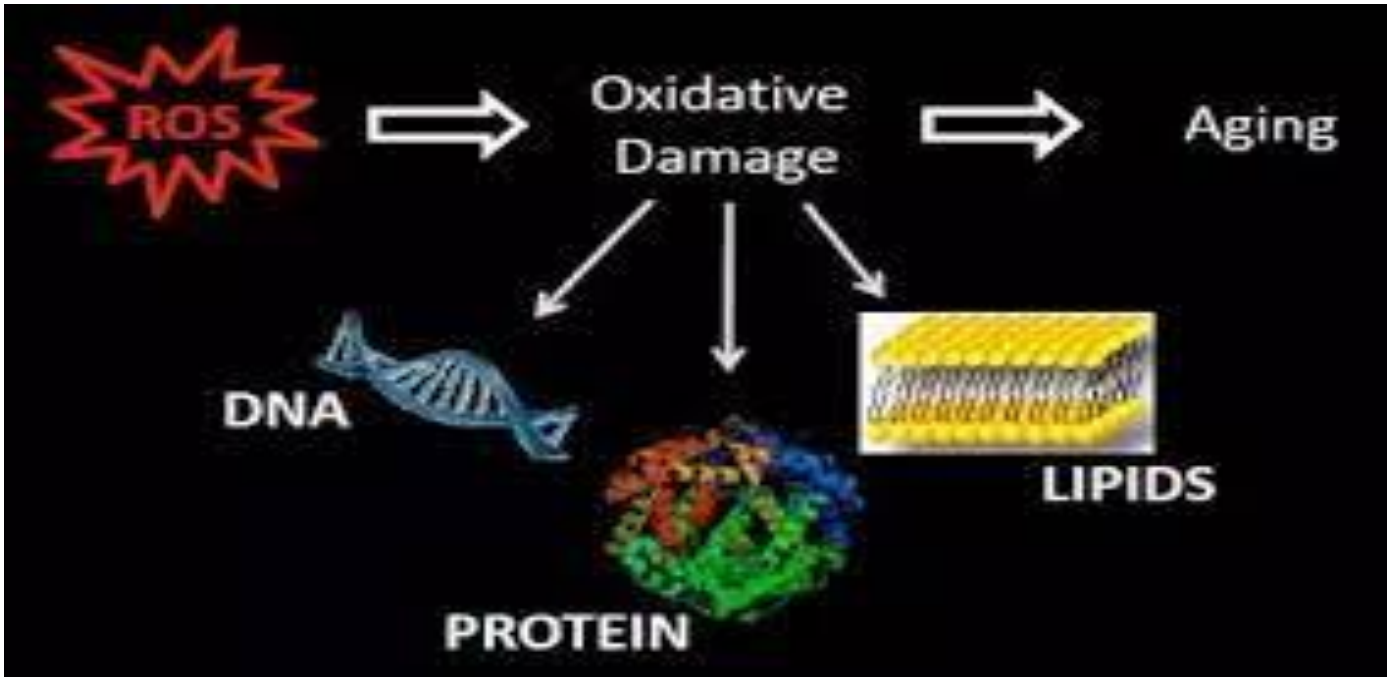


Figure2: ROS or reactive oxygen species which cause different types of damage.

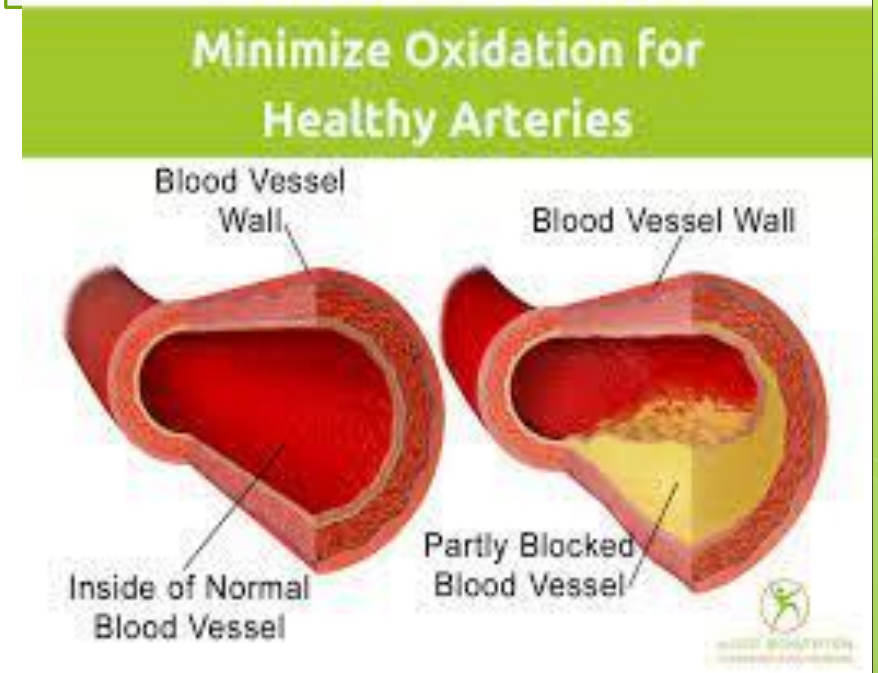

Free Radical Generating Substances
Fried Foods
Alcohol
Tobacco Smoke
Pesticides
Air Pollutants

- **Sources of free radicals:**

- It's impossible to be alive and not have some oxidative damage, because free radicals are **produced by normal processes in the body**, such as the production of energy and immune function.

- Free radicals also come from **environmental sources including heavy metals, household chemicals, ultraviolet radiation, tobacco smoke, food additives, foods that have been fried in** oil that's been used over and over again (typical in many fast-food restaurants), and other pollutants.

- Once free radicals are released, they will multiply in chain reactions, unless they are stopped by antioxidants.



- When a free radical comes in contact with the inner lining of arteries, microscopic injuries results.

- The key is to neutralize free radicals before they damage arteries, and that's done with antioxidants.

Thank you

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