

Composition of DNA

Nucleic Acid Bases: Adenine

Guanine

Thymine

Cytosine

"Backbone": Phosphorus

Deoxyribose

Cellular Aging has been attributed to errors that occur during DNA repair and replication. research

Cells---DNA is an essential component of all new healthy Cells of the body.

Immune System---Abnormal DNA synthesis may be implicated in Cancer:

- DNA is (in addition to being an essential component of all new healthy Cells) is an essential constituent of Cancer Cells - some Antimetabolite Anti-Cancer Pharmaceuticals attempt to prevent further growth of Cancer Cells by preventing the conversion of Folic Acid to its active Folinic Acid form which is essential for the endogenous production of DNA.

Proteins--**DNA carries the instructions for the synthesis of endogenous Proteins from Amino Acids.**

Sexual System---DNA is essential for the transmission of hereditary characteristics to offspring (due to DNA being an essential component of Chromosomes).

Glutamine supplies the necessary Nitrogen atom for the manufacture of endogenous DNA.

Orotic Acid is essential for the synthesis of endogenous DNA (due to its role as an intermediate in the synthesis of Pyrimidine Nucleotides).

S-Adenosylmethionine (SAM) is essential for the production of DNA (SAM functions as a methyl donor for DNA). research

Carbohydrates--Ribose is a component of DNA.

Enzymes--Deoxyribonuclease (a Nuclease) splits DNA at specific places in the DNA molecule and is the catalyst for the hydrolysis (breakdown) of DNA into its individual Nucleotides.

DNA Polymerase catalyzes the production and replication of DNA by linking individual Nucleotides into the "unzipped" DNA molecule (a Polynucleotide).

Minerals---

Magnesium facilitates the production and utilization of endogenous DNA.

Selenium (especially the L-Selenomethionine form) facilitates the methylation of endogenous DNA.
research

Zinc assists the enzyme that produces DNA.

Proteins

Lactoferrin facilitates the endogenous production of DNA.

Vitamins

Choline is essential for the synthesis of endogenous DNA.

Folic Acid is a cofactor for the synthesis of endogenous DNA and is required for the incorporation of Uracil into DNA: research

Vitamin A is essential for the synthesis of endogenous DNA.

Vitamin B6 is essential for the synthesis of endogenous DNA.

Vitamin B12 is essential for the synthesis of endogenous DNA.

Vitamin E is essential for the synthesis of endogenous DNA.

These Substances Protect the Body's Endogenous DNA

Amino Acids

Acetyl-L-Carnitine inhibits and reverses damage to mitochondrial DNA (mtDNA).

N-Acetyl-Cysteine protects the body's DNA from damage: --NAC can prevent the Cross-Linking of the body's endogenous DNA that is caused by Tobacco Smoking.

Auxins

Indole-3-Carbinol reduces the ability of Heterocyclic Aromatic Amines (HAAs) (e.g. PhIP) to damage the body's endogenous DNA. research

Coenzymes

Coenzyme A facilitates the repair of the body's endogenous DNA.

NADH facilitates the repair of damaged DNA (presumably by supplying the Energy necessary to "fuel" the repair of DNA). research

Enzymes

Sir2p protects Deoxyribonucleic Acid (DNA) from the "Cell strangulation" and "cellular death" messages issued by Extrachromosomal rDNA Circles (ERCs). research

Hormones

Melatonin prevents Free Radicals from damaging (fragmenting) the DNA content of Cells: Melatonin prevents Amyloid-Beta Protein (the Neurotoxin that is strongly implicated in Alzheimer's Disease) from causing oxidative damage to the (mitochondrial) DNA of the Mitochondria of Cells.

Minerals

Zinc helps to repair damaged DNA. research

Peptides

Glutathione activates enzymes that repair damaged DNA. research

Phenolic Acids

Ellagic Acid forms adducts with the body's endogenous DNA, thereby blocking binding sites on the DNA of Cells that could otherwise be occupied by carcinogens or mutagens. research

Polyphenols

Apigenin helps to prevent oxidative damage to the body's endogenous DNA.

Epigallo-Catechin-Gallate (EGCG) protects the body's endogenous DNA from damage (including the damage inflicted by exposure to Ultra-Violet Radiation).

Luteolin helps to prevent oxidative damage to the body's endogenous DNA.

Oligomeric Proanthocyanidins (OPC) help to prevent damage to the DNA content of Cells.

Pycnogenol helps to prevent damage to the DNA content of Cells (due to the OPC content of Pycnogenol). research

Quercetin protects the body's endogenous DNA from breakage and oxidation (by chelating (removing) Ferric Iron from the body).

Rutin helps to prevent oxidative damage to the body's endogenous Deoxyribonucleic Acid (DNA). research

Quinones

Coenzyme Q10 protects the body's endogenous DNA (including Mitochondrial DNA) from oxidative damage caused by Free Radicals (via its Antioxidant properties).

Smart Drugs

Idebenone protects mitochondrial DNA (mtDNA) from the damage caused by Free Radicals (due to the Antioxidant effects of Idebenone).

Vitamins

Folic Acid helps to repair damaged DNA.

Inositol Hexaphosphate facilitates the repair of damaged DNA (it repairs double-strand DNA breaks). research

Lipoic Acid inhibits damage to mitochondrial DNA (mtDNA).

Vitamin B3 (especially the Niacinamide form of Vitamin B3) helps to repair damaged DNA.

Vitamin C facilitates the repair of damaged endogenous DNA. --Vitamin C protects against age-associated oxidative damage to Mitochondrial DNA (mtDNA).

Vitamin E and prevents Free Radical damage to DNA: Vitamin E protects against age-associated oxidative damage to Mitochondrial DNA (mtDNA).

These Foods/Herbs Protect the Body's Endogenous DNA

Herbs

Cat's Claw helps to prevent damage to the body's endogenous DNA and facilitates the repair of damaged DNA.

Ginkgo biloba protects against age-associated oxidative damage to Mitochondrial DNA (mtDNA).

Golden Root facilitates the repair of damaged DNA and helps to protect DNA from damage.

Green Tea protects human DNA from the formation of adducts (lesions).

Korean Ginseng inhibits the oxidative damage caused to the body's endogenous DNA caused by the Free Radicals generated by Tobacco smoking.

Skullcap helps to repair damaged DNA (due to the Baicalein content of Skullcap). peer-reviewed

Seeds

Grape Seeds help to prevent damage to the DNA content of Cells (due to the OPCs content of Grape Seeds).

Other Factors that Protect Endogenous DNA

Diets

Diet Restriction improves the efficiency of the endogenous repair of damaged DNA.