Xenobiotics, Oxidants, Antioxidants, Drugs, (Vitamins C, E, K, Resveratrol, Isothionates, Curcuminoids, Chalcones Polyphenol Michael Acceptors etc) Chemo-preventatives

Ionising Radiation, Ultraviolet Light

Heavy metals

Infective agents (viral, bacterial), Inflammatory Cytokines, Growth Factors, Lipoproteins

Reactive Oxygen Species

NRF 2

KEAP 1

KEAP 1

Cell Membrane

Ionising Radiation, Ultraviolet Light

Nuclear Membrane

Cytoplasm

NRF

Antioxidant Response Elements

Many Molecules & Pathways Ways

Ubiquination & Proteosomal

Many Molecules & Pathways Ways

Chaperone & Stress Response Proteins

Many Molecules & Pathways Ways

Phase I & II

Eg Glutathione Pathway

Antioxidant Pathways

Many Molecules & Pathways Ways

Detoxifying Proteins

Many Molecules & Pathways Ways

eg Superoxide Dismutases

Phase III

Metabolism Enzymes

Many Molecules & Pathways Ways

Detoxifying Proteins

Transport of Xenobiotics

Many Molecules & Pathways Ways

Decrease in Oxidants

Many Molecules & Pathways Ways

Repair & Removal of Damaged Proteins

Cell Survival

Prevents Tumourigenesis

Metabolism &/or Detoxification of Xenobiotics

Increase in Antioxidants