Antioxidants & Healthy diet

Dr Zarban

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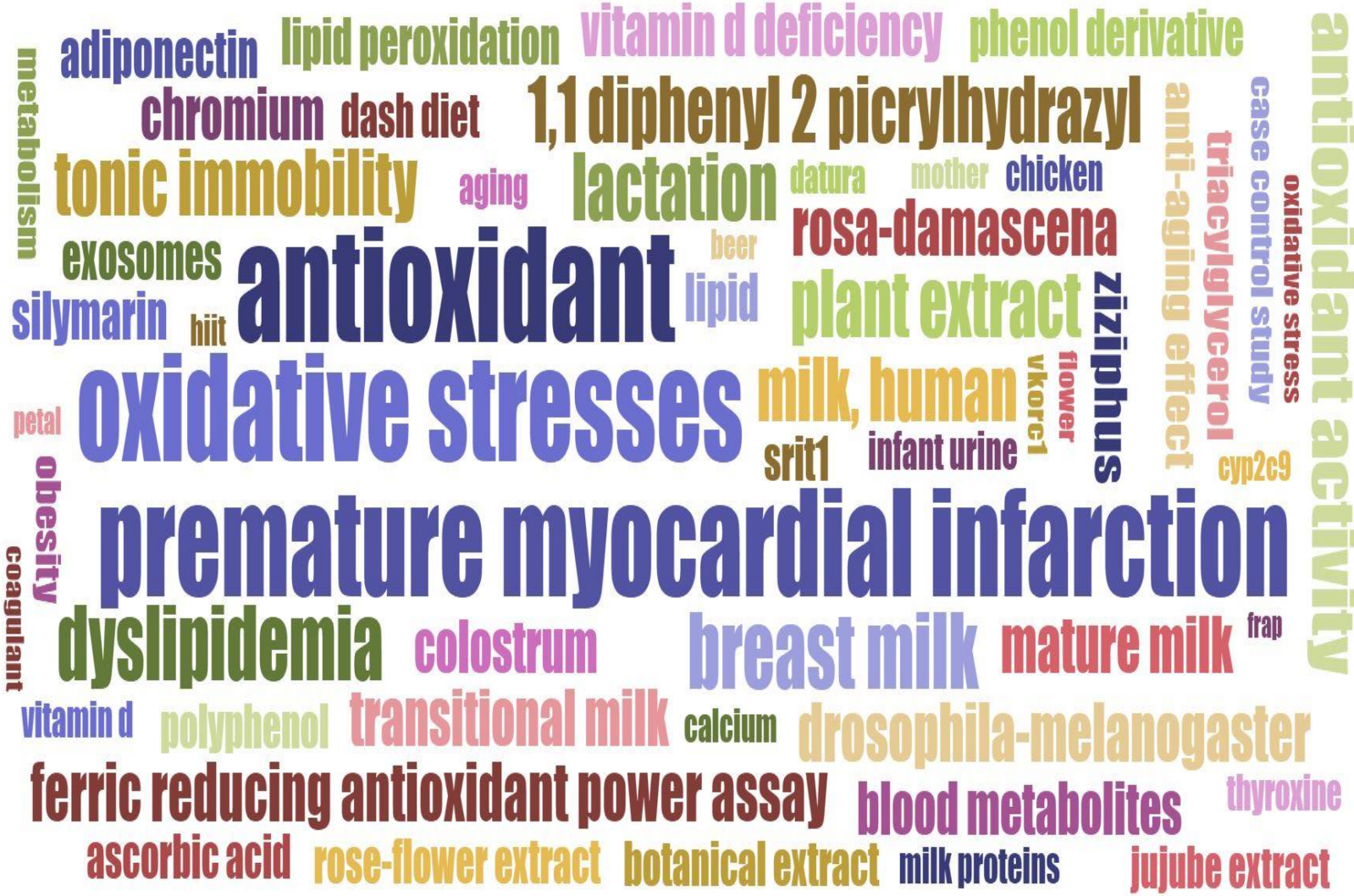
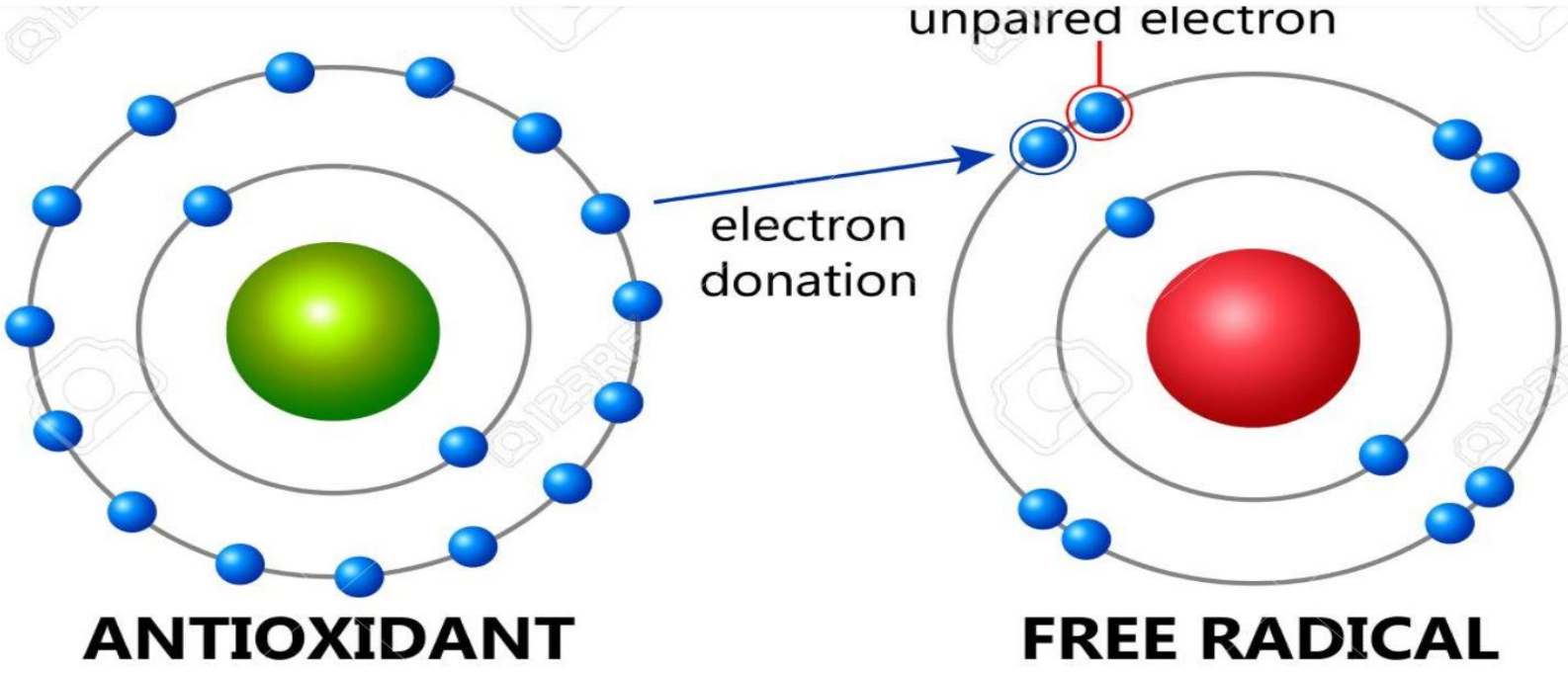

adiponectin
lipid peroxidation
vitamin d deficiency
phenol derivative
antioxidant activity
metabolism
chromium
dash diet
1,1 diphenyl 2 picrylhydrazyl
anti-aging effect
triacylglycerol
case control study
oxidative stress
tonic immobility
aging
lactation
datura
mother
chicken
rosa-damascena
exosomes
antioxidant
beer
lipid
plant extract
ziziphus
silymarin
hiit
petal
oxidative stresses
milk, human
vkorc1
flower
srit1
infant urine
cyp2c9
obesity
premature myocardial infarction
coagulant
dyslipidemia
colostrum
breast milk
mature milk
frap
vitamin d
polyphenol
transitional milk
calcium
drosophila-melanogaster
ferric reducing antioxidant power assay
blood metabolites
thyroxine
ascorbic acid
rose-flower extract
botanical extract
milk proteins
jujube extract



chemically reactive unpaired electron + electron donation: stable electron pair is formed, free radical is neutralised

WHAT ARE FREE RADICALS OR REACTIVE OXYGEN SPECIES (ROS)?

- Any molecule with an unpaired electron
- Extremely chemically reactive
- Damage cell membranes
- Responsible for more than 100 human diseases
- Aging, cancer, heart attacks, stroke and arthritis
- Some beneficial effects

Sources of Reactive Oxygen Species

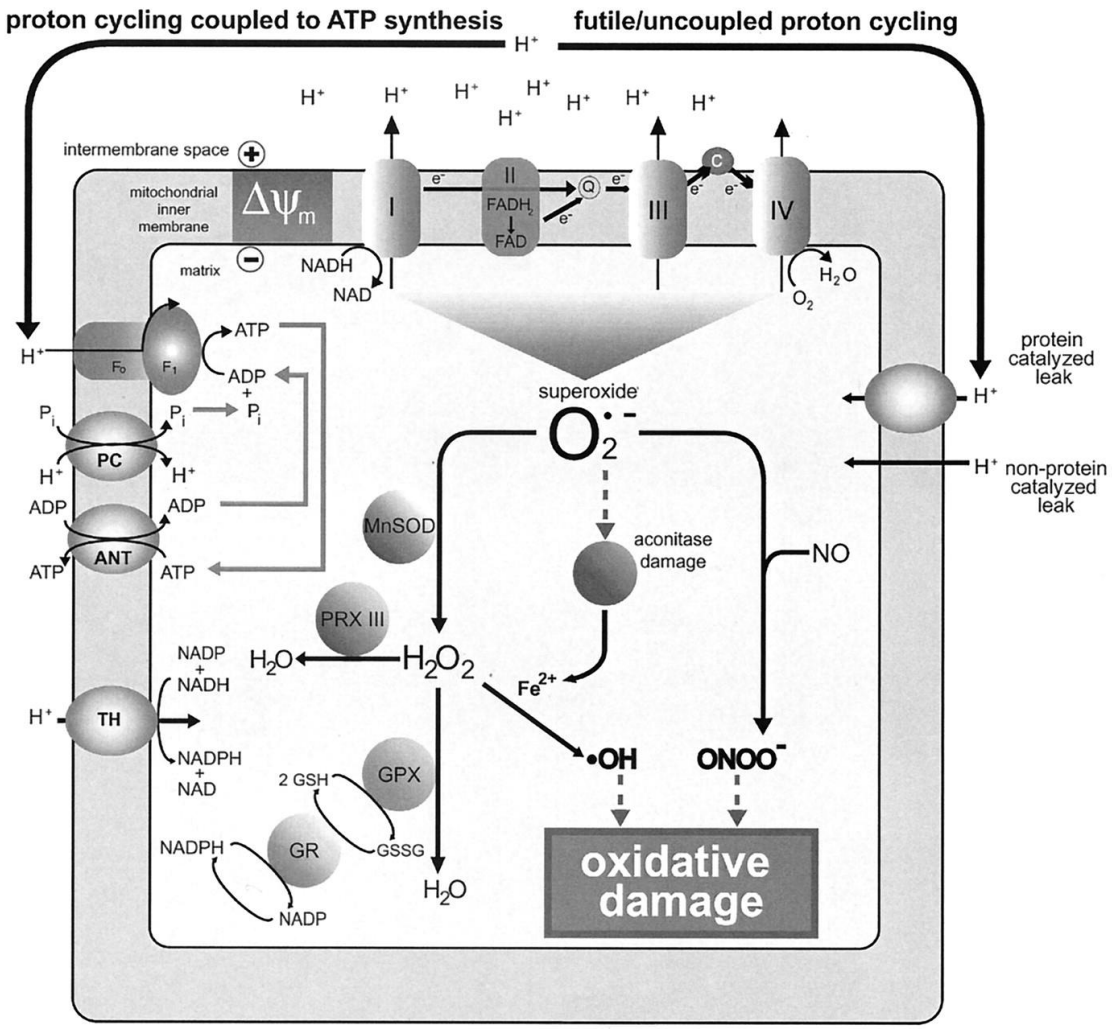
Non mitochondrial:

- **NADPH Oxidases**
- **Microsomal cytochrome P-450**
- **Cyclooxygenases**
- **Monoamine oxidases**
- **Peroxisomal β oxidation of fatty acids**
- **Phagocytes**

>90% is mitochondrial

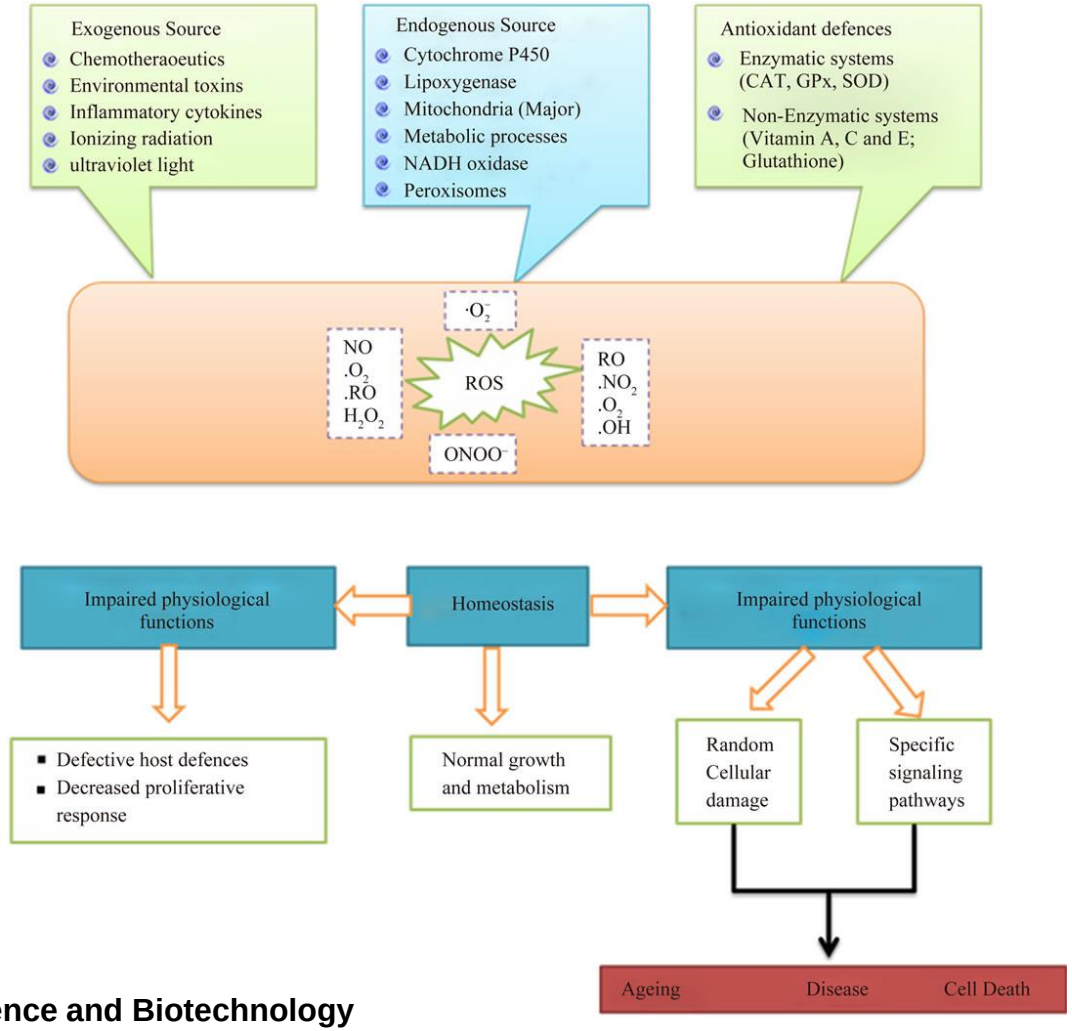
electron transport chain contains several redox centers that may leak electrons to oxygen

Mitochondrial oxidative damage.



Katherine Green et al. Diabetes 2004;53:S110-S118

THE SOURCE AND CELLULAR RESPONSES TO REACTIVE OXYGEN SPECIES (ROS).



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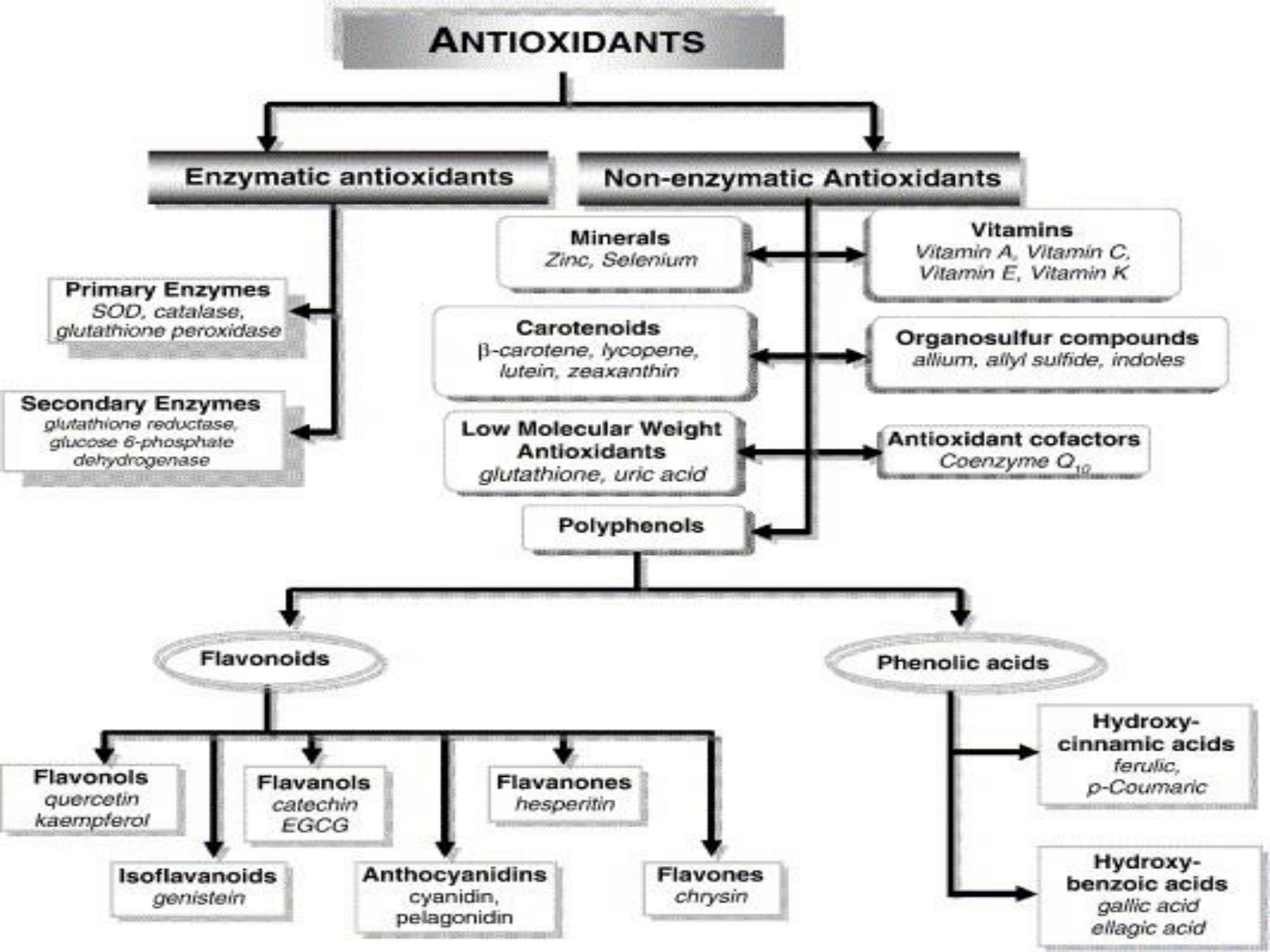
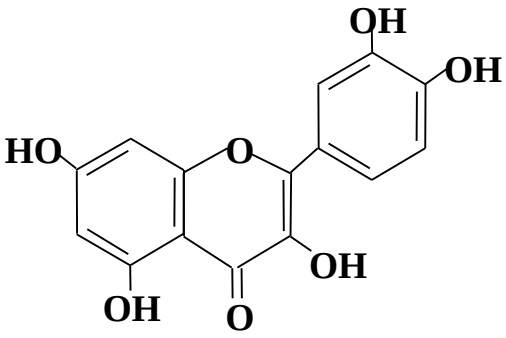

ANTIOXIDANTS
Enzymatic antioxidants
Non-enzymatic Antioxidants
Primary Enzymes
SOD, catalase, glutathione peroxidase
Secondary Enzymes
glutathione reductase, glucose 6-phosphate dehydrogenase
Minerals
Zinc, Selenium
Vitamins
Vitamin A, Vitamin C, Vitamin E, Vitamin K
Carotenoids
β-carotene, lycopene, lutein, zeaxanthin
Organosulfur compounds
allium, allyl sulfide, indoles
Low Molecular Weight Antioxidants
glutathione, uric acid
Antioxidant cofactors
Coenzyme Q_{10}
Polyphenols
Flavonoids
Phenolic acids
Flavonols
quercetin kaempferol
Flavanols
catechin EGCG
Flavanones
hesperitin
Isoflavanoids
genistein
Anthocyanidins
cyanidin, pelagonidin
Flavones
chrysin
Hydroxy-cinnamic acids
ferulic, p-Coumaric
Hydroxy-benzoic acids
gallic acid ellagic acid

Flavonol

***e.g.* quercetin**

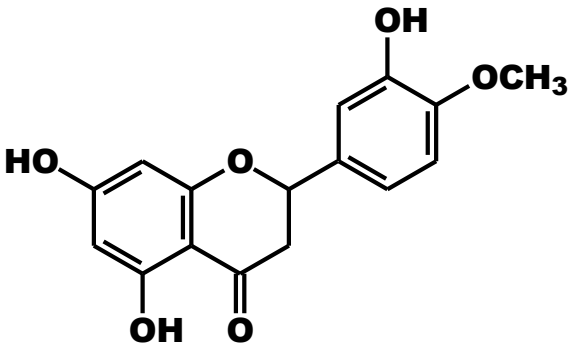
onion, cranberry, red apple many fruit and vegetables



Flavanone

e.g. hesperetin

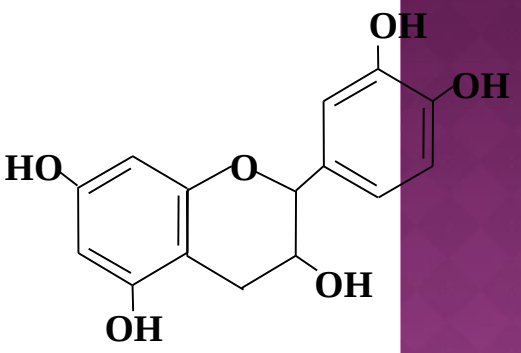
Citrus fruit, orange



Flavanol

***e.g.* epicatechin**

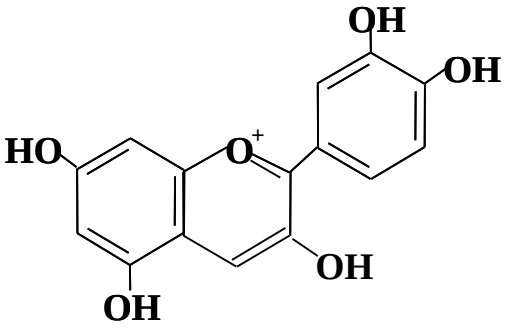
red wine, green tea, as procyanidins in apple, chocolate



Anthocyanidin

***e.g.* cyanidin**

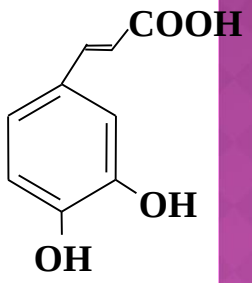
major constituents of dark red fruit berries e.g. raspberries



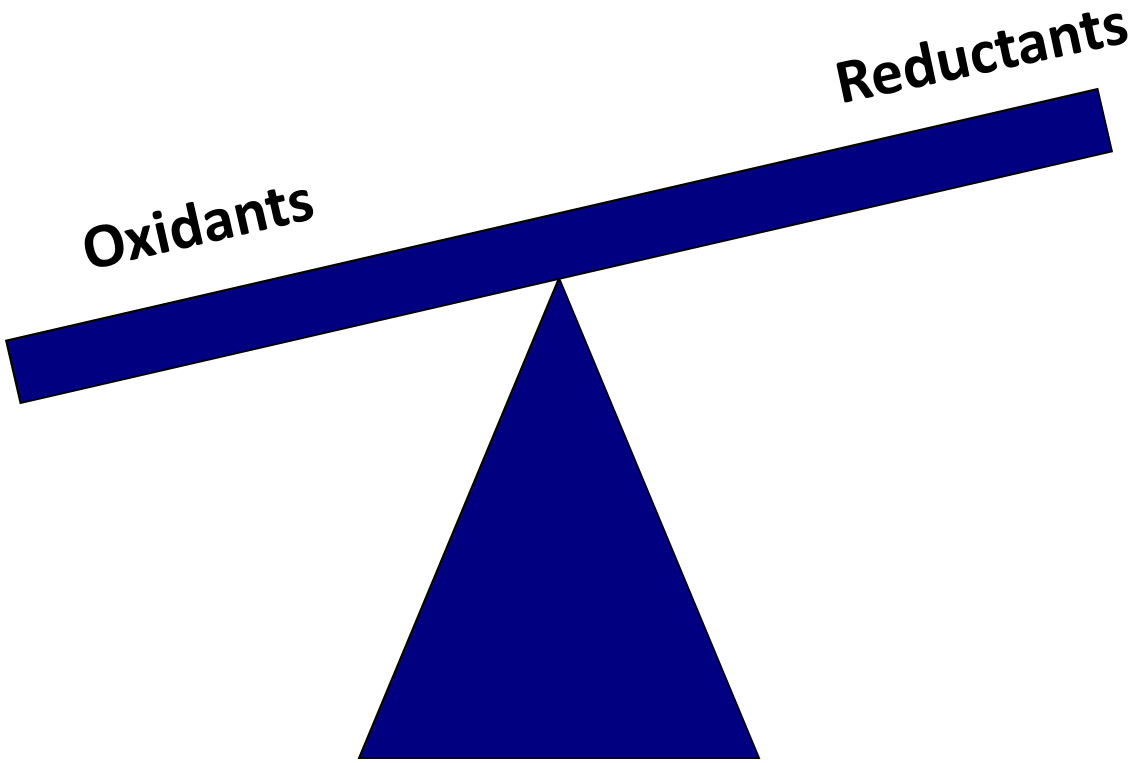
Hydroxycinnamate

***e.g.* caffeic acid**

most fruit especially tomato, apple some vegetables e.g. egg plant grains

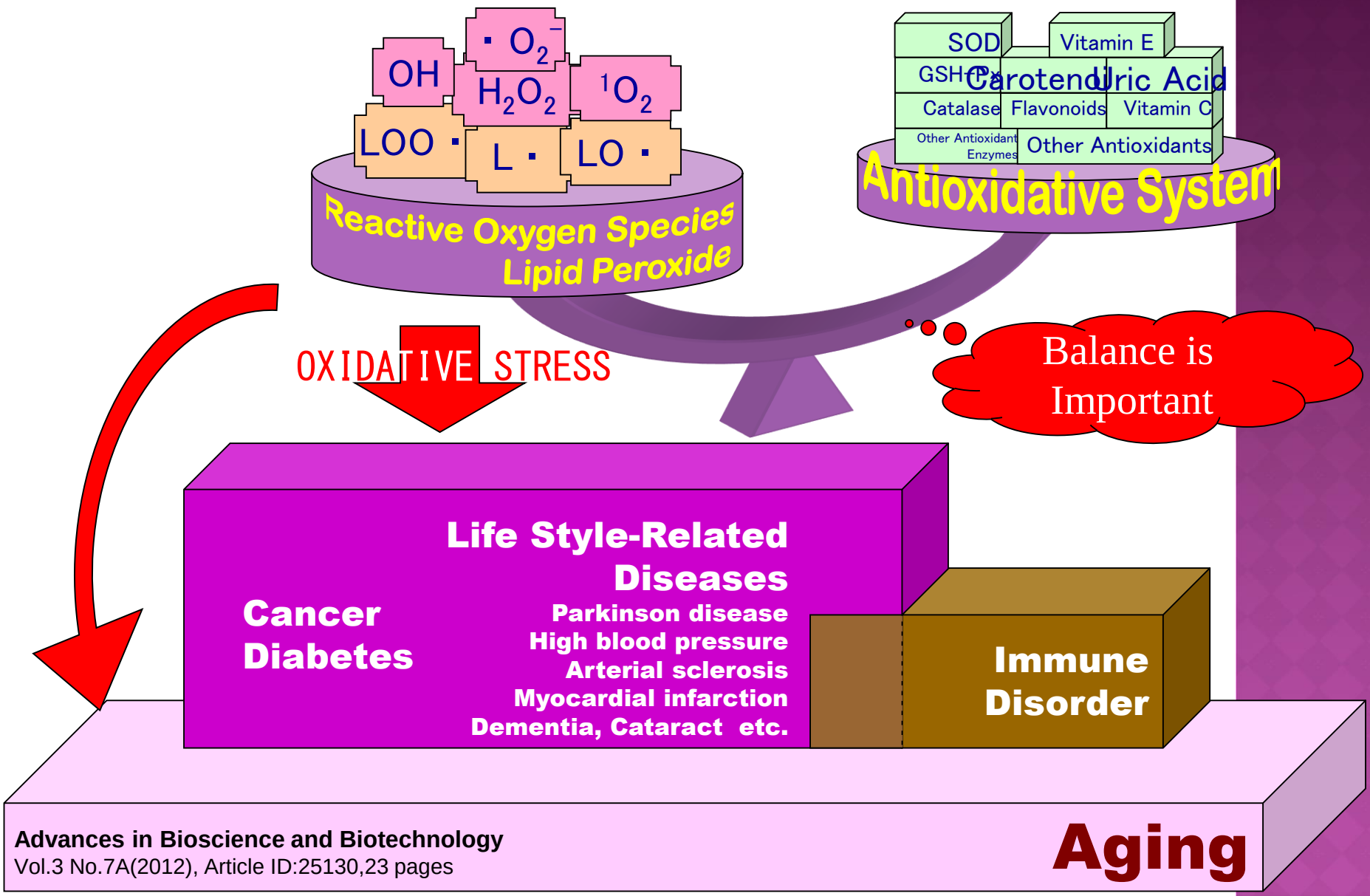


IMBALANCE



INJURY

Balance of Oxidative Stress and Anti-oxidative System



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Consequences of mitochondrial oxidative stress

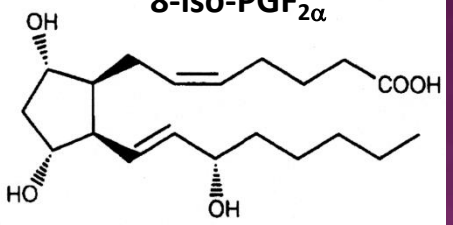
Marker

Oxidative Damage to Lipids

Membrane peroxidation
Decreased membrane fluidity

F_2-Isoprostanes

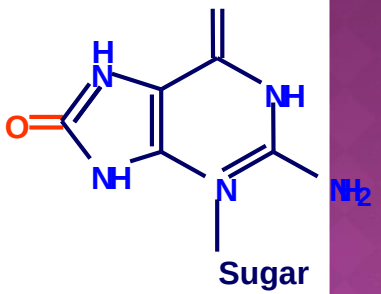
8-iso-$PGF_{2\alpha}$



Oxidative Damage to DNA

Mutations
Deletions

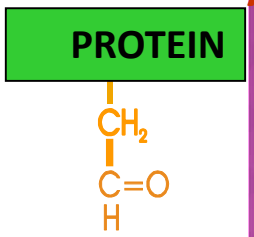
oxo8dG



Oxidative Damage to Proteins

Oxidation of sulfhydryl groups
Reactions with aldehydes
Protein aggregation

Protein carbonyls



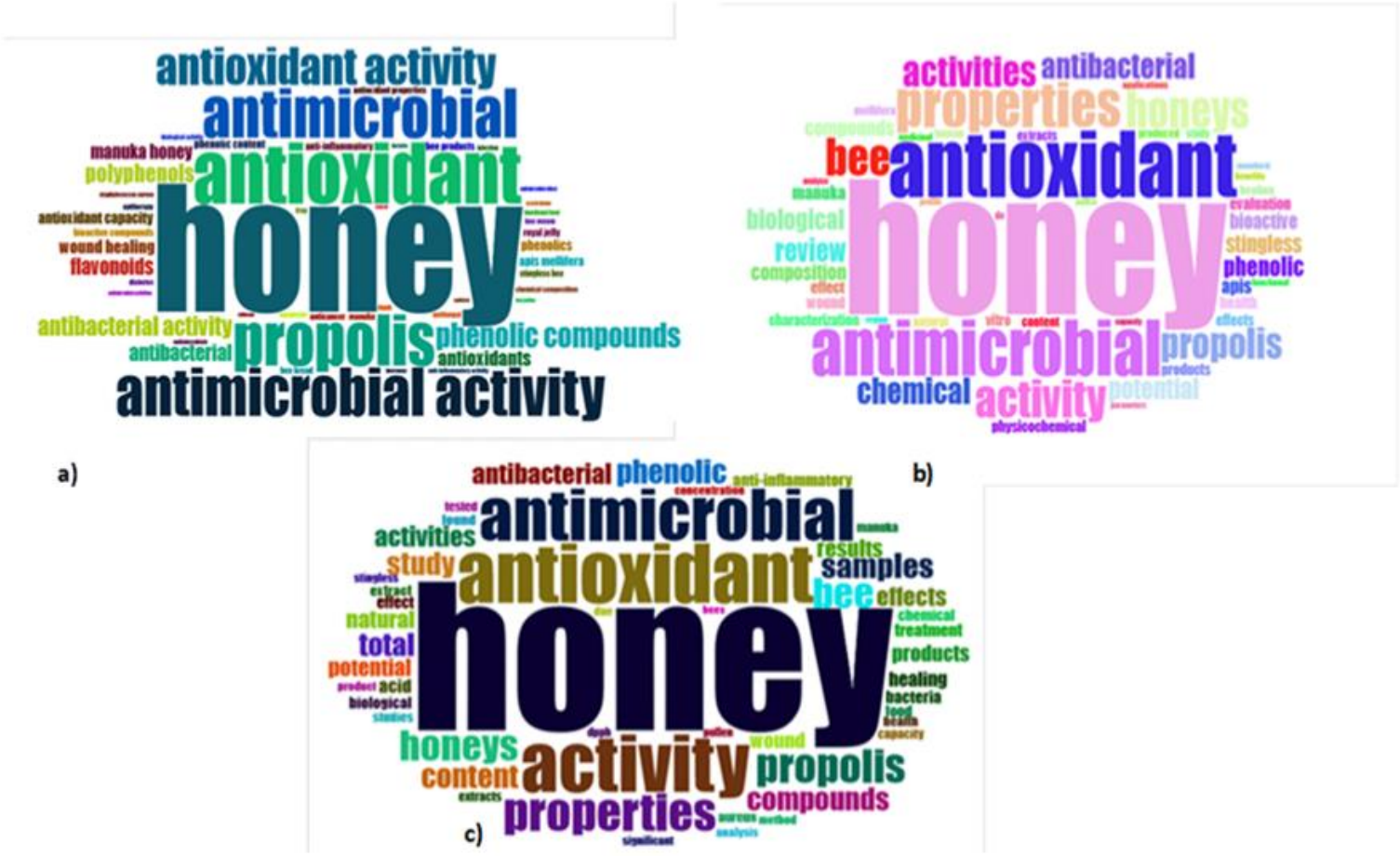


Figure 8. Frequency word clouds of (**a**) titles; (**b**) abstracts; (**c**) keywords.

خواص درمانی و دارویی عسل

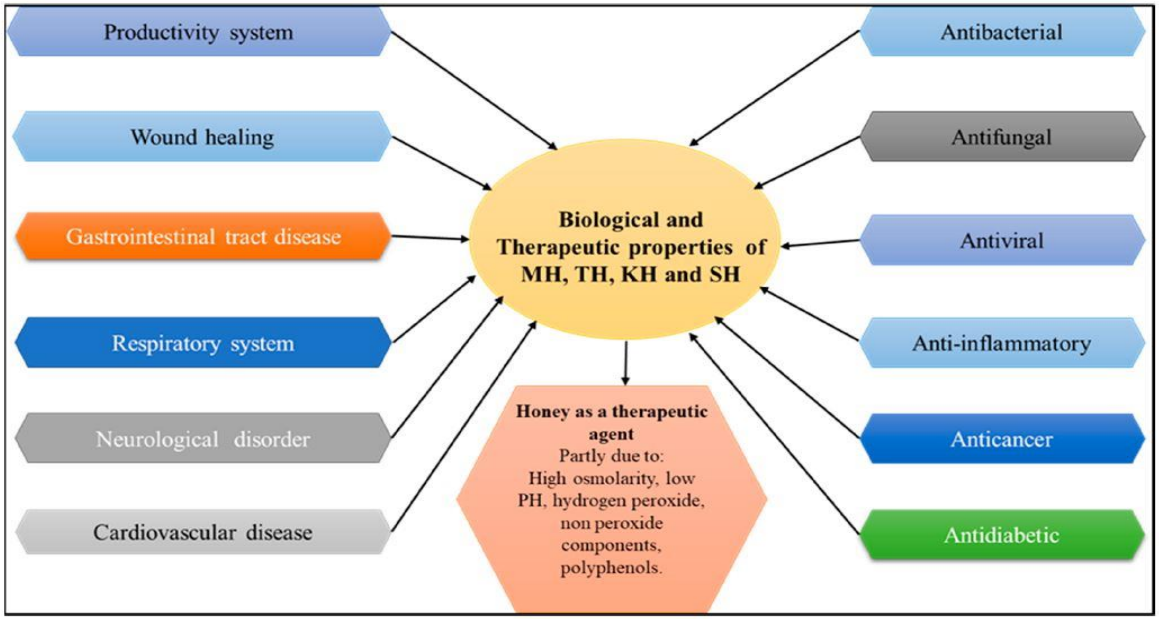


Figure 1. Schematic representation of the therapeutic effects of honey. Adapted from Nweze et al. (2019) [26], Vazhacharickal et al. (2021) [27], Al-kafaween et al. (2022) [28], and Rao et al. (2016) [61].

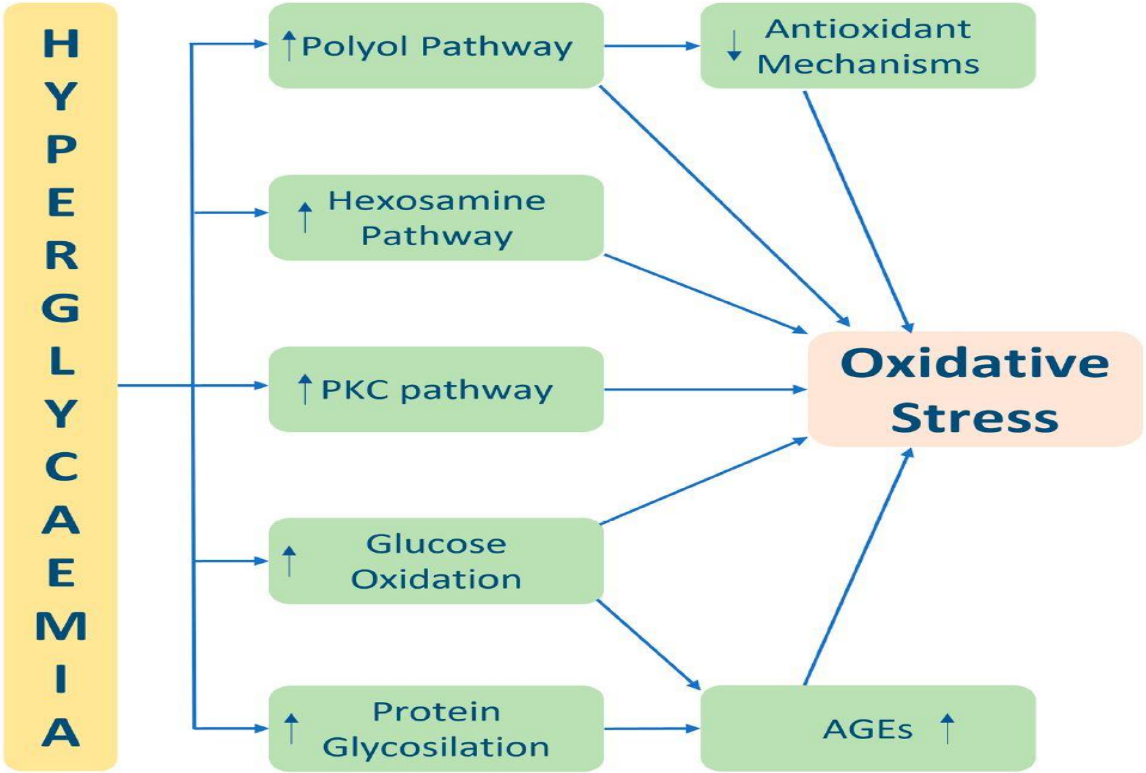


Figure 1. Main pathophysiological mechanism of hyperglycaemia induced oxidative stress. Abbreviations: PKC—Protein Kinase C and AGEs—advanced glycation end products.

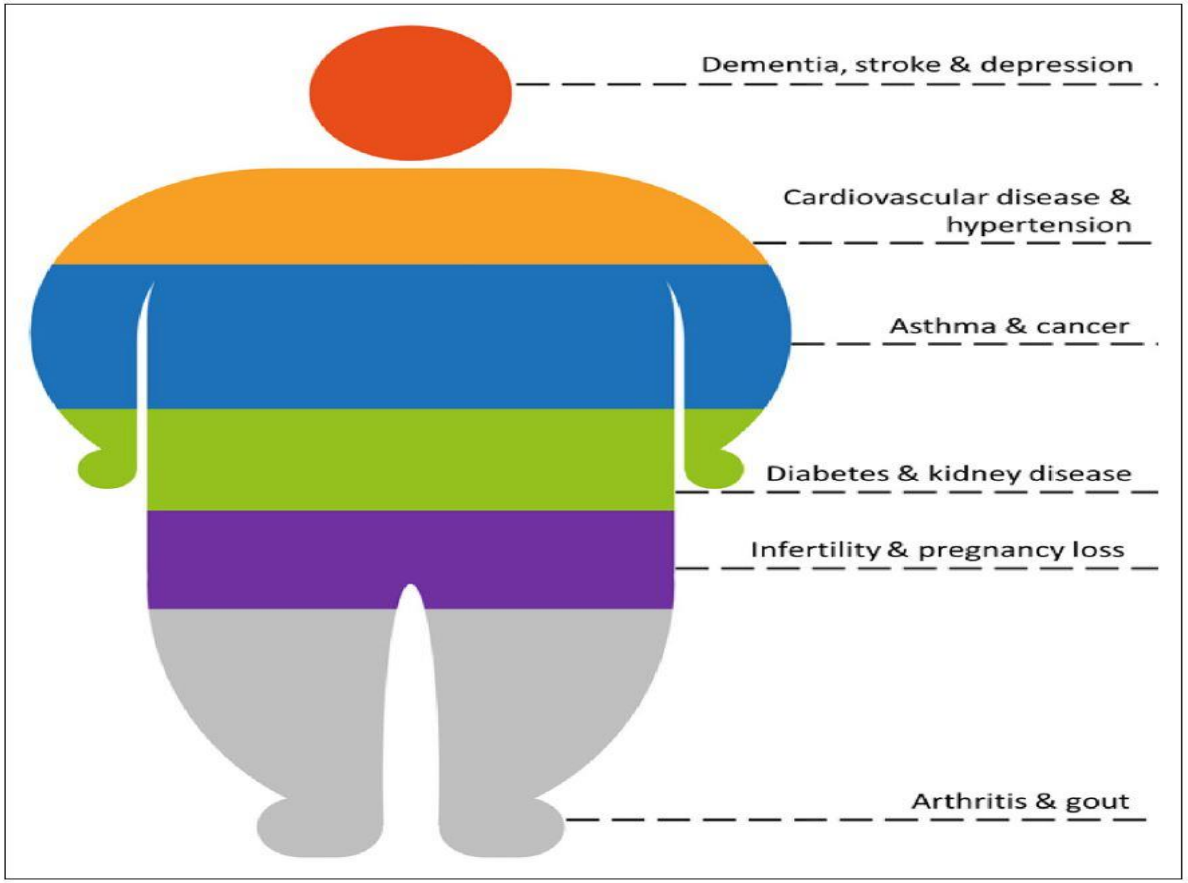


Figure 1. Complications due to obesity.

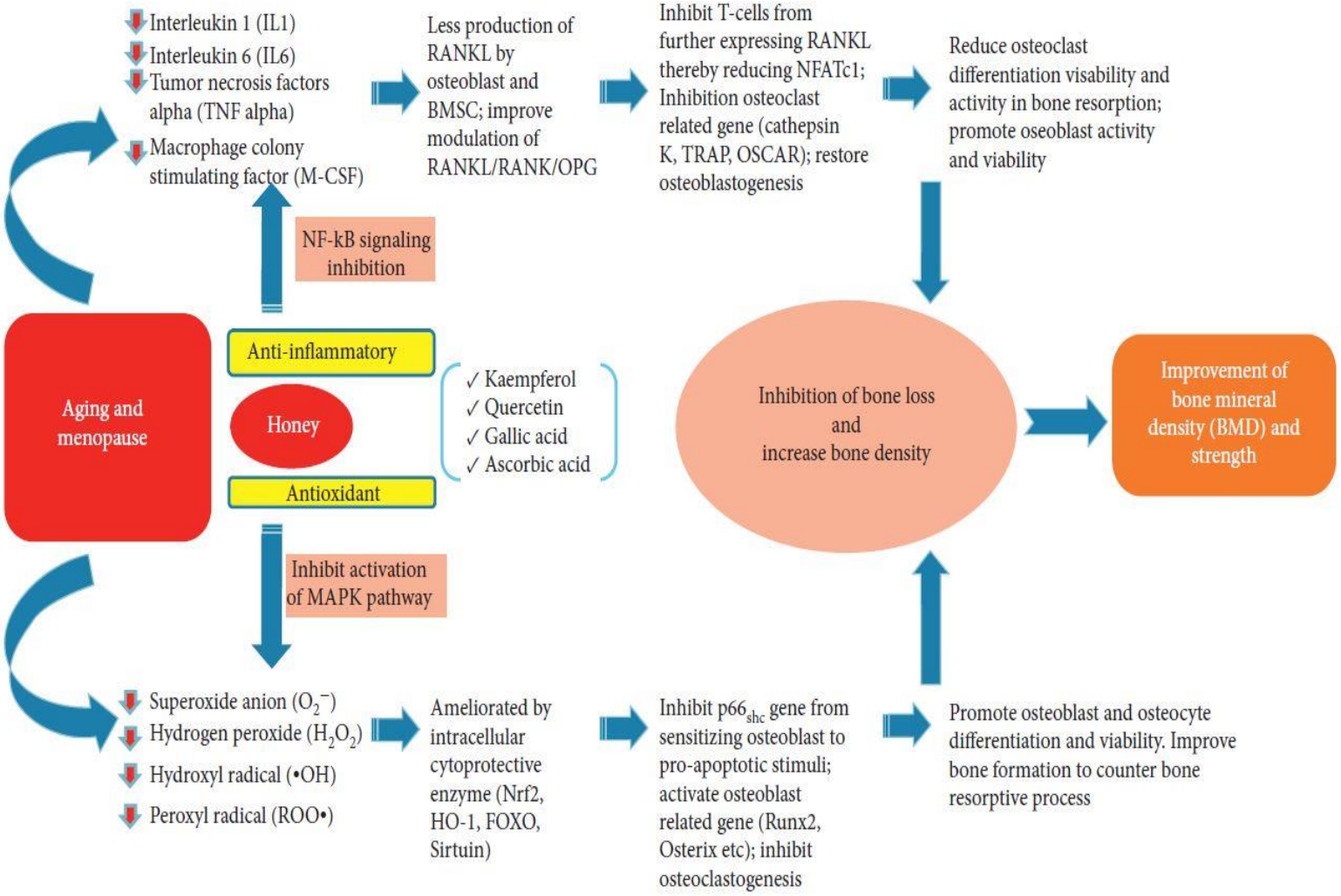


FIGURE 1: Potential effects of honey on bone health. Menopause and ageing give rise to oxidative stress and chronic low-grade inflammation, which cause bone loss. Phytochemical components found in honey, such as quercetin, kaempferol, gallic acid, and ascorbic acid, exert antioxidant and anti-inflammatory action by inhibiting activation of MAPK pathway and NF-κB signalling, respectively. This action will prevent the formation of osteoclasts and favour bone formation by osteoblasts, subsequently preserving bone density.

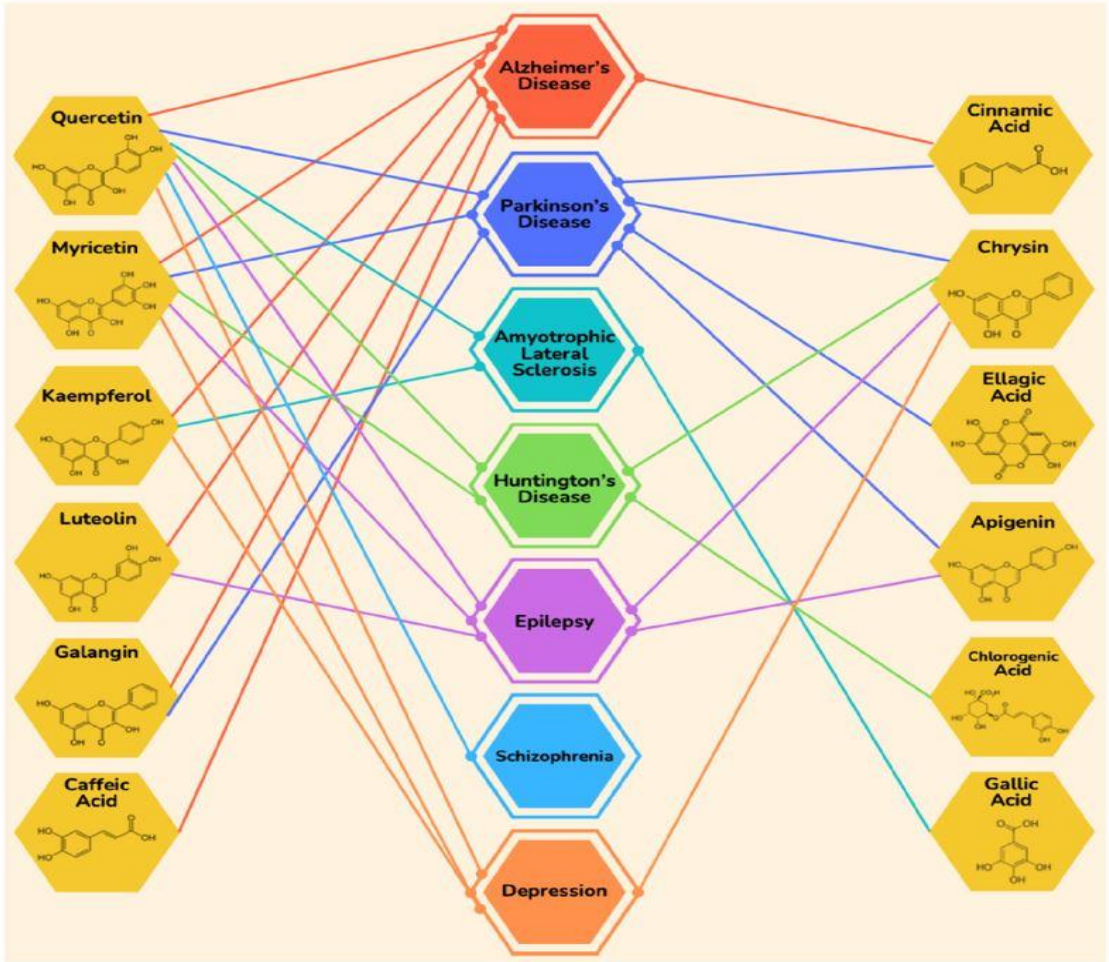
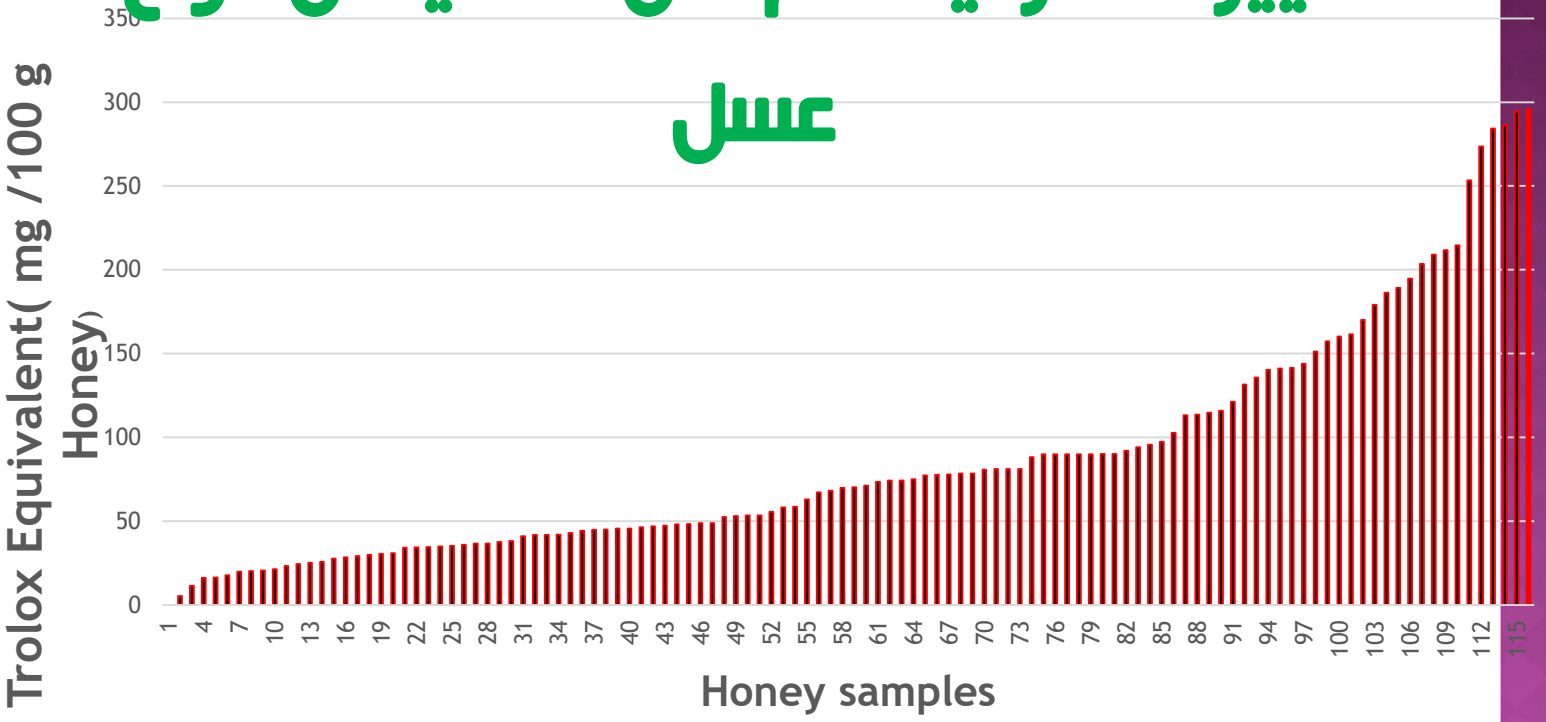
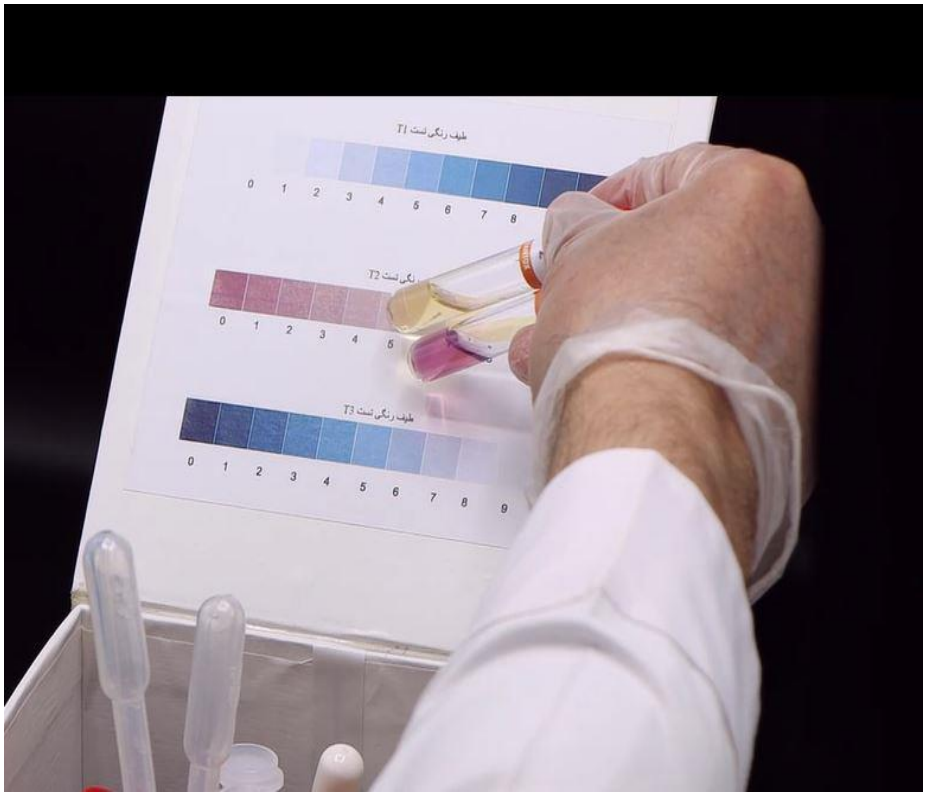


Figure 1. The therapeutic potential of various polyphenols in honey in different neurological diso ders. Various types of honey have a wide range of these vital polyphenols, suggesting honey as potent complementary and alternative medicine for the management and treatment of a variety o neurological diseases.

تغییرات ظرفیت تام آنتی اکسیدانی انواع عسل

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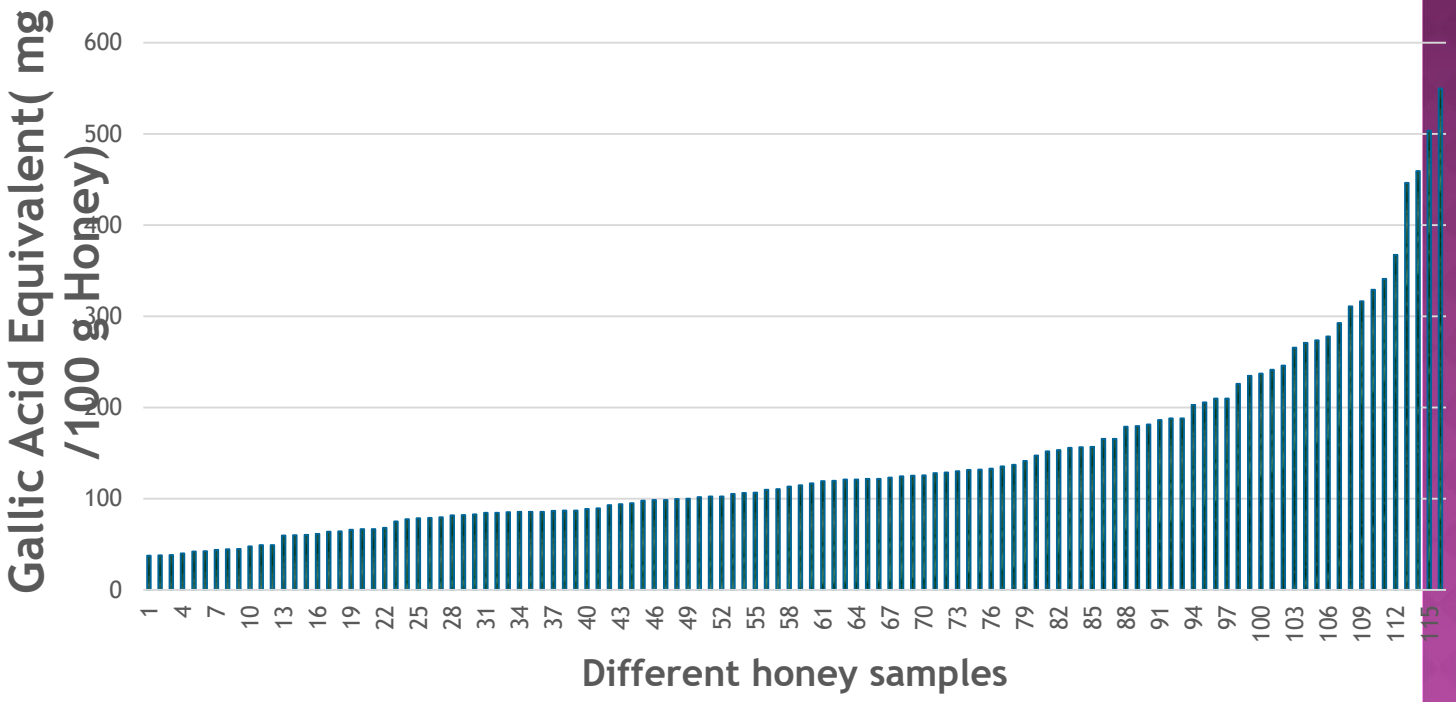
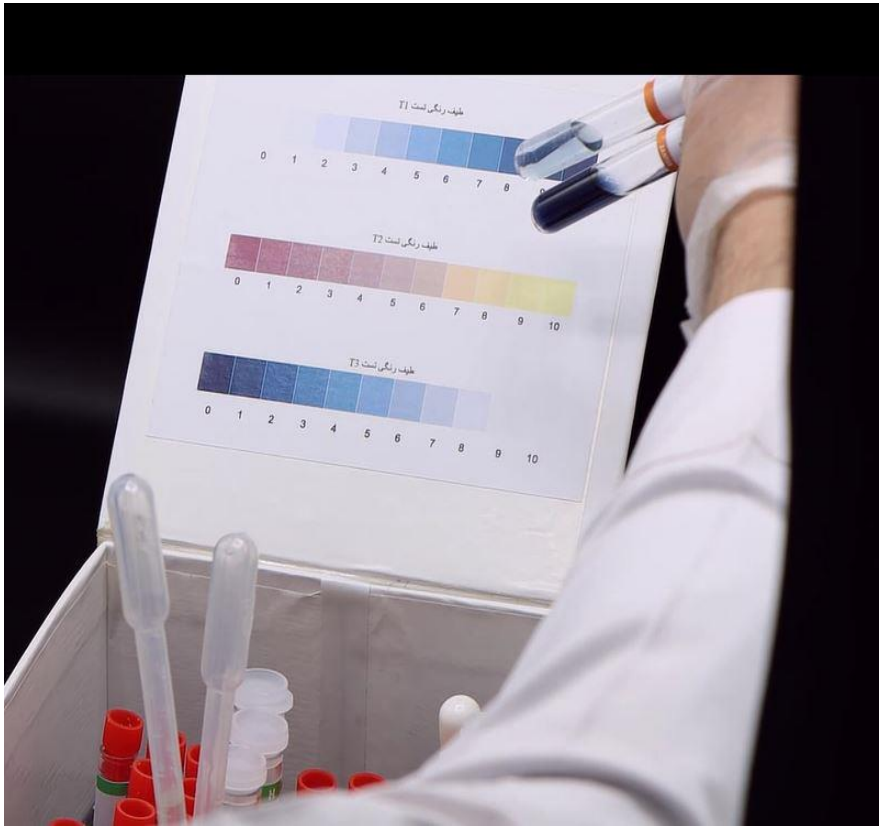
طیف رنگی تست T2
0 1 2 3 4 5
طیف رنگی تست T3
0 1 2 3 4 5 6 7 8 9

تغییرات سطح ترکیبات فنولیک انواع عسل

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طیف رنگی تست T3
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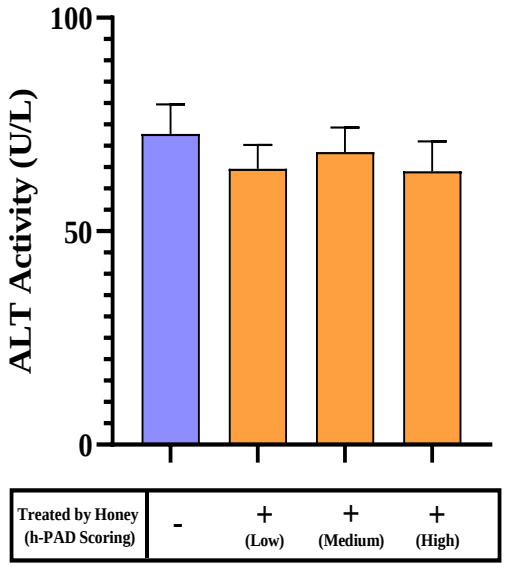
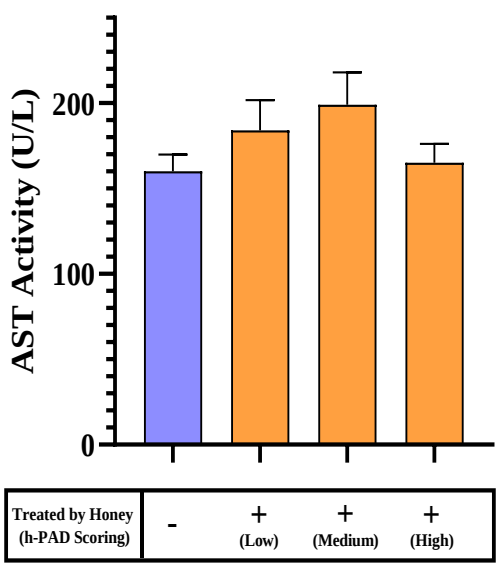
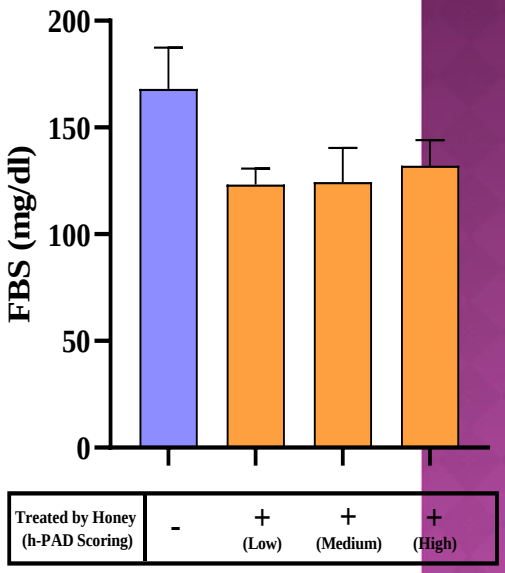
تاثیر مصرف عسل بر قند خون وشاخص های کبدی در موش صحرایی







اثرات محافظت کبد در برابر عوامل سمی و توکسیک

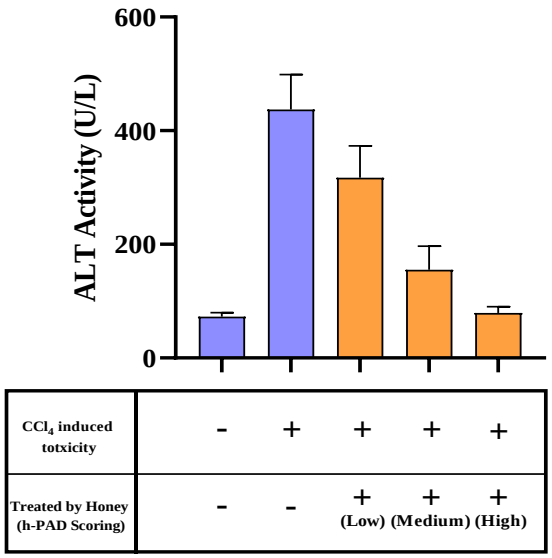
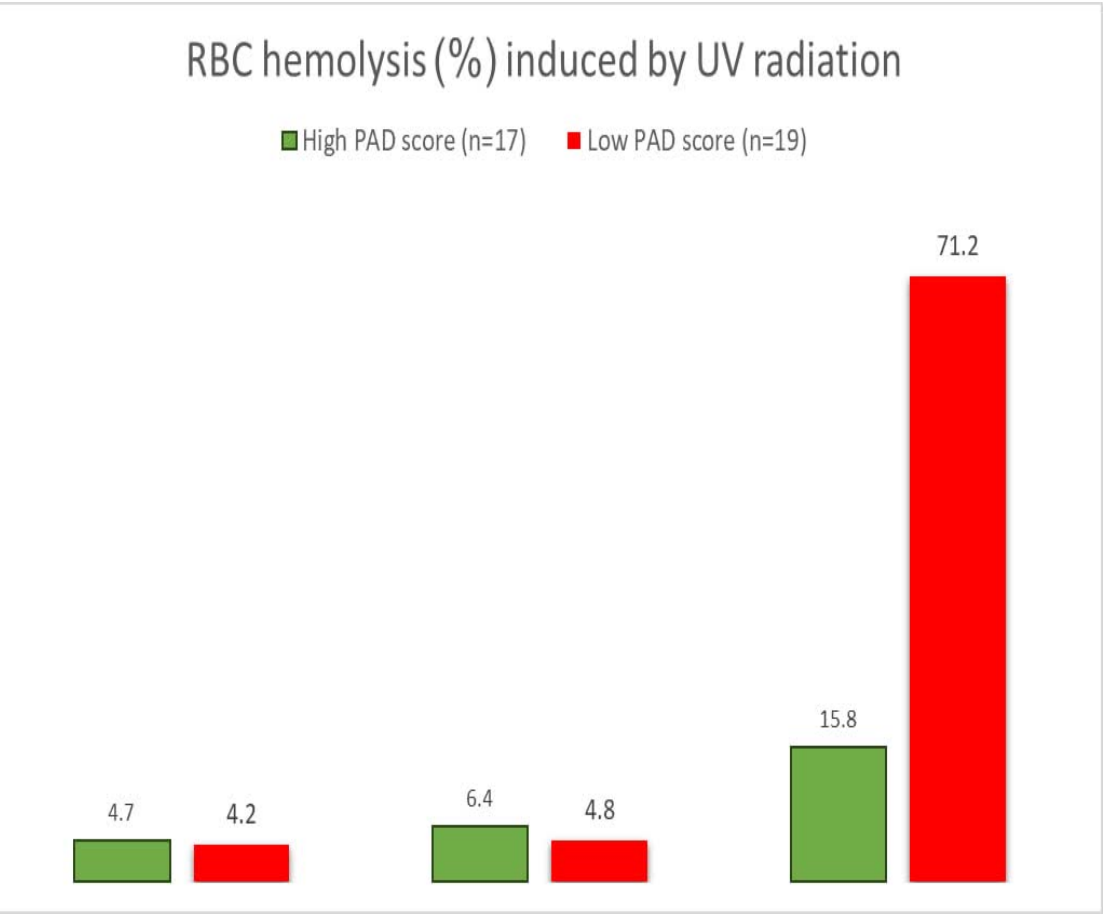
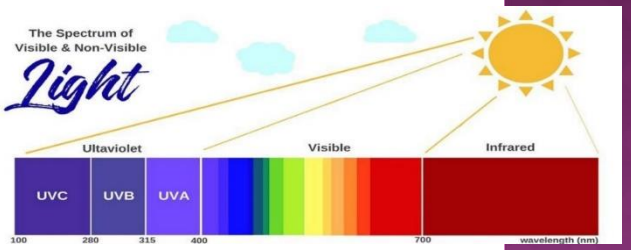


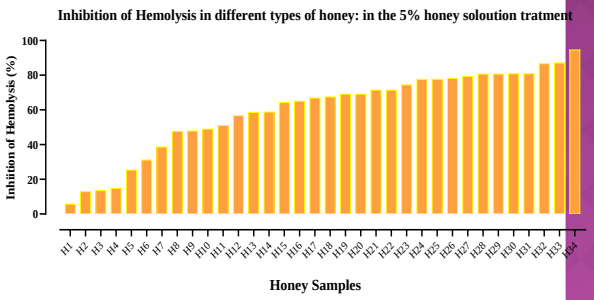
Table 1: Liver appearance in study rat groups

Picture					
CCl4 induced toxicity	-	+	+	+	+
Treated by Honey h-PAD) (Scoring	-	-	+ (Low)	+ (Medium)	+ (High)
Results	Normal Liver tissue	Damaged Liver tissue	Consumption of honey (Low h- PAD score) for 28 days failed to to protect the liver	Consumption of honey (Medium h- PAD score) for 28 days has been able to protect the liver	Consumption of honey (high h- PAD score) for 28 days has been able to protect the liver

اثرات محافظتی عسل در برابر اشعه UV







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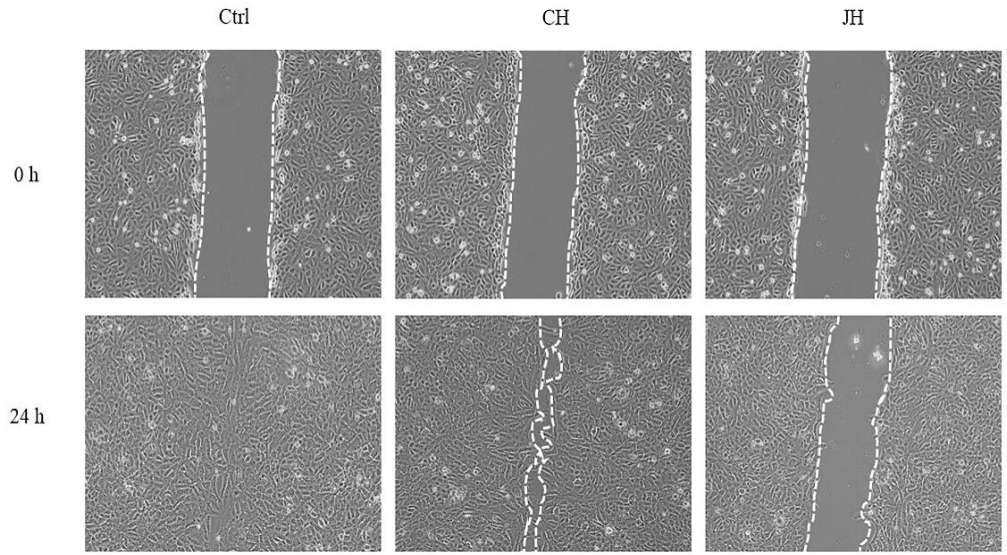
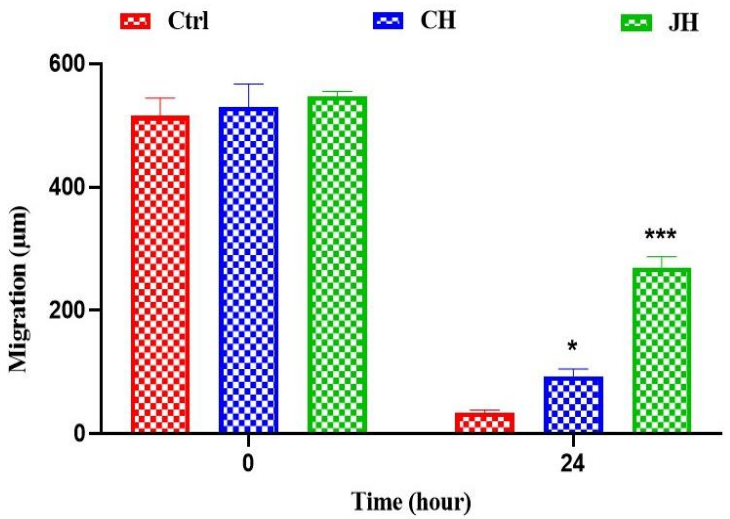
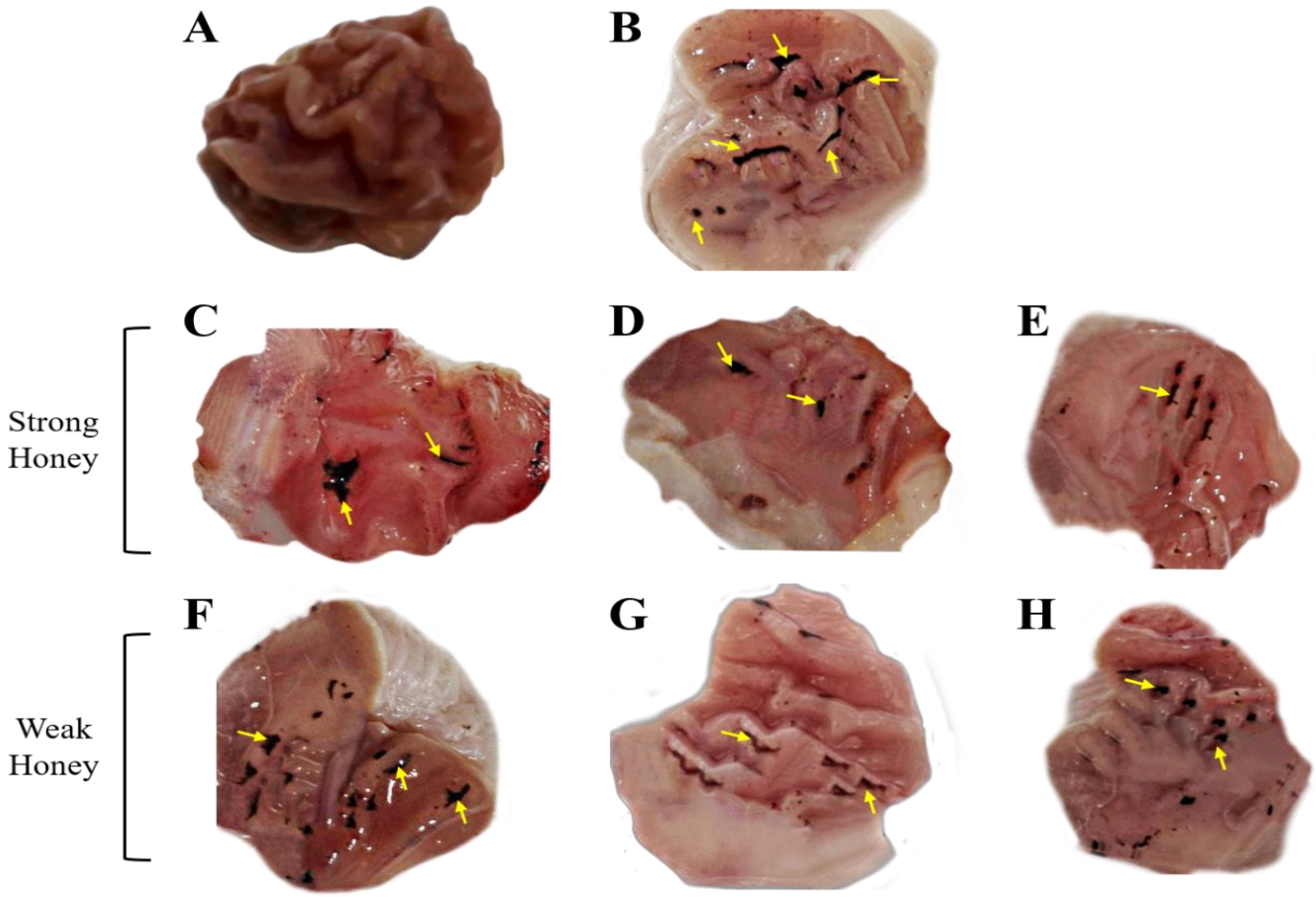




Effect of CH (commercial honey) and JH (*jujube* honey) on MCF7 migration after 24 hours

اثرات محافظت عسل در جلوگیری از زخم معده



Kavosh Arian Azma Co.

با تشکر از همراهی شما