

# **AGEING AND DISEASE FACTSHEET**

## **FREE RADICALS**

The ageing process is the result of the gradual breakdown of efficient cellular function and replacement. This may occur for many different reasons – a major reason is the damage caused by excess free radicals. Free radicals are highly unstable molecules which contain at least one unpaired electron. As soon as they are produced, they search for other molecules to react with, causing a cascade of damaging reactions. Free radicals may result from environmental pollution, radiation, infection, overexertion, excess sunlight, smoking, the consumption of rancid fats, alcohol and even emotional stress. The consequence of excess free radical production means that more cells are being damaged than the body can replace.

### **Effects of Free Radicals:**

- *Damage to cell membranes* with possible predisposition to atherosclerosis, thrombosis and other conditions
- *DNA damage* leading to genetic damage with possible predisposition to cancer and other conditions
- *Reduced immune function* leading to increased susceptibility to infection, increased risk of cancer and increased risk of immune-mediated inflammatory conditions such as rheumatoid arthritis
- *Oxidation of low-density lipoproteins (LDLs)* leading to atherosclerosis and incr. risk of heart disease, stroke and peripheral vascular disease
- *Cross-linking of tissue proteins* leading to loss of tissue elasticity and function and increase in visible signs of ageing.

## **ANTIOXIDANTS**

The body has defence mechanisms against free radicals: antioxidant enzymes and nutrients in the blood 'mop up' free radicals rendering them harmless. Free radical damage can be slowed, prevented or even reversed if there are sufficient quantities of antioxidants in the body.

### **Main Antioxidant Nutrients:**

Vitamin A, vitamin C, vitamin E, selenium, zinc, copper, iron, and manganese. Other plant substances also provide protection such as beta-carotene and the bioflavonoids.

### **How to minimise exposure to free radicals / slow down ageing process:**

- Eat at least 5 servings of fresh fruit and veg. (lightly steamed) per day
- Avoid refined (white) and processed foods – use complex carbohydrates, such as whole grain starches (wholemeal bread, brown rice, wholewheat pasta), beans, pulses, millet, rye, oats, corn, quinoa
- Eat foods rich in essential fats such as oily fish, nuts and seeds and avoid saturated, hydrogenated and processed fats
- Drink plenty of filtered water each day
- Minimise intake of salt, caffeine and sugar and avoid smoking and alcohol and any form of stress on your body
- Avoid exposure to pollutants from air/water, UV radiation, strenuous exercise (but do take regular gentle exercise if and when you can!)