

Which are the biomarkers of genotoxic stress?

Table 15: EXEMPLARY MARKERS OF GENOTOXIC STRESS CAUSED BY TOXIC METABOLITES OF OXIDATIVE PROCESSES DUE TO SOME OF OUR DAILY ACTIVITIES AND HABITS, PHYSIOLOGICAL FUNCTIONS OR CONDITIONS

ACTIVATED ANTIOXIDANT PROTECTION AND NATURAL SOURCES OF THE NECESSARY ANTIOXIDANTS IN THE BODY.

<i>Activity / status</i>		<i>Signal of disturbance</i>	
Intensive sport trainings:		muscle fever, fatigue, cramps	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> malone dialdehyde,, superoxide, peroxy-nitrite 	<ul style="list-style-type: none"> protein breakdown, fat peroxidation, deposition of toxins around muscle tissue and tendons <i>(p. 61)</i> 	<ul style="list-style-type: none"> glutathione, uric acid, superoxide dismutase, magnesium 	<ul style="list-style-type: none"> biosynthesis in the body, natural anti-oxidant protection, mineral water, cheese, tomatoes
Work with computer:		impaired vision, dry skin and hair	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> hydroxyl radical, hydrogen peroxide, superoxide, positive ions 	<ul style="list-style-type: none"> radiolysis, breakdown of water molecules in the skin and hair, dehydration <i>(p. 47)</i> 	<ul style="list-style-type: none"> glutathione, selenium, water, electrolytes, Vitamin C, vitamin E, polyphenols 	<ul style="list-style-type: none"> natural biosynthesis, complete nutrition with import of enough water, minerals, fruits and vegetables
Sunbathing, Solarium:		burning, redness of the skin	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> hydroxyl radical 	<ul style="list-style-type: none"> lipid peroxidation, protein breakdown, DNA damage in epithelial cells <i>(p. 60)</i> 	<ul style="list-style-type: none"> melatonin, superoxide dismutase, catalase, peroxidase, vitamins A, E. 	<ul style="list-style-type: none"> biosynthesis in the body, natural antioxidant protection, carotenoids (carrots, olive oil, spinach)

<i>Activity / status</i>		<i>Signal of disturbance</i>	
Digestion::		heartburn, bloating, upset stomach	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> hydroxyl radical, hydrogen peroxide, superoxide 	<ul style="list-style-type: none"> increase or decrease of pH in the gastrointestinal tract, breakdown of important proteins and DNA in the tissues and organs involved in the entero-hepatic cycle (p.109,128) 	<ul style="list-style-type: none"> superoxide dismutase, catalase peroxidase, coenzyme Q10, Vitamin C 	<ul style="list-style-type: none"> biosynthesis in the body, natural antioxidant protection, lettuce, dill, parsley

Smoking::		extrasystoles, shortness of breath	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> peroxynitrite, benzo-a-pyrene 	<ul style="list-style-type: none"> lipid peroxidation of the airways and cell walls in the lungs 	<ul style="list-style-type: none"> superoxide dismutase, catalase, peroxidase, Vitamin C 	<ul style="list-style-type: none"> biosynthesis in the body, natural antioxidant protection, citrus fruits

Illness:		fatigue, loss of appetite, constipation	
<i>Oxidative process</i>		<i>Antioxidant protection</i>	
activating free radical	Biochemical / Physiological disorder	Antioxidant	Source
<ul style="list-style-type: none"> hydroxyl radical, toxic xenobiotics (Paracetamol) 	<ul style="list-style-type: none"> inflammation, increased liver toxicity and renal stagnation 	<ul style="list-style-type: none"> superoxide dismutase, catalase, peroxidase, Vitamin C 	<ul style="list-style-type: none"> biosynthesis in the body, natural antioxidant protection, citrus fruits



Think fresh! Live fresh!
 See fresh! Eat fresh!
 Be fresh!