Oxygen (O₂) plays a major role in cell metabolism because its ability to accept hydrogen atoms and/or electrons from amino acids, sugars and lipid catabolism in order to generate adenosine triphosphate (ATP) that cells utilise as energy source for they activities (e.g. ion transport, movement, anabolic processes and so on) (1). Indeed a decreased oxygen pressure (pO₂) under its normal level, named hypoxia, can lead to serious damages in cells and tissues (2) that are exacerbated – via acidosis and iron release – by an increased production and release in to the microcirculation of reactive oxygen species (ROS) (3). Unfortunately when the blood flow is restored the concomitant shift of xanthine dehydrogenase to its oxidising form xanthine oxidase can further increase the production of ROS, such as superoxide anion (O₂⁻) and hydrogen peroxide (H₂O₂), according to the well-known ischemia-reperfusion damage mechanism (4). When the production of ROS is not perfectly balanced by antioxidant defences – that into the cell depends mainly by intracellular activity/levels of glutathione (GSH) and superoxide dismutase (SOD) – a condition of oxidative stress (OS) may occur (3). In turn intracellular OS by oxidising cell membrane lipids, citosol proteins and even mitochondrial/nuclear DNA can impair cell functions while extracellular stress by affecting matrix protease/anti-protease balance, by oxidising LDL and by affecting endothelial function can ultimately promote atherosclerosis (3, 5). In fact OS stress is believed to be an emerging health risk factor that is common to more than one hundred diseases and especially it is related to early aging (6). Classically proposed antioxidant strategies – that are generally aimed to improve antioxidant defences – may counteract only partially OS that is generated primarily by a defect of oxygen bioavailability (7). In this general picture Cellfood™ (CF, some time indicated as Deutrosulfazyme™, NU Science Corporation, CA, US, distributed in most European Countries by Eurodream s.r.l, La Spezia, Italy) (8) appears very promising as the prototype of a novel class of “physiological modulators” aimed to make available O₂ “on-demand” (9). Cellfood™ is a non-addictive, non-invasive, and completely non-toxic unique proprietary colloidal-ionic formula containing finest all-natural, plant-based organic substances like ionic minerals, enzymes, amino acids and deuterium sulphate as traces (8, 10). Previous experiments in vitro had shown that CF in water systems improves oxygen solubility as well as reduces iron from its ferric to ferrous form, according to the BAP test that is assumed as a measure of antioxidant capacity (11) while a preliminary report had documented the ability of CF to reduce significantly the oxidant capacity of plasma, according to the d-ROMs test, in subjects at high risk of OS, like cigarette smokers, obeses and athletes (12). In a double-blind cross-over placebo controlled clinical trial on marathon runners CF was also able to improve cardiopulmonary performances, to increase haemoglobin levels – thus mimicking the physiological response to the hypoxia – and to decrease serum lactate, thus mimicking an increased ability to utilise the O₂ (13). Moreover CF successfully improved clinical symptoms in fibromyalgia which pathophysiology is closely related to OS (14) and vO₂ max and maximal power in cyclists (15). Furthermore in a in vitro model CF was able to inhibit the oxidation of GSH by three different oxidants, including the powerful hypochlorous acid, at different dilutions (range 1:5000–1:50), while in a cell-free system it protected DNA from oxidation, both in a dose-dependent manner; in the some study CF protected from oxidation either erythrocytes by reducing cell lysis and intracellular GSH depletion or lymphocytes (16). More recently in a
pivotal study on human umbilical vein endothelial cells (HUVEC) CF stimulated O₂ consumption rate and ATP synthesis maintaining lactate dehydrogenase (LDH) intracellular concentrations and inhibited hypoxia-induced ROS generation by up-regulating the expression of manganese-dependent SOD (Mn-SOD), the key enzyme in superoxide anion detoxification (17). Taken together, the above scientific evidence by confirming previous trials and personal experiences of clinicians suggests that CF supplementation can be useful – together with a well-balanced diet and adequate exercise – in the modulation of oxygen availability by facilitating its consumption and by avoiding its unwanted side-effects thus protecting cells when a condition of hypoxia or hyperoxia/oxidative stress, respectively, may occur, with a favorable impact also on endothelial functions (9, 16). These properties – that make unique CF at the moment in the current picture of nutritional supplements – are enhanced by the documented in vitro colloidal properties of the formula that allows CF to reduce superficial tension and to improve electric conductance thus favoring even by sublingual way – as an original oral spray formula – the widest bioavailability of its active principles, including deuterium (18). Now available in different combinations (e. g. with vitamins, folic acid, silica, methylsulfonylmethane, S-adenosylmethionine, isocitric acid, and so on) CF is successfully used according to the modern concept of “physiological modulator” (19, 20) in different clinical conditions to prevent oxidative-stress related diseases in healthy peoples, especially in exercising peoples, and to support conventional treatments in a wide range of either acute or chronic diseases as well as in anti-aging therapy where CF is proposed in specific protocols. The classical anti-age protocol includes a gradually increasing daily dosing of CF basic formula (three times/day starting from three to reach eight drops in low fix residue water) and thereafter one or more combined oral spray formulas like DNA-RNA that proven useful in improving DNA methylation (21) a commonly believed factor of longevity.

References