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Quantitation of oxidative stress, problems and perspectives

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Oxidative stress (OS), caused by access reactive oxygen species (ROS) is commonly blamed for being involved in the pathogenesis of many diseases. Yet, many (but not all) intervention epidemiologic studies of the possible benefits of antioxidant supplementation yielded disappointing results, attributed to the important physiological role of ROS. The prevailing, reasonable but questionable hypothesis is that high-risk groups would benefit most from antioxidant interventions. This yielded the "identify and treat" approach, based on the assumption that determination of OS can enable identification of people in risk of oxidative damages, thus Improve patient management decisions and patient outcome. The major problems with this approach are (i) the lack of a universal criterion for OS and the lack of correlations between the OS, as evaluated on the basis of results obtained with different biomarkers (ii) the different potency of different antioxidants and its dependence on the type of OS and (iii) the validity of the paradigm that the effect of antioxidants increases with the OS, as evaluated by different methods. We think that even if we disregard these three problems, as long as we do not know the pathophysiological meaning of the different types of OS, the search for improved methods of quantifying OS is of limited applied value, namely OS is not a diagnostic tool. This conclusion is strongly supported by the finding that lists of the people with the highest 10% OS according to different biomarkers exhibit only small overlapping. Studies of the association of the steady state concentrations of biomarkers do not help identifying people under OS.

Biography

Dov Lichtenberg did his BS, MS and PhD in Chemistry at Hebrew University of Jerusalem, Post Doc in Chemical Biophysics, Caltech (1972-1974), Lecturer, Hebrew University (1974-1979), Visiting Professor, University of Virginia (1979-1981), Professor, Tel Aviv University (1981-2011) Previous Dean of Medicine (2002-2006). Professor Emeritus (2011-present). Present Topics: Solubilization and reconstitution of membranes, Oxidative stress and Antioxidants, Admission to Medical schools. He has over 200 publications that have been cited over 200 times, and his publication H-index is 41 and has been serving as an editorial board member of reputed Journals.

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