Graphical Review: The Redox Dark Side of E-cigarettes; Exposure to Oxidants and Public Health Concerns

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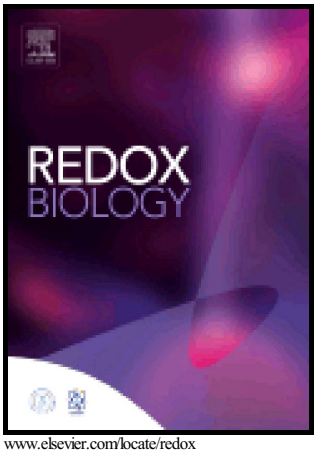

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Graphical Review: The Redox Dark Side of E-cigarettes; Exposure to Oxidants and Public Health Concerns

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Abstract

Since the initial marketing in 2005, the use of e-cigarettes has increased exponentially. Nonetheless, accumulating evidence has demonstrated the ineffectiveness of e-cigarettes in leading to smoking cessation, and decreasing the adverse health impacts of cigarette smoking. The number of adolescents adapted to e-cigarettes has been increasing substantially each year, and this adaptation has promoted openness to tobacco smoking. The present review discusses controversies regarding the smoking cessation effects of e-cigarettes, recent governmental policies and regulations of e-cigarette use, toxic components and vaporization products of e-cigarettes, and the novel molecular mechanisms underlying the adverse health impacts of e-cigarettes leading to oxidative stress in target tissues, and consequent development of cardiopulmonary diseases (i.e. COPD), neurodegenerative disorders (i.e. Alzheimer's' disease), and cancer. Health warning signs on the packaging and professional consultation to avoid adaptation in risk groups might be helpful solutions to control negative impacts of e-cigarettes. It is also recommended to further expand basic and clinical investigations to reveal more detailed oxidative stress mechanisms of e-cigarette induced damages, which would ultimately result in more effective protective strategies.