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Sommario/riassunto	The history of science can teach modern men that our understanding of life is to a great extent based on the accuracy of the analytical methods that we use and, on our readiness to oppose dogmatic opinions, which are based on outdated methods and black/white approaches to the major questions raised by mankind in the past. The recent decades have brought a lot of new insights into the fundamentals of the active principles of reactive oxygen species that are necessary for living cells, but which also cause dangerous pathophysiological processes. Accordingly, although they were previously considered to be the most undesired toxic compounds generated as the final products of the oxidative degradation of lipids, reactive aldehydes are now considered to play important roles both in health and in major diseases. Represented mostly by 4-hydroxynonenal (HNE), a substance discovered only fifty years ago, reactive aldehydes are the focus of research not only because of their toxicity but also because of their positive effects regulating the most important metabolic processes such as growth of living cells or the death of cells. Better understanding the interactions between reactive aldehydes and natural or synthetic antioxidant substances might eventually help us to better monitor, prevent and control modern diseases, thus building pillars for the development of the modern, multidisciplinary life sciences and integrative medicine of the 21st century.