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הנושא:

Radicals Formed from Tea Polyphenols and Reactive Oxygen Species at the 50-ns Time Scale. An Investigation by Time-Resolved EPR and Quantum Chemical Calculations

המפגש יתקיים

ביום א', 9 נובמבר 2014, בשעה 9:00

מועדון סגל

Abstract:

Oxidative stress and its prevention by anti-oxidants are active areas of research with application in many different fields ranging from the molecular sciences to medicine. In terms of our everyday life, it has been recognized for many years that tea is a good source of antioxidants. Many experiments have sought to assess the antioxidant potential of tea ingredients, particularly polyphenols. A key conclusion is that polyphenols act as potent anti-oxidants to radical attack, via hydrogen-atom transfer at the phenolic OH groups. However, a structural characterisation of the species formed directly upon Hydrogen-atom transfer (HAT), a key reaction of oxidative stress has not been achieved. In our work, we consider this reaction for catechin and green-tea polyphenols at a molecular level and at real time of 50 ns using time-resolved EPR (Electron Paramagnetic Resonance) spectroscopy. Our results show that there is essentially no site specificity for HAT and statistical (entropic) factors are substantially ruling initial antioxidative events. This conclusion is supported by comparison of results obtained by time-resolved, steady-state EPR spectroscopy and quantum chemical calculations.

Thus, at early stages of their antioxidant activity, all phenolic OH groups act as scavengers for reactive oxygen species operating via HAT. In first instance, not only thermodynamically favoured phenoxyl radicals are formed but also less stable short lived species. Latter are less reactive than ROS but may cause harmful effects.

סגל וסטודנטים מוזמנים להשתתף

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