The Threshold Force for Membrane Tether Formation Depends Strongly on Loading Rate. 

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Inhibition of the Peroxidation of Liposomal Lipids by Uric Acid Requires Tocopherol. 

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Urate is the major water-soluble low molecular weight antioxidant in serum, contributing about 50% to the antioxidative potential of the serum. Unexpectedly, both urate, as well as the other major antioxidant ascorbate, promote the copper-induced peroxidation of liposomal PUFA. In a previous study it has been shown that ascorbate inhibits copper-induced oxidation of liposomal lipids when the liposomes contain Tocopherol, whereas urate does not. In an attempt to explain these findings we studied the temporal order of events, by monitoring continuously and simultaneously the time-course of formation of oxidation products and the consumption of the various components of the system. The result of kinetic profiles show that: 1. Both water-soluble antioxidants slightly inhibit the oxidation of tocopherol; 2. Ascorbate becomes oxidized very rapidly (much faster than tocopherol), whereas urate and tocopherol become oxidized simultaneously. 3. In the presence of tocopherol, both urate and ascorbate inhibit copper-induced peroxidation of PUFA. 4. AAPH-induced peroxidation of liposomal PUFA is inhibited by both urate and ascorbate, independent of the presence of tocopherol. Our interpretation of these results contribute to understanding the complex, interdependent dependence of the susceptibility of aggregated (unlike soluble) lipids on all the water-soluble antioxidants. This is particularly important for evaluation of the oxidizability of serum lipids when the serum contains excess urate, as in the case of insulin-resistant and obese subjects.