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Assay for the Detection of Rubber Oxygenase Activities

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Abstract:

Microbial biodegradation of rubber relies on extracellular rubber oxygenases that catalyse the oxidative cleavage of the double bond of the polyisoprene backbone into oligo-isoprenoids. This protocol describes the determination of rubber oxygenase activities by an online measurement of molecular oxygen consumption via a non-invasive fluorescence-based assay. The produced oligo-isoprenoid cleavage products with terminal keto- and aldehyde-groups are identified qualitatively and quantitatively by HPLC. Our method allows for the characterization of homologue rubber oxygenases, and can likely be adapted to assay other oxygenases consuming dioxygen. Here we describe the determination of rubber oxygenase activities at the examples of the so far two known types of rubber oxygenases, namely rubber oxygenase A (RoxA) and latex clearing protein (Lpc).

Keywords: Latex clearing protein (Lpc), rubber oxygenase, dioxygenase, polyisoprene, rubber, oxygen monitoring