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In-situ monitoring of H2O2 degradation by live cells using voltammetric detection in a lab-on-valve system{

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This paper describes a method for monitoring the degradation of hydrogen peroxide by cells immobilized on a beaded support. The detection is based on the voltammetric reduction of hydrogen peroxide on a mercury film working electrode, whilst combining the concept of sequential injection (SI) with the lab-on-valve (LOV) manifold allows the measurements to be carried out in real time and automatically, in well-defined conditions. The method is shown to be capable of simultaneously monitoring hydrogen peroxide in the 10–1000 mM range and oxygen in the 160–616 mM range. A correction algorithm has been used to ensure reliable H2O2 results in the presence of varying oxygen levels. The method has been

successfully applied to monitoring the degradation of H2O2 by wild-type cells and by catalase-

overexpressing mouse embryonic fibroblasts. Since the technique allows the monitoring of the initial response rate, it provides data not accessible by current methods that are end-point-based measurements.

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