A novel biosensor for the detection of zearalenone family mycotoxins in milk

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Real-time Measurement of Cell Permeabilization With Low-molecular-weight Membranolytic Agents

A new method for studying the action of membranolytic agents by simple measurement of light emitted from cells is described. It is based on the expression of the click beetle (Pyrophorus plagiophthalamus) luciferase gene (lucGR) in Escherichia coli, Bacillus subtilis and Spodoptera frugiperda cells in order to make them bioluminescent. The diffusion of the substrate for luciferase enzyme through the cell membranes is very slow at physiological pH, and therefore a change in membrane permeability is seen as a change of in-vivo luminescence of cells. The cells used in this study represent different membrane structures, and thus allow a comparison of the reactions of the different membranes towards membranolytic agents in a real-time measurement. The dose-response data correlated well with target cell viable count. In addition, the time course of light emission as a consequence of permeabilizing compound is dose-dependent. The action of the compounds on prokaryotic and eukaryotic cells was found to be highly dependent on the permeabilizer used.

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