

## A direct technique for preparation of magnetically functionalised living yeast cells

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### Abstract

A direct technique for preparation of magnetically functionalised yeast cells by using polyelectrolyte mediated deposition of magnetite nanoparticles is reported. We demonstrate that the cells preserve their viability after the magnetite deposition and show that the magnetic nanoparticles form a multilayered coating on the outer side of the yeast cell's wall. We applied our technique to produce magnetically functionalised yeast cells expressing green fluorescent protein (GFP) under the control of RAD54-GFP reporter and demonstrated that their fluorescence emission is not influenced by the presence of magnetite-polyelectrolyte composite coating. We show that the individual cells can be successfully manipulated by an external magnetic field which can be used for their deposition, holding and subsequent removal from microfluidic devices for genotoxicity and cytotoxicity biosensor applications. Our technique for direct magnetization of cells can find many other biotech applications including biosensors, bioreactors and bioseparation. © 2011 The Royal Society of Chemistry.

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