

DNA enrichment by functionalized magnetic nanoparticles for on-site and fast detection of virus in biomedical application

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Abstract: Label-free electrochemical DNA sensor is a promising technique for simple, fast, on-site virus detection. However, the low sensitivity is still a challenge for this method. This report shows a way to improve the sensitivity by magnetic enrichment of the DNA concentration before measuring DNA concentration by the DNA sensor. The enrichment was performed by conjugating superparamagnetic nanoparticles with the DNA probe single strand. Then, the system of nanoparticles-DNA probe was matched with the target DNA followed by magnetic decantation and compulsorily unfolding the DNA strands at a high temperature. The obtained solution was determined by the electrochemical DNA sensor. The results showed that the DNA enrichment process by magnetic nanoparticles improved the sensitivity of the electrochemical DNA sensor to about 200 times, which can be used for on site virus detection. ?? 2009 IOP Publishing Ltd.

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