Magnetic Nanotechnology for Biodetection

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Abstract: A highly sensitive biodetection technology using nanomagnetic sensors and magnetic nanoparticles (NPs) was developed. Absorption of magnetic NPs by the hybridized DNA alters the sensor resistance and generated electrical signals that can be directly measured with the off-die or on-die circuitry. Assays with DNA concentration down to sub-10 pM with a dynamic range of three orders of magnitude were demonstrated. The proposed biochip can be applied to other bioreaction detections, for example, protein assay, through different surface modifications.
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