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Abstract

Sensitive and selective detection of microRNAs (miRNAs) in cancer cells derived exosomes have attracted rapidly growing interest owing to their potential in diagnostic and prognostic applications. Here, we design a ratiometric electrochemical biosensor based on bipedal DNA walkers for the attomolar detection of exosomal miR-21. In the presence of miR-21, DNA walkers are activated to walk continuously along DNA tracks, resulting in conformational changes as well as considerable increases of the signal ratio produced by target-respond and target-independent reporters. With the signal cascade amplification of DNA walkers, the biosensor exhibits ultrahigh sensitivity with the limit of detection (LOD) down to 67 aM. Furthermore, owing to the background-correcting function of target-independent reporters termed as reference reporters, the biosensor is robust and stable enough to be

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