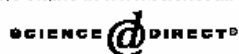




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Label-free bioelectronic detection of aptamer–protein interactions

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Abstract

We demonstrate for the first time the utility of nucleic acid aptamers for electrochemical detection of proteins. Highly specific and sensitive label-free detection of the target protein is achieved by combining aptamer-coated magnetic beads and chronopotentiometric stripping measurements of the captured protein (in connection to the intrinsic electroactivity of the protein). Lysozyme has thus been detected selectively in a mixture containing a large excess of six proteins and amino acids (both electroactive and non-electroactive), with a detection limit of 350 fmol (7 nM). While aptamer-based electronic sensors are in their infancy, such devices offer attractive opportunities for electrochemical detection of proteins and for developing proteomic chips.
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