Rapid detection method for protein-protein interaction in a cell-free protein synthesis system

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We have developed a simple method for the analysis of protein-protein interaction based on a highly efficient cell-free protein synthesis system. In this method, genes of potential prey proteins are co-expressed with a affinity-tagged bait protein in a cell-free protein synthesis reaction. In addition, synthesis reactions were conducted in the presence of affinity beads so that the bait-prey complex can be in situ isolated onto the beads.
As a model system to validate this approach, human EPO and EPO receptor (histidine-tagged) were cell-free synthesized simultaneously in the presence of Ni-NTA magnetic agarose beads. Mass spectrometry and immunoblotting analysis of the eluates confirmed the presence of EPO and EPO-receptor in the eluates from the beads indicating the successful isolation of the interacting proteins. We expect the developed method will be easily expanded for parallel analysis of protein interactions.