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ABSTRACT

Natural bacterial communities provide a rich source of biocatalysts, however, high-throughput screening for the functional bacteria remains a major challenge. Here, we present an agarose-based microwells array chip for functionally screening and isolating novel microorganisms with merits of high-throughput, high specificity and sensitivity. In this approach, the bacterial cells were loaded with single cell per a microwell mode and were incubated in the arrayed agarose microwells. The growths of single cells were then monitored in real time and the enzyme reaction activities were assessed at the individual microwell resolution. To validate the reliability of the method, we subsequently applied it to screen lipase-producing bacteria from the pond water based on lipase hydrolysis of the substrate in the presence of