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## A novel immobilized method for isolation of phage display library-derived scFv antibody specific to *Listeria monocytogenes*

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We developed a novel simple and cost-effective immobilization method for bio panning of a phage-display library. We used Light Expanded Clay Aggregate (LECA) as biomass support matrix to isolate phage display library-derived scFv antibody specific to *Listeria monocytogenes*, a bacterium causing serious illness in human and animal. Four rounds of positive selection against LECA-immobilized *L. monocytogenes* and an additional subtractive panning against *L. innocua* were performed. This panning scheme in combination with our novel immobilization method allowed us to isolate the phage clones bind to *L. monocytogenes* without cross-reactivity toward ten other non-*L. monocytogenes*

bacteria. One of the selected phage clones was able to specifically recognize three major pathogenic serotypes (1/2a, 1/2b and 4b) of *L. monocytogenes* and 11 tested *L. monocytogenes* strains isolated from foods. This scFv antibody has potential use in development of immunoassay-based methods for rapid detection of *L. monocytogenes*. In addition, the LECA-immobilization method described here offers an efficient, simple and cost-effective bio panning strategy to isolate specific monoclonal antibodies against any given species of pathogenic bacteria from phage-display libraries.

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