Bacterial surface display of nanobodies against cancer and toxic micoalgal cells

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The production and the outwards display of antibodies on biosensor surfaces are time consuming and expensive steps. Antibody fragments (nanobodies) suitable for antigen immunocapturing enable alternative approaches. Nanobodies were displayed on the surface of *Escherichia coli* through autotransporter secretion mechanism and such bacteria were directly coated on surfaces to serve as immunoreagents for detection of cancer cells and toxic microalgae. The nanobody-displaying bacteria were also genetically engineered for the coexpression of green fluoresence protein in their cytoplasm and used as fluorescent immunoreagents for the quantification of relative affinity to the target cell by flow cytometry analysis and surface display ELISA. For efficient functionality of the system, we optimize the bacterial adhesion on solid surfaces by optimizing the functionalization strategies and the washing steps. Our study showed the feasibility of the approach for inexpensive diagnostic applications without the necessity to purify the nanobodies.

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