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Use of nanobodies in developing a bacterial antibody production platform

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SHuffle is a genetically engineered E.coli strain that allows disulfide bond formation in its cytoplasm with high fidelity. Many proteins containing disulfide bonds have been successfully expressed in SHuffle. In this study, we have expressed for the first time full length human, rabbit and mouse antibodies, along with chimeric versions, including the commercial blockbuster Humira in SHuffle (Nature Communications (2015) Aug 27; 6:8072). In order to improve the folding and assembly of IgG, we have co-expressed a set of chaperones and other helper proteins from our newly developed pAL plasmid system. The co-expression of the pAL plasmid set increased the production of IgG in SHuffle several fold. The IgG produced in SHuffle was comparable to hybridoma produced IgG. SHuffle is an easy, fast, robust platform for antibody engineering, screening and expression.

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