

### High-level production of human Fc $\gamma$ receptor in high cell density cultures of *Escherichia coli* and its purification

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Human Fc receptors are expressed as membrane-bound molecules on a variety of immune cells, and which are play well-defined role in regulation of innate and adaptive immune responses by binding to immunoglobulin G (IgG) class antibody. In this research work, we achieved large scale production of recombinant Fc $\gamma$ RIIa by high cell density cultivation of *E. coli*. Fc $\gamma$ RIIa expression was induced at two different cell concentrations, OD600 of 46 and 100. When *E. coli* cells were induced at higher cell concentration (OD600 of 100), cell concentration reached to OD600 of 234 in 9 h cultivation after induction. Fc $\gamma$ RIIa was produced as insoluble inclusion body in cytoplasm and receptor productions were also maintained at high levels during induction period. The maximum content of Fc $\gamma$ RIIa was 17.4% of total proteins at 10 h after induction and volumetric productivity was about 0.32 g/L/h. By simple purification procedures including denaturation and refolding process, 87 mg of soluble Fc $\gamma$ RIIa could be obtained from 20 mL of culture with high purity. The biological activity of refolded Fc $\gamma$ RIIa was also evaluated with its interaction to all subclasses of IgG antibodies.