Microbial Cell Factories

Poster Presentation

Antibody production by a protease-deficient strain of methylotrophic yeast, *Ogataea minuta*

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Background

At present the expression system of mammalian cells such as CHO has been adopted as the conventional method to produce antibody for pharmaceuticals. However a novel method of producing antibody has been sought after as a substitute for the costly production of antibody by mammalian cells. Therefore, we tried to construct a novel antibody production system by using methylotrophic yeast, *O. minuta*.

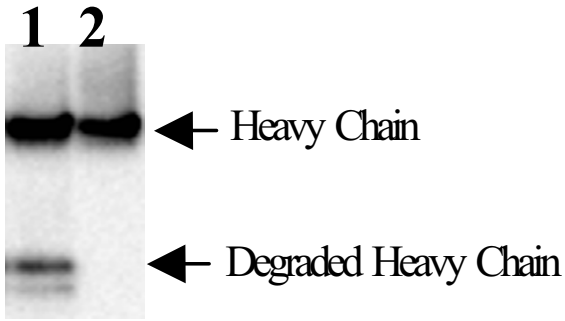

Figure 1
Culture supernatant from the yeast *O. minuta* was subjected to Western analysis with HRP conjugated anti-human Fc antibody. Lane1: heavy chain secreted by *YPS1*+ strain. Lane2: heavy chain secreted by Δ*yps1* strain.

Results

When human antibody genes were introduced in the methylotrophic yeast *O. minuta* to produce an antibody, the heavy chain of the antibody was partially degraded (see Figure 1, lane 1). Peptide sequencing revealed that degradation occurred in the CH1 region (see Figure 2). In order to inhibit this degradation, the *YPS1* gene coding Aspartic protease attached to the plasma membrane, a homologue of *Saccharomyces cerevisiae*, was cloned from *O. minuta*, and we constructed the Δ*yps1* strain. As a result, the Δ*yps1* strain repressed the partial degradation of the antibody (see Figure 1, lane2).

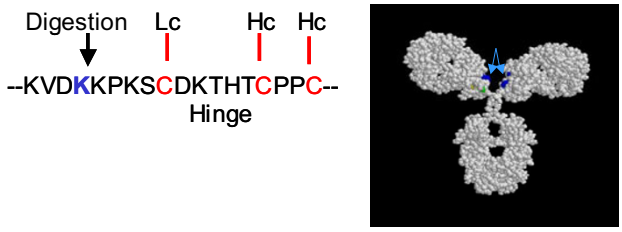

Figure 2
Position of the partial degradation in the heavy chain on its CH1-hinge region produced by *O. minuta YPS1* + strain. Arrows show the position of the degradation.

Conclusion

We constructed a protease-deficient strain and confirmed the secretion of full-length antibody by yeast. Improving the production of antibody should be a subject of further research.

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