

# Fermentation of fully-dispersed filamentous fungi mutant

Capable of several-fold production of the desired product!

## Overview

Filamentous fungi (e.g. *Aspergillus oryzae*) are well-used for production of useful proteins and small molecules in industry. However, it is well-known that hyphal aggregation during the liquid cultivation often prevents from growing with high density, resulting in low productivity. This invention discloses a mutant fungus, in which  $\alpha$ -1,3-glucan synthase (AGS) genes plus the genes on galactosaminogalactan (GAG) cluster are deficient.

AGS deficient fungi (AG $\Delta$ ) showed a highly dispersed property [1]. By inducing further deficiency in genes on GAG cluster, the mutant (AG $\Delta$ -GAG $\Delta$ ) shows a fully dispersed state in liquid culture. Further, this phenotype contributes to well aerobic conditions during cultivation, resulting in increasing growth of cells and substance production thereby.

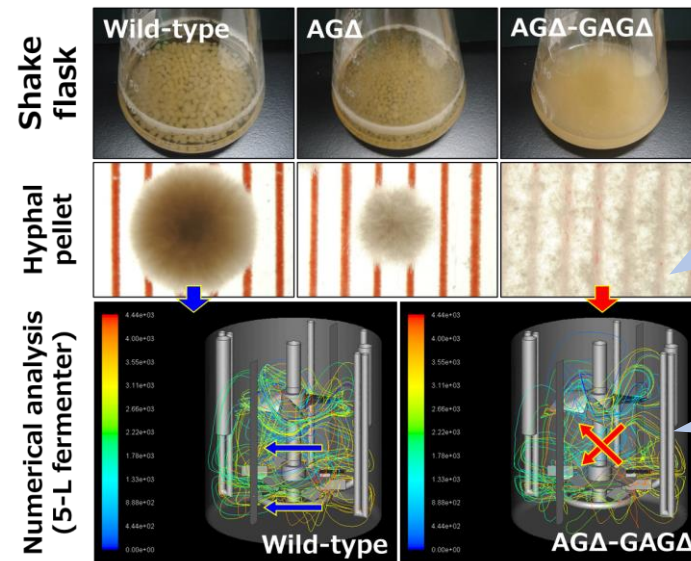
## Product Application

- ❑ Production of functional proteins/peptides like enzymes
- ❑ Production of small molecules with biological activities such as amino acids, antibiotics, etc..
- ❑ Application of increased fungi biomass to meat alternative

## IP data

IP No. :JP6647653B2, US11021725B2, etc..  
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 Admin No. :T16-155

## Distinct morphology / mixing property

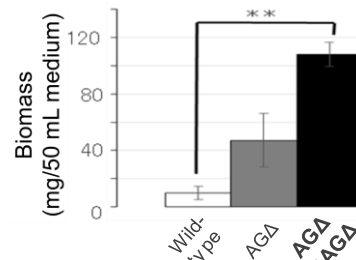


Fully-dispersed!  
Low - viscosity!

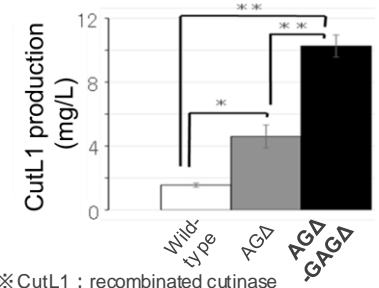
Improved mixing effect!

## Increased biomass / productivity

10-fold biomass per unit (vs. wild-type)



5-fold production per unit (vs. wild-type)



## Related works

- [1] Miyazawa et al (2019) Front Microbiol 10:2090
- [2] Miyazawa et al (2020) Fungal Biol Biotechnol 7(10) 1-13
- [3] Ichikawa et al (2022) J Biosci Bioeng 133(1):39-45

## Contact