

Microbial production of antioxidant amino acid, ergothioneine

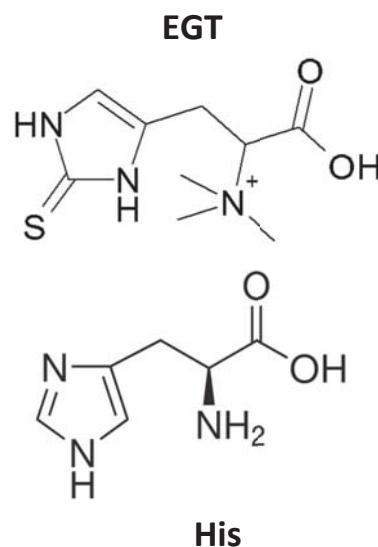
抗酸化性アミノ酸エルゴチオネインの微生物生産

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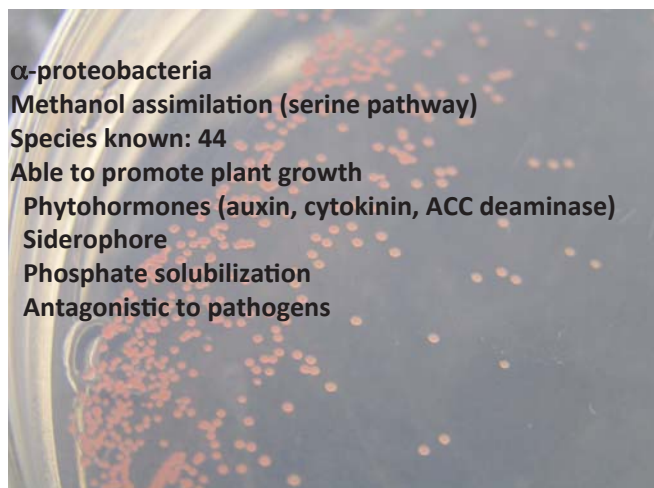
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Ergothioneine (EGT)

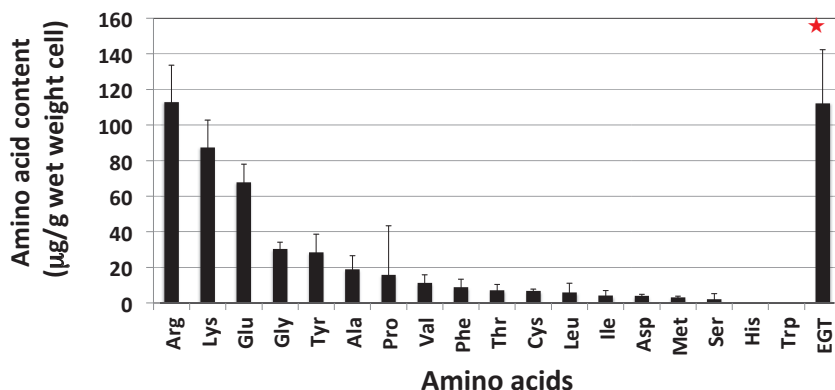
- A histidine derivative with trimethylated amino group
- Anti-oxidative
- Reduces harmful UV effect
- Reduces melanine and oxidized lipids
- Chelates metal ions
- Limited bacteria and mushrooms are distinctive source. (Fungi, mushroom, actinomycetes, cyanobacteria, fission yeast).
- Human blood contains EGT (~37 mg/L).
- No symptom is reported for deficiency.
- A specific transporter, OCTN1 was found in human.
- The gene is related to Crohn's disease.
- The chemical is expensive (\$10,000 per gram)



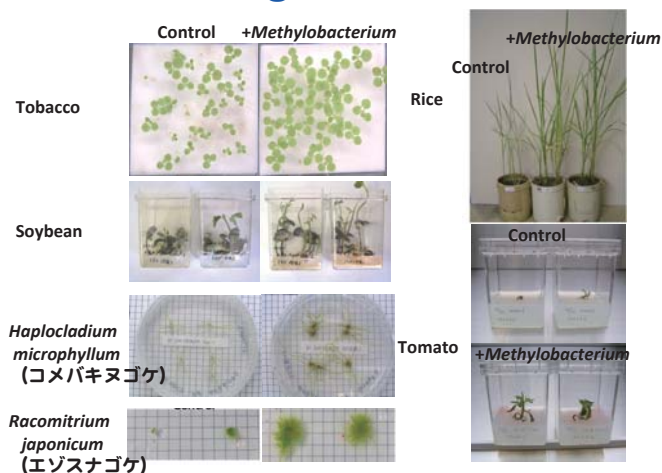
Genus *Methylobacterium*



Intracellular amino acid contents in *Methylobacterium*



Methylobacterium promotes plant growth



EGT-productive microorganisms

- Using 2% methanol, *M. aquaticum* strain 22A produced **10 mg/L/30days** EGT.
- Further optimization of culture conditions, and by using **glycerol** as a carbon source and genetic modification, productivity increased up to **32 mg/L/7days**.
- We screened yeasts and fungi for EGT producer, and found potent strains that can produce **24-30 mg/L/7days**.

Patents

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