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# Nagase increases rare amino acid productivity using Smart Cell technology

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**Antioxidant "Ergothioneine" production increased by 1000-fold achieving one of the highest microorganism-using production efficiency levels in the world**



The Nagase R&D Center, the research and development arm of NAGASE & CO., LTD. based in Tokyo, has been developing fermentative production technology for ergothioneine (EGT) and researching EGT's functions.

Using revolutionary biotechnology developed as part of the New Energy and Industrial Technology Development Organization's (NEDO) Smart Cell Project, the center's team has succeeded in increasing EGT productivity by a factor of approximately 1,000 compared to when research first began, achieving one of the highest microorganism-using production efficiency levels in the world. The team will now work on achieving industrial production as soon as possible.

EGT is a natural amino acid found in trace amounts in mushrooms and other organisms, with excellent antioxidant properties and potential applications in a variety of fields, including food products, cosmetics, and medicine. Current EGT production methods include extracting natural EGT and chemical synthesis, but either require high cost or cause environmental concerns, therefore preventing the widespread adoption of EGT.

The Nagase R&D Center's technology could provide a stable supply EGT through a sustainable fermentation process using microorganisms. Four Smart Cell foundational technologies (enzyme design, metabolic pathway design, HTP microorganism construction/evaluation, transporter identification) were applied to improve EGT productivity by optimizing production reaction within microorganism cells. As a result, exponential improvement in production became possible.