Proprietary *E. coli*-Based Production Technology

NAGASE U-E's Technology™

Nagase Bio-Innovation Center leverages its proprietary fermentation-based technology to deliver a wide range of bio-based chemicals and ingredients with outstanding efficiency.

Production of Functional Substances Using *E. coli*

The production of various functional proteins, including enzymes, often utilizes *E. coli*-based expression systems. Many expression platforms, such as the well-known pET system, have been developed to suit the intended protein application and experimental setup, and are widely used around the world[1].

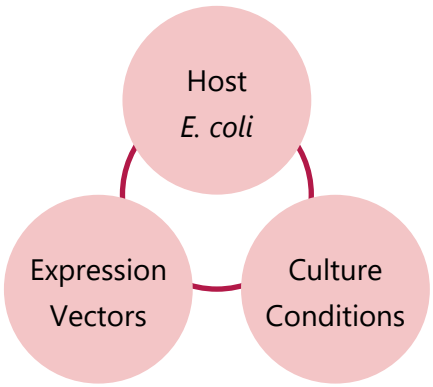
However, depending on the properties or toxicity of the target protein, issues may arise such as the formation of inclusion bodies within host cells, lack of expression, or cell lysis[2]. As a result, it is often necessary to fine-tune expression conditions to suit the specific protein.

NAGASE's Unique Technology

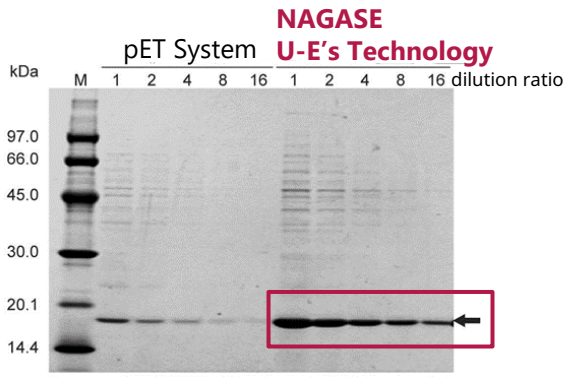
NAGASE Group's strength lies in its combination of trading, research & development, and manufacturing capabilities. We have developed and manufactured multiple valuable proteins using *E. coli*, delivering them to our customers. Throughout this process, we have faced many challenges and difficulties, sometimes experiencing setbacks, but have accumulated extensive knowledge and expertise.

Building on these experiences, we continue to offer our proprietary *E. coli*-based protein production through " **NAGASE U-E's Technology™** " to a wide range of customers.

Technology Platform
NAGASE U-E's Technology™



NAGASE Proprietary Approach



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Products

- Bio-based Chemicals
- Bio-based Ingredients
- Functional Peptides
- Functional Proteins
- Enzymes

NAGASE U-E's Technology™ utilizes *E. coli* as the host, combines expression vectors carrying the genetic information for the target protein, and optimized cultivation conditions suitable for large-scale manufacturing. Compared to conventional technologies, our platform achieves high productivity and enables commercial-scale production. We work closely with our customers to develop technologies based on proven expertise and past achievements.

References

1) Rosano, GL. *et al.*: Front Microbiol., 5, 172 (2014)
2) 東端啓貴：生物工学会誌，91, 96-100 (2013)