Contact Our BIO-INNOVATION CENTER ▷

NAGASE

NAGASE's *Streptomyces* Technology for Production of Valuable Materials

- N-STePP™ -

We dedicate ourselves to the technology development using *Streptomyces* strains as host cells for producing chemicals and ingredients.

What is N-STePP™

We, at NAGASE, together with our affiliate daughter company, Nagase ChemteX Corporation, initiated a project to develop proprietary technology using the *Streptomyces* bacterial strains as host cells to produce enzymes, chemicals and ingredients approximately 10 years ago. N-STePP™ is the abbreviation for NAGASE's *Streptomyces* Technology for Precious Products and is our registered trade mark in Japan. N-STePP™ made over-expression of enzymes from *Streptomyces* possible, resulted in multiple enzyme product launches. At NAGASE BIO-INNOVATION, this technology is further expanded for efficient production of biochemical compounds.

Characteristics of N-STePP™

Streptomyces is classified in the order of *Streptomycetales*. Although it is a prokaryotic bacterium, its morphology resembles that of filamentous fungus (Figure 1). *Streptomyces* is well known to produce antibiotics, as well as other bioactive compounds. A typical example is streptomycin, the first drug for curing tuberculosis found in 1943. Another example is a famous anti-parasite drug, ivermectin – the modified form of avermectin, discovered by the Nobel prize winner Prof. Omura at Kitasato University. As a matter of fact, new substances from *Streptomyces* are continuously discovered even now, proving the microbe to be a treasure trove in terms of material production.

Streptomyces as hosts for material production

Compared to *E. coli* and yeast, the two renowned hosts for material production, knowledge about *Streptomyces* is still in short, both physiologically and genetically. Because of the difficulties of genetic engineering and a long fermentation period needed for *Streptomyces*, applications using the microbe for material production have been limited in precious antibiotic production. However, *Streptomyces* continues to produce materials long (>2 months) after cell proliferation. This characteristic of *Streptomyces* could be turned into an advantage. We, at NAGASE BIO-INNOVATION CENTER, is overcoming *Streptomyces*' demerits and developing it into a new biotechnological platform for material production at industrial scales.

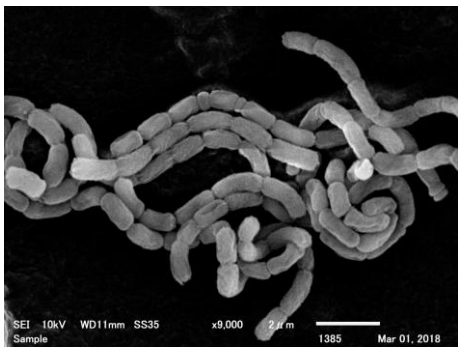

Figure 1 *Streptomyces violaceoruber*
(SEM image was taken by Dr. Hideki Yamamura, University of Yamanashi, Japan)

The NAGASE BIO-INNOVATION CENTER is committed to developing processes for efficiently producing a wide range of compounds with proprietary fermentation technologies.

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