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Thai researchers' new yeast acts as protein 'factory'

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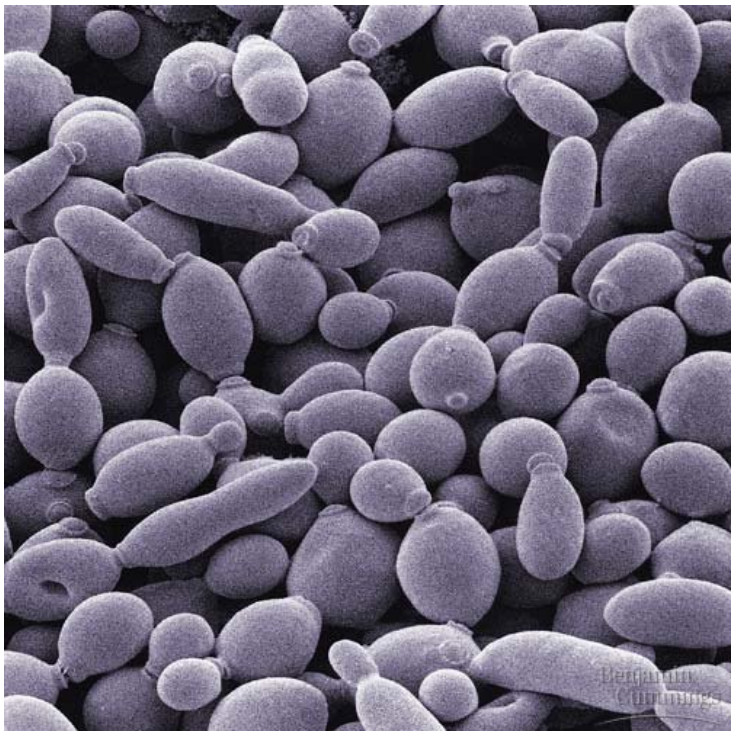

Singapore: Many diseases can be treated with protein-based drugs, however, producing them affordably in large quantities continues to remain a major hurdle. Although yeast can be genetically engineered to produce proteins from other eukaryotic organisms with reasonable fidelity, but the species used in laboratory settings are too inefficient for drug manufacture.

In order to solve these problems, researchers at the National Science and Technology Development Agency (NSTDA), Thailand, led by Dr Sutipa Tanapongpipat, have characterized the protein-production performance of a methylotrophic strain, Pichia thermomethanolica.

The strain, which is isolated from soil samples from southern Thailand, have been engineered to produce two different fungal enzymes, phytase and xylanase, and have achieved production at temperatures ranging from 30-40°C. This gives scientists greater flexibility for culture conditions than is possible with conventional, temperature-sensitive yeast.

Researchers led by Ms Sutipa Tanapongpipat of Thailand's National Science and Technology Development Agency have now characterized the protein-production performance of a methylotrophic strain, Pichia thermomethanolica, isolated from soil samples from southern Thailand.They engineered P. thermomethanolica to produce two different fungal enzymes, phytase and xylanase, and achieved production at temperatures ranging from 30-40 °C, giving scientists greater flexibility for culture conditions than is possible with conventional, temperature-sensitive yeast.

To function properly, many secreted proteins must undergo a process called glycosylation, in which they are tagged with sugar molecules by specialized enzymes. Ms Tanapongpipat and colleagues determined that foreign proteins expressed in P. thermomethanolica undergo extensive glycosylation, and that these modifications could be altered by modifying culture

conditions. The researchers hope to exploit this yeast's reduced temperature-sensitivity as a means to achieve lower-cost manufacture of functional therapeutic proteins. They are also looking into ways to boost the productivity of this promising species.