



SufFeSient Cells

WARF: P190138US01

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The Wisconsin Alumni Research Foundation is seeking commercial partners interested in developing an improved derivative of *E. coli* strain BL21 λ DE3, which is commonly used for inducibly overexpressing recombinant proteins

Overview

The commercially available *E. coli* strain BL21 λ DE3 is commonly used for inducibly overexpressing recombinant proteins. Many derivatives of BL21 cells have been developed and commercialized, with properties that enhance the options for inducing and controlling expression, reducing leak expression, and much more. However, BL21 λ DE3 is not optimized for purification of some proteins containing Fe-S cluster cofactors that are synthesized by proteins of the Suf Fe-S cluster biogenesis pathway. Fe-S proteins are found throughout the biological world and possess various catalytic activities and are the bottlenecks to produce many products; therefore, in this present optimized strain (PK11466) has improved the purification yield of at least two different Fe-S cluster-containing proteins.

The Invention

UW-Madison researchers have developed an improved derivative of the overexpression strain BL21 λ DE3. The new cell strain is called PK11466 and was nicknamed 'SufFeSient cells' by a collaborator. The researchers found that BL21 λ DE3 has an 854 bp deletion within the *sufABCDSE* operon that encodes for the Suf proteins; the deletion encompasses portions of *sufA* and *sufB*. They created the improved strain derivative by constructing a functional *sufABCDSE* operon. Furthermore, they modified the promoter of the reconstructed *sufABCDSE* operon to provide increased and constitutive expression. As a result, they found that overexpressed Fe-S cluster-containing proteins had better cluster occupancy and better yield for the overexpressed product.

Applications

- Improved derivative of the overexpression strain BL21 λ DE3

Key Benefits

- Could improve the production of many proteins (regardless of Fe-S content), by enhancing the yield and activity of key Fe-S cluster containing enzymes necessary to produce the target protein or product
- Improved purification of at least two different Fe-S cluster-containing proteins

Additional Information

For More Information About the Inventors

- [Patricia Kiley](#)

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