Therapeutics & Vaccines

Microorganisms And Methods For Producing Reuterin

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Inventors: Jan Peter Van Pijkeren, Zhiying Wang

The Invention

UW-Madison researchers have developed a method to optimize the production of reuterin in bacterial cells that contain the reuterin production pathway (i.e., the pdu operon). The inventors compared the production of reuterin in their lab strain, L. reuteri ATCC PTA-6475, which contains two prophages, with their previously-developed isogenic mutant L. reuteri ΔΦ1ΔΦ2, in which the two prophages were deleted. The deletion of the two prophages abolished reuterin production, which was restored by complementation of the prophages; testing individual deletion mutants demonstrated that prophage Φ2 (not Φ1) drove reuterin production. By comparing the two prophage genomes, the inventors identified five unique genes on Φ2 (orf3, orf6, orf14, orf16, and orf17), and individually cloned each into the inducible vector pSIP411 and then transfected into L. reuteri ΔΦ1ΔΦ2 to create L. reuteri ΔΦ1ΔΦ2 (pSIP-orf14). Overexpressing Orf14 in L. reuteri ΔΦ1ΔΦ2 not only rescued reuterin production in the L. reuteri ΔΦ1ΔΦ2 background, the inventors also observed a 3-fold increase ($P < 0.05$) in reuterin production compared to that in the wildtype strain following a 5 h incubation. Inactivation of Orf14 with an in-frame stop codon does not restore reuterin production, suggesting that the Orf14 protein product is involved in the effect. Taken together, the inventors have engineered a hyper-producer of reuterin by deleting prophages and overexpressing the phage-encoded gene Orf14. More broadly, the inventors have discovered a means of increasing reuterin production through the overexpression of Orf14 in strains that contain the reuterin production pathway (i.e., the pdu operon).

Additional Information

For More Information About the Inventors

- Jan Peter Van Pijkeren

Tech Fields

- Animals, Agriculture & Food : Food ingredients & additives
- Research Tools : Biomanufacturing
- Research Tools : Microbial technologies
- Therapeutics & Vaccines : Anti-infectives (antibacterials, antifungals, antivirals)

For current licensing status, please contact Rafael Diaz at rdiaz@warf.org or 608-960-9847