Biosynthesis of Silver Nanoparticles Using Plant Extracts

Non-Confidential Summary

BACKGROUND
The emergence of nanosilver materials in anti-microbial consumer goods and medical products is a major growth driver in the nanosilver market; a growth that is expected to continue from US$1.1 billion in 2015 to around US$2.45 billion by 2022. To meet these needs, more than five hundred tons of silver nanoparticles (AgNP) are synthesized yearly by conventional methods that usually require harmful reductants, involve many steps in the synthesis process and often produce hazardous by-products. More eco-friendly, “green” methods for AgNP biosynthesis are necessary in order to reduce toxic waste produced during these more conventional manufacturing processes.

BREAKTHROUGH IN GREEN SYNTHESIS OF SILVER NANOPARTICLES

Researchers at the University of South Alabama have implemented green nanobiotechnology for the biosynthesis of silver nanoparticles (AgNP) using plant extracts. In this method, AgNP (spherical in shape, 10-100 nm in size) are synthesized via a bottom up process that relies on synthesis of materials from atomic or molecular species. In the present process, silver salt (AgNO₃) is reduced to AgNP using an aqueous plant extract as both the reducing agent and the stabilizing agent. This single-step process allows for rapid, eco-friendly and economical biosynthesis of AgNP possessing anti-microbial and anti-inflammatory properties, without producing toxic byproducts. Thus, these biosynthesized silver nanoparticles using plant extracts have attractive potential to replace conventionally synthesized AgNP.

COMPETITIVE ADVANTAGES
• Novel use of plant extract
• Green method for producing AgNP
• Rapid AgNP production
• Inexpensive

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Intellectual Property Status
Patent Filed