



Category: Nanotechnology

# Over-expression of the splice variant of CONSTANS enhances the *in vitro* synthesis of silver nanoparticles

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## Abstract

Eco-friendly biosynthetic approach for silver nanoparticles production using plant extracts is an exciting advancement in biotechnology and has been successfully attempted in more than 41 plant species. However, an established model plant system for unravelling the biochemical pathways of silver nanoparticle (AgNPs) production is lacking. Here we have shown in *Arabidopsis thaliana* a genetic model plant and in its misexpressing lines of splice variant CONSTANS (CO $\beta$ ) for the silver nanoparticle biosynthesis *in vitro*. Employing the biochemical, spectroscopic, Transmission Electron Microscopy (TEM), Raman spectroscopy, Nuclear Magnetic Resonance (NMR) and powder x-rays diffraction (Powder XRD) methods and using selected mutants and over-expressing line of *Arabidopsis thaliana* involved in sugar homeostasis. Additionally, a comparative analysis of AgNPs synthesis using different transgenic lines of *Arabidopsis* was explored. Here we have shown that plant extract of CO $\beta$  and *gi-100* (mutant line of GIGANTEA) showed the highest potential of nanoparticle production as comparable to Col-0 and over-expressing line of GIGANTEA (35SGi). Silver nanoparticles production in the *Arabidopsis* not only opens up a possibility of using molecular genetics tool to understand the biochemical pathways, but also could address the mechanism behind different shapes of AgNPs produced using plant extracts.

**Citation:** Kumar, A. and Panigrahi, K.C.S. Over-expression of the splice variant of CONSTANS enhances the *in vitro* synthesis of silver nanoparticles [Abstract]. In: Abstracts of the NGBT conference; Oct 02-04, 2017; Bhubaneswar, Odisha, India: Can J biotech, Volume 1, Special Issue, Page 184. <https://doi.org/10.24870/cjb.2017-a170>