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## Efficacy of Synthesized NO-releasing Nanoparticles on the Germination and Growth of *Arabidopsis thaliana*

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### [Abstract]

Nitric oxide (NO) is a versatile signaling molecule, which is not only involved in plant growth and development but also regulates biological processes in response to biotic and abiotic stresses. Exogenous application of NO regulates the endogenous level of nitric oxide in response to stress conditions and therefore, NO donors are frequently used for stress alleviation. However, NO has very short half-life along with high reactivity. Therefore, conventional NO donors are often disadvantageous due to the relative instability of NO. On the contrary, development of NO releasing nanoparticles is a potential technique for enhancing the availability of NO in plants. Therefore, our aim was to synthesize such potential NO releasing nanoparticles which may be useful for application in agriculture. We have prepared Chitosan encapsulated S-nitrosoglutathione nanoparticles (GSNONP) and tried it with different concentrations for basic research in *Arabidopsis thaliana*. Our results suggest that lower concentration of this nanoparticle is highly effective for better growth of plants whereas higher concentration produces toxicity that leads to plant death. We observed better growth of *Arabidopsis thaliana* at 1 μM concentration of the GSNONP compared to free GSNO.

**Keyword:** Nitric oxide, S-Nitrosoglutathione, Chitosan encapsulated S-Nitrosoglutathione nanoparticles.

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