

## **Biochemical synthesis and evaluation of the antimicrobial activity of nano chitosan**

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Chitosan has been shown to have potential applications in various fields such as biomedicine, biomaterials, food preservation, agriculture, environmental remediation, and so on. However, chitosan has not been thoroughly exploited and applied due to its large molecular weight which makes it insoluble in water. This downside could be addressed by converting chitosan into nano chitosan. In this study, chitosan was obtained from shrimp shells via the biochemical pathway. The synthesis efficiency reached 19.33%, and the deacetylation degree of chitosan was 87.24%. Nano chitosan was synthesized from chitosan and sodium tripolyphosphate (STPP) by ionic gelation method. The obtained nano chitosan was soluble in water and showed the antibacterial activities against *Bacillus cereus*, *Escherichia coli*, and *Staphylococcus aureus*. Remarkably, nano chitosan performed the inhibitory effect against *Pseudomonas aeruginosa*, *Alternaria* sp., and *Colletotrichum musae* causing diseases in shallot, cucumber, and banana, respectively, in farming areas of the Mekong delta.