# Green Synthesis of Gold Nanoparticles forBio-applications

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**ABSTRACT**

Even though AuNPs were synthesized successfully by chemical approach, synthesizing them by biological methods is becoming important day by day. This is due to the sustainable or green chemistry insight. With this approach, it is likely that bio-synthetically prepared AuNPs will have more biocompatibility; which is more suitable for using them in potential biological applications. Up to now, remarkable works have been done to synthesize the AuNPs using bio- entities such as bacteria, yeast, fungi, plant, fruit extract, peptide and have attained novel results. Contrary to the synthesis by chemical methods, the synthesis by biological systems generaly follows non-toxic, moderate processes which occur at ambient temperature and pressure. It has been known that ancient gold colloids had been used for therapeutic and decorative purposes. AuNPs are now widespread used for various applications especially in biology namely labeling, heating, sensing, delivering.

## I. Introduction

It is obvious that various gold nanoparticles can be produced by chemical methods [1-6]. But it is now popular to utilize the bio-materials. With the creation of green chemistry that is safe, harmless, and acceptable to the environment methods, biological resources involving a variety of species, including bacteria, fungus, and plants have been used to synthesize the AuNPs [7-19]. Similar to the synthesis by chemical methods, the the AuNPs' size and form achieved through bio-route could be controlled by adjusting variables like pH and temperature, the ratio of Au ion to reducing agents and so forth. Some efforts have been done to generate the AuNPs using bacteria. Only a small number of microorganisms have been shown to be capable of selectively reducing particular metal ions [20]. First, Beveridge and Murray showed that AuNPs were formed when exposed to Bacillus subtilis [21]. Only a small number of microorganisms have been shown to be capable of selectively reducing particular metal ions [20]. First, Beveridge and Murray showed that microscopic gold [22]. The reduction of gold ions additionally utilised Pseudomonas aeruginosa bacterial cell supernatant [7]. As being shown in this research, with the help of greater control over the size and polydispersity of nanoparticles was achieved using cell filtrate achieved.

Shape-control AuNPs has been attained using the filamentous cyanobacterium Plectonema boryanum UTEX 485. With different reaction conditions, cubic AuNPs or octahedral platelets were formed [23]. The mechanisms of gold bioaccumulation by cyanobacteria have also been documented.

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