

# Polychaete-Mediated Biosynthesis of Gold Nanoparticles (AuNPs)



## Abstract

Gold nanoparticles (AuNPs) have unique and outstanding optical properties that can be applied in various applications. The current productions of AuNPs are cumbersome owing to the use of reducing agents which are highly reactive and toxic in nature. Hence, a biogenic synthesis of AuNPs by exploiting local marine baitworm (Polychaeta), *Marphysa moribidii* as potential reducing agents was conducted. AuNPs were biosynthesised by using different masses of polychaete extracts (5, 10, 15, and 20 g) and observed up to 3 months. The formation of AuNPs was confirmed by the appearance of red-ruby colour and the presence of surface plasmon resonance (SPR) absorption peaks (548–563 nm) from UV-Vis spectroscopy. The AuNPs were in spherical-like shapes with large aggregations based on scanning electron microscope (SEM). The average particle size and morphology of AuNPs were confirmed using transmission electron microscopy (TEM) (30–150 nm) and dynamic light scattering (DLS) (20–100 nm). Fourier transformed infrared (FTIR) analysis and X-ray diffraction (XRD) were carried out on polychaete extracts to explore the functional groups existing and also to prove the absence of AuNPs in them. Lastly, the antibacterial assessment of AuNPs was examined using Kirby-Bauer disc diffusion method and revealed the exhibition of antibacterial activity on both Gram-positive and Gram-negative bacteria.

## Noor Aniza Harun

Universiti Malaysia Terengganu, Malaysia

## Biography

Noor Aniza Harun interests in material chemistry focusing on nanomaterials research areas particularly in polymer nanoparticles, quantum dots, metallic nanoparticles, nanoalloys and nanocomposites. Her present research is focused on the development of hydrophilic polymer nanoparticles and inorganic-hydrophilic polymer composite nanoparticles composed of encapsulation quantum dots (QDs) within polymer nanoparticles with potential application as fluorescent marker in medical and material sciences. She also involves in the research for the development of metallic nanoparticles that compliance with green technology approach utilizing polychaetes extract as biogenic reducing agents for various applications ranging from medical & pharmaceuticals, textile, aquaculture, coating and etc.

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