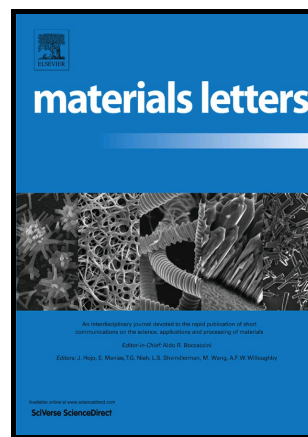


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## Biosynthesis of gold decorated reduced graphene oxide and its biological activities

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### Abstract

An eco-friendly, very simple method for synthesis of gold-reduced graphene oxide (Au-rGO) nanocomposite was developed using fruit of *Piper pedicellatum* C.DC. Its characterization was done by UV-Visible, FT-IR, XRD, XPS, Raman, SEM-EDX, TEM analysis. The antibacterial activity of Au-rGO nanoparticles was investigated against the Gram negative bacteria *Pseudomonas aeruginosa*, *Klebsiella pneumonia* and Gram positive bacteria *Staphylococcus aureus* and *Bacillus cereus*. In addition, in-vitro cell based cytotoxicity study was performed for Au-rGO and GO against PC3 (aggressive human prostate carcinoma cell line) and RWPE-1 (non-malignant human prostate epithelial cells). Cytotoxicity assay revealed that Au-rGO is more toxic than GO nanoparticles against PC3 cancer cells compared to RWPE-1.

Key Words: Nanoparticles; Green synthesis; Biomaterials; Biological activities

### 1. Introduction:

Graphene is one of the advanced carbon nanomaterials which have enjoyed a significant recent attention. Graphene oxide (GO) is of great interest due to its low cost, easy access and its numerous applications like in energy storage, biosensors [1-2], and electro-catalysis, [3] in optical applications, [4] electro-chemical application [5] etc.

It has already been reported by our group that the fruit of *Piper pedicellatum* C.DC are great reducing agent for the synthesis of Au nanoparticles [6]. Therefore, we use the fruit

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