Synthesis and Characterization of Tellurium Nanoparticles with Antimicrobial and Anticancer Properties made by Green Synthesis with Orange Extract

Abstract

- Widely spread use of antibiotic medications puts pressure on bacteria populations
- At least 23,000 people die each year as a direct result of antibiotic-resistant. By 2050 it is predicted that more people will die from these infections than all other diseases combined.
- Metallic nanoparticles offer one of the most promising alternatives to antibiotics, since bacteria cannot develop resistance to these nanostructures.
- Physico-chemical synthesis has drawbacks such as cost, extreme processing conditions and toxic waste production. Green chemistry approaches are presented as a solution.

Methods and Procedure

Impact and Significance

Concluding Points:

- Orange juice green eco-friendly synthesis of metallic nanoparticles overcomes the limitations of traditional synthesis.
- Successful synthesis of tellurium nanoparticles for biomedical applications.
- Antimicrobial properties: Escherichia coli and Staphylococcus aureus.
- Biocompatibility: Melanoma vs. Human Dermal Fibroblasts.

Future Steps:

- Alternative biogenic synthesis of tellurium nanoparticles.
- Design of bio-reactors for the synthesis of nanoparticles.

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Results

Antibacterial & Anticancer biocompatibility assays

- Needle-shaped NPs
- Organic coating
- Antibacterial & Anticancer
- Biocompatibility