# BIOSYNTHESIS OF ZINC OXIDE NANOPARTICLES CAPPED BY FUMARIA PARVIFLORA EXTRACT AGAINST BREAST CANCER CELL LINES

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Background: Fumaria parviflora is an important medicinal herb which is used in various traditional medicines to cure many diseases. Fumaria parviflora Lamm. belonging to family Fumariaceae is used widely in traditional and folkloric medicine. It is known as 'Pittapapra' in Ayurveda, 'Shahtaraa' in Unani is used to treat various ailments like indigestion, vomiting, fever, fatigue. It is found to have properties like antihelminthic, diuretic, diaphoretic, blood purifying properties.

Methods: The plant extract was isolated by using a soxhlet apparatus and using methanol as the solvent. The anticancer components present in the Fumaria parviflora extract is identified by using the gas chromatography and mass spectroscopy method. Fumaria parviflora extract is subjected to the preformulation studies like UV- spectroscopy, DSC and FTIR. Fumaria parviflora zinc oxide nanoparticles (FpZnO) are prepared by using the stirring method. The prepared FpZnO nanoparticles are subjected to the evaluation like particle size, PDI, Zeta potential, % entrapment efficiency, SEM, TEM, Compound microscopy, XRD, *In-vitro* drug release studies, *In-vitro* cell viability test.

Results: 3-Nonyn-2-ol, 3-Decyn-2-ol are the anticancer compounds identified by the GCMS method. By UV spectroscopy it is observed that the extract is having the wavelength of 283nm. DSC study showed that extract is having the melting point at $149.08^0$ C. FTIR study showed that the extract and the excipient are compatible and it has not showed any interaction. The particle size and PDI of the optimized Fumaria parviflora zinc oxide nanoparticles was found to be 173.1 nmand 0.11 respectively. Zetapotential of the FpZnO nanoparticles was found to be-0.1mV. % entrapment efficiency was found to be 98.9%. SEM and TEM analysis showed that FpZnO nanoparticles are cylindrical in shape. In XRD analysis absence of peaks in the formulation indicated that the drug was dispersed in an amorphous state. The in-vitro drug release from the Fumaria parviflora zinc oxide nanoparticles is greater than the Fumaria parviflora extract. *In-vitro* cell viability test showed that an increase in the concentration of Fumaria parviflora extract and the Fumaria parviflora zinc oxide nanoparticles so increase in the % of cell death and the % inhibition in time and dosage-dependent manner

Conclusion: The prepared FpZnO nanoparticles are showing the anti-cancer activity on the human breast cancer.