

1. **Title of research project:** Design and Evaluation of Silver Nanoparticles as Potential Wound Healing Agents
2. **Name of PI:** Dr. Mrs. V. B. Pokharkar
3. **Funding Agency:** UGC Minor Research Project
4. **Project Reference number/ File number:** 47-004/12 (WRO) 2013-2015
5. **Executive summary of the project along with output:**

Silver nanoparticles (Ag NPs) were synthesized by adopting green synthetic approach using aqueous *Bryonia* leaf extract. Biosynthesized silver nanoparticles showed distinctive surface plasmon resonance (SPR) in the range of 400-500 nm and particle size of 15 nm. Synthesized silver nanoparticles showed zeta potential values above -30mV which confirmed the electrostatic stability of synthesized silver nanoparticles as well as their anionic nature. The role of *Bryonia* leaf extract in reduction based synthesis of silver nanoparticles was confirmed from the FTIR studies. Characteristic XRD peaks of silver nanoparticles at (111), (200), (220) and (311) corresponding to the face-centered cubic (FCC) crystal structure of silver was congruent with the standard silver values as reported in the literature. Also, they were stable at various pH and electrolytic conditions up to 6 months.

*In vitro* antimicrobial assays ascertained the broad spectrum activity of synthesized silver nanoparticles. They were active against both, Gram-positive as well as Gram-negative bacteria. Later the biosynthesized silver nanoparticles were formulated as gels. In wound excision models, these gels showed rapid wound epithelialisation as compared to the control group. Also, the silver nanoparticle embedded gels showed less scar formation along with reduced inflammation in rats.

#### Publications

V Dhapte, S Kadam, A Moghe and **V Pokharkar**. Probing the wound healing potential of biogenic silver nanoparticles. *Journal of Wound Care*, Sep 2014, 23(9), 431-441.