

## THE TECHNOLOGY

Novel Method of preparing a silver nanoparticle solution as an anti-bacterial additive for products (Silmetic™)

## KEY INFORMATION

- Unique Value Proposition
  - ✓ Cost competitive, highly stable, concentrated silver nanoparticle solution with an extended shelf life prepared through a novel method under ambient conditions.
- Technology Category
  - ✓ Cosmetics/Cosmeceuticals
  - ✓ Healthcare
  - ✓ Textile
  - ✓ Pharmaceutical
- Technology Readiness Level
  - ✓ TRL 9 – The technology has been successfully demonstrated in commercial applications such as cosmetic formulations in lotions and serums.
- IP Status:
  - ✓ Trade Secret
  - ✓ Silmetic protected as trademark.
  - ✓ Patent application filed.

## OVERVIEW

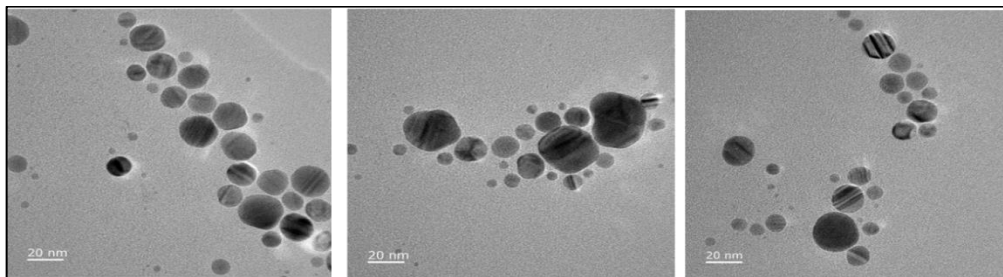
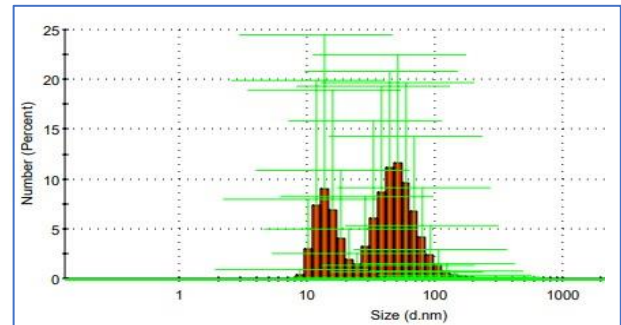
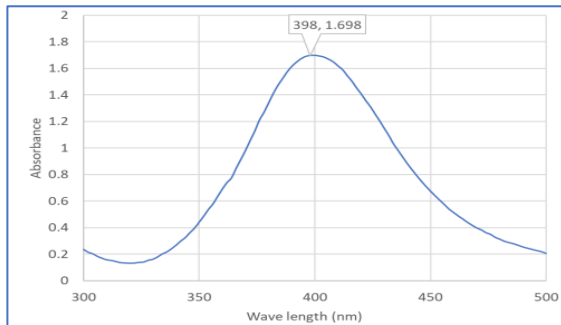
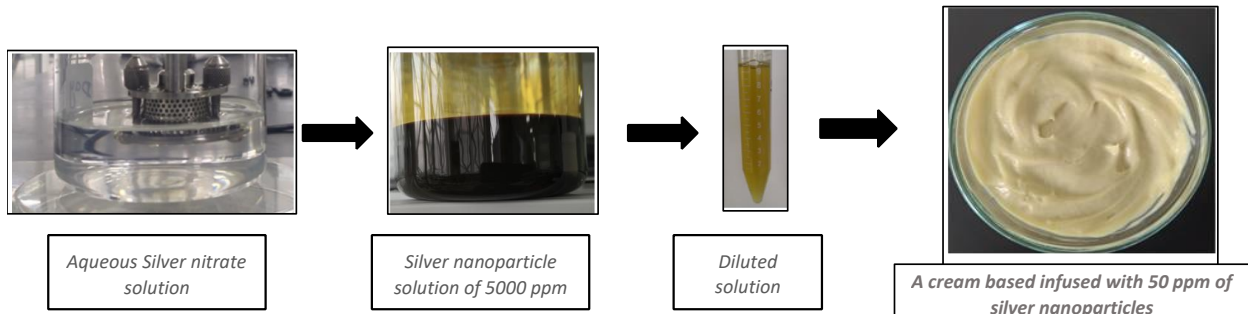
Silver in the form of colloids has been vastly used throughout decades for diverse applications including usage as a biocidal. Due to its effective antibacterial properties' small quantities are ideal to be incorporated as an additive into products such as creams/lotions/shampoo etc. Existing silver nanoparticle solution production methods pose limitations relevant to reaction rate, chemical stability, and high energy consumption for the synthesis process.

The novel methodology developed by John Keells Research (JKR) produces high quality and stable silver nanoparticle suspension which can be easily incorporated into a cream base. Upon testing it was confirmed that developed silver nanoparticles incorporated to a cream base at a concentration of 50 ppm is adequate to destroy 99.9% of *Staphylococcus aureus*, *Pseudomonas aeruginosa* and of *Escherichia coli* strains. It was further observed that silver nanoparticle solution prepared by JKR method was stable for prolonged duration under exposure to light.

This technology is available for IP licensing and R&D collaboration with industrial partners who are interested in incorporating silver nanoparticles into products.

## TECHNOLOGY FEATURES & SPECIFICATIONS

- 250 ml silver nanoparticle solution of 5000 ppm can be synthesized in 10 minutes.
- Preparation process can be carried out under ambient environment.
- Stable at high concentrations of 5000 ppm under prolonged exposure to light
- Shelf life of 5000 ppm solution over 12 months



The silver nanoparticle exhibits particle stability which is proven through Particle size analysis (PSA) that remains stable over time. Transmission Electron Microscopic (TEM) analysis revealed that silver nanoparticles were in the nanometer range and spherical.

## POTENTIAL APPLICATIONS

- Cosmetics products: Lotions/Creams/Serums
- Healthcare products: Soap/Shampoo/Shower gel/Conditioner/After shave
- Pharmaceutical Products: Dermal Creams/Burn Creams/Wound dressings/Anti-bacterial sprays
- Cleaning Products: Detergents/ Disinfectants
- Textiles and fabric: Anti-bacterial fabric

## CONTACT INFORMATION

**Thilina Weersekera**

**Head of John Keells Research**

Mobile: +94 77 685 5999

Email: [thilina.jkh@keells.com](mailto:thilina.jkh@keells.com)

**Sivanjale Ravindrakumar**

**IP & Business Development Executive**

Mobile: +94 77 035 6382

Email: [sivanjalera.jkh@keells.com](mailto:sivanjalera.jkh@keells.com)

**John Keells Research**

Nanotechnology & Science Park,

Mahenwatta, Pitipana,

Homagama

Sri Lanka

Website: <https://johnkeellsresearch.com/>