

Journal of the American Chemical Society differentiates EVÖQ Nano's EVQ-218 nanoparticle as a new form of silver; holds promise for widespread medical applications

April 15, 2024 LinkedIn ## EVQ-218 is the first stable, nonemissive, pure metal nanoparticle on par with NIST standards. ## The 'clean and green' EVQ-218 nanosilver is free of toxic ion emissions. SALT LAKE CITY, Utah, (April 16, 2024) — EVÖQ Nano, a nanoscience company that engineers novel nanoparticles for the life, materials, and textile science industries, today announced that the American Chemical Society journal, ACS Omega, published a peer-reviewed study characterizing and differentiating the company's lead asset, EVQ-218, as a new form of silver nanoparticle (AgNP). EVQ-218 meets the highest standards set by the National Institute of Standards and Technology (NIST) while avoiding the limitations and safety risks of other nanosilvers.

The characterization of EVQ-218 is timely as the rise of antimicrobial resistance (AMR) has caused a surge of research into safer, more effective treatments. Prioritized by the World Health Organization as one of the top 10 global public health threats, AMR threatens the effective prevention and treatment of infections.¹

"The discovery and development of a non-ionic silver nanoparticle represents a pivotal innovation, unlocking the full therapeutic potential of silver without its detrimental trade-offs," said Shaun Rothwell, EVÖQ Nano CEO.

While silver's antibacterial qualities have been known for centuries,^{2,3} it is widely established that the antimicrobial activity is due to ion emission, which poses toxicity risks for biomedical and consumer product applications.⁴⁻⁷

Realizing silver's therapeutic potential

Compared to traditional nanosilvers, EVQ-218 is differentiated due to its characterization and behavior as the first stable, nonemissive, pure silver nanoparticle that is on par with NIST standards for ideal materials, making it a superior candidate for biomedical and consumer product use.⁸

"Not only does EVQ-218 match NIST's standards for particle size and shape, but it possesses an ultrastable shell structure that completely inhibits ion emission — a first for a pure metal nanoparticle," said Bretni Kennon, Ph.D., principal investigator, EVÖQ Nano.

Novel mechanism of action

EVQ-218's antimicrobial efficacy is rooted in its ability to disrupt bacteria's metabolic processes without triggering antimicrobial resistance.

- EVQ-218 stops bacterial growth by sequestering sulfur.
- The sequestration of sulfur inhibits metabolic activity within the bacterial cell without compromising cell structures or lysing the cell wall. This blocks activation of bacterial mutations that contribute to AMR.
- In contrast, nanosilvers with ions rupture cell walls, triggering activation of AMR pathways. ## Multi-patented laser nanofabrication process

EVQ-218 is a high-energy produced silver nanoparticle with a method of manufacture that avoids chemical or biological synthesis. Ablation via a multiple, cross-laser system occurs at temperatures and pressures akin to diamond formation. The patented single-step, high-volume laser process generates stable, pure metal nanoparticles directly into pharmaceutical-grade water.⁸

- The sub-10 nm spherical nanoparticles have an ultrastable shell structure that inhibits the hallmark ion emission that occurs in other nanosilver species.
- The resulting particle size and shape characteristics prevent the need for stabilizing chemistries.⁸
- When factoring in shelf life, EVQ-218 maintains uniform stability for years; traditional nanosilvers degrade within weeks.⁸
- These properties make EVQ-218 an attractive clean and green alternative to traditional nanosilvers.⁸ ## Advancing antimicrobial solutions with EVQ-218

To address the critical issue of healthcare-associated infections (HAIs), primarily caused by indwelling devices like catheters, EVQ Nano is collaborating with leading catheter manufacturers. By infusing EVQ-218 throughout the polymer, medical devices are extrinsically equipped with antimicrobial protection that has proven to be effective against the most prevalent pathogenic microorganisms. The company is currently targeting the \$29 billion catheter market, expected to reach \$50 billion by 2031.⁹

EVQ Nano has also received two grants from the Cystic Fibrosis Foundation for the development of an inhaled therapeutic to treat pulmonary bacterial infections. The company had its Pre-Investigational New Drug (pre-IND) meeting with the U.S. Food and Drug Administration (FDA) in March and, with the agency's feedback, is confidently advancing toward Phase I clinical trials.

About EVQ Nano

EVQ Nano is a nanoscience company that engineers novel nanoparticles for the life science, materials science, and textile science industries. The company's multi-patented, high-volume laser nanofabrication process creates uniform, sub-10 nm nanoparticles with distinct surface chemistry. These properties represent a significant advancement in nanoscience with the potential for a wide range of applications. To learn more, visit evoqnano.com.

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References

1. Walsh TR, Gales AC, Laxminarayan R, Dodd PC. Antimicrobial resistance: addressing a global threat to humanity. *PLoS Med.* 2023 Jul 3;20(7):e1004264. doi: 10.1371/journal.pmed.1004264. PMID: 37399216; PMCID: PMC10317217.
2. Alexander JW. History of the medical use of silver. *Surg Infect.* 2009;10(3):289.
3. Medici S, Peana M, Nurchi VM, Zoroddu MA. Medical uses of silver—history, myths, and scientific evidence. *J Med Chem.* 2019;62:5923–5943.
4. Stabryla LM, Johnston KA, Millstone JE, Gilbertson LM. Emerging investigator series: it's not all about the ion: support for particle-specific contributions to silver nanoparticle antimicrobial activity *Environ Sci Nano.* 2018;5:2047–2068.
5. Kedziora A, Speruda M, Krzyzewska E, Rybka J, Bugla-Ploskonska G. Similarities and differences between silver ions and silver in nanoforms as antibacterial agents. *Int J Mol Sci.* 2018;19:444.
6. Slavin YN, Asnis J, Häfeli UO, Bach H. Metal nanoparticles: understanding the mechanisms behind antibacterial activity. *J Nanobiotechnology.* 2017;15:65.
7. Liao C, Li Y, Tjong SC. Bactericidal and cytotoxic properties of silver nanoparticles. *Int J Mol Sci.* 2019;20:449.
8. Kennon BS, Niedermeyer WH. EVQ-218: Characterization of high-energy nanoparticles that measure up to NIST standards. *ACS Omega.* 2024;9(7):7891-7903. doi: 10.1021/acsomega.3c07745.
9. Darandale M, Talekar D, Deshmukh R. Catheters Market Research, 2031. Allied Market Research. Published May 2022. Accessed December 6, 2023. <https://www.alliedmarketresearch.com/catheters-market>.