BioSpectrum the business of Bio & Health Sciences ASIA EDITION

EV?Q Nano CEO Shaun Rothwell Discusses Advanced Antimicrobial Solution EVQ-218 and Its Impact on AMR

06 November 2024 | News | By Ankit Kankar | ankit.kankar@mmactiv.com

EVQ-218's innovative non-ionic silver nanoparticle mechanism targets antibiotic-resistant pathogens without triggering antimicrobial resistance, offering promising applications in healthcare.

In an insightful interview with **BioSpectrum Asia, Shaun Rothwell, CEO of EV?Q Nano,** reveals the transformative potential of EVQ-218, a next-generation antimicrobial solution developed to tackle antibiotic-resistant infections. Unlike conventional silver nanoparticles, EVQ-218 employs a unique non-ionic mechanism that eliminates harmful bacteria from within, sidestepping the pathways that typically lead to antimicrobial resistance (AMR). Rothwell explains how EVQ-218's ultrastable shell structure enhances safety and efficacy, its effectiveness against top antibiotic-resistant pathogens, and its promising applications in treating cystic fibrosis-related pulmonary infections and preventing catheter-associated infections

Q: How does EVQ-218's non-ionic silver nanoparticle mechanism avoid triggering antimicrobial resistance?

EVQ-218 has been characterized as a new form of silver by the *Journal of the American Chemical Society, ACS Omega* . Unlike conventional antibacterial agents and nanosilvers that often trigger antimicrobial resistance (AMR) by rupturing bacterial cell walls, EVQ-218 employs a novel mechanism of action that kills bacteria from the inside.1 Here's how it works:

- EVQ-218 infiltrates the bacterial cell and begins sequestering sulfur. This neutralizes the cell's energy source, disabling metabolic pathways and destroying the cell from the inside.

- With death of the bacteria and no cell wall damage, warning signals are not sent to adjacent and/or sibling bacteria, preventing bacterial proliferation and AMR.

- In contrast, nanoparticles with silver ions rupture cell walls, triggering activation of AMR pathways.

Q: What makes EVQ-218 effective against the top six antibiotic-resistant pathogens identified by the WHO?

EVQ-218 is the first stable, nonemissive, pure silver nanoparticle. Its efficacy is rooted in EVQ-218's ability to disrupt bacteria's metabolic processes without triggering AMR, opening opportunity for widespread therapeutic use.

Q: How does the ultrastable shell structure of EVQ-218 contribute to its safety and efficacy?

The ultrastable shell structure completely inhibits ion emission — a first for a pure metal nanoparticle. The ions in traditional silver have hindered its medical applications due to toxicity risks and limited stability. With its non-ionic properties, EVQ-218 delivers effective antimicrobial action free of cytotoxicity.1

Q: What advantages does EVQ-218 offer over traditional silver-based antimicrobial therapies?

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. EVQ-218 nanoparticles demonstrate greater stability, exhibit a true "bare" surface chemistry, and are less likely to degrade or transform compositionally over time.1

Q: Can you elaborate on the potential impact of EVQ-218 in treating pulmonary bacterial infections in cystic fibrosis patients?

EV?Q Nano received two grants from the Cystic Fibrosis Foundation to help develop and test an inhaled therapeutic using EVQ-218 to eliminate bacterial growth in the lungs. In vitro studies found EVQ-218 demonstrated efficacy against pathogens linked to pulmonary infections. In vivo studies conducted to date demonstrate early safety and toxicity data, generating an initial safety profile of EVQ-218:

- Killed 64 strains from nine known drug-resistant bacteria, including *Pseudomonas*, *Burkholderia*, MSSA, MRSA, NTM, *Achromobacter*, and *Stenotrophomonas.*
- Showed efficacy against 14 biofilms tested.
- Eradicated multiple yeast and filamentous fungi.
- Exhibited no toxicity in lung epithelial cells.
- No observable histopathologic findings.
- Developed no bacterial resistance during 28-day testing assay. Resistance to other antibiotics typically occurs in 4-5 days.2-6

Q: How is EVQ-218 being applied in collaborations with catheter manufacturers to reduce healthcare-associated infections?

The majority of healthcare-associated infections (HAIs) are associated with indwelling devices, with catheter-associated urinary tract infections (CAUTIs) representing the most common type.7 Rising antimicrobial resistance has compounded this health threat — as up to one-third of CAUTIs in the U.S. are drug resistant.8

In collaboration with leading catheter manufacturers, extensive lab testing on catheters, luers, and fittings manufactured with EVQ-218 nanoparticles infused throughout the polymer, demonstrated:

- Strong antibacterial, antifungal, and antibiofilm efficacy
    - *Staphylococcus aureus*: 7-8 log reduction
    - *Pseudomonas aeruginosa*: 6-7.5 log reduction
    - *Candida albicans*: 5-6.5 log reduction
- Broad-spectrum activity against 64 bacterial strains tested
- No degradation of antimicrobial activity; sustained presence for the life of the product??

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