

EMSL Analytical, Inc.
Microbiology Division
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Certificate of Analysis

Product: Mesosilver®

Project: Antimicrobial effectiveness of colloidal silver

EMSL Reference Number: 090402726

Experimental Design Summary:

Test survival of vancomycin-resistant *Enterococcus faecalis* American Type Culture Collection Strain No. 51299 in two Mesosilver products (20 and 75 ppm) using two (1% and 10%) concentrations of product as supplied. The microorganism was tested for survival at four (0, 2, 5, and 24 hour) time points. A negative control (no product) was included for comparison. The treatments were performed in triplicate in sterile phosphate buffer with MgCl₂ (Hardy Diagnostics) and incubated without continuous mixing at 35°C then plated in duplicate on nutrient agar for 72 hours. Results were reported as mean ± standard deviation. Media sterility controls showed no growth.

Experimental Results Summary:

Vancomycin-resistant *Enterococcus faecalis* inoculated at 3.6×10^8 cells ml⁻¹ was used to determine the effect of Mesosilver colloidal silver on bacterial survival. The results show that both Mesosilver products have a negative impact on the survival of *E. faecalis* when used at 1% and 10% concentrations (Tables 1 and 2). After 5 hours, 1% and 10% 20 ppm Mesosilver reduced the numbers of *E. faecalis* cells to below the level of detection. Likewise, 1% and 10% 75 ppm Mesosilver reduced the numbers of *E. faecalis* cells to below the level of detection within 5 hours.

Analyst _____
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Date 10-19-2004

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Antimicrobial effectiveness of Mesosilver 20 ppm colloidal silver

20 ppm Mesosilver (%)	CFU ml ⁻¹		
	2h	5h	24h
0	$3.7 \times 10^8 \pm 5.8 \times 10^6$	$3.1 \times 10^8 \pm 1.0 \times 10^6$	$1.5 \times 10^8 \pm 4.7 \times 10^7$
1.0	$2.5 \times 10^8 \pm 2.5 \times 10^7$	<1	<1
10.0	$1.9 \times 10^8 \pm 3.5 \times 10^7$	<1	<1

Table 1. Survival of vancomycin-resistant *Enterococcus faecalis* American Type Culture Collection Strain No. 51299 inoculated at 3.6×10^8 cells ml⁻¹ in the presence of 1% and 10% 20 ppm Mesosilver colloidal silver.

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Antimicrobial effectiveness of Mesosilver 75 ppm colloidal silver

75 ppm Mesosilver (%)	CFU ml ⁻¹		
	2h	5h	24h
0	$3.7 \times 10^8 \pm 5.8 \times 10^6$	$3.1 \times 10^8 \pm 1.0 \times 10^6$	$1.5 \times 10^8 \pm 4.7 \times 10^7$
1.0	$1.4 \times 10^8 \pm 1.2 \times 10^7$	<1	<1
10.0	$1.3 \times 10^8 \pm 7.9 \times 10^6$	<1	<1

Table 2. Survival of vancomycin-resistant *Enterococcus faecalis* American Type Culture Collection Strain No. 51299 inoculated at 3.6×10^8 cells ml⁻¹ in the presence of 1% and 10% 75 ppm Mesosilver colloidal silver.

Antimicrobial effectiveness of Mesosilver colloidal silver

Treatment	Time Point (hours)					
	2		5		24	
	Colony Count	Dilution Factor	Colony Count	Dilution Factor	Colony Count	Dilution Factor
1.0% 20 ppm Mesosilver-1	258 / 241	1000000	0 / 0	1000000	0 / 0	1000000
1.0% 20 ppm Mesosilver -2	281 / 282	1000000	0 / 0	1000000	0 / 0	1000000
1.0% 20 ppm Mesosilver -3	240 / 224	1000000	0 / 0	1000000	0 / 0	1000000
10% 20 ppm Mesosilver -1	134 / 204	1000000	0 / 0	1000000	0 / 0	1000000
10% 20 ppm Mesosilver -2	235 / 230	1000000	0 / 0	1000000	0 / 0	1000000
10% 20 ppm Mesosilver -3	184 / 169	1000000	0 / 0	1000000	0 / 0	1000000
1.0% 75 ppm Mesosilver -1	147 / 148	1000000	0 / 0	1000000	0 / 0	1000000
1.0% 75 ppm Mesosilver -2	147 / 155	1000000	0 / 0	1000000	0 / 0	1000000
1.0% 75 ppm Mesosilver -3	127 / 131	1000000	0 / 0	1000000	0 / 0	1000000
10.0% 75 ppm Mesosilver -1	126 / 132	1000000	0 / 0	1000000	0 / 0	1000000
10% 75 ppm Mesosilver -2	133 / 145	1000000	0 / 0	1000000	0 / 0	1000000
10% 75 ppm Mesosilver -3	120 / 127	1000000	0 / 0	1000000	0 / 0	1000000

Table 3. Raw data of antimicrobial effectiveness of colloidal silver against vanomycin resistant *Enterococcus faecalis*. Average colony count x dilution factor = colony forming units per ml (CFU ml⁻¹).