EMSL Analytical, Inc.
Microbiology Division
307 West 38th Street, New York, NY 10018
212-290-0051
www.emsl.com

Certificate of Analysis

Product: Mesosilver®

Project: Phase II: Methicillin Resistant *Staphylococcus aureus*

EMSL Reference: 030321870

Experimental Design Summary:

Test survival of methicillin resistant *Staphylococcus aureus* American Type Culture Collection Strain No. 33591 in two Mesosilver products (20 and 75 ppm) using 2 (1 and 10%) concentrations of product as supplied. The organism was tested for survival at 4 (0, 2, 5, and 24 h) time points. A negative control (no product) was included for comparison. All tests were performed in triplicate and plated in duplicate.

Experimental Results Summary:

Methicillin resistant *Staphylococcus aureus* at 1.2 x 10^6 cells ml^{-1} was used to determine the effect of Mesosilver on bacterial survival. The results show that both Mesosilver? products have a negative impact on the survival of *S. aureus* when used at 1 and 10% concentrations (Tables 1 and 2). Specifically 10% 75 ppm Mesosilver was successful in reducing the numbers of cells to below the level of detection within 5 hours. The remaining tested concentrations were successful in reducing the numbers of cells to below the level of detection within 24 hours.

Analyst_____ Date: 01-12-04
Lori L. Daane, Ph.D.

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Table 1. Survival of methicillin resistant *Staphylococcus aureus* ATCC 33591 inoculated at 1.2×10^{6} cells ml^{-1} in the presence of 1 and 10% 20 ppm Mesosilver colloidal silver.

20 ppm Mesosilver (%)	CFU ml^{-1}		
	2 h	5 h	24 h
0	$1.5 \times 10^{6} \pm 8.1 \times 10^{4}$	$1.2 \times 10^{6} \pm 1.6 \times 10^{5}$	$2.0 \times 10^{2} \pm 1.3 \times 10^{2}$
1.0	$1.1 \times 10^{6} \pm 1.7 \times 10^{4}$	$7.5 \times 10^{5} \pm 1.3 \times 10^{5}$	0.8 ± 1.0
10.0	$7.1 \times 10^{5} \pm 9.8 \times 10^{4}$	$7.8 \times 10^{3} \pm 3.0 \times 10^{3}$	<1

All treatments performed in triplicate in 0.35% NaCl incubated without continuous mixing at 35°C. All plate counts performed in duplicate using nutrient agar incubated at 35°C for 72 hours. Results reported as mean ± standard deviation. Media sterility controls showed no growth.

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Table 2. Survival of methicillin resistant *Staphylococcus aureus* ATCC 33591 inoculated at 1.2 x 10^6 cells ml^{-1} in the presence of 1 and 10% 75 ppm Mesosilver colloidal silver.

75 ppm Mesosilver (%)	CFU ml^{-1}		
	2 h	5 h	24 h
0	$1.5 \times 10^6 \pm 8.1 \times 10^4$	$1.2 \times 10^6 \pm 1.6 \times 10^5$	$2.0 \times 10^2 \pm 1.3 \times 10^2$
1.0	$9.0 \times 10^5 \pm 3.9 \times 10^4$	$4.7 \times 10^4 \pm 6.5 \times 10^4$	<1
10.0	$2.4 \times 10^5 \pm 2.7 \times 10^4$	<1	<1

All treatments performed in triplicate in 0.35% NaCl incubated without continuous mixing at 35°C. All plate counts performed in duplicate using nutrient agar incubated at 35°C for 72 hours. Results reported as mean ± standard deviation. Media sterility controls showed no growth.

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Purest Colloids, Inc. Product Efficacy Phase II – p. 4 (Raw Data-MR S. aureus)

Treatment	Time Point (hours)					
	2		5		24	
	Colony Count	Dilution Factor	Colony Count	Dilution Factor	Colony Count	Dilution Factor
0.35% Saline-1	140/132	10,000	103/105	10,000	2/0	100
0.35% Saline-2	164/135	10,000	132/120	10,000	5/2	100
0.35% Saline-3	145/154	10,000	134/137	10,000	2/1	100
1.0% 20ppm Mesosilver-1	110/106	10,000	87/75	10,000	0/0	1
1.0% 20ppm Mesosilver-2	100/110	10,000	77/90	10,000	2/2	1
1.0% 20ppm Mesosilver-3	105/112	10,000	70/50	10,000	0/1	1
10% 20 ppm Mesosilver-1	63/57	10,000	70/84	100	0/0	1
10% 20 ppm Mesosilver-2	80/77	10,000	122/95	100	0/0	1
10% 20 ppm Mesosilver-3	80/70	10,000	46/52	100	0/0	1
1.0% 75ppm Mesosilver-1	86/90	10,000	139/105	1,000	0/0	1
1.0% 75ppm Mesosilver-2	85/104	10,000	20/14	1,000	0/0	1
1.0% 75ppm Mesosilver-3	91/84	10,000	23/27	100	0/0	1
10% 75ppm Mesosilver-1	256/235	1,000	0/0	1	0/0	1
10% 75ppm Mesosilver-2	24/30	10,000	0/0	1	0/0	1
10% 75ppm Mesosilver-3	216/215	1,000	0/0	1	0/0	1

average colony count x dilution factor = colony forming units per ml