

NANO SILVER FACTS

In today's market there are various forms of silver products available for medical use and general wellness. The intention of this paper is to summarize the various products currently on the market and the research that has been conducted on them. The features of the Ag4O4 molecule sold under the names SilverSol®, Silver Biotics® and ASAP Silver made by American Biotech labs are specifically focused on in this paper as well as the research related to this product.

With COVID-19 making headlines and disrupting our lives today, there is a lot of confusion about...essentially everything. Colloidal silver is also making headlines and much confusion is surrounding this as well. I am hoping that by explaining the differences in various types of colloidal silver products currently available this will help to reduce some confusion. Research specific to the SilverSol product is outlined below.

DIFFERENT TYPES OF SILVER PRODUCTS

Silver is one of the most broad-spectrum antimicrobial elements that exist as it can kill a wide variety of pathogens such as harmful bacteria, fungus, yeast, and mold. It will also neutralize virus and a number of protozoa. It is for these reasons that silver is used extensively in wound care products and medical devices to prevent infection. Antibiotics have an ability to kill different types of bacteria but they cannot kill bad types of yeast like candida or kill viruses. The patented Ag4O4 molecule has demonstrated the ability to kill these pathogenic bacteria, yeasts and viruses in numerous research studies and in over 20 years of clinical use.

- **UNDERSTANDING PARTICLE SIZE**

The argument over particle size is mostly for marketing. The theory behind the argument is that as you break down silver into smaller and smaller particles you increase the surface area. By increasing the surface area, it could increase the effectiveness of the product because there would be more silver exposed to the surrounding environment. This is true to a point, but as the silver particles become smaller and smaller particles, they reach a point where they can no longer maintain their molecular structure as a metal and they become ionic or just a single silver ion.

- **UNDERSTANDING PARTS PER MILLION (PPM)**

Silver content in supplement products is usually stated as "parts per million," (or ppm). If a product's label states that it has a 10 ppm silver content, this means that for every million parts water, there are 10 parts of silver. A 22ppm content means for every million parts of water there are 22 parts of silver, etc.

- **COLLOID VERSUS SOL**

A colloidal solution is defined as "particles larger than a molecule in size, suspended in a second solution". A colloidal is a mixture that has particles ranging between 1 and 1000 nanometers, yet are still able to remain evenly distributed throughout the solution. A sol is a type of colloid where the particle size ranges from 1 nanometer to 100 nanometers. Sols do not separate or settle over time. Ionic colloidal products tend to separate, evidenced by silver particles collecting in the bottom of the bottle.

DIFFERENT TYPES OF SILVER PRODUCTS

There are many different types of silver products, but for the most part there are only three that make up the majority available in the health care market today:

- Ionic silver products
- Ionic silver protein products
- Metallic Nano particles

1. IONIC SILVER

Ionic silver is one of the most common forms of silver liquid found in the supplement industry today. Many ionic silver products are made by diluting chemical forms of silver, like silver nitrate, to a desired use level or parts per million (ppm). Although ionic silver products have the smallest particle size, they are often the least stable and can easily fall out of suspension and end up in the bottom of the bottle.

Each silver ion is missing an electron which it means it has a plus one charge. These silver ions want their electrons back so they steal them from the cell wall of a bacteria, essentially poking holes in the bacteria's cell wall. If enough silver ions poke enough holes in the cell wall, the bacteria dies. But each silver ion can only steal one electron and then it becomes neutralized. Therefore ionic silvers are called "a one and done technology".

Ionic silver products are often marketed under names like Colloidal silver, Bio Active Silver Hydrosols or Ph balanced silvers.

2. IONIC SILVER PROTEINS

Mild silver proteins are another form of ionic silver. The difference is that because ionic forms of silver are not generally stable and they usually contain large amounts of silver, they sometimes need to be bound to a protein to stay in suspension.

Silver proteins help the ionic silver stay suspended in the water for longer periods of time. However, as a result of this binding with protein, the silver ions are less functional than traditional ionic silver ions. Consequently, higher levels of silver (ppm) are needed to obtain the desired effect. Sometimes hundreds or even thousands of ppm of silver are added to mild silver protein products to help them be more effective.

These products are often touted as being more effective because of the higher silver content. In reality they are not, because the protein inhibits the silver's ability to work. The key to remember with silver proteins is that more silver in a product does not necessarily make it better or more effective.

3. METALLIC NANO PARTICLES

Metallic Nano forms of silver are the most stable form of silver. They are highly effective and work by multiple modes of action and are not as easily affected by outside forces. They can remain stable for many years and can kill bacteria and other pathogens at very low levels of silver concentration. These are not ionic particles but rather Nano particles. And because they do not harm beneficial microbes, this makes them an excellent choice as a first-line-of-defense to use against an infection. Since they are over 90% effective on most pathogens, the need for antibiotics is greatly reduced.

SilverSol and the Ag4O4 molecule

This is a patented Nano silver molecule. It remains stable for very long periods of time and in various conditions. It even remains stable even if it is frozen or boiled. The multiple modes of action include:

- Multivalent silver oxide coating
- Ability to steal many electrons per molecule
- Emission of a resonant frequency equal to ultra violet light

1. Multivalent silver oxide coating

These special Nano particles are coated with a multivalent silver oxide coating or “skin” [\(1\)](#) [\(2\)](#). With this outer coating, this new silver particle is attracted to the surrounding water molecules, and as such, becomes semi-bound to the structure of the water molecules. This makes the silver much more stable and bioavailable than other types of silver particles.

2. Ability to steal many electrons per molecule

Additionally, the unique coating on the Ag4O4 molecule gives these silver particles the ability to steal 8 electrons for each silver molecule instead of just one, unlike regular silver. Each Nano particle is covered with thousands of these super action oxide molecules, making them virtual pathogenic killing machines. Think using a machine gun versus using a hand gun.

3. Emission of a resonant frequency

Pathogenic microbes are also killed by the emission of specific resonant frequencies. The frequency of the Ag4O4 molecule has been measured to vibrate at between 200–300 nanometers, which is the same vibrational frequency as ultraviolet light. This means is that the Ag4O4 molecules put out a wave of energy into water or other liquids that can kill bacteria and other pathogens that it doesn't actually have to come physically in contact with. This gives the product the extra ability to penetrate biofilms which has a very significant effect on healing both acute and chronic conditions.

RESEARCH AND PEER REVIEWED PUBLICATIONS

COMPARISON OF DIFFERENT IONIC SILVERS AND COLLOIDAL SILVERS

Brigham Young University's Microbiology Department did a study to compare commercial colloidal silver products. In their report, they found that almost all of the products were chemical or ionic forms of silver [\(3\)](#). Most were found to be very unstable and that the silver in them could and did fall out of solution or the suspension very quickly.

In comparison tests the Ag4O4 Nano particle was at least 2–3 times more effective at killing bacteria than the ionic forms of silver in the commercial colloidal silver products and remained very stable over time.

THE SAFETY OF SILVER USAGE

The EPA (Environmental Protection Agency) is the governing body to assess the toxicity of most products. In a document called the RED document (Registration Eligibility Document) states that the daily recommended intake limit on silver is .005/mg/kg. This means an average sized adult could safely drink up to an ounce (six teaspoons) of a 10 ppm silver product every day for their entire life, and that amount would be deemed safe by U.S. EPA standards.

Silver is not a heavy metal and has been used for hundreds of years in traditional cultures as a preservative and to prevent spoilage.

There have been some extreme cases where people have consumed large amounts of the ionic silver product daily over years of use, causing the silver to build up in the body and cause a condition called argyria (blue man syndrome). Even with ionic silver products it is very difficult to overdose to the point where you can show symptoms of argyria. This has been proven to be not possible with the SilverSol in numerous toxicity studies (14). SilverSol has been found to completely wash out of the body after 24 hour of ingestion.

HUMAN INGESTION TOXICITY STUDIES

In 2013, a ground breaking study was published and was the first ever single blind human ingestion study on silver (2). The study tested the safety of humans drinking SilverSol at 10 ppm and HealthMax 30 ppm liquid (HealthMax 30 is prescription only). The 60 people drank about 3 teaspoons of the silver products daily for 14 days. The study concluded that drinking either the 10 or 30 ppm silver Nano particle supplements had no negative effect on any system in the body. It was also found that after drinking the products, the silver hit its high point in the blood in about two hours, and the Nano silver washed out of the body in 24 hours.

Another human study also assessed blood platelet cells for any negative action. It was found that the silver had no negative action or effect on the blood cells (4).

STUDIES ON VARIOUS STRAINS OF PATHOGENS

1. Studies on bacteria

Testing has also proven that the Ag4O4 silver will kill numerous deadly forms of bacteria. Testing has been done on specific bacteria including the following: Anthrax; Tuberculosis; E. coli; Salmonella; Y. pestis (the bacteria that causes Bubonic Plague (6)); H. influenza; numerous different strains of streptococcus; and many other pathogenic bacteria too numerous to list here.

Other tests have shown that the Nano silver Ag4O4 molecule can kill numerous deadly forms of bacteria like MRSA, even when using the 10ppm liquid in significantly smaller doses (5).

2. Studies on yeast and fungus

Studies have also shown that silver Nano-particles, in the right form, can kill pathogenic yeasts like Candida Albicans as well as other yeasts (7). Candida causes problems like vaginal yeast infections, diaper rash, dysbiosis and a number of other common problems.

The Ag404 Nano-particles can also kill different kinds of mold and environmental fungus like black mold. Black mold plagues many houses and office buildings in the United States, causing upper and lower-respiratory-tract infections among family members and employees. In test-tube testing all pathogenic organisms were killed with small amounts of the Ag404 Nano-particles (8).

3. Studies on virus

Silver Nano-particles can also kill or neutralize virus like Hepatitis C., SARS, Beijing flu, three different types of Bird flu including the deadly H5–N1 type (9).

There are current studies underway by several groups who are studying the effectiveness of SilverSol (the Ag404 molecule) with Covid-19. We are all anxiously awaiting these results. Even though Covid-19 is considered to be a “novel” virus, the fact that the Ag404 molecule was very effective on SARS (also a corona virus) feels very encouraging.

Three additional human studies have been completed for a total of 124 patients that demonstrate the Ag404 molecule acts as an effective immune enhancing product. The information from this testing was released to the public by the US Congress in the form of a US Congressional Testimony (10).

EFFECTIVENESS IN COMBINATION WITH ANTIBIOTICS

The intention of the producers of this product is that the SilverSol is used as a first-line-of-defense for immune support and to save antibiotics for those rare times when they may really be needed. Most pathogenic problems may potentially be solved with appropriate use of an effective silver. But when death of a loved one is on the line because of a disease or infection, sometimes it is time to pull out all the stops to really attack the problem. A 2013 study showed that mixing Nano silver with antibiotics could make some of the antibiotics as much as 1000 times more effective (11).

One scientific report (12) goes one step further. This report found that by combining the Nano silver with antibiotic therapy it had an added value to all of the 19 antibiotics tested using seven different pathogens. When combining a course of antibiotics with the 32ppm ABL liquid the effectiveness of the antibiotic was made significantly stronger in 94 of the 96 of the tests. What is more interesting is that adding the Nano silver liquid killed all tested pathogens and avoided the development of resistance to the antibiotic. The researchers concluded that in the most difficult cases it may be best to double up on the disease or infection by using both antibiotics and the Nano silver product at the same time.

DOES NOT HARM PROBIOTICS

One of the most remarkable and powerful features of the Ag404 molecule is that is able to kill pathogenic microbes and yet spare the healthy, beneficial ones. Studies were done to compare ionic silver products with the Ag404 molecule and their ability to either kill or to spare probiotics (your beneficial microbes). They found that ionic silver products killed probiotics at a concentration of 3ppm. In the Ag404 molecule tests the probiotics were not killed until concentrations starting at 36ppm were used. The highest concentration of SilverSol® currently used is 30ppm (28).

WOUND CARE

This is one of the primary and most powerful uses of the SilverSol products. The Ag404 molecule has been shown to help wounds heal that will not normally heal. It also demonstrates the ability to heal regular wounds in about half the normal time ([13](#)). Its effects with wound care are very dramatic ([15](#)) ([17](#)) ([18](#)).

The following is a link to compare the effectiveness with ArmorGel with other wound care products ([16](#)).

CONCLUSION

Silver is an effective broad-spectrum antimicrobial agent and it can kill many different types of problem bacteria, yeast, fungus, parasites, and it can neutralize certain virus. There are many different types of silver products on the market, and there is a wide difference in the effectiveness of different types of silver products. Metallic Nano silver is the most effective type of silver technology on the market today and the most widely researched. The SilverSol® Ag404 particle has:

- Over 400 independent studies performed by more than 60 leading laboratories and universities
- 30 safety reports and studies
- 3 published and FDA cleared human ingestion studies
- 20+ peer-reviewed and published scientific and medical journal articles
- Thousands of case studies on SilverSol Technology

REFERENCES:

1. Rustum Roy, M. Richard Hoover, A.S. Bhalla, Tania Slawecki, et al., Ultradilute Ag-Aquasols with extraordinary bactericidal properties: the role of the system Ag-0-H₂O, Current Science Investigation 2007.
2. Munger MA., Radwanski P., Hadlock GC., Stoddard G., Shaaban A., Falconer J., Deering-Rice CE., Nanomedicine, June 28, 2013. In vivo human time-exposure study of orally dosed commercial silver Nano Particles
3. David A. Revelli, June 18, 1999. Brigham Young University. Nano Silver vs. three commercial colloids.
4. Smock Jk. Schmidt RL. Hadlock G. Stoddard G. Grainger DW. Munger MA. Assessment of orally dosed commercial silver Nanoparticles on human ex vivo platelet aggregation. May 2, 2013. University of Utah
5. Pedersen G. Silver Sol and the Successful Treatment of Hospital Acquired MRSA in Human Subjects with Ongoing Infection. Anti-Aging Therapeutics, Vol. 11, Chapter 35, pgs. 295-300.
6. R. Robinson, 2003. Bactericidal activity of ASAP Silver Solution on Yersinia Pestis, the etiological agent of plague. Department of Microbiology, Brigham Young University
7. C.G. Laboratories, April 8, 2010. Antimicrobial Time Kill Study Report. Eight pathogens including; Candida a., MRSA, VRE, etc. Challenge levels of 1-3 billion pathogens/ml. 90%+ kills at 5 min, at 10, 20, 30 ppm levels.
8. Nelson Labs - June 10, 2005. Antimicrobial testing – Hard surface. Kill times against Candida a., Trichophyten m., Aspergillus n., and Stachybotrys c., a type of black mold.
9. G. Pedersen, Effect of prophylactic treatment with ASAP-AGX-32 and ASAP Solutions on an avian influenza A (H5N1) virus infection in mice, JSHO August 17, 2008. Note- HIV data is the editor's note at the first of the article.
10. William D. Moeller, U.S. Subcommittee on Africa Global Human Rights and International Operations. Committee on International Relations House of Representatives. April 26, 2005. Malaria and TB: Implementing Proven Treatment and Eradication Methods. Written testimony on Malaria
11. J. R. Morones-Ramirez, J.A. Winkler, C.S. Spina, J.J. Collins. Silver Enhances Antibiotic Activity Against Gram Negative Bacteria. Sci. Transl. Med. 19 June 2013, Vol. 5, Issue 190. A. De Souza, D. Mehta, R. W. Leavitt, Bactericidal activity of combinations of Silver-Water Dispersion with 19 antibiotics against seven microbial strains, Current Science. NO. &. October 2006
12. G. Pedersen, Keith Moeller, Silver Sol improves wound healing: Case studies in the use of silver sol in closing wounds (Including MRSA), preventing infection, inflammation and activating stem cells
13. G. Pedersen, Keith Moeller, Silver Sol improves wound healing: Case studies in the use of silver sol in closing wounds (Including MRSA), preventing infection, inflammation and activating stem cells
14. Nichols, NAMSA ,Toxicity Tests, - 200 times normal adult dosage, July 7, 1999
15. <https://a2p214daysk2lcyxv62818v6-wpengine.netdna-ssl.com/wp-content/uploads/2018/07/Arm-and-Hand-Wound-Case-Study.pdf>
16. https://a2p214daysk2lcyxv62818v6-wpengine.netdna-ssl.com/wp-content/uploads/2018/11/SB_ArmorGel_Comparison_Sheet_10_18.pdf
17. <https://a2p214daysk2lcyxv62818v6-wpengine.netdna-ssl.com/wp-content/uploads/2018/11/Diabetic-Foot-Burn-Case-Study-pdf>
18. <https://a2p214daysk2lcyxv62818v6-wpengine.netdna-ssl.com/wp-content/uploads/2018/11/Head-Wound-Case-Study.pdf>

ADDITIONAL REFERENCES

19. David A. Revelli, C. G. Lydixsen, J. D. Smith, R. W. Leavitt, A unique Silver Sol with broad antimicrobial properties, JSHO Vol 3 April 2011
20. Holladay et al., United States Patent No.: 7,135,195 B2, Treatment Of Humans With Colloidal Silver Composition, November 14, 2006
21. G. Pedersen, B. M. Hedge, Silver Sol completely removes malaria parasites from the blood of human subjects infected with malaria in an average of five days, The Indian Practitioner, Vol. 63 September 2010
22. Sheri C. Patel Research Centre, Oral Mouse Model Tests at 50, 500, 5000 mg/kg
23. Dr. Sherrill Sellman, A Silver Lining for Women's Health. Total Health Magazine. Volume 30, No. 5 Pg. 24-26.
24. A .Hafkine, 2003. ASAP antiviral activity in Hepatitis B; DNA Polymerase Inhibition, Reverse Transcriptase Inhibition. Hafkine Institute for Training, Research and Testing.
25. FDA ASAP Wound Dressing Gel- date cleared 04/02/09
26. Viridis BioPharma – March 2003- June 2003, Cytotoxicity of ASAP 10 and 22 ppm against both a Vero cell line and also a Hep2 cell line
27. Ron W. Leavitt Ph.D., February 18, 2009. SilverSol prevents Microorganisms from Becoming Resistant, a Discussion.
28. ViridisBiopharma report prepared for American Biotech Laboratory; Selective interaction of ASAP Silver on Probiotics.
<https://www.faim.org/selective-inaction-of-asap-on-probiotics>